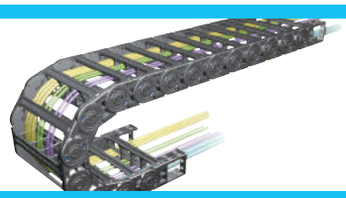
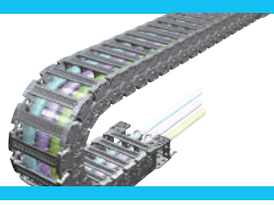
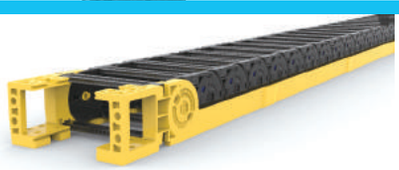
Product information, Company information, Application, How to select product — A

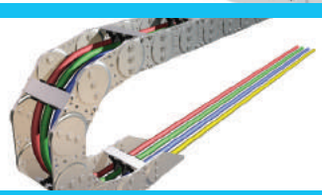
CPS CABLECHAIN (mini) — B

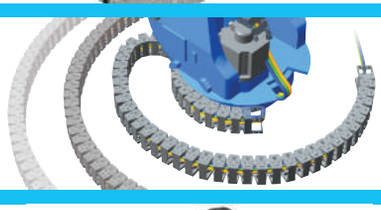

Shift Chain — C


Sabin Chain — D

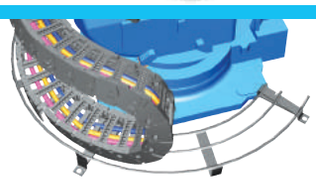

Unity systems — E

Guide channel system — F


Steel chain — G


Revolving chain — H

Roboway, ROBO-KIT — I


Helix Chain — J

Flexible tube — K

Connector — L

PRODUCT APPLICATION :

To protect industrial cable in various industrial circumstance,
CPS has diverse and wide solutions.

- **Gantry Crane**
- **Transfer Crane**
- **Goliath Crane**

C-77 page

Sabin Chain Skid Type at Goliath Crane

Goliath Crane

C-71 page

▲ Shift Chain Roller Skid Type at Goliath Crane

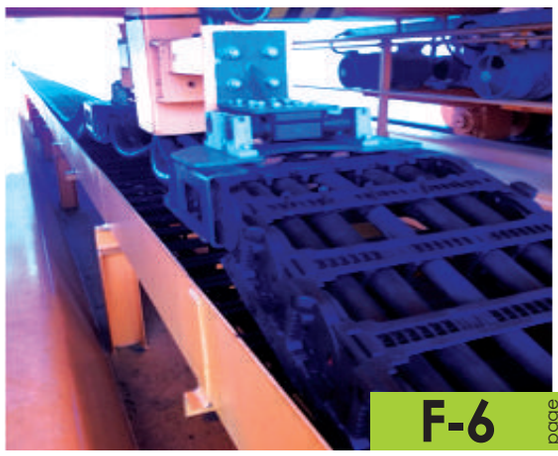
D-77 page

▲ Sabin Chain Skid type at Goliath Crane

Crane

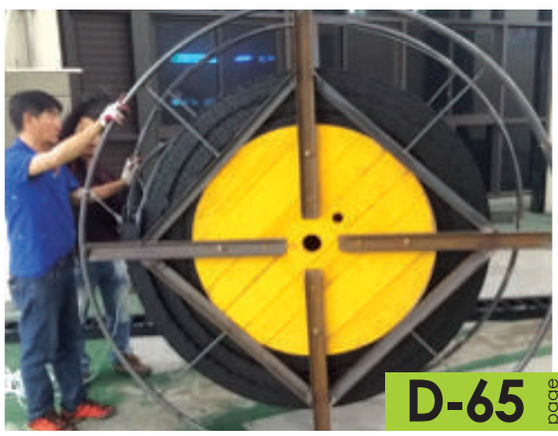
C-75 page

▲ Sabin Chain Skid type at Crane



F-6 page

▲ Special Moving Arm at Crane



D-65 page

▲ Sabin Chain applied to winding equipment for long stroke cable chain

Primary Customers

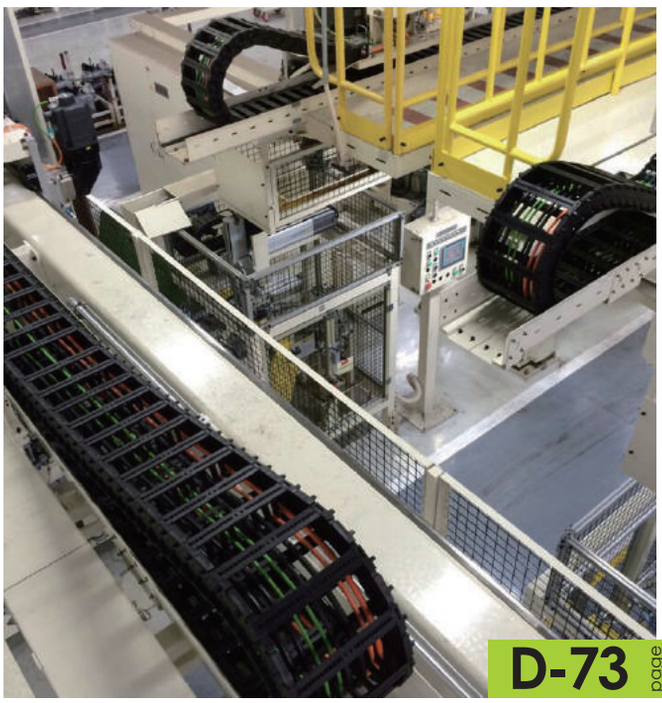
SAMSUNG HEAVY INDUSTRIES

DSME

HANJIN SHIPPING

KONECRANES

Gantry Loader ※ Suitable for high speed and long stoke.


D-73 page

▲ Sabin Chain Skid type

D-75 page

▲ Sabin Chain Skid type

C-67 page

▲ Shift Chain Roller Skid type

C-13 page

▲ Shift Chain Normal type

D-45 page

▲ Sabin Chain Normal type

Robot Carriage

D-77 page

▲ Sabin Chain Skid type

D-17 page

▲ Shift Chain Normal type

Primary Customers

HYUNDAI
KIA MOTORS
HYUNDAI WIA
SAMSUNG
RENAULT SAMSUNG MOTORS
HYUNDAI POWERTECH
GM
DRB Fatec
SUNGWOO HITECH

※ Our cable chain is suitable for robot carriage cables.
We are supplying our cable chain for gantry loader and robot carriage lines from 2007.

Boarding Bridge

D-75 page

▲ Sabin Chain Skid Type

Railway Train, Subway

K-6 page

▲ CPS FLEX

L-7 page

▲ CPS FIX

Industrial Vehicles

C-9 page

▲ Shift Chain Normal at special vehicle type

C-13 page

▲ Shift Chain Normal type at high place operation car

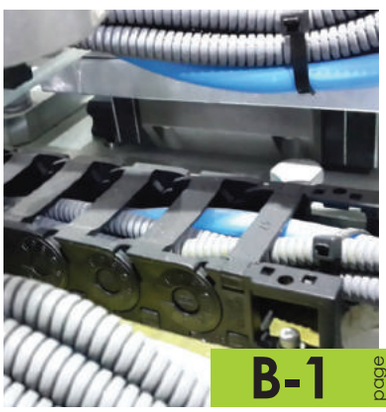
G-5 page

▲ Steel Chain at high place lift car

K-4 page

▲ CPS FLEX, CPS FIX at high place lift car

Machine Tools



B-1 page

▲ CPS CABLECHAIN (mini)

C-3 page

▲ Shift Chain Normal type

D-35 page

▲ Sabin Chain Normal type (nsb)

C-21 page

▲ Shift Chain Enclosed type

D-51 page

▲ Sabin Chain Enclosed type (nsb)

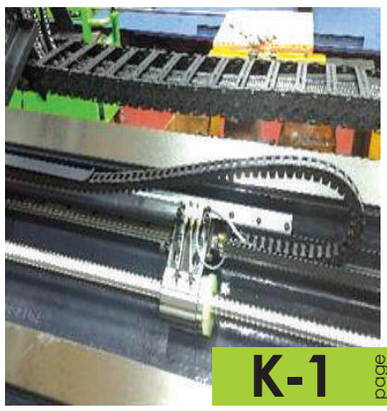
K-1 page

▲ CPS FLEX

Machine Tools

K-1 page

▲ CPS FLEX



K-1 page

▲ Revolving Chain

Primary Customers

DOOSAN

HYUNDAI WIA

HWACHEON

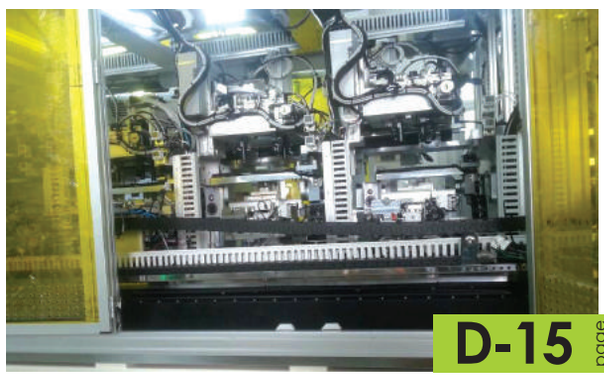
YUDO-ROBOTICS

Hanwha Corporation/Machinery

CleanRoom - Circumstance

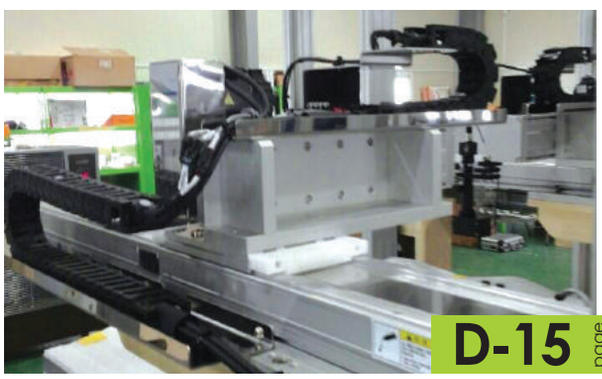
D-15 page

▲ Sabin Chain Clean room type at LCD manufacturing m/c (nsb)



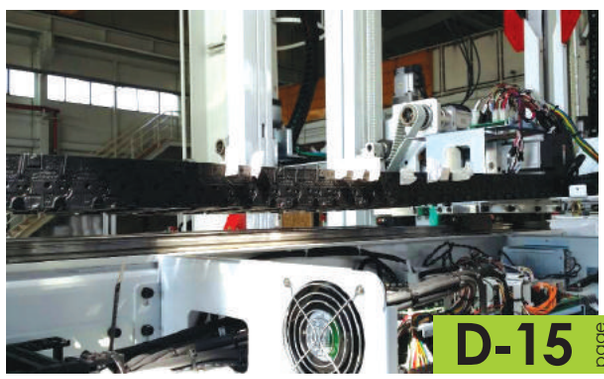
D-15 page

▲ Sabin Chain Clean room type at LCD manufacturing m/c (nsb)



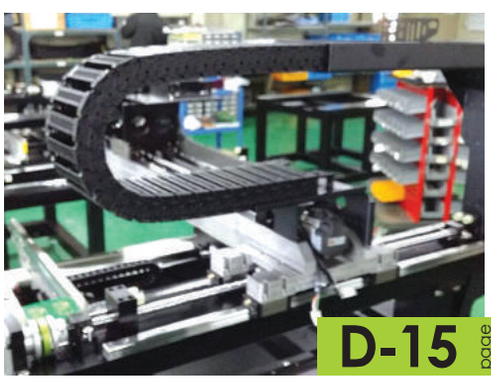
D-15 page

▲ Sabin Chain Clean room type at LCD Printing m/c (nsb)



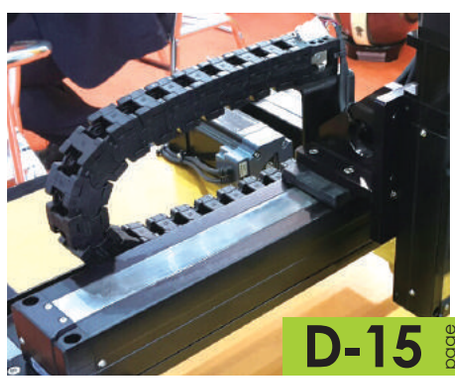
D-15 page

▲ Sabin Chain Clean room type at Purging m/c (nsb)



D-15 page

▲ Sabin Chain Clean room type at Test Machine of LCD Plant (nsb)



D-15 page

▲ Sabin Chain Clean room type at Servo Robot (nsb)

Primary Customers

SAMSUNG ELECTRONICS

LG Electronics

LG Display

SAMSUNG SAMSUNG CORNING PRECISION MATERIALS

PRODUCT APPLICATION :

CPS cable chain is installed for very severe circumstance such as
Thermoeletric power plant with our high quality level and specialists.

D-77 page

Thermoeletric Power Plant

D-77 page

▲ Sabin Chain Skid type (nsb)

C-71 page

▲ Shift Chain Roller Skid type

F-6 page

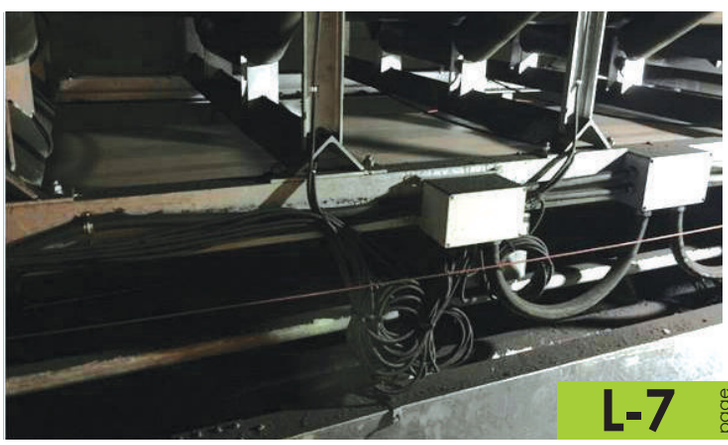
▲ Special moving arm with Sabin Chain Skid type

F-6 page

▲ Special moving arm with Shift Chain Roller Skid type

K-4 page

▲ CPSFLEX



L-7 page

▲ CPSFIX

PRODUCT APPLICATION :

CPS products can be applied to very various circumstances to protect cables.

C-13 page

Shift Chain Normal & Skid type at cereal warehouse in Italy.

Factory, Diverse Circumstances ※ Can be applied to various direction!

D-35 page

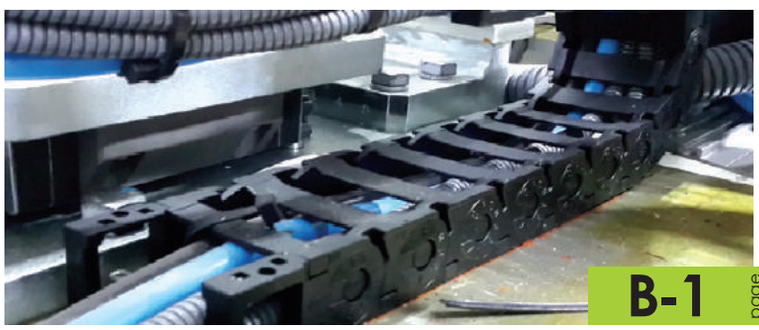
▲ Sabin Chain Normal type at PCTC ship (flame retarding, ESD/nsb Chain)

C-15 page

▲ Shift Chain Normal type at Shipbuilder production line

C-15 page

▲ Shift Chain Normal type (Reiteration)



B-1 page

▲ CPS mini Chain without guide channel

C-13 page

▲ Shift Chain Normal type

C-13 page

▲ Shift Chain Normal type

C-17 page

▲ Shift Chain Normal type

D-35 page

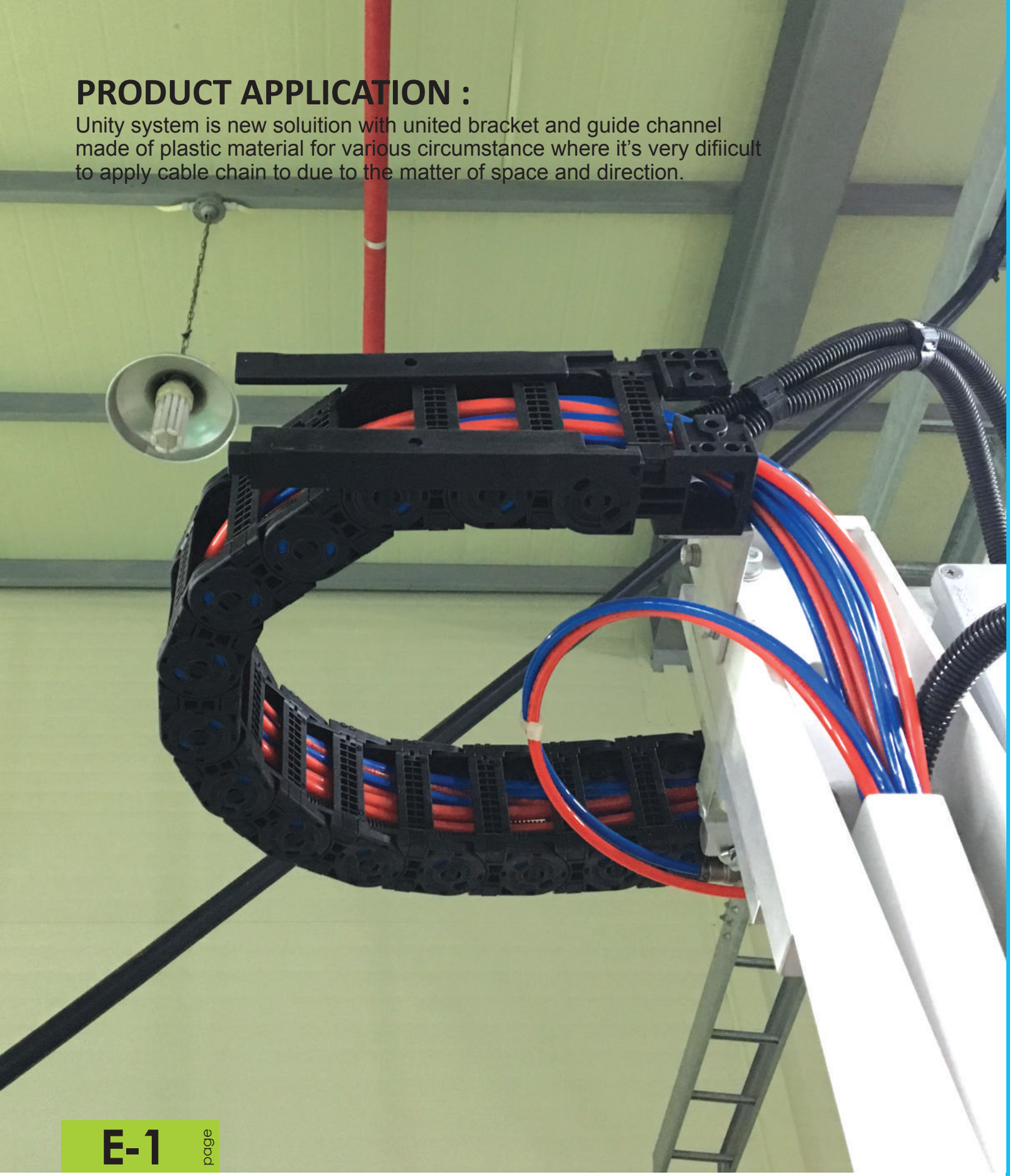
▲ Sabin Chain (nsb Chain)

H-1 page

▲ Revolving Chain

PRODUCT APPLICATION :

Unity system is new soluition with united bracket and guide channel made of plastic material for various circumstance where it's very difiicult to apply cable chain to due to the matter of space and direction.



E-1 page

Unity systems with Shift Chain Normal type.

Installation at Narrow Space

E-6 page

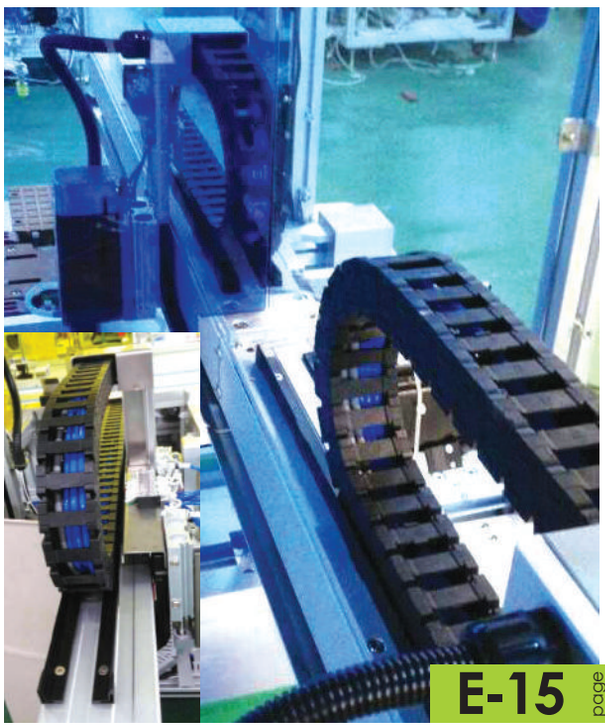
ST072N

Application:
Narrow space, Production line

Location:
China

Remark:
Stroke : 3meters

Date of Installation:
Aug, 2014


E-15 page

nsb022CR

Application:
Parts Factory of Apple

Location:
China

Remark:
Stroke : 1 meter

Date of Installation:
Sep, 2014

E-6 page

ST072N

Application:
Machine tools,
Side mounted

Specification:
ST072N with Unity systems

E-16 page

nsb028CR

Application:
Machine tools,
Horizontal mounted

Specification:
nsb028CR with
Unity systems

E-22 page

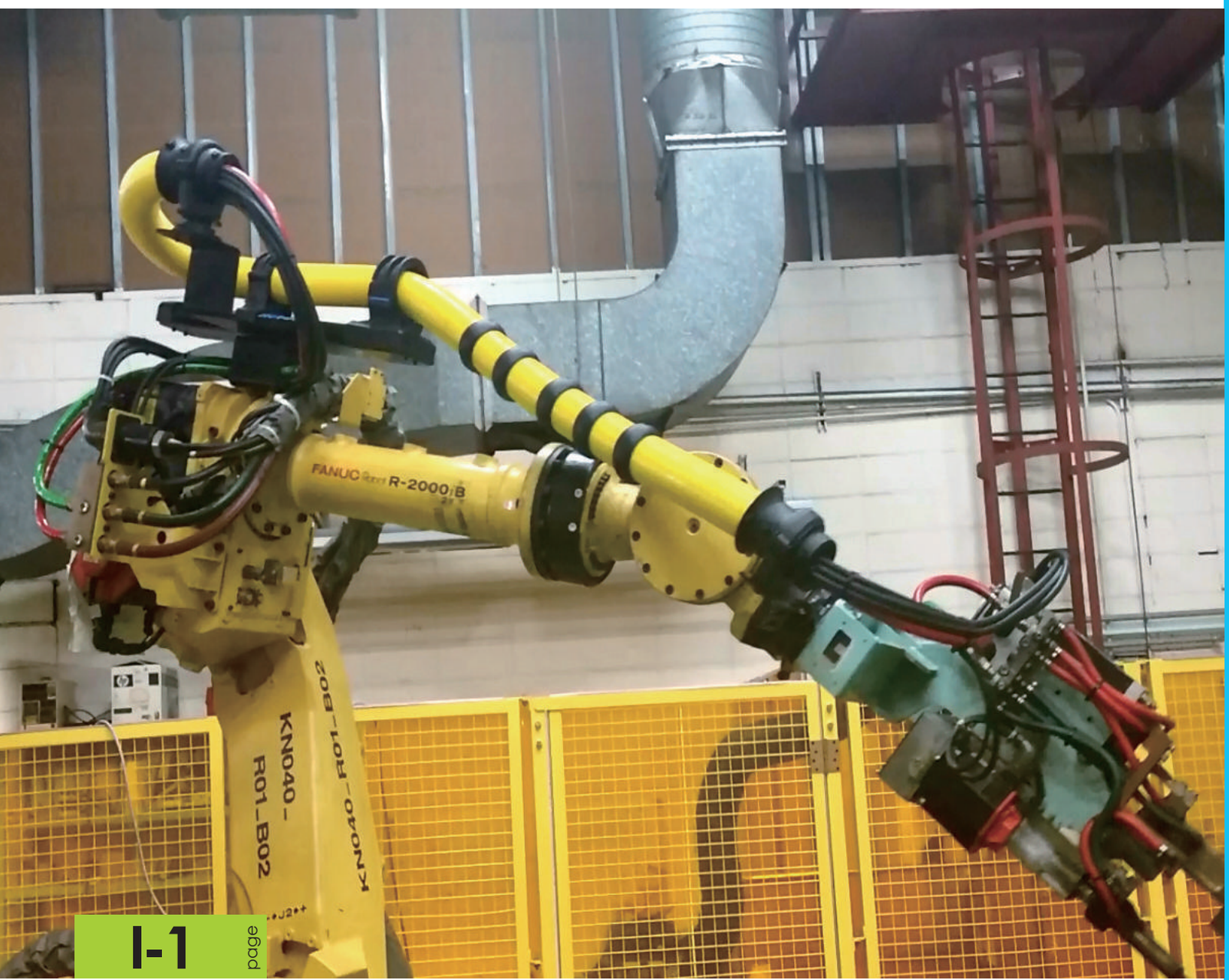
nsb035N

Application:
PCTC ships, Vertical
mounted

Specification:
nsb035N with Unity systems

PRODUCT APPLICATION :

CPS Roboway System is to protect robot cables and hoses.
We are the only one manufacturer of whole components of roboway which is also called robot dresspack in Korea.
We release Roboway system after testing over 2 million times of reliability, which means its quality and durability is guaranteed.



I-1 page

Roboway at a welding robot.

Primary Customers

HYUNDAI
SAMSUNG RENAULT SAMSUNG MOTORS
KIA MOTORS
FANUC
GM
DRB Fatec
HYUNDAI HEAVY INDUSTRIES CO.,LTD.

Roboway

I-1 page

▲ ROBOWAY A type(High priced type) at GM in Korea

△ ROBOWAY at Hyundai Motors in Czech

I-1 page

▲ ROBOWAY in Korea

I-1 page

I-1 page

▲ ROBOWAY B type (Low priced type) at Yaskawa robot

I-1 page

▲ ROBOWAY B ype (Low priced type) at Fanuc robot

I-1 page

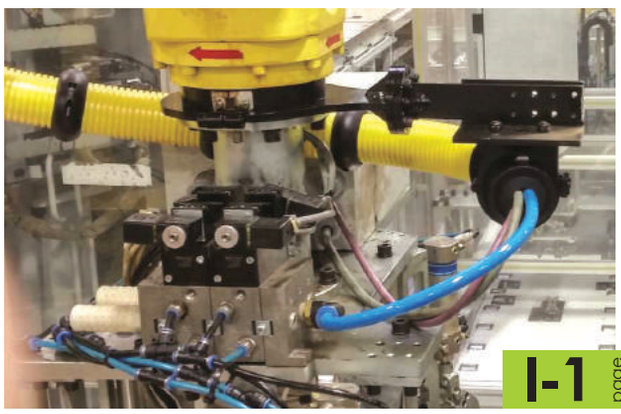
▲ ROBOWAY B type (Low priced type) at Nachi robot

I-1 page

▲ ROBOWAY B type (Low priced type) at Hyundai robot

I-1 page

▲ ROBOWAY A type Brackets (main bracket, sub-bracket)



I-1 page

▲ Components of Roboway (VCG, RKSC, RKS, RKC, RCS)

PRODUCT APPLICATION :

CPS Roboway components, robo-kit and PAR tube, can be applied to Universal robot series. In many industrial circumstance such as machine tool and production line, Universal robot has necessity to protect outside cables and hoses from diverse movement of robot. With our robo-kit, PAR tube and NHF connector, customer can protect outside cables and hoses of UR series.

I-15 page

For Universal robot series.
(Robo-kit and PAR tube)

UR Series with Robo-kit, PAR tube or NFH connectors

I-15 page

▲ Robo-kit & PAR tube for UR series

I-15 page

▲ NFH connector & PAR tube for UR series

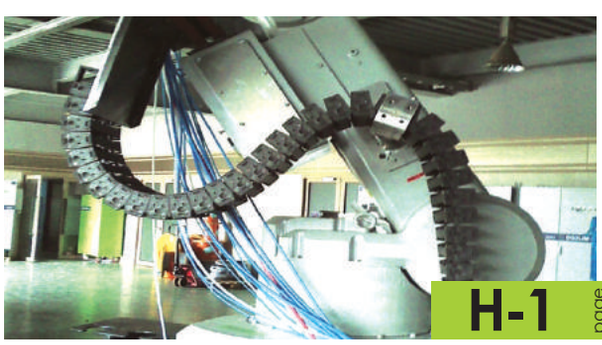
Rotaing Machine, Robot

J-1 page

▲ Helix Chain at Hyundai robot

J-1 page

▲ Helix Chain at Kawasaki robot



H-1 page

▲ Revolving Chain at robot

C-3 page

▲ Zig-zag Chain (Shift Chain)

H-1 page

▲ Revolving Chain at wind power generation equipment

CPS Quality from Reliability Test room

- CPS has a reliability test room in Research Institute building and we are operating this room 24/7.
  The test has effect on making the best product and improvement of our product quality for long time as CPS uses reliability data from this room. There are several equipment and machine for cable chain and also we have a test robot and relevant test equipment for Roboway.

Cable Chain

nsb050S, nsb065S, nsb080S

▶ Specification
Gantry loader

▶ Remark
3m/s, 365days operated

▶ Tested from 2013

Zig-zag type of ST chain

▶ Specification
Zig-zag operation machine

▶ Remark
1m/s, 365days operated

▶ Tested from 2012

**CPSmini, ST-N / E,
nsb-CR / N / E**

▶ Specification
Magnetic linear machine

▶ Remark
3~5m/s, 365days operated

▶ Tested from 2010

**Revolving Chain
Test Equipmnet**

Unity Systems

▶ Specification
Vetical operation machine

▶ Remark
2m/s, 365days operated

▶ Tested from 2013

ST072N, nsb045CR/N

▶ Specification
Linear Test Machine

▶ Remark
3m/s, 365days operated

▶ Tested from 2010

Special Equipment

CPS FLEX & CPS FIX

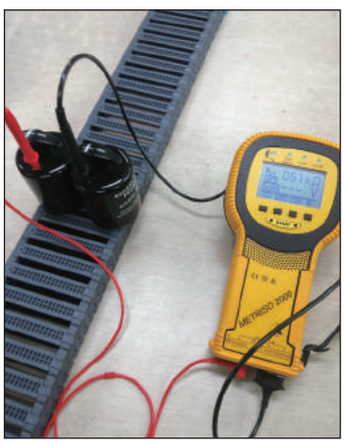
▶ Specification
Pulling-out Test Machine

▶ Remark
Test criteria is UL1696

For raw material

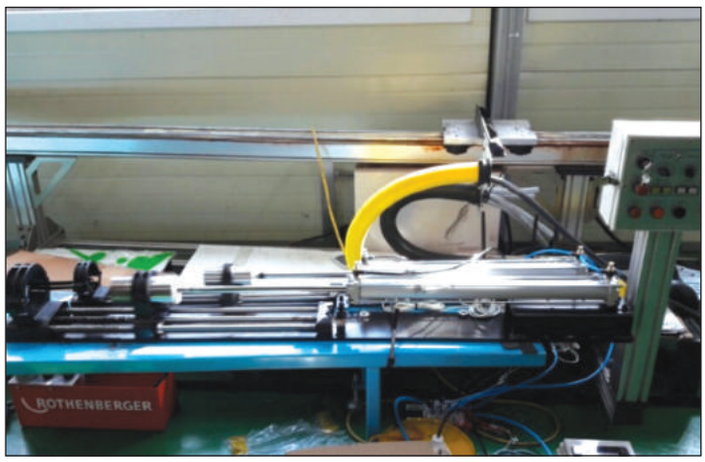
▶ Specification
Impact Strength Equipment

▶ Remark
IZOD, Charpy Test



ESD
Test Equipment

Roboway



PAR-56Y, PAR-48B & Special Springs for Roboway

▶ Specification
Test equipment for robot tube and special springs of Roboway

▶ Remark
Part of Roboway system

▶ Tested from 2015

Roboway-70B

▶ Specification
Test robot

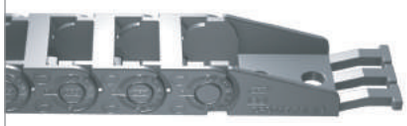
▶ Remark
With weliding cables and hoses

▶ Tested from 2014

CP SYSTEM PRODUCT

CPS CABLECHAIN

Mini type ◀◀B-1 page



Shift chain®

Normal type ◀◀C-3 page

Shift chain®

Enclosed type ◀◀C-21 page

Shift chain®

Sliding type ◀◀C-41 page

Shift chain®

Enclosed Sliding type ◀◀C-45 page

Shift chain®

Roller Sliding type ◀◀C-59 page

Shift chain®

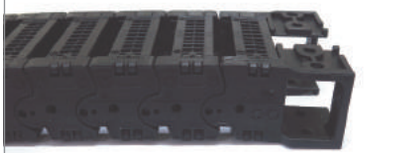
Enclosed Roller Sliding type ◀◀C-75 page

Sabin chain®

asb Clean Room type ◀◀D-3 page

Sabin chain®

nsb Clean Room type ◀◀D-17 page



Sabin chain®

Normal type ◀◀D-35 page

Sabin chain®

Enclosed type ◀◀D-51 page

Sabin chain®

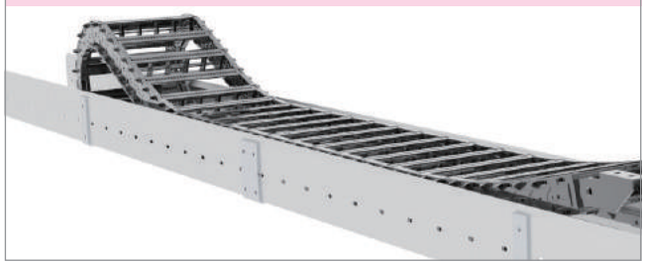
Sliding type ◀◀D-65 page

Unity Systems®

◀◀E-1 page

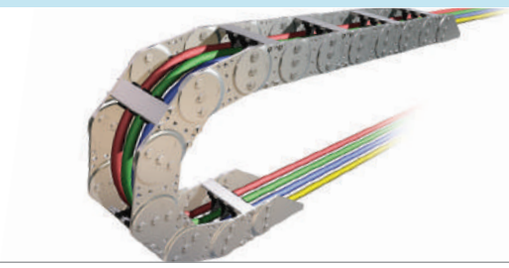
Guide Channel System

◀◀F-1 page



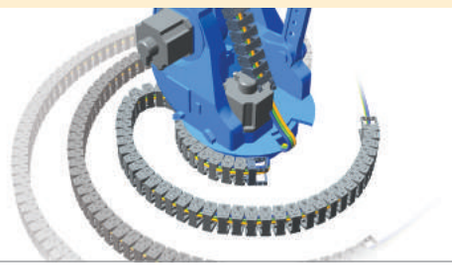
Steel Chain

◀◀G-1 page



Revolving chain

◀◀H-1 page

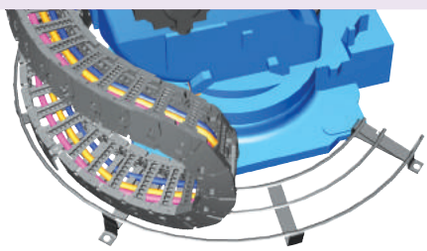


Roboway®

◀◀I-1 page

HeliX chain

◀◀J-1 page



CPSFLEX

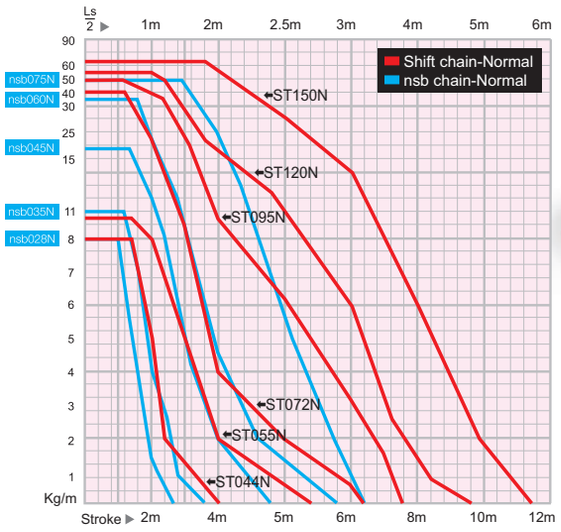
◀◀K-1 page

CPSFIX

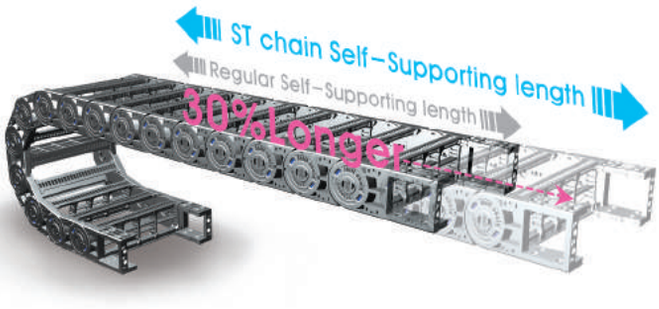
◀◀L-1 page

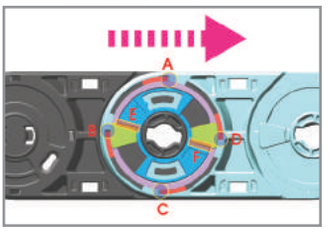
CHARACTERISTIC AND MERIT OF Shift chain®

- Shift chain is the next generation cable of chain developed to protect the inner cables and hoses applied to equipment and machinery of overall industries.
- Shift Chain, with the unique structure, is a new concept that the value of Bending Radius is decided by the independent Bending Radius unit inserted.
- As BR unit(Bending radius unit) has 6 points of supporting area when inserted into side band, *its durability and self-supporting level are 30% longer than previous models and other models of CPS.*

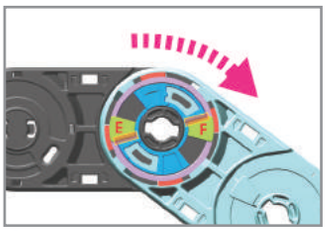


■ Shift chain Self- Supporting Length ■



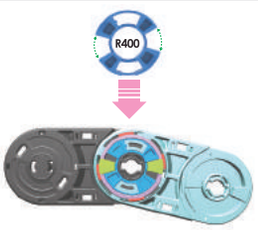
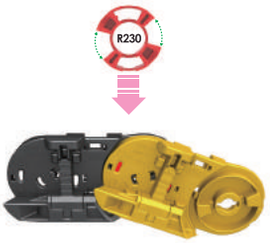
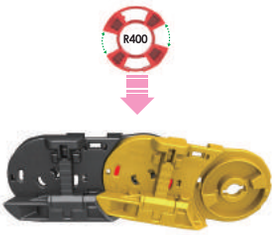


Supporting points when the side bands connected. (A,B,C,D,E,F)

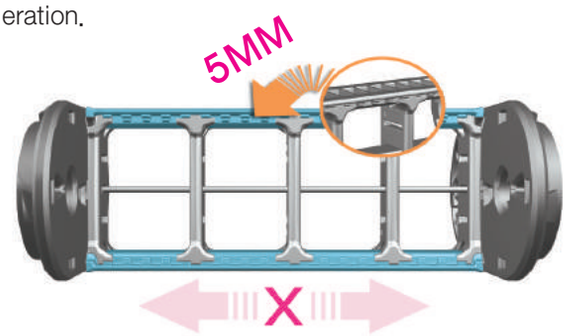


Supporting points when the side bands bent. (E,F)

- Side-band of each model is the same, but BR unit is different to decide Bending Radius value. It's *efficient stock management and cost reduction.*

▶ Shift chain (Normal type)	In R135 BR connection	In R230 BR connection	 In R400 BR connection
▶ Shift chain (Sliding type, Enclosed type)	In R135 BR connection	In R230 BR connection	In R400 BR connection
▶ Shift chain (Roller Skid type)	In R135 BR connection	 In R230 BR connection	 In R400 BR connection

- Frame with teeth every 5mm for long lifetime of cable and stable operation. Divider never moves during operation.



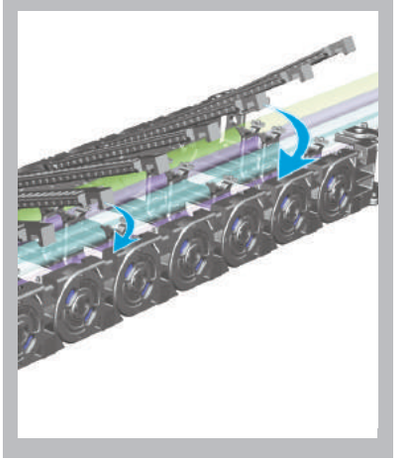
1. Frame with teeth every 5mm!

2. Long life for cable!

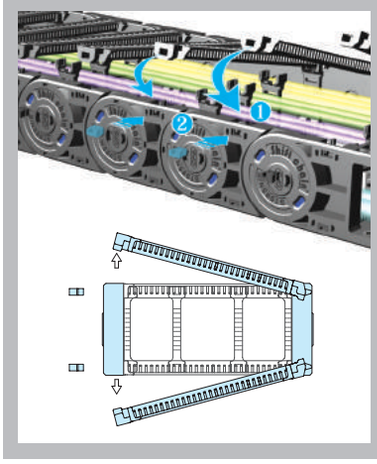
3. Stable operation !

- Hinge type frame to keep stable operation. Frame never break away during operation.

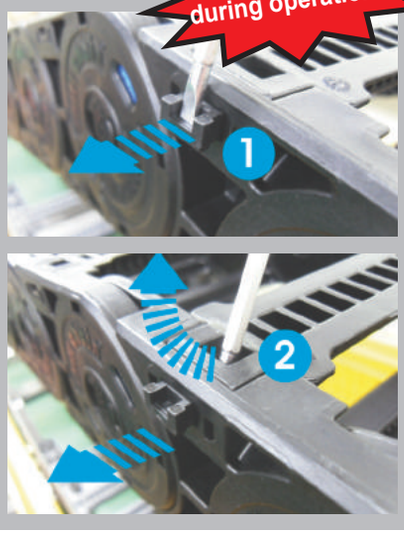
Hinge + Hook Type
: ST044, ST055



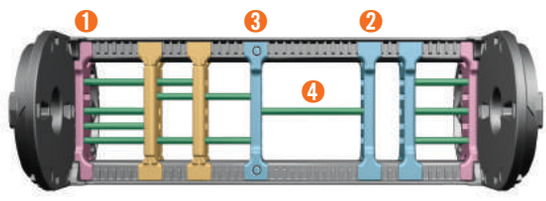
Hinge + Frame Pin Insert Type
: ST072, ST095, ST120, ST150

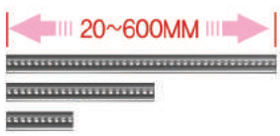


Never breakaway during operation!!



- To make sure of long lifetime of cable, divider is designed not to move during operation. Also, there can be diverse section with dividers and separators.





❹ Separator (SP)

Separator Pin

❶ DV-S

To fix separators at the both side section

If separators used

❷ DV-M

Standard type

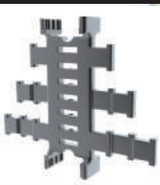
Every second frame

❸ DV-T

To prevent sagging probelem of long frames by using alignment pin.

Every frame (If applicable)

❺ DV-W



Tie-wrap type divider at end bracket part.

Only for End-brackets

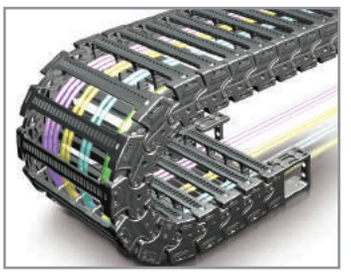
- Shift Chain is produced with high-quality engineering plastic material, which have strong durability and great abrasion resistance, so the chain has less breakage possibility by outside damage and performs stable cable protection in any difficult environment.
As the chain is verified through the tests for electrostatic discharge (ESD) and explosion proof (ATEX-Dirctive 94/9/EC), it can be applied in stability to electric equipment and machinery. Also, the chain is UV-coated, and can protect cable in outside installation of the chain. Furthermore, the chain is produced with high-quality engineering plastic, which include none of the 6 harmful substances (restrictives in the Europe market); Lead(Pb), Cdmium(Cd), Mercury(Hg), Hexavalent Chromium (Cr6+), PBB, PB DEs etc and which is recyclable and harmless both to user and enviornment.

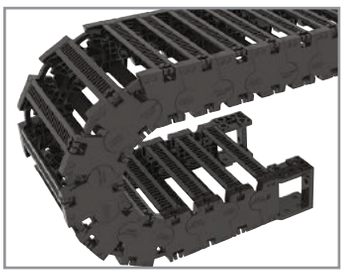
CHARACTERISTIC AND MERIT OF Sabin chain®

- Sabin Chain is new solution for high speed, low noise and low dust exposed ervironment. It also guarantees the great durability during operation. Regarding the Clean room type and Normal type, there are two types of Sabin Chain are available. They are nsb chain and asb chain which are special solution for customers.

Type	nsb Chain	asb Chain
Clean Room Type	■	■
Normal Type	■	■
Enclosed Type	■	
Sliding Type	■	

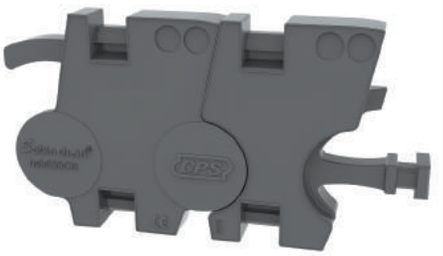
(■ : available)





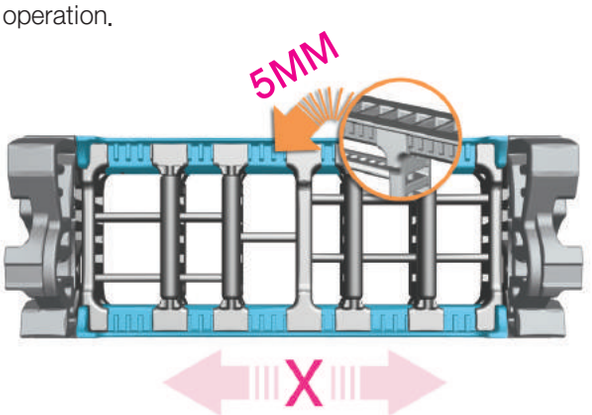
- Sabin chain's side band is holding-band structure that maintains tension at both sides to minimize noise.

nsb chain



asb chain

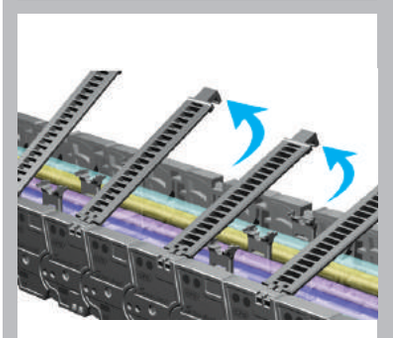
- Frame with teeth every 5mm for long lifetime of cable and stable operation. Divider never moves during operation.



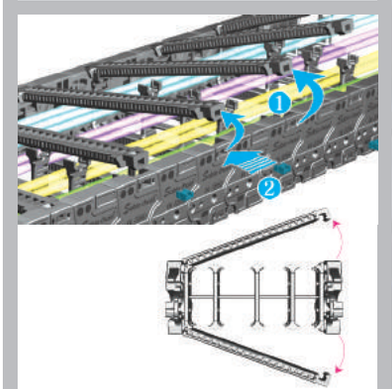
1. Frame with teeth every 5mm!
2. Long life for cable!
3. Stable operation !

- Hinge type frame to keep stable operation. Frame never break away during operation.

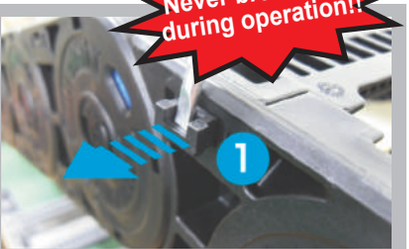
Hinge + Hook Type
: nsb028, nsb035
asb028, asb035

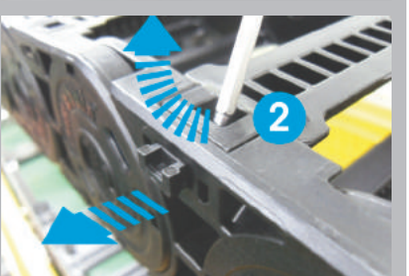


Hinge + Frame Pin Inserted Type
: nsb045, nsb060, nsb075
asb045, asb060, asb075
nsb050S, nsb065S, nsb080S

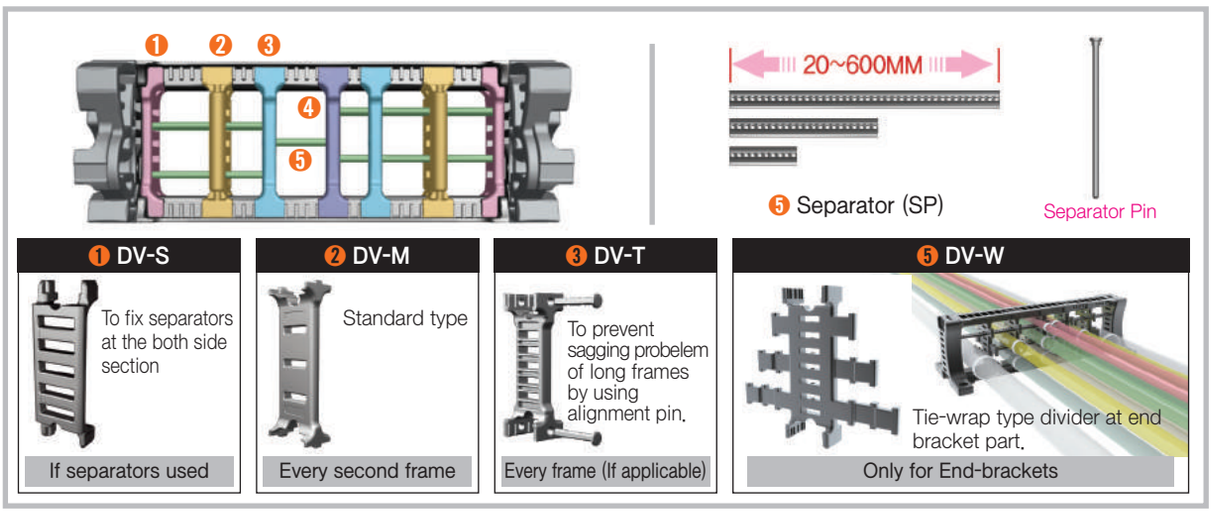


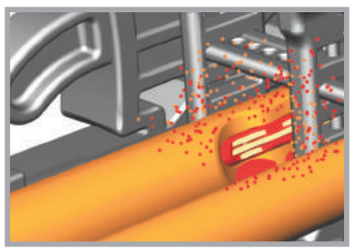
Never breakaway during operation!!



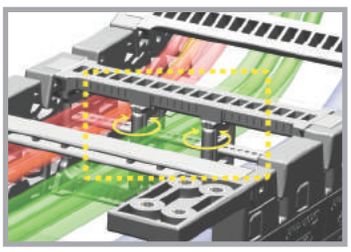


- To make sure of long lifetime of cable, divider is designed not to move during operation. Also, diverse section can be composed with dividers and separators.





▲ Damage to the cables and during operation get dust and dust collects at friction area.

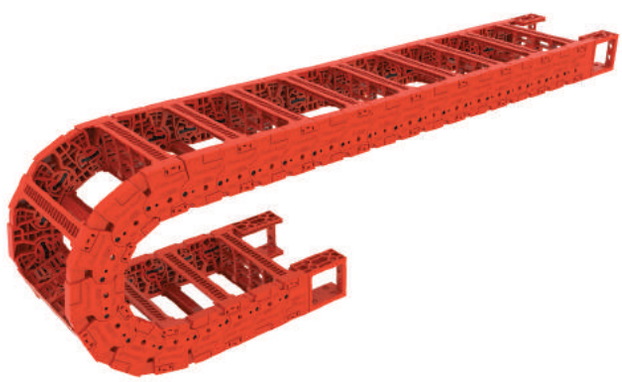


▲ Prevent damage to the cables and reduce dust by using roller type of divider.

- CPS can produce special products according to customer's requests for diverse industrial environment and conditions.

- Sabin Chain is produced with high-quality engineering plastic material, which has strong durability and great frictional resistance, so the chain has less breakage rate from external impact and performs stable cable protection in severe environment.
  As the chain is verified through the tests for electrostatic discharge (ESD) and explosion proof (ATEX-Dirctive 94/9/EC), it can be applied to electric equipment and machinery. Also, the chain is UV-coated, and it protect's cables from exposed environment. Furthermore, the chain is produced with high-quality engineering plastic, which include none of the 6 harmful substances (restricted to the Europe market); Lead(Pb), Cadmium(Cd), mercury(Hg), Hexavalent Chromium (Cr6+), PBB, PB DEs etc and which means CPS cable chain is recyclable and harmless for both user and enviornment.

ESD EX UV RoHS

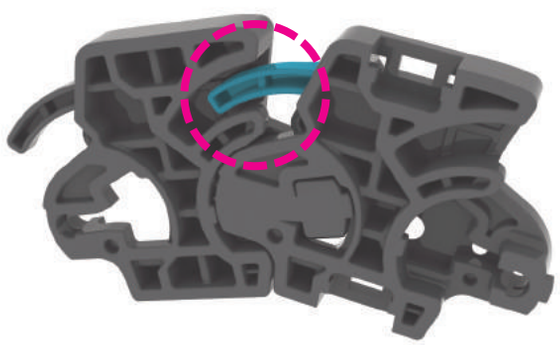


Sabin chain® CLEAN ROOM type

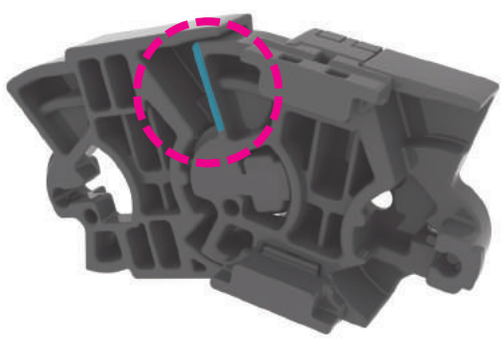
- Sabin Chain Cleanroom type is designed to meet the low noise and low dust required environment which are semiconductor production lines, LCD / PDP production lines, and any application where "cleanliness" and "slience" are regulated by the law.
- High-end technology adapted design of side bands for low noise and low dust.

asb chain

nsb chain



nsb CR type

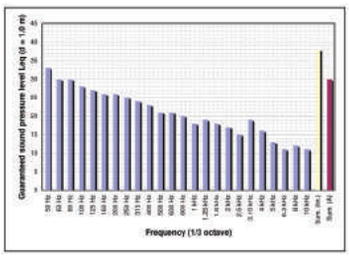


nsb N type

- Can produce ESD product and special color. (which can be produced as customized product.)
- Sabin Chain is produced with high-quality engineering plastic material, which has strong durability and great frictional resistance, so the chain has less breakage rate from external impact and performs stable cable protection in severe environment.
  As the chain is verified through the tests for electrostatic discharge (ESD) and explosion proof (ATEX-Dirctive 94/9/EC), it can be applied to electric equipment and machinery. Also, the chain is UV-coated, and it protect's cables from exposed environment. Furthermore, the chain is produced with high-quality engineering plastic, which include none of the 6 harmful substances (restricted to the Europe market); Lead(Pb), Cadmium(Cd), mercury(Hg), Hexavalent Chromium (Cr6+), PBB, PB DEs etc and which means CPS cable chain is recyclable and harmless for both user and enviornment.

THE QUIETEST CABLE CHAIN IN THE WORLD!

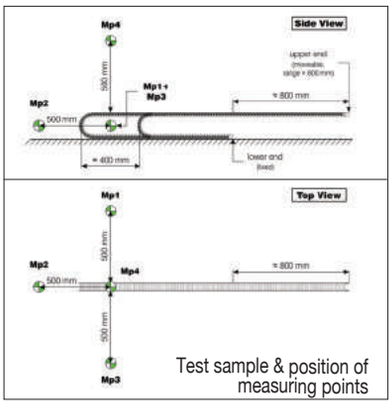
Unsatisfied with only our own internal testing, we sent our cable chain to the experts at the TUV testing facility in Germany and let them decide. The result was 30db noise level. The quietest ever recorded.
It is the patented techniques CPS spends so much time perfecting this astounding accomplishment possible.



3 Measurement Procedure

3.1 Fundamentals

- Date and time of measurements: March 15th 2007
- Environmental conditions:
  - Temperature: 21 °C (indoor, air conditioned)
  - Background noise level: $L_{pA} \leq 29$ dB(A) (air condition off during measurements) ⇒ no correction was made for the influence of background noise (see Annex 2, p. 9)
  - Environmental correction K_{2A}: $K_{2A} = 0$ dB



Test sample & position of measuring points

All measurement results in detail are compiled in Annex 2 (p. 9). The summary below describes the evaluation of the measurements according to 2000/14/EC [1] and the guidelines belong to this directive [2].

• Arithmetic mean of the L_{WA}	(d = 0.5 m (as measured)):	33.1 dB
	(d = 1.0 m (calculated)):	27.1 dB
• Product standard deviation S_P:		0.8 dB
• Estimated comparative standard deviation S_M:		1.0 dB
• Total standard deviation S_t:		1.3 dB
• Confidence level:		95 %
• Quantity of samples:		5
• Coverage factor (see [2], annex A to part 4, table A1):		2.132
• Correction value K (K = S_t x coverage factor):		2.8
• **Guaranteed sound pressure level L_{WA} (d = 1.0 m):**		**30 dB**

Figure 2 shows the guaranteed sound pressure level L_{WA} for frequencies from 50 Hz to 10 kHz (1/3 octave). The values for each frequency band are calculated as given above.

Measurement results

[1] DIRECTIVE 2000/14/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors

[2] Position paper on guidelines for the application of the European Parliament and Council Directive 2000/14/EC on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors, December 2001

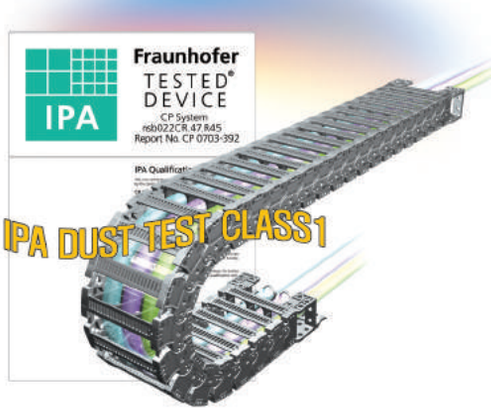
[3] DIN EN ISO 3744 (ISO 3744 : 1995). Acoustics – Determination of sound power level of noise sources using sound pressure – Engineering method in an essentially free field over a reflecting plane, November 1995

[4] DIN EN ISO 4871(ISO 4871 : 1996). Acoustics – Declaration an verification of noise emission values of machinery and equipment, March 1997

[5] DIN EN 61672-1 (IEC 61672-1:2002), Electroacoustics – Sound level meters – Part 1: Specification, October 2003

Reference documents

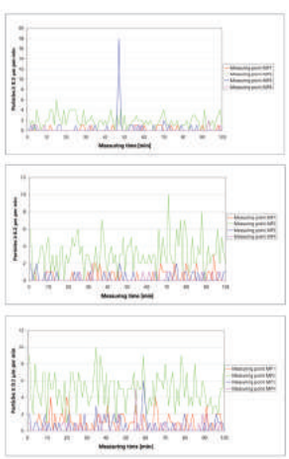
LOW DUST CHAIN WITH MOST SUITABLE FOR CLEANROOM AREA!

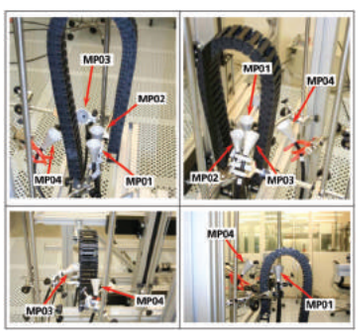


Sabin Chain was given ISO CLASS1 clean room certification according to the Germany IPA Dust Collection Test (VDI 2083 CLASS 1 / DIN EN 14644-1 ISO CLASS 1) It is qualified to be used in semiconductor production lines on automation machine tools and machines requiring quiet and quick applications.

※ This test was done by the IPA TEST CENTER for the semiconductor manfacturer equipment and measurement processed with CLASS1 CLEAN ROOM. (US Federal Standard 209E)

▶ IPA Test result
- nsb 020CR.20.R48 : ISO Class1
- nsb 045CR.75.R75 : ISO Class1
- nsb 035CR.55.R75 : ISO Class2





■ Clean room environment
Air speed(0.45 m/s)
Temperature(+5°C)
Humidity (45%)

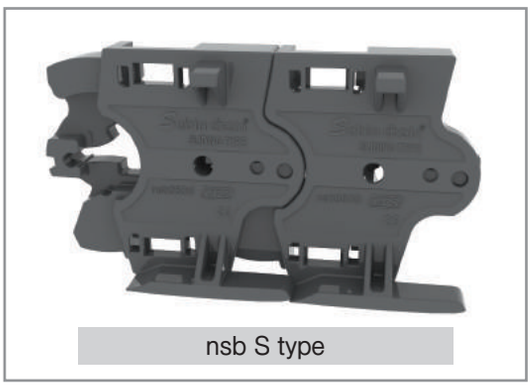
■ Test equipment
Fraunhofer IPA Test machine

■ Measurement Skill
To checking the dust dimension of ＞0.2㎛, ＞0.3㎛, ＞0.5㎛, use LPSA210 TYPE machine made by PMS.

■ Test operation and analysis
Operated by the guideline of VDI 2083 Part8

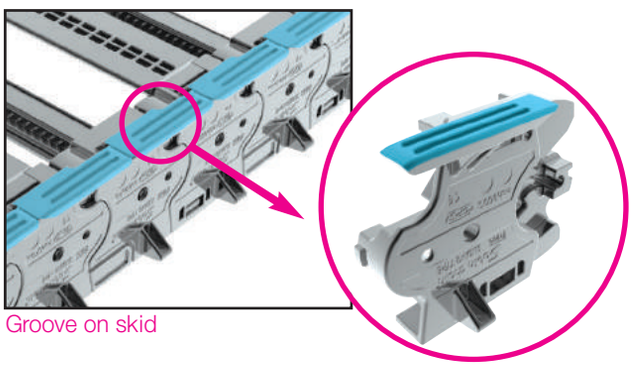
Sabin chain® SLIDING type

- Sabin chain sliding type is the best solution for long travel and high-speed operating circumstance excellent durability and optimized design.
- Great Low Noise level due to high technology.

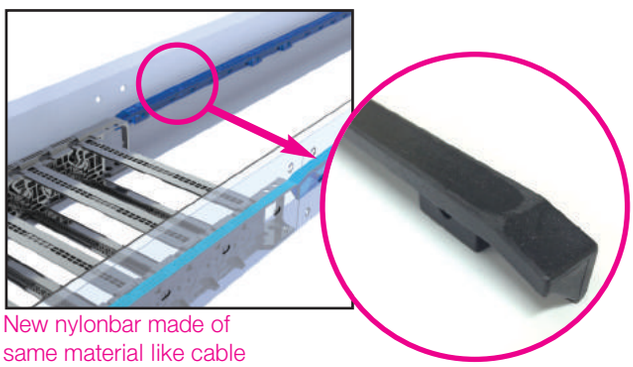


nsb S type

- Low Dust lever due to groove on skid and nylon bar is same material like cable chain.



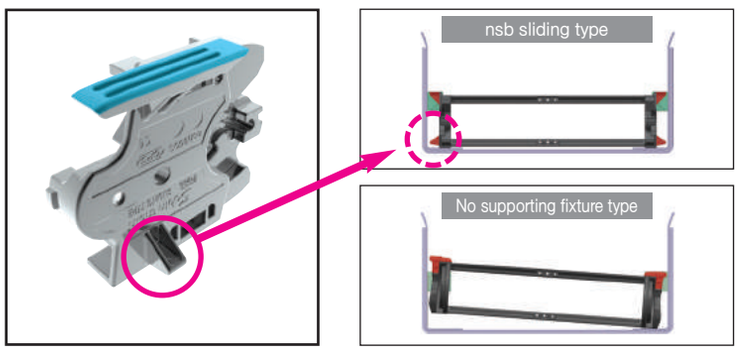
Groove on skid



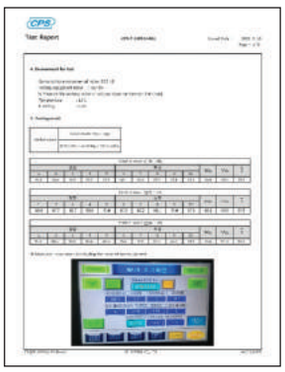
New nylonbar made of same material like cable chain for reducing dust particles.

- *Stable operation and Suitable for high speed*

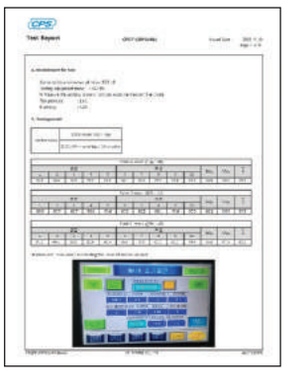
Supporting fixture has been added to keep stable operation inside Guide channel. This type is designed for gantry loader application which has fast movement with lower friction. Moreover, our previous model, our Shift chain sliding type, have risk to be detached between sideband and skid. Thus, detached skid would be inside guide channel or cable chain it means that it disturbs stable and smooth movement. But, nsb sliding type has been designed integral type sideband with skid, there's no risk for this issue.



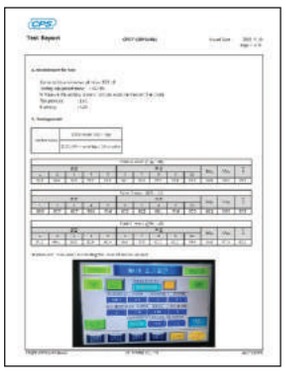
- Passed over 2million times of reliability test in 2015!



■ nsb050S ■

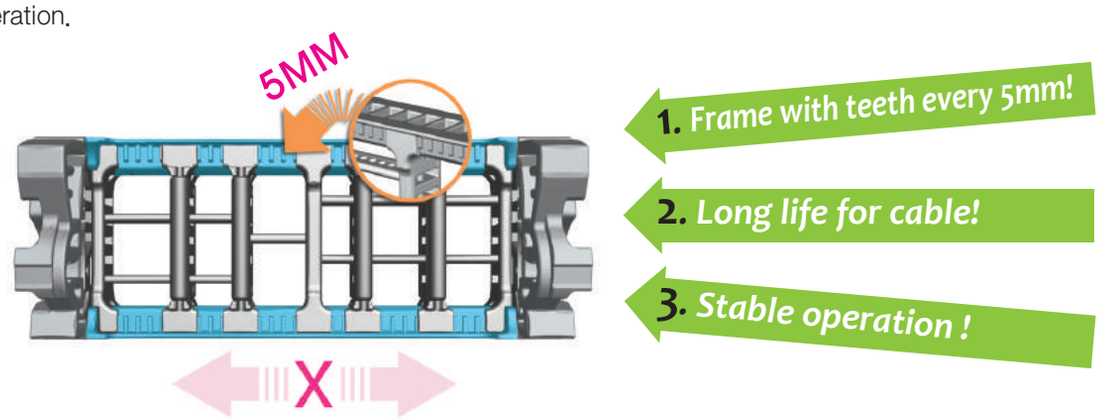


■ nsb065S ■

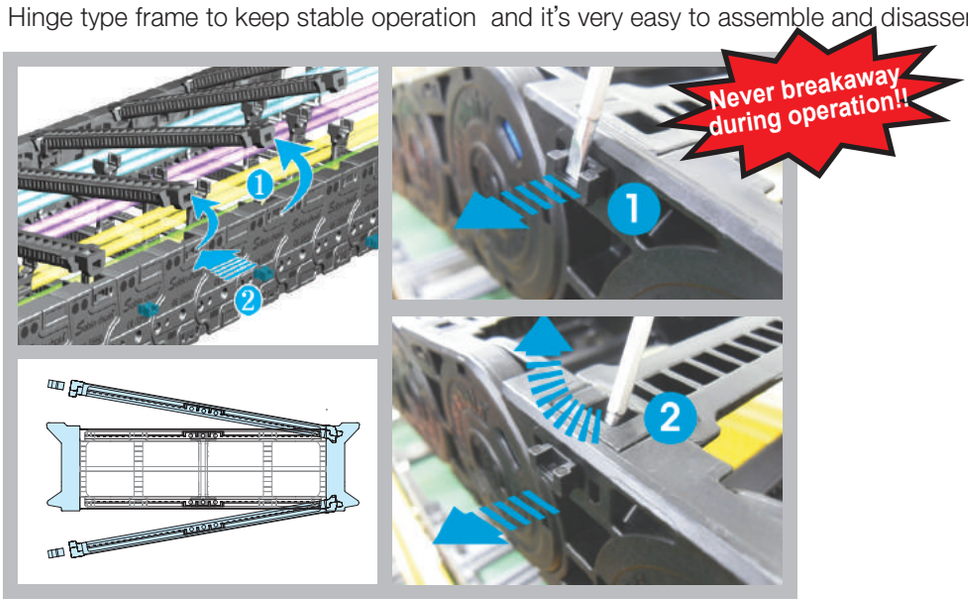


■ nsb080S ■

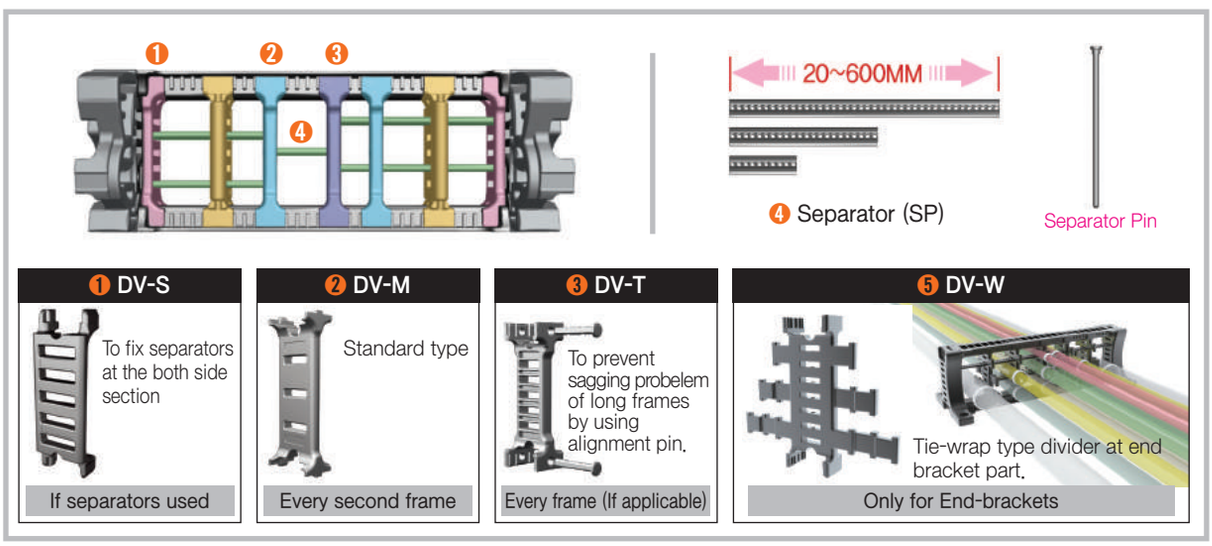
- Frame with teeth every 5mm for long lifetime of cable and stable operation. Divider never moves during operation.



- Hinge type frame to keep stable operation and it's very easy to assemble and disassemble.



- To make ensure of long lifetime of cable, divider is designed not to move during operation. Also, diverse section can be composed with dividers and separators.



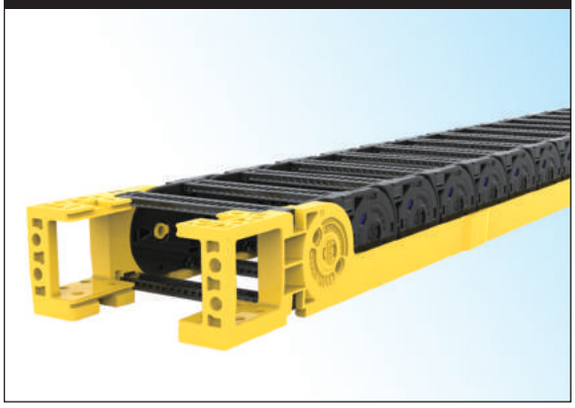
CHARACTERISTIC AND MERIT OF Unity Systems®

- Unity system is a new solution for customers who are looking for cost-saving. As it's designed to combine bracket with guide channel made of PA6. (Economical than using alunminum or steel material)
  It can be applied to Normal type, Enclosed type and CR type.

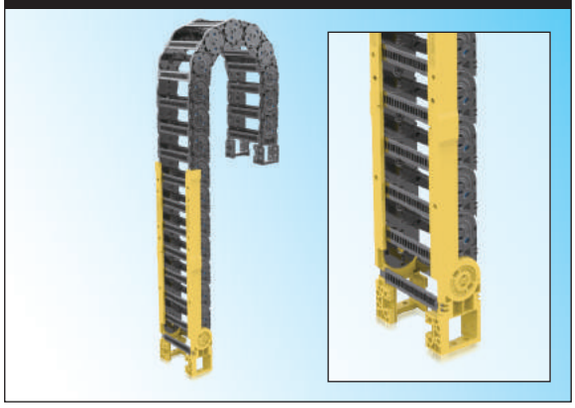
Unity Systems				
Shift Chain	Sabin Chain		Sliding Chain of Shift Chain Sliding Chain of Sabin Chain	Color
	nsb Chain	asb Chain		
- -	nsb020CR nsb022CR	Not developed yet.		Black or Yellow
ST044N ST044E	nsb028CR nsb028N nsb028E			
ST055N ST055E	nsb035CR nsb035N nsb035E			
ST072N ST072E	nsb045CR nsb045N nsb045E			
ST095N ST095E	nsb060CR nsb060N nsb060E			
ST120N ST120E	nsb075CR nsb075N nsb075E			

- Can save cost and steel or aluminum guide channel are another option.

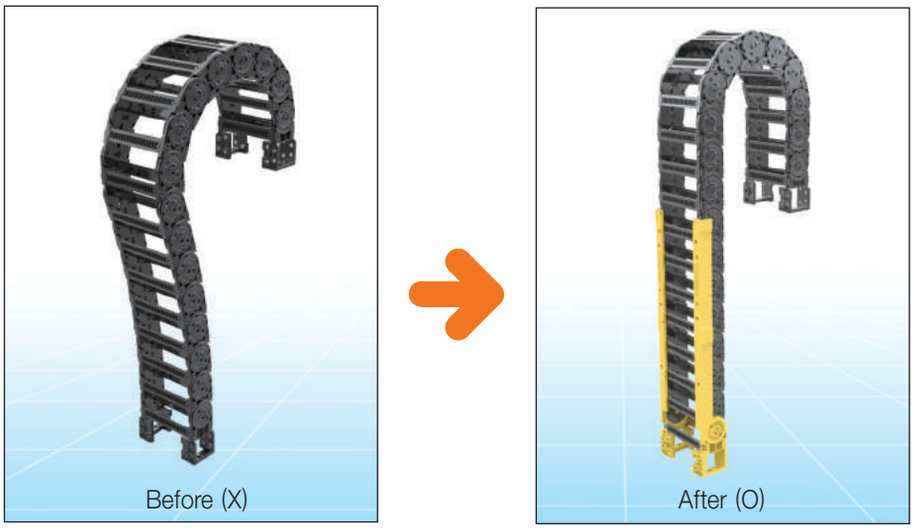
Horizontal Condition



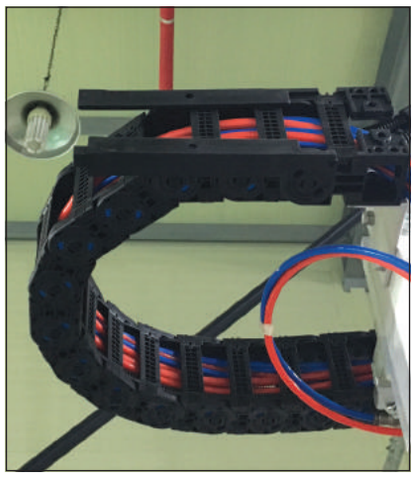
Vertical Condition



- Vertical type is especially a good solution to prevent falling backward.



- Vertical & side mounted application.



Unity systems

▶ **Application**
Parts Factory of
Applem Vertical mounted
▶ **Specification**
ST044N with Unity systems

Unity systems

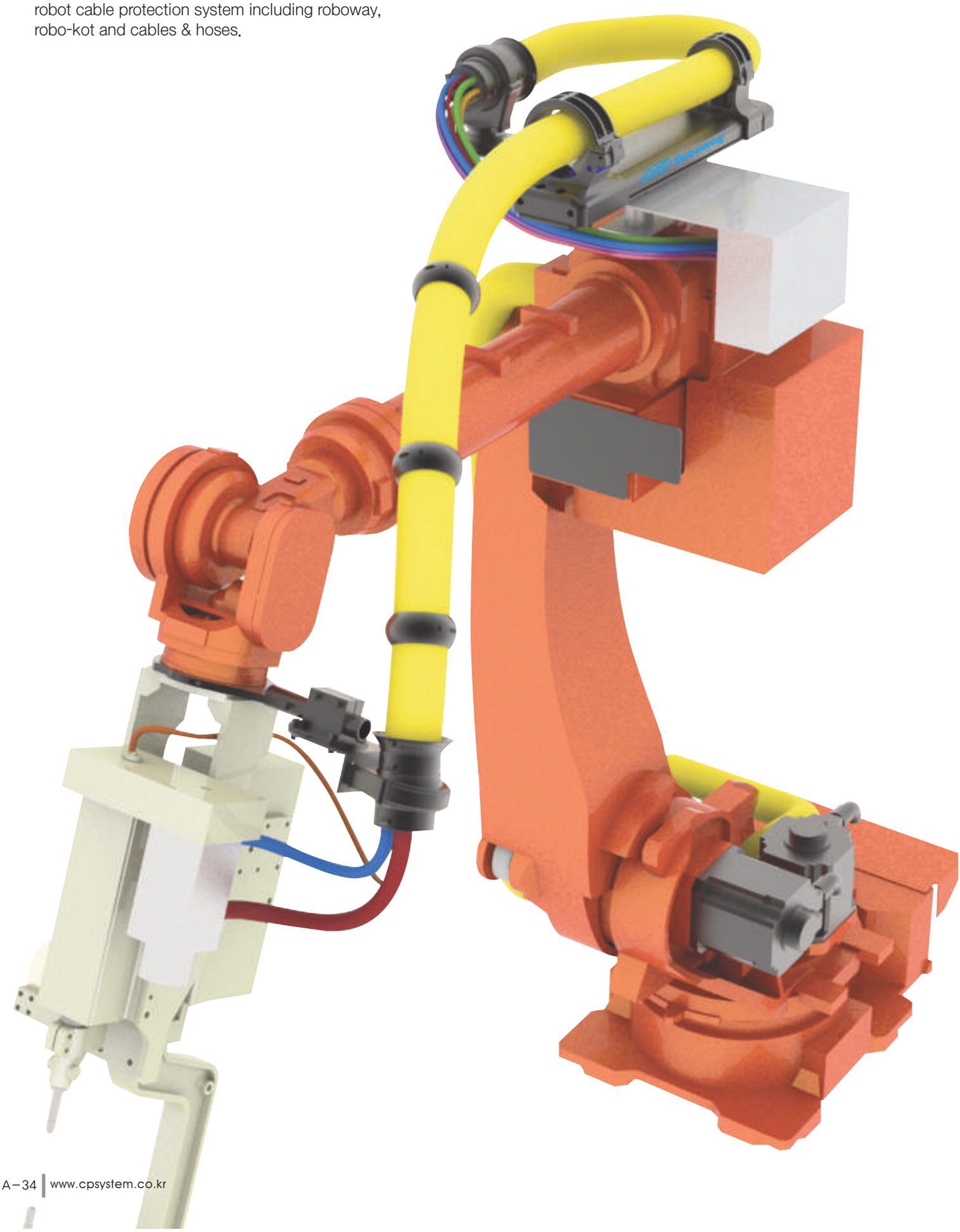
▶ **Application**
PCTC ships, Vertical mounted
▶ **Specification**
nsb035N with Unity systems

Unity systems

▶ **Application**
Machine tools, Side mounted
▶ **Specification**
ST072N with Unity systems

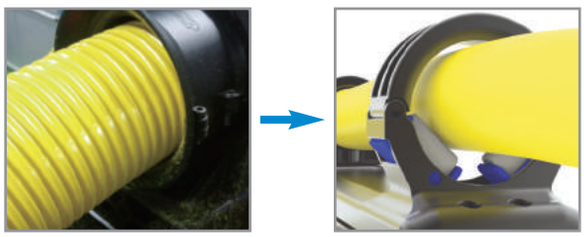
Roboway®

- Roboway is a new solution for customers who are looking for Robot dresspack system.
  CPS released roboway after 2 million times of round trip test in our reliability test room.
  For long time, we have been supplying
  robot cable protection system including roboway,
  robo-kot and cables & hoses.

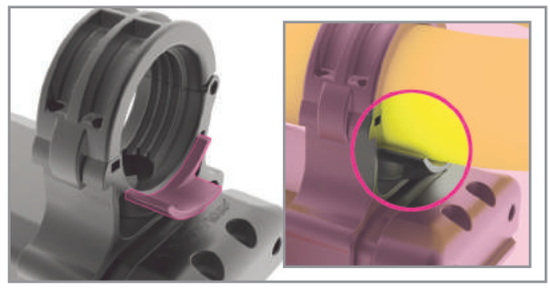


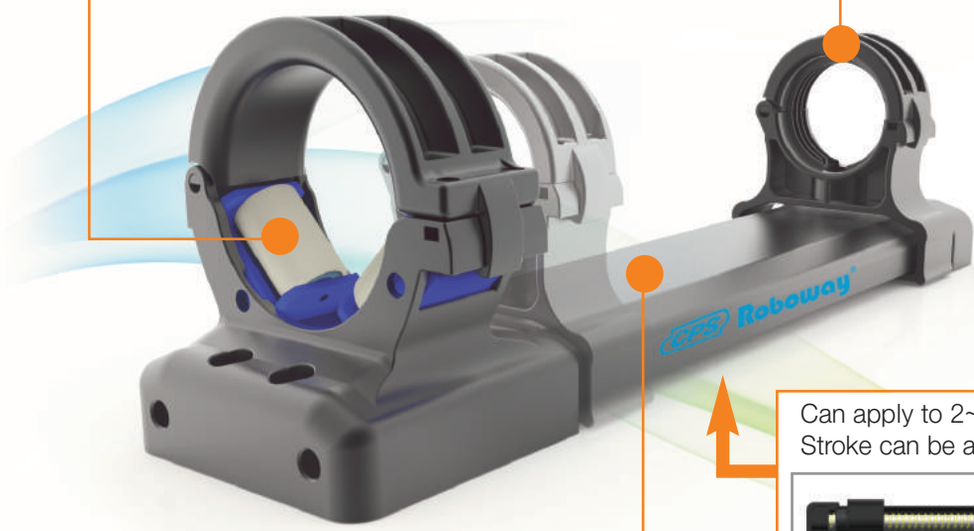
- Roboway can protect cables effectively by making tube's movement to one direction while robot arm operates complicated direction.

Minimized dust by applying rollers to fixing part.

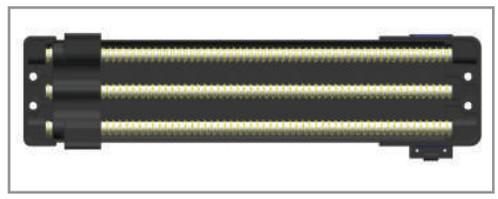


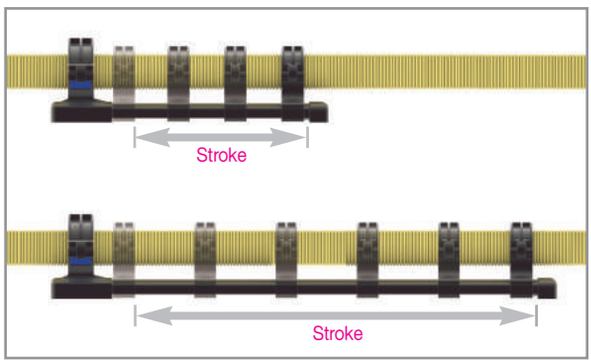
Design the supporting guide to prevent sagging problem to down side at Moving part.





Can apply to 2~3 special springs.
Stroke can be adjusted.

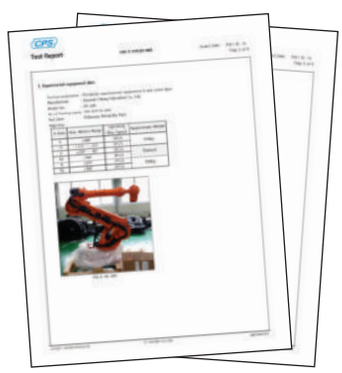


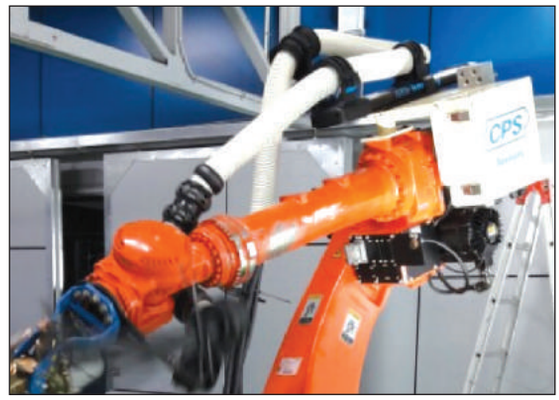


Adjustable stroke structure.

Possible to keep always certain tension to protect tube and cables.

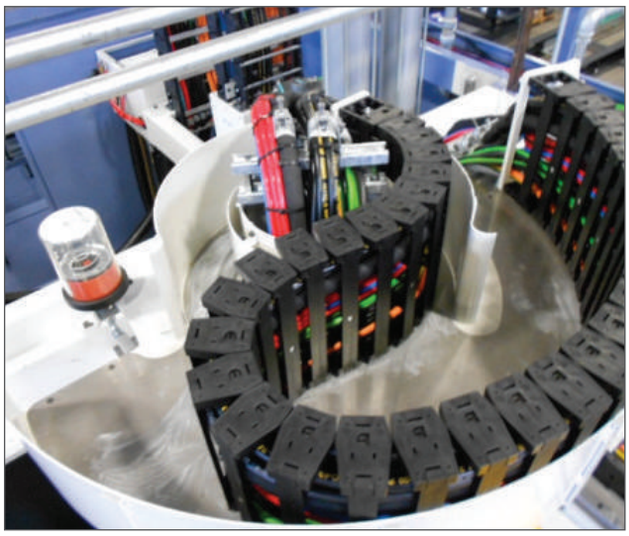
- Released after 2 million times of round trip test in our reliability test room.



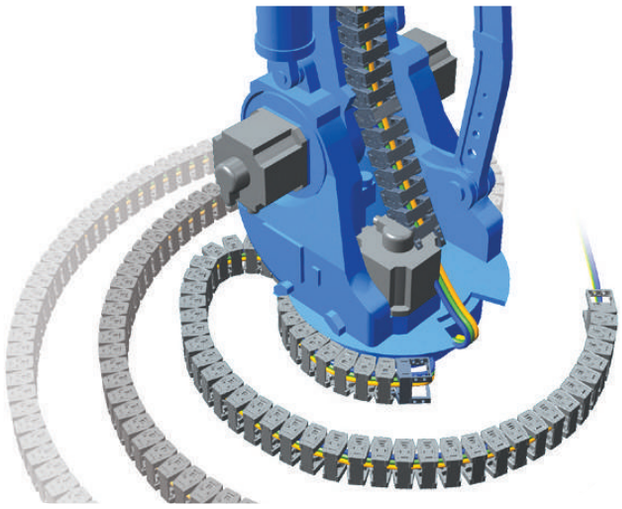


Revolving chain

- Revolving chain is designed for protecting cables installed to machines or robots and it operates to diverse directions as specially designed for preventing damage from mevement in various directions.
  This movement is performed with free bending control method of cable chain and it is also can be applied to low dust & noise required plant.

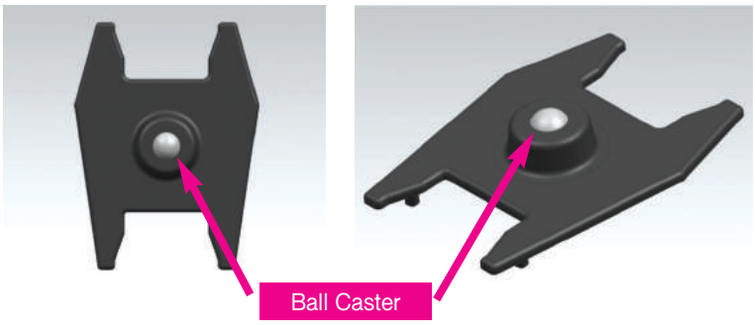


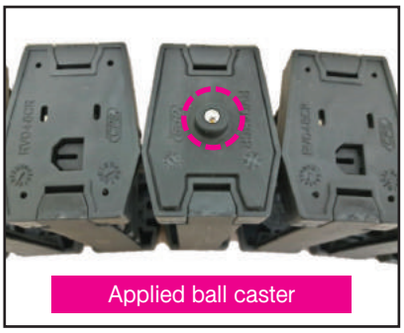
- Free bending radius!



- Appropriate for low noise and dust required environment with its specially designed side band!

- Ball caster for better movement
  - In order to reduce friction value and be better movement, you need to apply a ball caster **every 8 links** as standard.
  - It could be applied **every 4 links** according to request of customer.





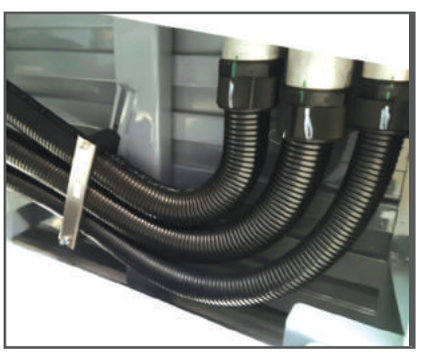
- Released after 2 million times of round-trip round trip test in our reliability test room.

◀ Revolving chain applied to a CPS's test equipment similar to wind power generator.

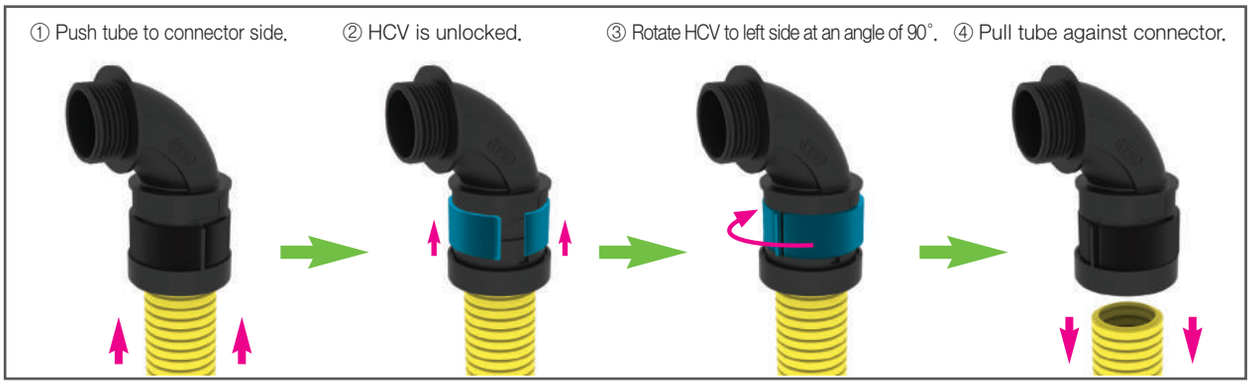
CPSFIX -PNC, PWC, PAC

- ***Easy to assemble and disassemble!***
- ***Intensified pull-out!***
- ***Diverse thread available such as G, M, Pg, NPT and UNEF!***

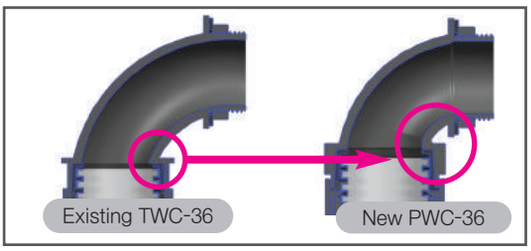
- CPSFLEX & FIX applied to train in Korea.



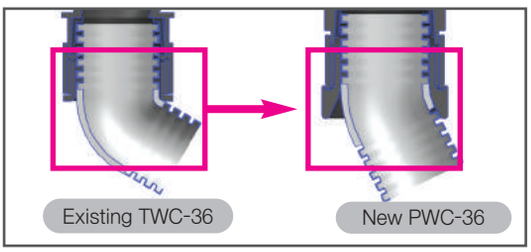
- Possible to apply to a limited and narrow space as it is much smaller than previous version.
- Intension of pulling out with changed design and it protects tube and cable by removing sharp edge.
- We have diverse international thread standard such as G, M, Pg, NPT and UNEF.
- TNC & TWC series can be replaced with new product such as PNC & PWC series as thread stadnard is same.
- Easy to assemble and disassemble with tube.



- Protect cable more safely by removing sharp edge of internal tube!



- Improved supporting unit is to protect tube from excessive bent condition. It protects tube and improves assembling performance.

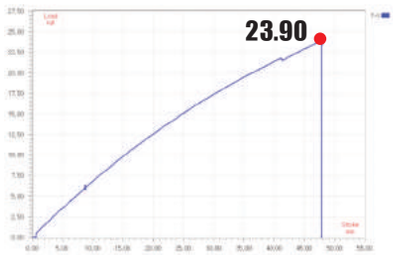


Pulling Out Test?

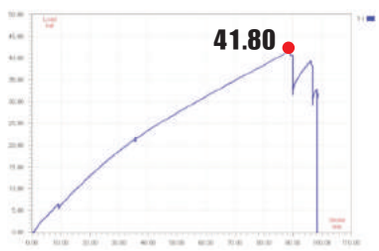
A sample of fitting having the same material and construction type shell be assembled in intended manner to approximately a 500mm (20 in) length of th MPT. The MPT shall not pull out of the fitting when subjected to the appropriate force as below test criteria.

※ Test criteria based on **UL 1696**
- 80N (18lbf) for tubing having an inside diameter less then 17mm (11/16 in)
- 165N (35lbf) for tubing having an inside diameter of 17mm or larger

※ Test result
- TWC-36, Pulled out 23.9kgf
- PWC-36, Pulled out 41.8kgf



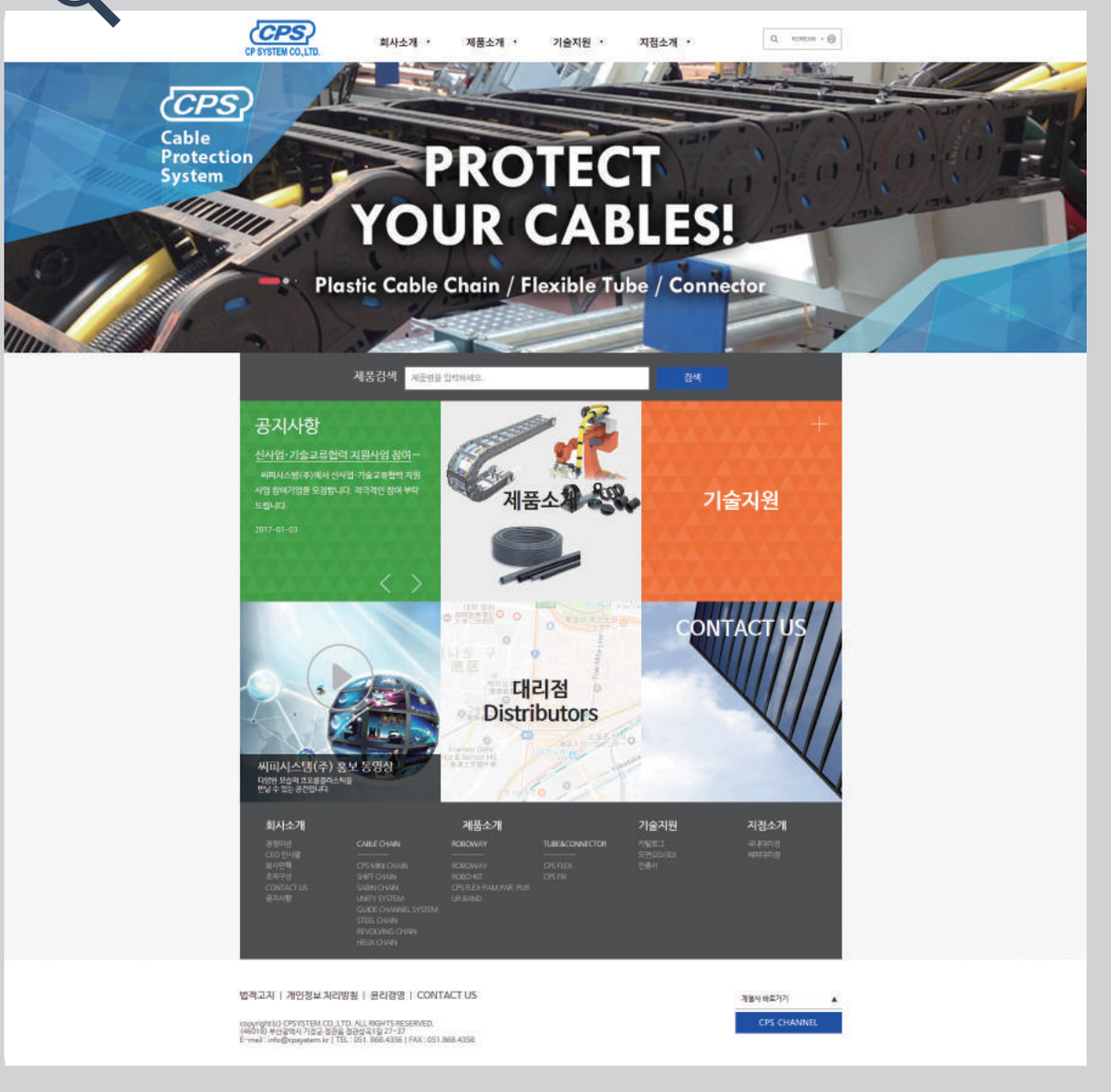
Existing TWC-36



New PWC-36

On-line support system

www.cpsystem.co.kr

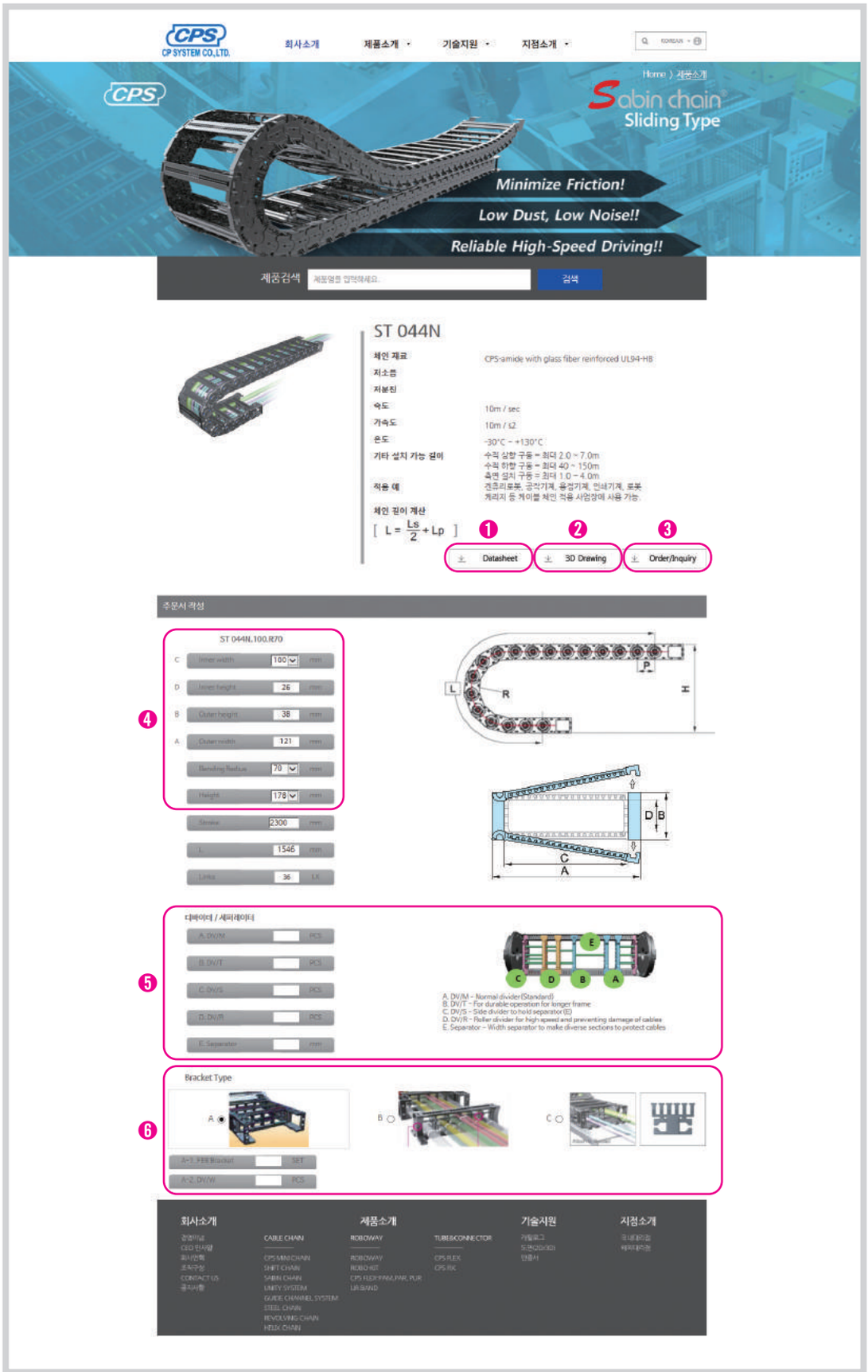


ON-LINE Service

The newly reorganized by the customer can be chosen to make the website more precise specification can more easily identify and take advantage of a variety of product information at a glance.

- E-Catalogue
- Automatically Select Dimension
- 2D DWG / DXF CAD file download
- 3D STP file download

❶ Data sheet includes all information of applicable product.
❷ 3D drawing can be downloaded.
❸ When you order product, please click and select below dimension table exactly.
❹ Select dimension according to your need.
❺ Select dividers or separators.
❻ Select bracket type.



CEO Greeting

We are CPS that realizes the customer's impression is decided by the customer satisfaction.

CPS is the leading company to develop the cable protection system. We are manufacturer of cable chain(Energy chain), flexible tube(corrugated tube), connectors, robot-kit and Roboway(robot dresspack system).

We are the only-one manufacturer who has localized these all products and is continuously developing them in Korea.

All of our product are manufactured based on the quality control system of ISO9001 and environment control system of ISO14001. Also our product and production system got certified on global standard such as CE, VDE, UL, IPA, TUV(Noise Testing), ATEX and etc.

With our well organized research institute and reliability test lab, we are continuously developing and improving our product to the best to offer customers.

We manage systematically production system from high quality material to delivery service. With efficient management system, we guarantee reasonable price with high quality product against competitors and fast delivery service for customers.

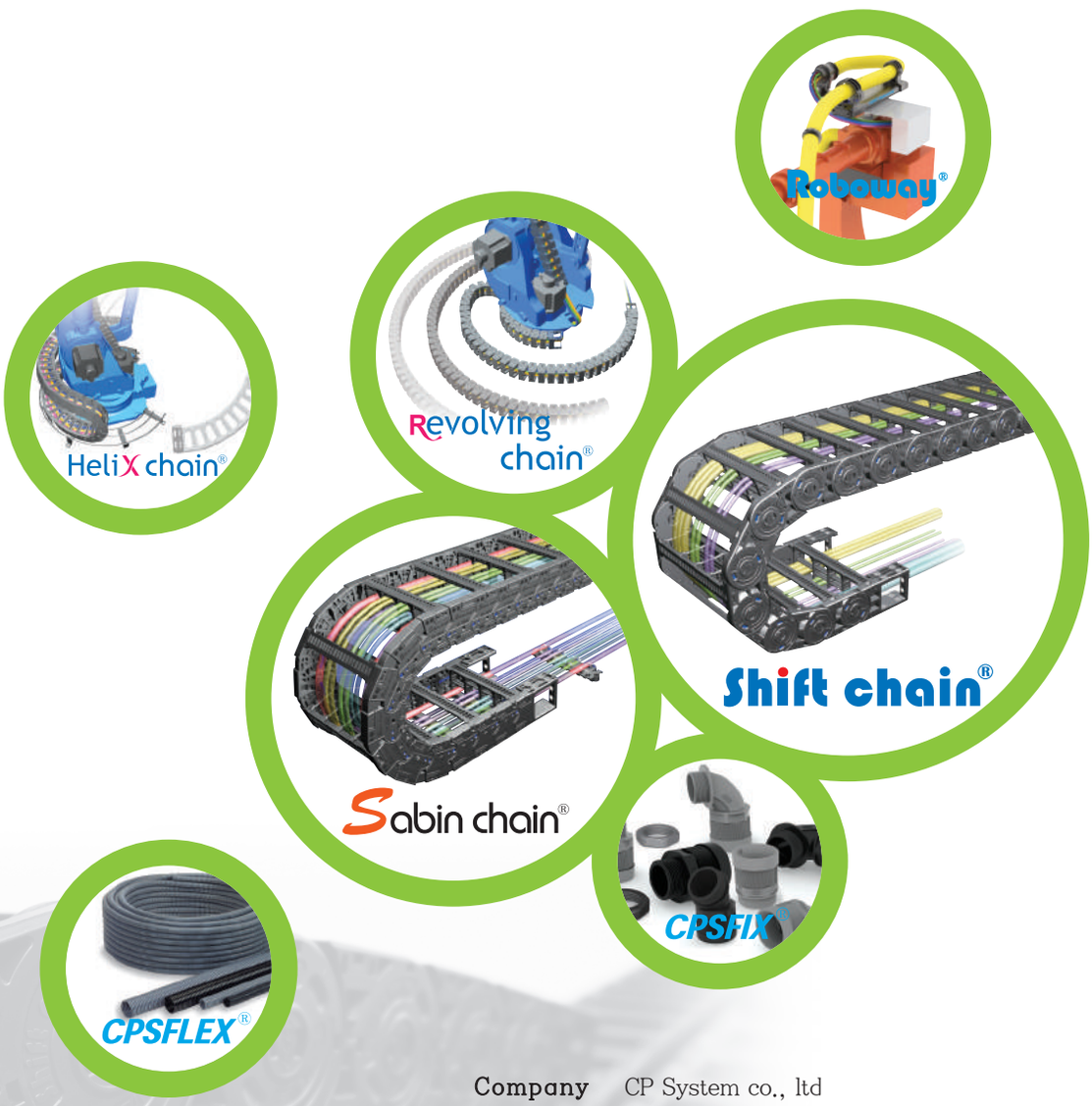
We will do our best effort to offer the best quality product, diverse solutions for customers with our management value that indicates "enterprise shall be disappeared right after stopping technical development".

Thank you all,

www.cpsystem.co.kr

CP SYSTEM CO.,LTD.

Technology and quality as much as any third party may have a higher self-esteem.
We've not satisfied with the current.
To meet greater customer satisfaction,
we will continue to strive to develop new technologies.
The best quality, best service and
new product development under a management philosophy is
what CPS is committed for innovation.



Company	CP System co., ltd
Established	Jan-1993
Business Sector	Manufacturer of Cable chain, Flexible tube, Connector and Roboway
Headquarter & Factory	Busan, South Korea.
Website	www.cpsystem.co.kr
E-mail	overseas_info@cpsystem.kr
+Phone	+82 51 526 4393 (Overseas sales Dept.) +82 70 4825 0808 / 0806 (Overseas sales Dept.)

Company History

Since 1993

1997
- Completed development of Non-Metal Nylon(PA6) connector.

1999
- Contracted with Hong Kong Distributor.

2000
- Contracted with India Distributor.
- Acquired UL Certification. (File No.191879)
- ISO 9001 Certified. (KOR-483-00-02)

2001
- Acquired VDE(CE) certification. (Licence No.135396)
- Established Japan Agency.
- Contracted with Thailand Distributor.

2002
- Established the CPS Shanghai corporation Agency.

2003
- Contracted with Russia, Austrailia Distributor.
- Contracted with Malaysia, Turkey Distributor.
- Acquired ASTM E662-01, E162-98 certification.
- Acquired BSS 7239 certification from Japan.

2005
- Acquired TUV Certificate, IPA Certificate
- Acquired ISO14001 Certificate.
- Opened the Exclusive responsibility R&D Center.

Management Value

Be Creative

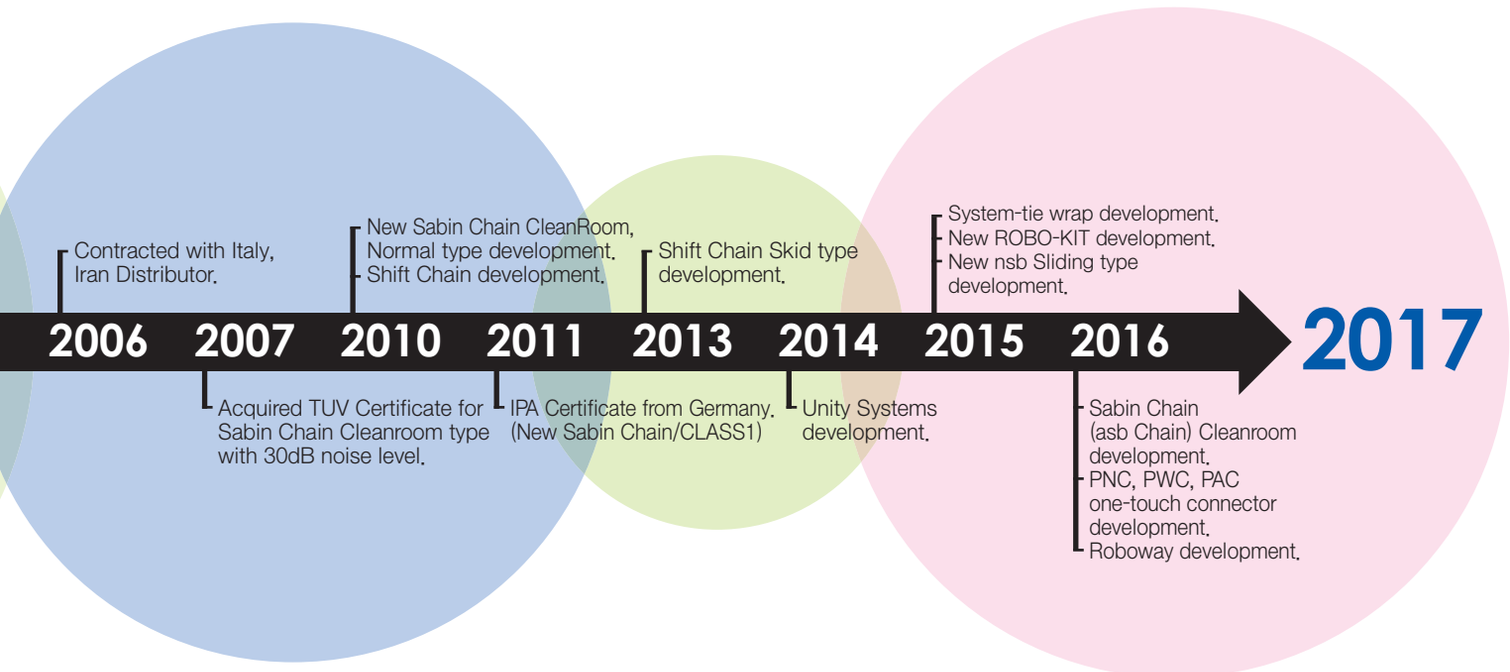
Challenge

Be Faithful

Have creativ

Enjoy chal

Be faith



As Quality Management, we are trying to offer the best quality and service. And also we are trying to meet satisfaction of customers by developing new products continuously.

ve thinking..!

allenges...!

thful....!

The Best Qulity

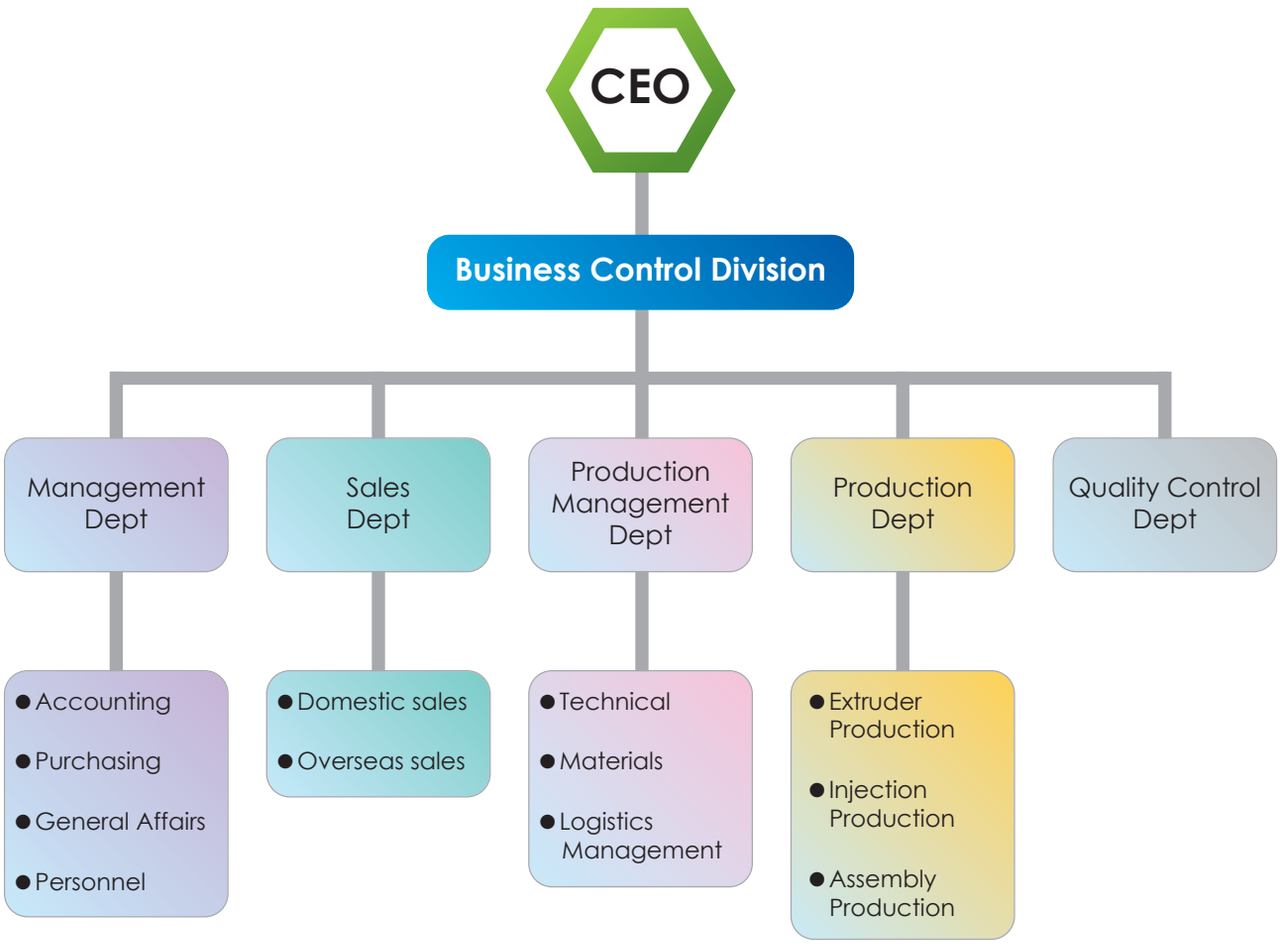
The Best Service

New Product Development

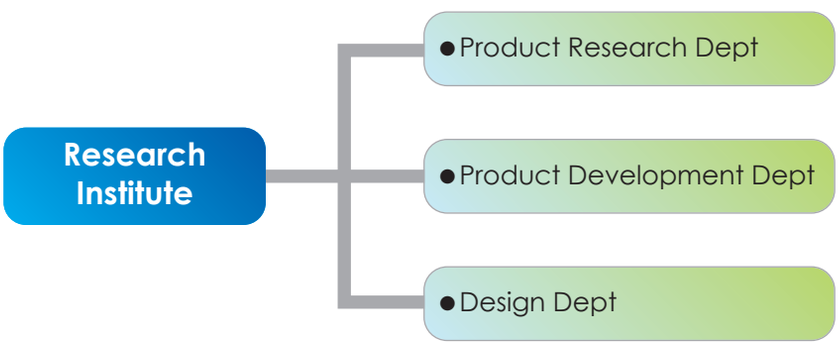
Company Organization

- CPS Headquarter and Factory is located in Busan, South Korea.
  Also, we have individual Research Institute to develop product and improve its quality continuously from 2005.

Headquarter & Factory



Research Institute(R&D Center)



Research Institute

- CPS Research Institute is striving to develop product and improve quality continuously from 2005 and it developed various range of quality product. As a part of development and improvement of product, they are also researching and experimenting raw material to create the best quality product.

Recent Research Performance

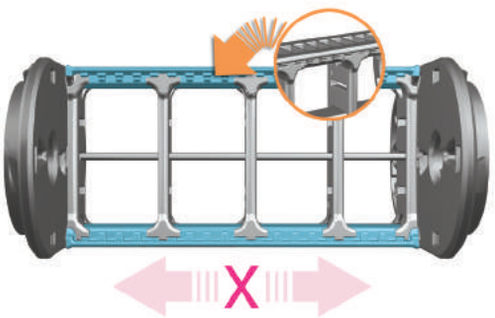
- Sabin Chain Cleanroom type Development
- Robo-kit Development
- Sabin Chain Enclosed type Development
- Shift Chain Development
- Shift Chain Enclosed type Development
- Shift Chain Roller Skid type Development
- Shift Chain Skid type Development
- Unity systems Development
- Sabin Chain Skid type Development
- Roboway system Development
- PNC, PWC, PAC Connector Development
- PAM Development

What's the cable chain?

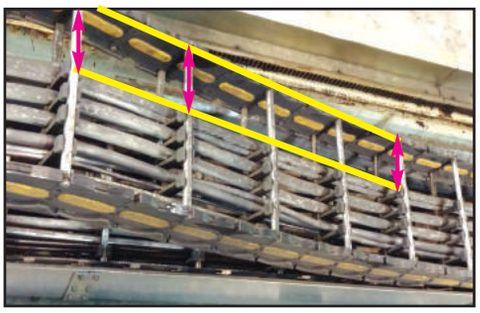
- Cable chain is to protect cables of moving machinery or automatic machinery.
  Without cable chain, it causes damage to cables.
  Hence cables can be protected by using suitable cable chain and it should be considered its stroke, cable types of machinery.

Good cable chain?

- Protect cable to be longer lifetime of cable
  - Divider never moves

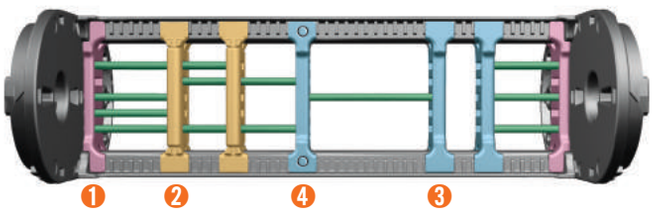


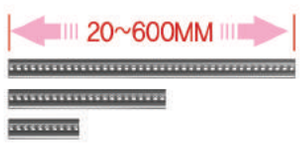
〈Bad case〉



If dividers move during operation, cables can be
1. focused toward one side or,
2. lost tension or,
3. twisted.

  - Can make section composition





Separator (SP)

Separator Pin

❶ DV-S

❷ DV-R

❸ DV-M

❹ DV-T

1. *Making section* is the one important criteria whether supplier has high technology or not. Without section composition, it's not possible to guarantee long lifetime of cable because of friction and loosing tension of cables.
2. *We have five units for making section.*
   It can protect cables more efficiently and safely by making suitable sections with diverse combination of Dividers and Separators.
3. The length of separator can be cut from 20 mm to 600 mm and be cut and used 5 mm apart.

- Characteristic of plastic frame

Frame(Bar) must be made by engineering plastic.

Friction factor of plastic(synthetic resins) against plastic(synthetic resins) is lower than plastic(synthetic resins) against aluminum(or steel) and it factor makes sure of protection for cables for long time.

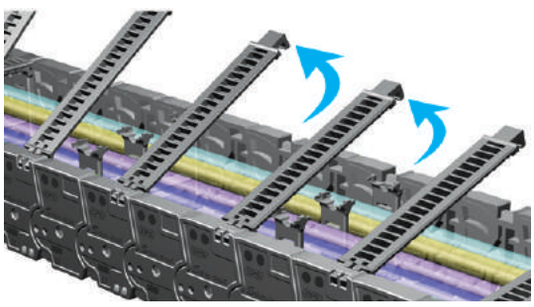
In addition, as plastic is lighter than aluminum and steel, it also guarantees long self-supporting length of cable chain.

〈Bad case〉

- Strong side band and frame structure

Self-supporting length is decided by side band's structure. If there's many supporting points between each side band when assembled, its self-supporting lengths sustain long.

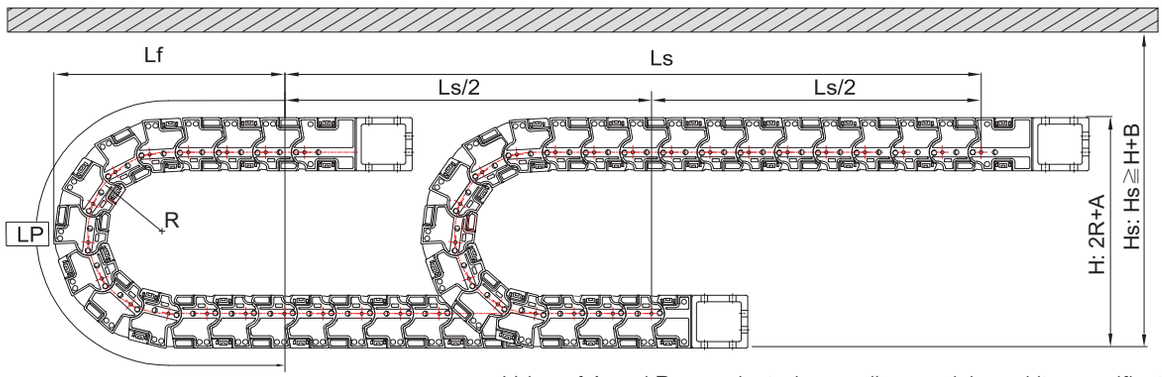
During the operation at high speed or tough circumstance, there is a possibilty of seperation of frame.
Good frame structure means frames are strongly assembled with side bands, so they are not seperated during operation.



How to calculate?

L : Cable chain length	**R** : Bending radius value
LS : Machine Stroke	**HS** : Safe Space
LP : loop length	**H** : Height(minimum)

• Calculation of Cable chain's length

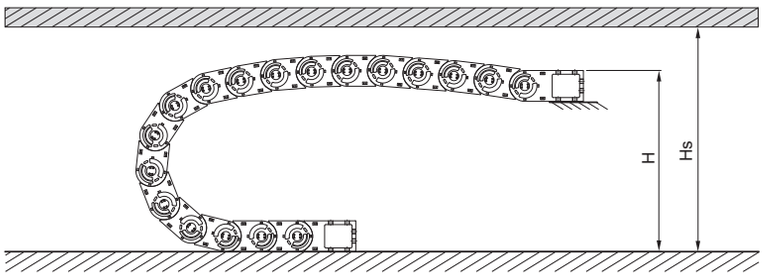


Value of A and B are selected according models and its-specification.

• Calculation of Cable chain's length

- BR Value(Min) 〉 8 ~ 10 x the biggest cables' outer diameter
- BR Value(Min) 〉 15 ~ 20 x the biggest hydranlic hose's outer diameter

• Calculation of Height(H value)



2R + B = H

- R : Bending radius value
- B : Outer height of cable chain

HS≧H+"S Value"

• "S Value"

- CPS mini chain

CPS015	CPS020	CPS030	CPS033
10mm	15mm	30mm	30mm

- Shift chain

ST044N/E	ST055N/E	ST072N/E	ST095N/E	ST120N/E	ST150N/E
30mm	35mm	40mm	50mm	60mm	80mm

- asb chain

asb028CR/CR.L	asb035CR/CR.L	asb045CR/CR.L
30mm	30mm	40mm

- nsb chain

nsb020CR	nsb022CR	nsb028CR/N/E	nsb035CR/N/E	nsb045CR/N/E	nsb060CR/N/E	nsb075CR/N/E
30mm	30mm	30mm	30mm	40mm	40mm	60mm

• How to select alternative model for other brand

When customers should select alternative models, they must check the following value exactly.

- Model number of existing model,
- Outer width of cable chain,
- Inner width of cable chain,
- Outer height of cable chain,
- Bending radius value,
- H value or HS value,
- Total machine stroke or length of cable chain,
- Speed of machine

• How to select alternative model for CPS's discontinued models produced until 2010

- Alternative model table for CPS Normal type

CPS Chain Normal type Discontinued production in 2010	Shift Chain Normal type	nsb Chain Normal type
CPS036N	ST044N	nsb028N
CPS050N	ST055N	nsb035N
CPS068N	ST072N	nsb045N
CPS077N	ST072N	nsb045N
CPS095N	ST095N	nsb060N
CPS120N	ST120N	nsb075N

- Alternative model table for CPS Enclosed type

CPS Chain Enclosed type Discontinued production in 2010	Shift Chain Enclosed type	nsb Chain Enclosed type
CPS036E	ST044E	nsb028E
CPS050E	ST055E	nsb035E

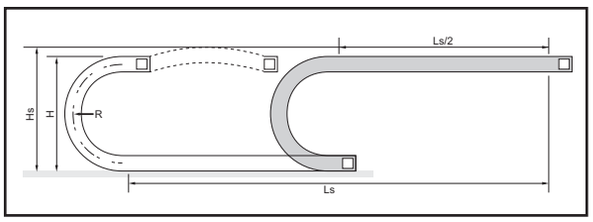
- Alternative model table for CPS Sliding type

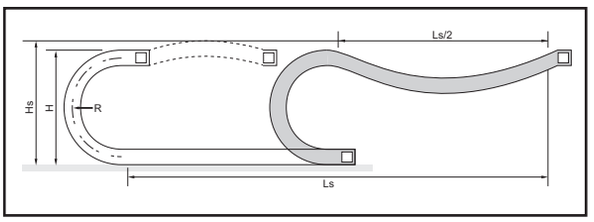
CPS Chain Sliding type Discontinued production in 2010	Shift Chain Normal type	nsb Chain Normal type
CPS036S	ST044S	-
CPS068S	ST072S (Discontinued prodction in 2017)	nsb050S
CPS077S	ST072S (Discontinued prodction in 2017)	nsb050S
CPS095S	ST095S (Discontinued prodction in 2017)	nsb065S
CPS120S	ST120S (Discontinued prodction in 2017)	nsb080S

- Alternative model table for sb chain CR type

sb Clean Room type Discontinued production in 2010	asb chain Clean Room type	nsb Chain Clean Room type
sb018CR	-	nsb020CR
sb020CR	-	nsb022CR
sb025CR	asb028CR	nsb028CR
sb035CR	asb035CR	nsb035CR
sb045CR	asb045CR	nsb045CR
sb060CR	-	nsb060CR
sb075CR	-	nsb075CR

Self-supporting / Short Stroke





• Self-supporting application

- Self-supporting means that cable chain moves on not sagging and touch-down condition. We call it “self-supporting” or “unsupported length”. It’s general type of cable chain and CPS’ cable chain is very suitable for high speed line and guarantees long lifetime. It could be varied due to inside weight or type of cable chain. There are 3 sections regarding self-supporting.

- Self-supporting section without sagging - SPg

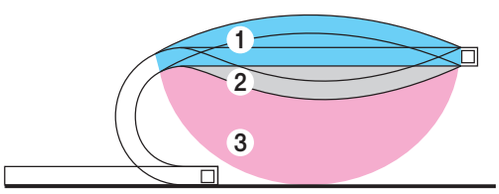
  When customer need stable operation of cable chain, they need to keep like No.1 in the picture. It’s the most stable operation.

- Allowable sagging section within self-supporting section - SPa

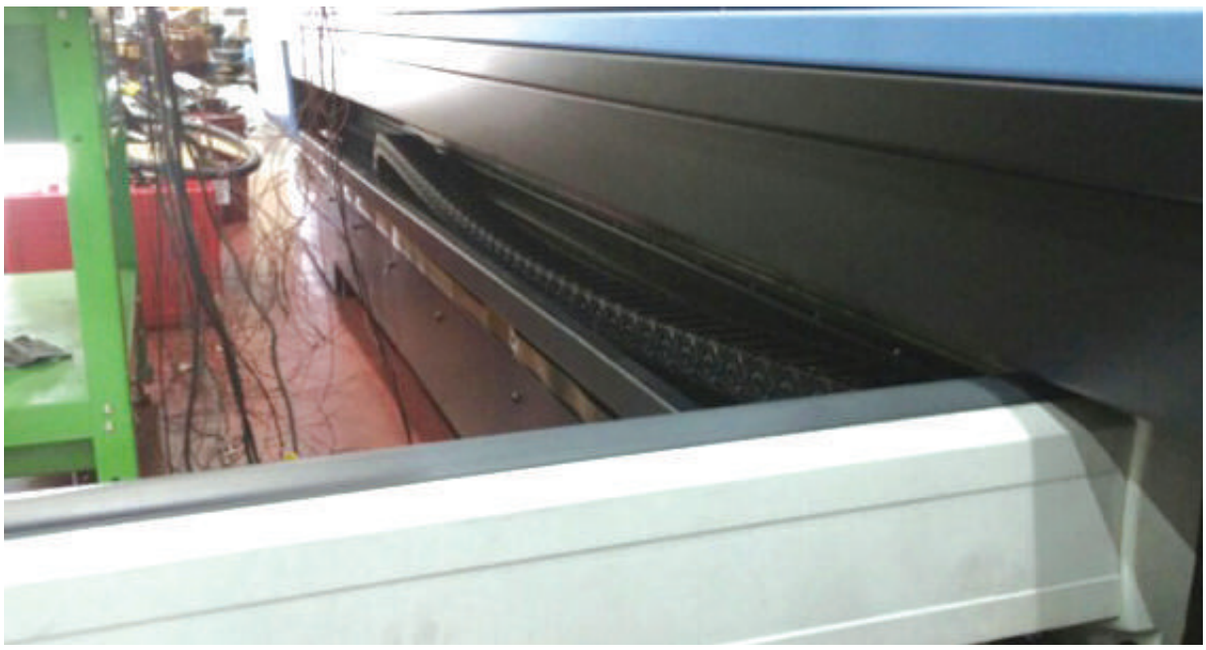
  If sagging volume is within 50mm like No.2 in the picture, it’s called “SPa”. It’s allowable to operate cable chain, even though it’s sagging, however, it could be problem when its speed is fast or its number of moving time is many.

- Exceed limit of sagging

  If sagging degree is formed like No.3 in the picture, it’s dangerous to operate anymore. It usually happens cased after long period usage, thus, customers must replace cable chain with new one immediately.

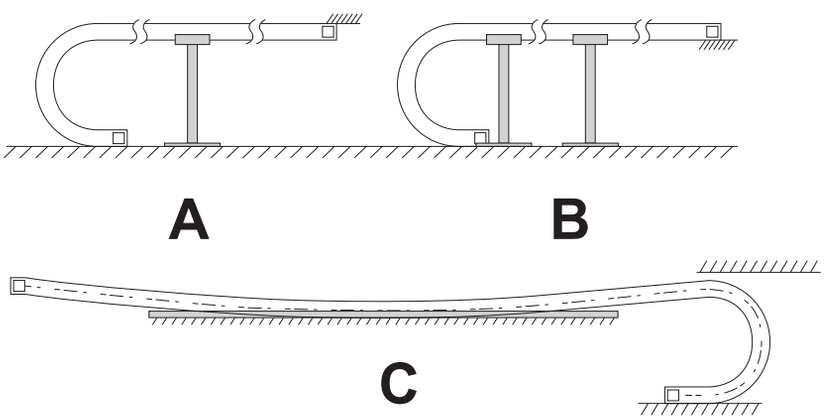


1. SPg. Self-supporting is good without sagging.
2. SPa. Allowable sagging section within 50mm. It’s fine.
3. You can’t use this condition for cable chain Normal type. You need to replace it with sliding(skid) type of cable chain.

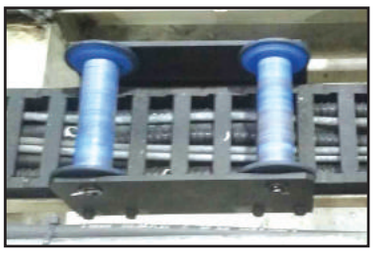


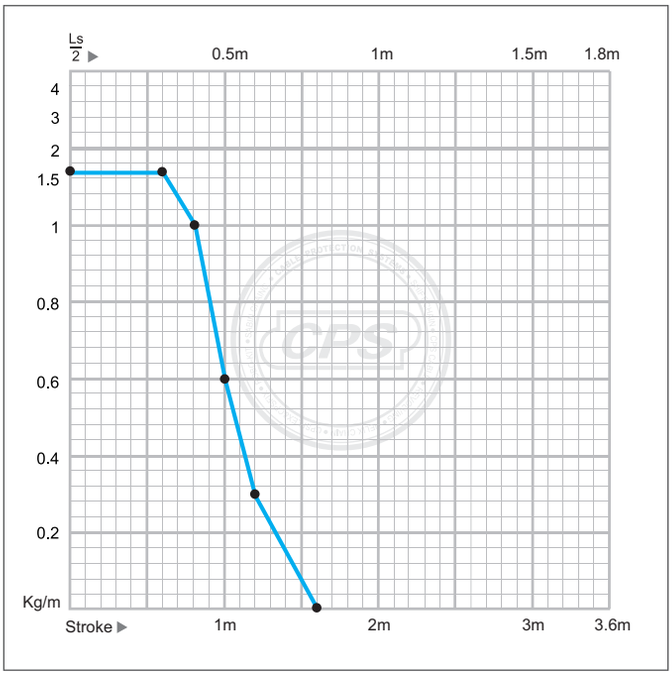
• What to do for not enough self-supporting length maintained

1. Select suitable model and type.
2. Otherwise, it is necessarily to install supporting guide as below;



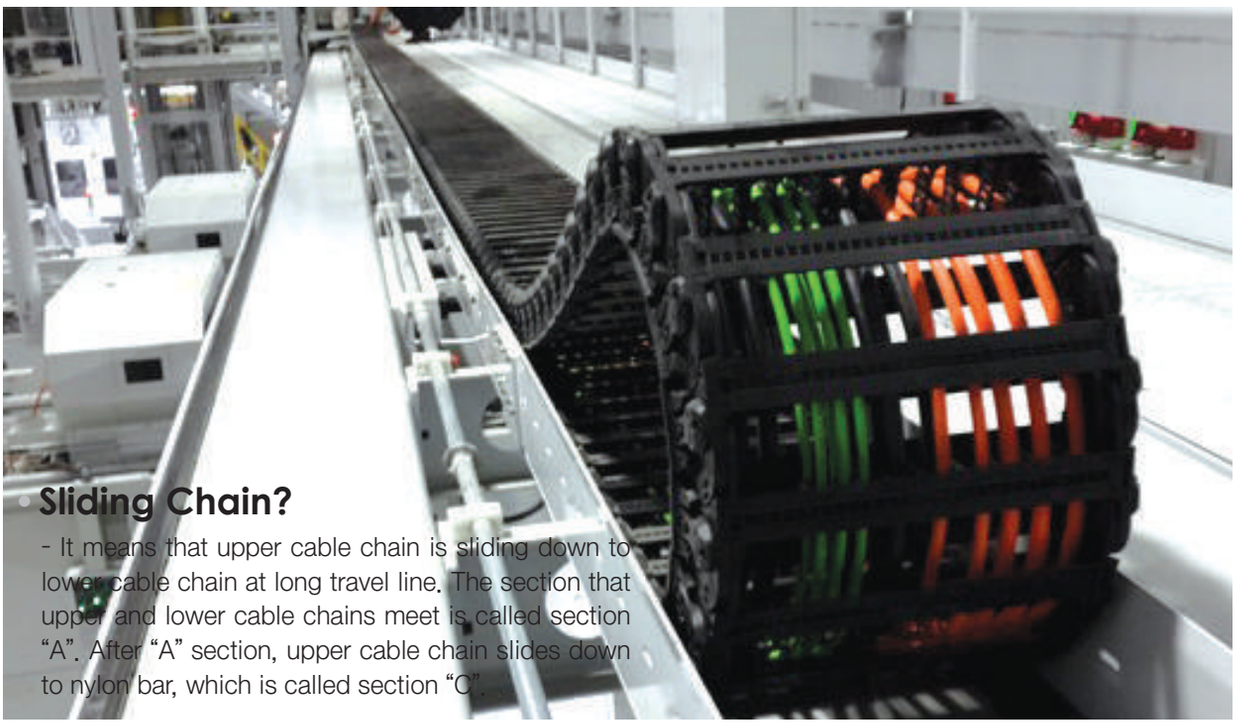
〈Supporting Guide〉





▶ *How to read a graph*
Kg/m means weight of bare cable chain.
Stroke means the travel length of machine movement.

Sliding type / long Stroke

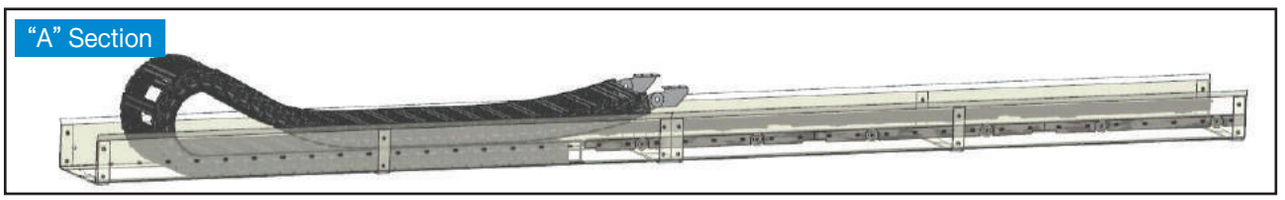


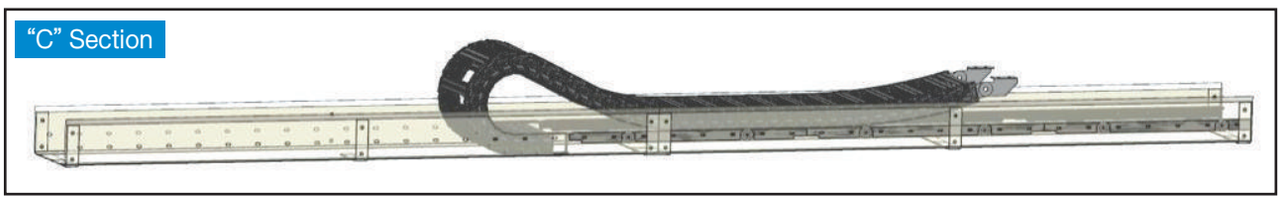
• Sliding Chain?

- It means that upper cable chain is sliding down to lower cable chain at long travel line. The section that upper and lower cable chains meet is called section “A”. After “A” section, upper cable chain slides down to nylon bar, which is called section “C”.

• Guide Channel?

- The guide channel system is applied to long stroke circumstance. Guide channel consists of 2 sections such as “A” section and “C” section. “A” section is for both cable chain(Upper + down side) and “C” section is cable chain + nylon bar.





• Advantage of Movement in low position

As we recommend low height application for moving bracket part to ensure that ;

1. It can save space,
2. It can make longer lifetime by reducing abrasion.
3. It can move longer.

• Advantage of long stroke cable chain.

- Stable operation
- Long lifetime(at least over 2 million times)
- Ultimate design for special circumstances
- We have experts who have various and long experience

• Must inform us of information below to make ultimate design for you.

- Machine stroke, speed, acceleration, weight(cables and hoses), specification of cables and hoses, necessary bending radius value, operating cycle(per 1 day or per 1 month) and other relevant conditions
- Contact us at overseas_info@cpsystem.kr

ST120RS

▶ **Specification**
Thermoeletric power plant

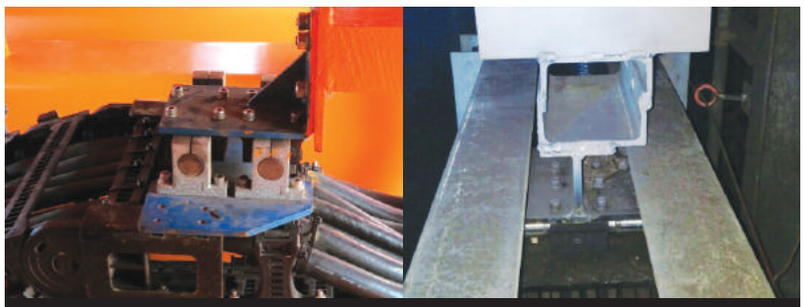
▶ **Location**
Korea(Hadong)

▶ **Stroke**
198 meters

• Moving Bracket & Moving Arm

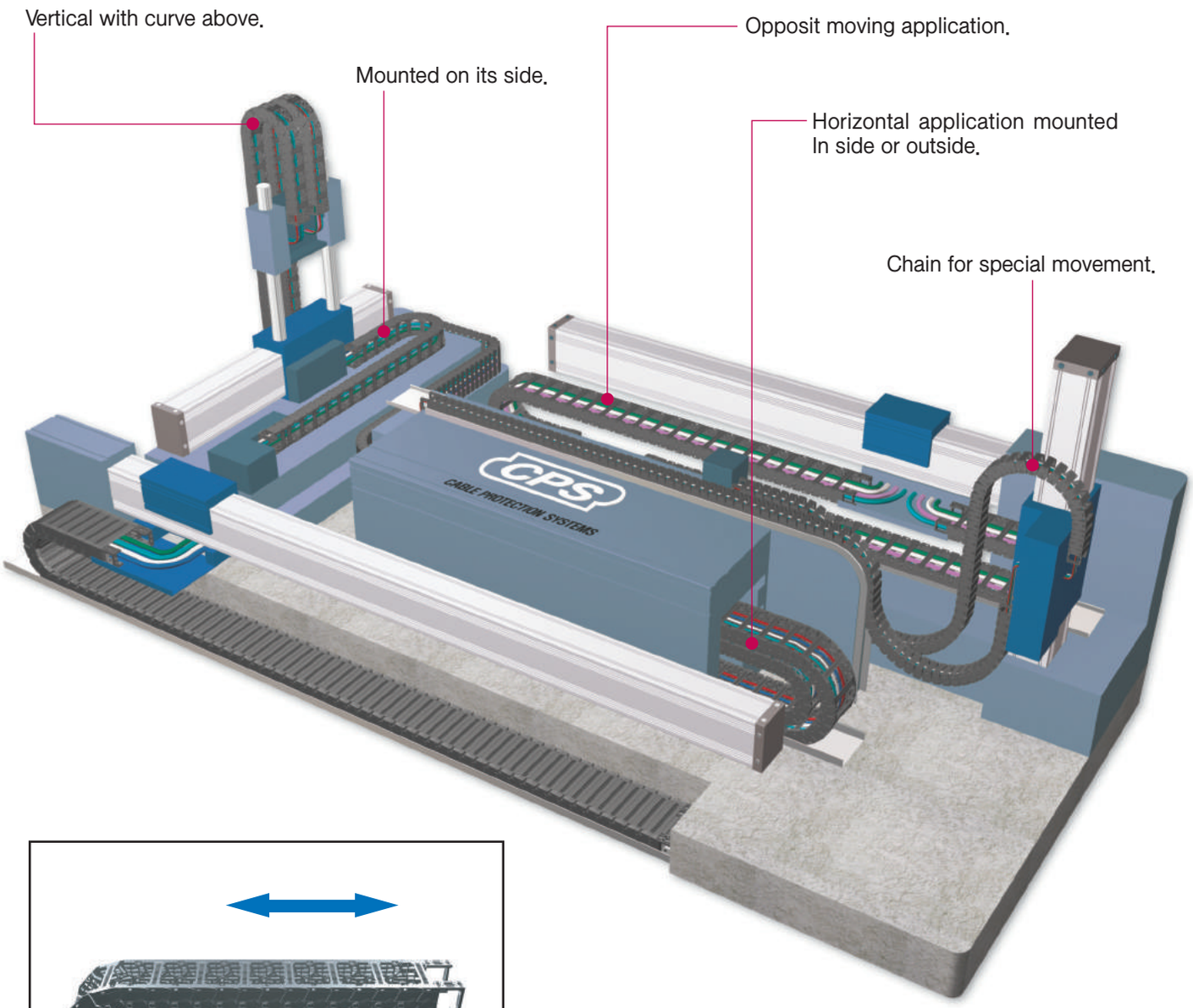
Basic Moving Bracket

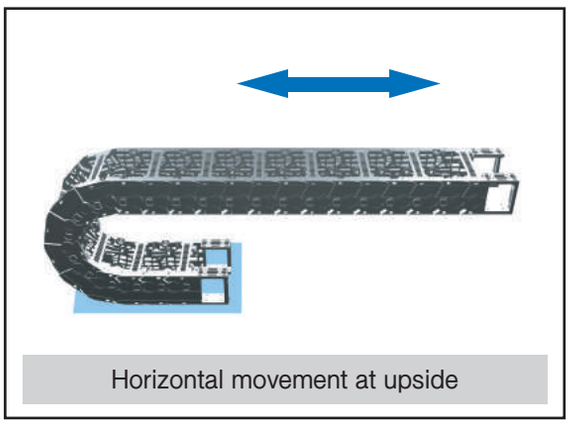
Basic Moving Arm



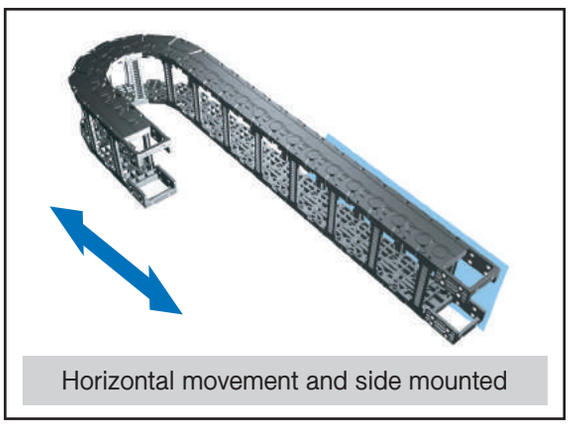
Basic Moving Bracket

Diverse application according to moving direction

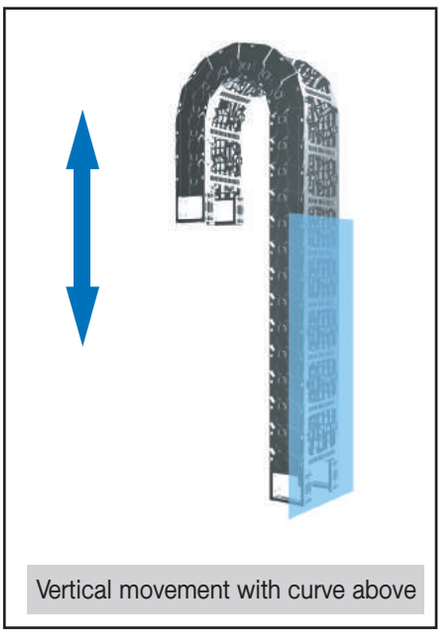




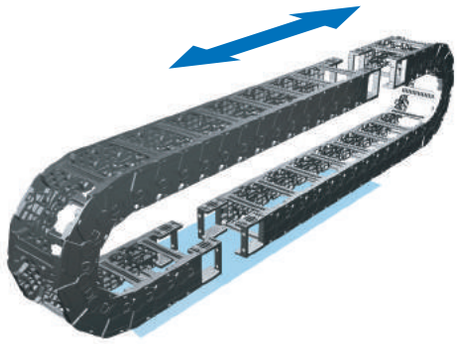
Horizontal movement at upside



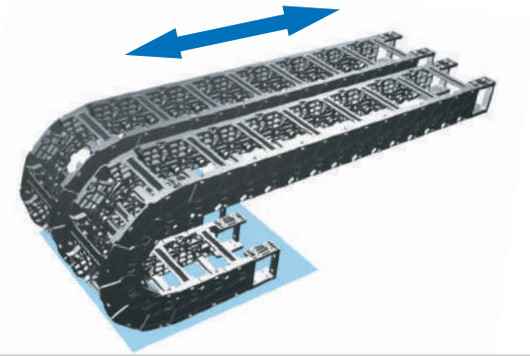
Horizontal movement and side mounted



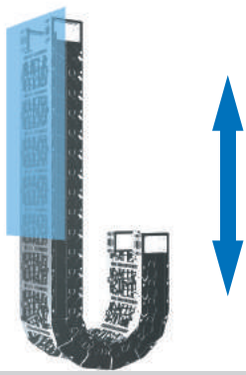
Vertical movement with curve above



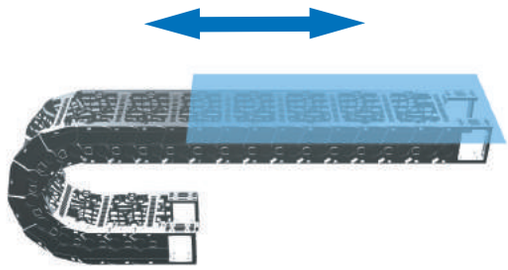
Double-way movement



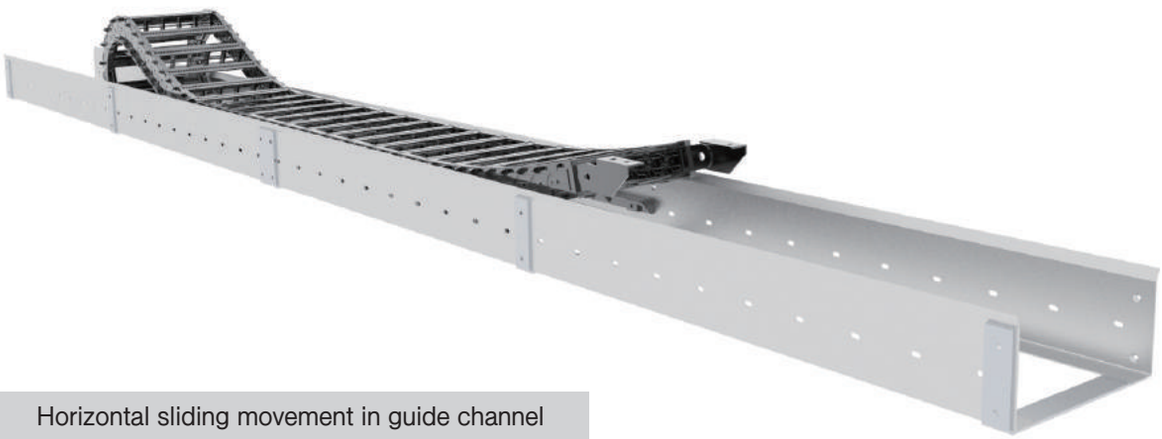
Horizontal movement of 2 same cable chains



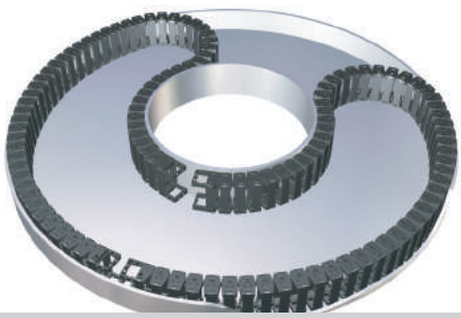
Vertical movement with curve below



Horizontal movement with curve below

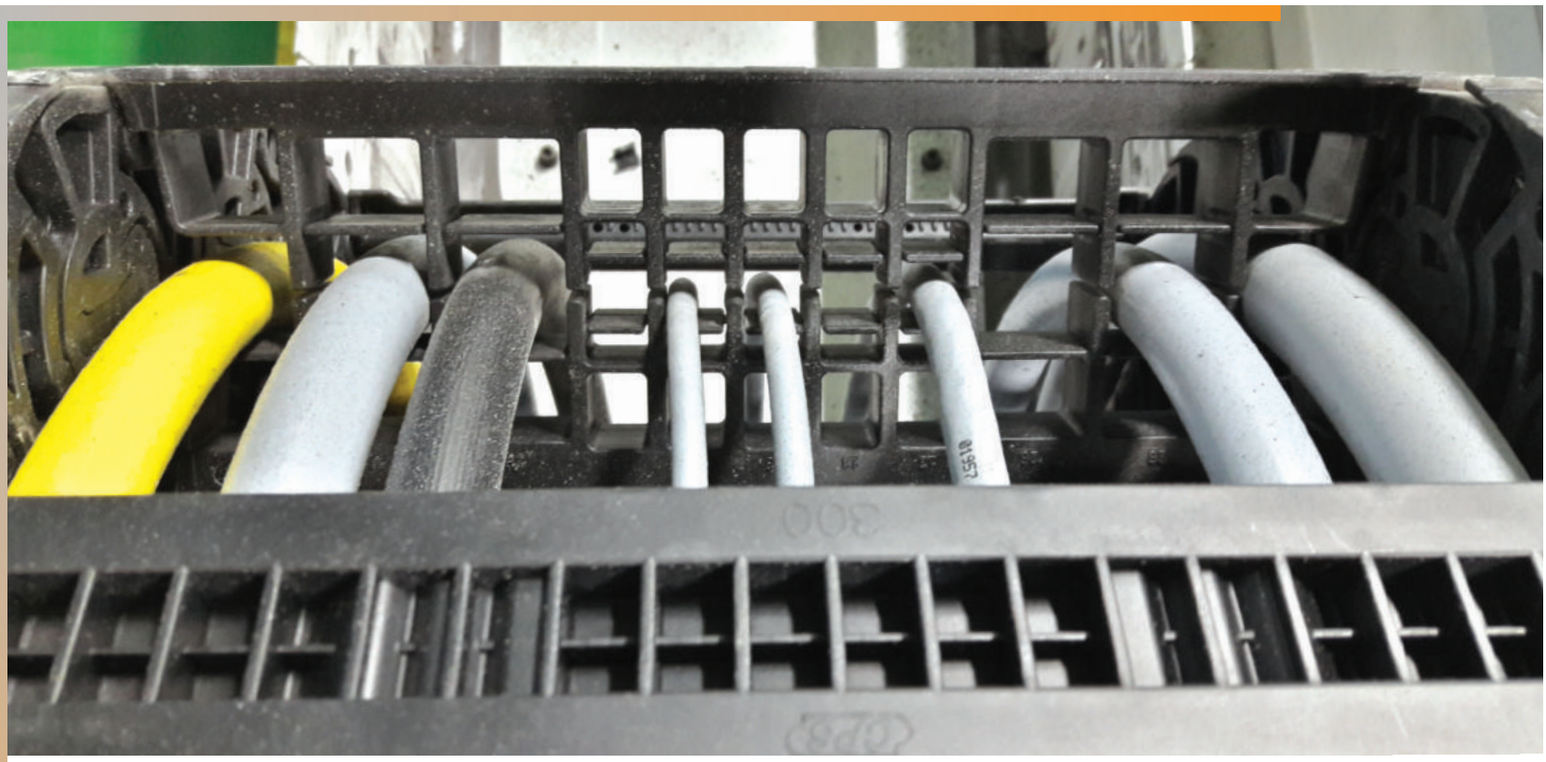


Horizontal sliding movement in guide channel



Revolving chain for reversed movemet

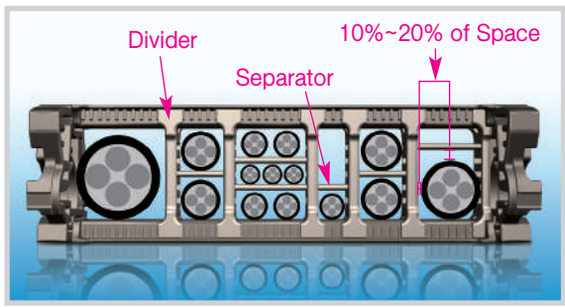
How to install cable chain with cables



Main purpose of cable chain is to protect cables and prolong cable's lifetime. To make sure, there are several standard guidance for arranging space between cables, cable layout and tension.

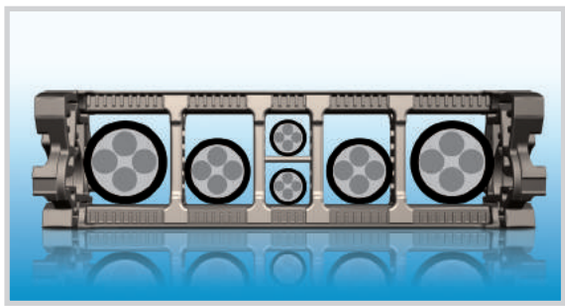
• Cable Space Standard

Round Cable	10% available space
Flat Cable	10% available space
Hose(Including Hydraulic Hose)	20% available space



• Cable Layout Standard

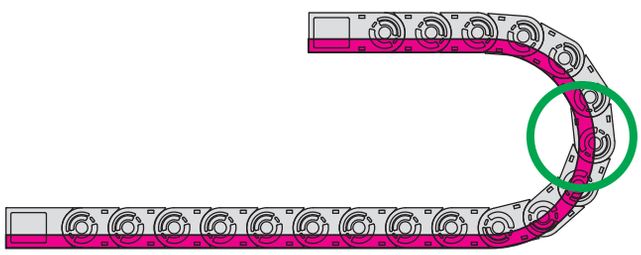
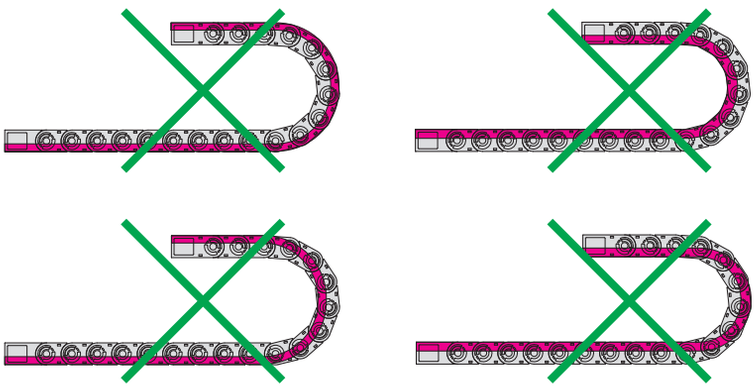
- When installing cables, the biggest cables or hoses should be laid at the side and the smallest cables should be laid in the middle to keep balance of weight during operation.



"R" min ⟩ 8 ~ 10 X Cable outer diameter
"R" min ⟩ 15 ~ 20 X Hydraulic Hose outer diameter

• Standard of Cable Tension

- Cables should be located as below at bent side of cable chain during operation.

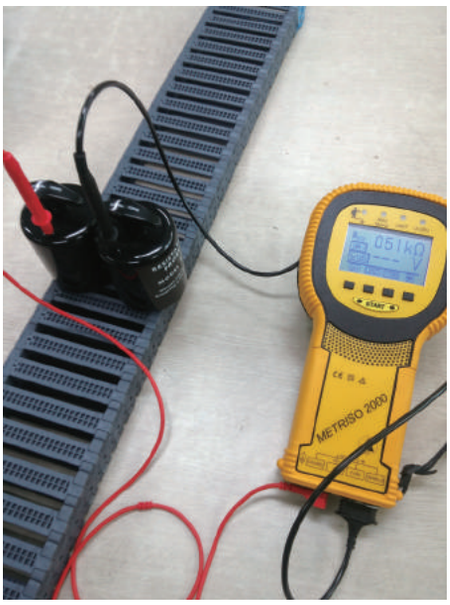
Correct arrangement of cables	Cable chain Cable		 Located in the middle between upper-frame and lower-frame : OK
Wrong arrangement of cables			 There's interference with frame due to short length of cables : NG

• To prevent twisted error when inserting cables

- Users or installers should use cable winding machine or equipment.
- Unfold and lay cables on the floor for 1 or half-day.

Technical sheet

- ESD & ATEX



• ESD Cable Chain

- CPS' cable chain can be produced ESD cable chain for special circumstance. ESD cable chain passed at least 2 millions reliability test and CPS is supplying ESD product for long time.

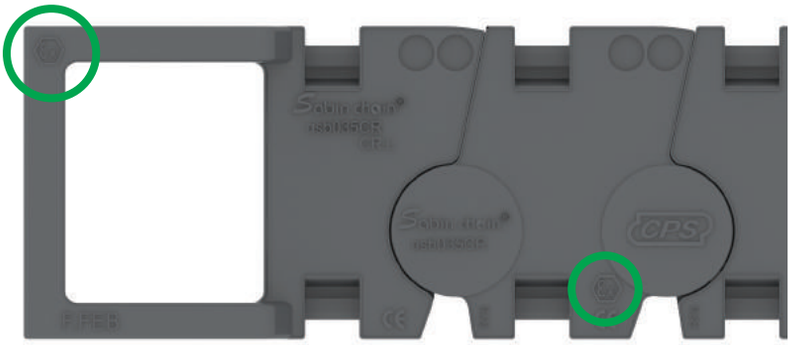
※If requested, we can produce other models as well.

ESD Cable Chain Stock Status

CPS mini Chain	
CPS030	O
CPS033	O
Sabin Chain	
nsb020CR	O
nsb022CR	O
nsb028CR	O
nsb035CR	O

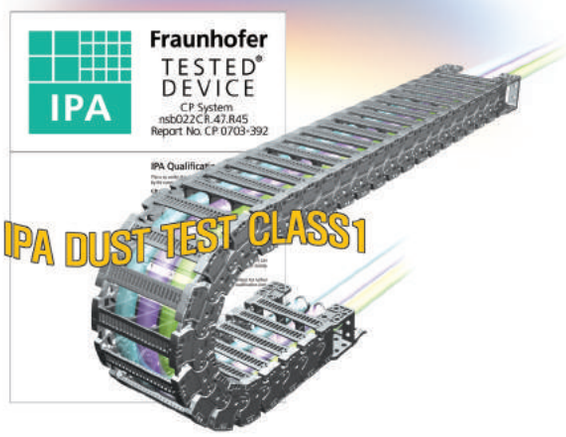
• ATEX

- CPS' cable chain obtained ATEX certificate from TUV Nord based on ATEX Directive 2014/4//34/EC. And it meets the Ex II 2 GD grade.



- Cleanroom & Customized

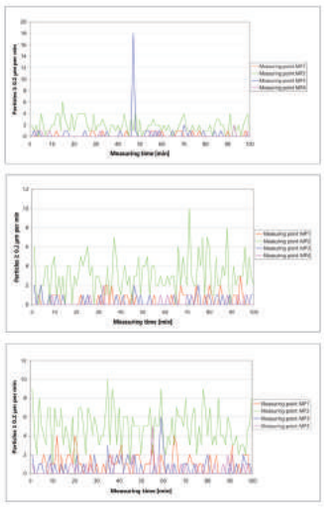
LOW DUST CHAIN WITH MOST SUITABLE FOR CLEAN-ROOM AREA!

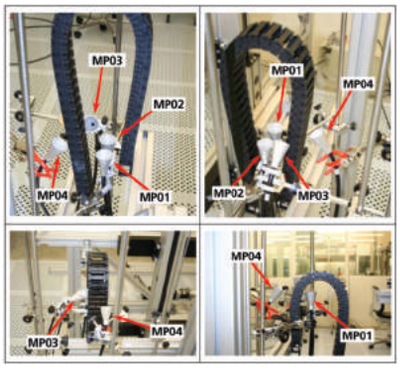


Sabin Chain was given ISO CLASS1 clean room certification according to the Germany IPA Dust Collection Test (VDI 2083 CLASS 1 / DIN EN 14644-1 ISO CLASS 1) thereby surpassing the allowable standard of Class 1 and easily qualifying it for use in semiconductor production lines on automation machine tools and machines requiring quiet and quick applications.

※ This test was done by the IPA TEST CENTER for the semiconductor manfacturer equipment and measurement processed with CLASS1 CLEAN ROOM(US Federal Standard 209E)

▶ IPA Test result
- nsb 020CR.20.R48 : ISO Class1
- nsb 045CR.75.R75 : ISO Class1
- nsb 035CR.55.R75 : ISO Class2





■ Clean room environment
Air speed(0.45 m/s)
Temperature(+5°C)
Humidity (45%)

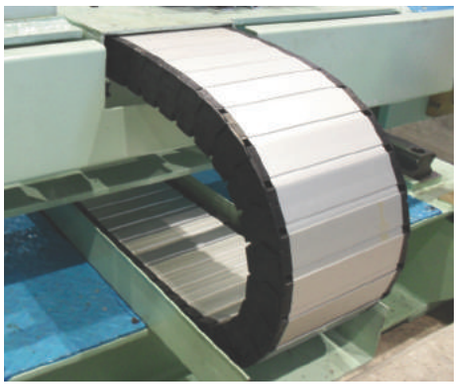
■ Test equipment
Fraunhofer IPA Test machine

■ Measurement Skill
Checking the dust dimension of >0.2㎛, >0.3㎛,>0.5㎛, use LPSA210 TYPE machine made by PMS.

■ Test operation and analysis
Operated by the guideline of VDI 2083 Part8

Customized Production

- CPS can produce UV Cable chain and Various colors' cable chain for long time.



nsb035N

▶ **Application**
Display production line

▶ **Location**
Korea (L-Display)

▶ **Remark**
Aluminum Frame Cover

nsb035N

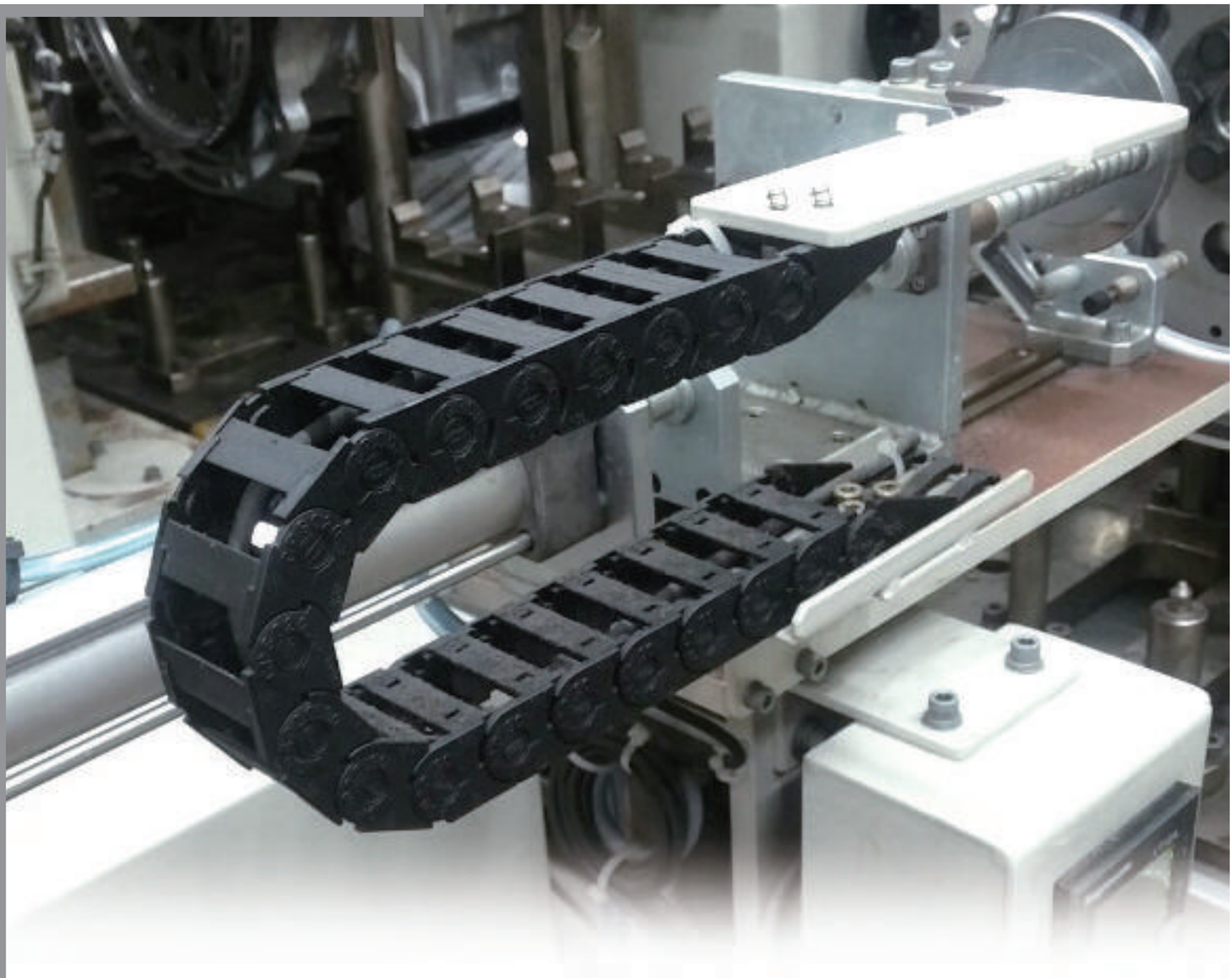
▶ **Application**
PCTC Ship

▶ **Location**
Korea (S-heavy industry)

▶ **Remark**
ESD / Orange color

▶ **Stroke**
2.5meters

CPS mini chain



General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Noise range	40dB(DIN EN 61672-1)
Speed	3m/s
Acceleration	10m/s²
Temperature	-30℃ ~+130℃
Special production	ESD, UV
Certificate	CE, ATEX(Ex)

Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

CPS Cable Chain **MINI Type**	Pitch	Bending Radlus(R)	Weight kg/m	Speed m/sec	Temperature ℃	Size A	Size B	Size C	Size D	Frame type	Section - composition
CPS 015	15	18, 28, 38	0.100 0.106 0.111 0.115	3	-30 ~ +130	12.6 16.6 21.6 26.6	13	6 10 15 20	10		
CPS 020	20	28, 38, 48	0.245 0.260 0.285 0.310	3	-30 ~ +130	24 29 39 49	20	15 20 30 40	14.5		
CPS 030	30	38, 48, 75, 100	0.380 0.400 0.420 0.440	3	-30 ~ +130	29 39 49 64	26	15 25 35 50	19		
CPS 033	33	35, 45, 75, 100, 120	0.550 0.590 0.610 0.680 0.700	3	-30 ~ +130	45 55 65 85 95	31	27 37 47 67 77	23		

(Dimensions in mm)

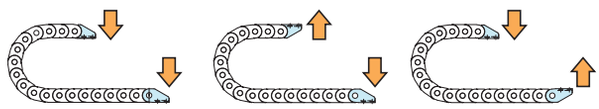
Ordering

CPS 015. 10. R28 / B2 - 550L : 10ST

- CPS CABLECHAIN
- Inside width
- Bending radius
- Bracket Type : B1, B2, B3 : E (CPS033)
- Length(mm)
- Q'ty(set)

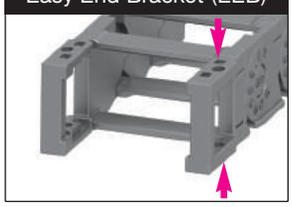
Bracket type

- CPS015, CPS020, CPS030



- CPS033

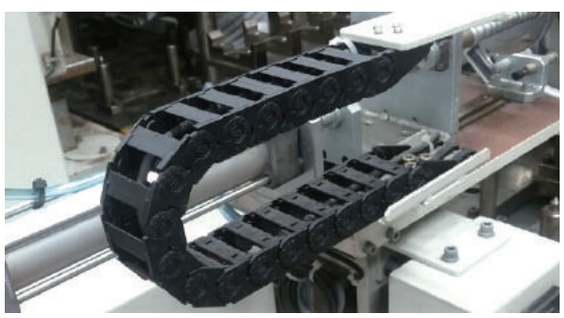
Easy End Bracket (EEB)



There are fixing holes of two directions including upper side and lower side.

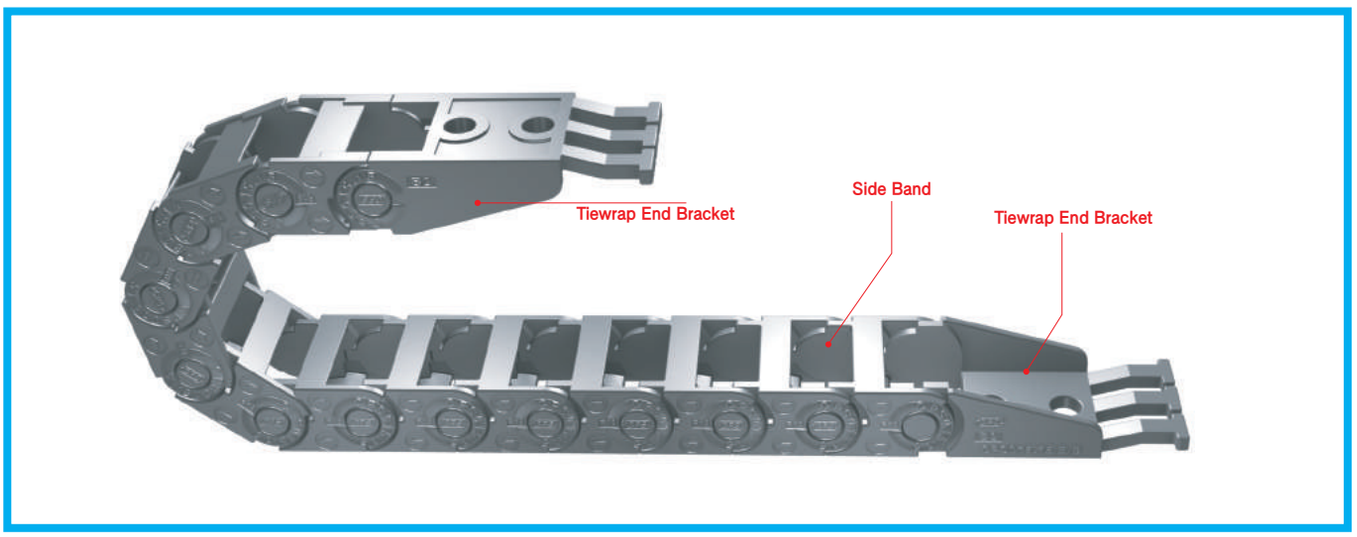
Application of CPS mini Chain

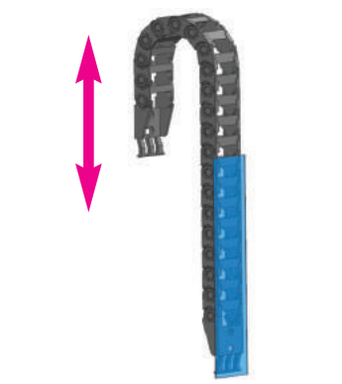
▲ Factory lines.



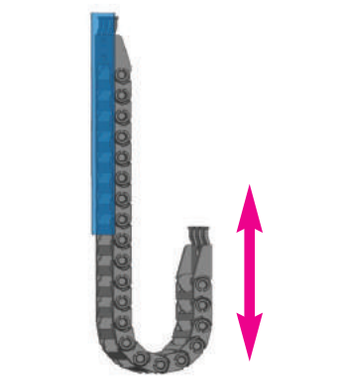
▲ Machine tools.

CPS 015

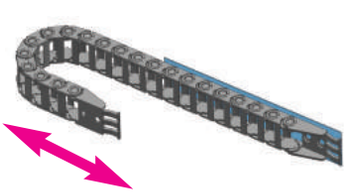




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

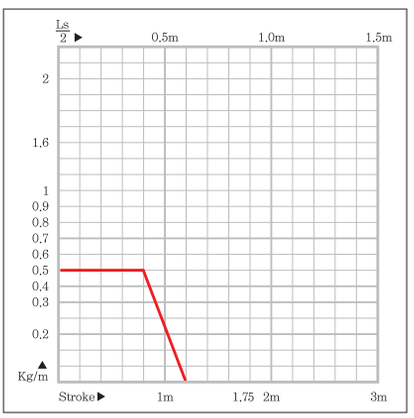
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

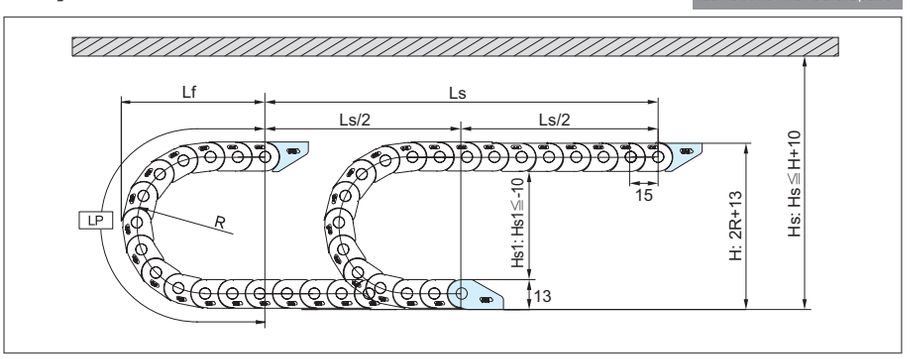
Vertical curve above = max 0.8m
Vertical curve below = max 3.0m
Side Mounted, Unsupported = max 0.2m

Load diagrams self-supporting length



Layout of the chain

Ls: Stroke Hs: Safe Space



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
18	117	55	49
28	148	65	69
38	180	75	89

(Dimensions in mm)

Chain radius, Weight

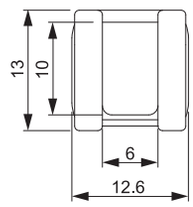
Chain Type	Bending Radius (R)	Weight kg/m
CPS 015.06	18, 28, 38	0.100
CPS 015.10		0.106
CPS 015.15		0.111
CPS 015.20		0.115

(Dimensions in mm)

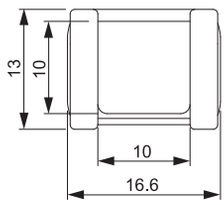
Chain cross section

(Dimensions in mm)

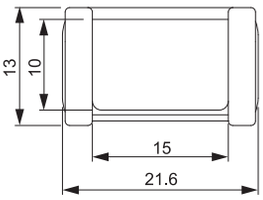
CPS015.06



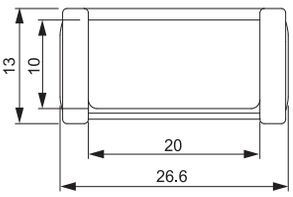
CPS015.10



CPS015.15



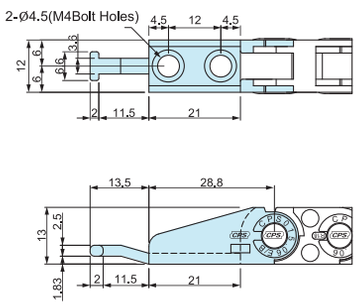
CPS015.20



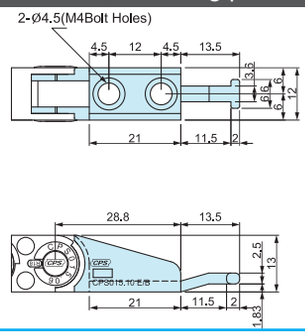
End bracket (Tie wrap type)

(Dimensions in mm)

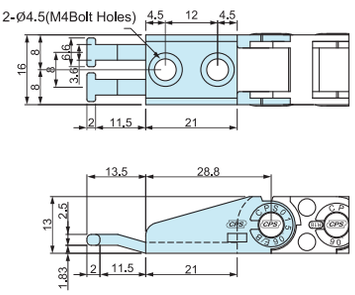
CPS015.06 Moving point



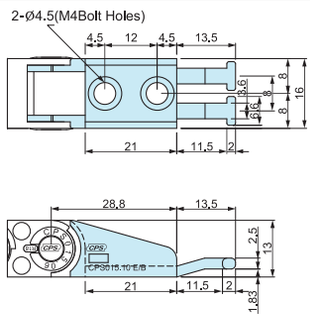
CPS015.06 Fixing point



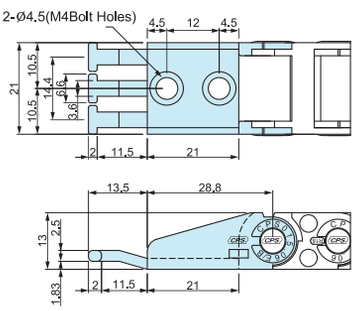
CPS015.10 Moving point



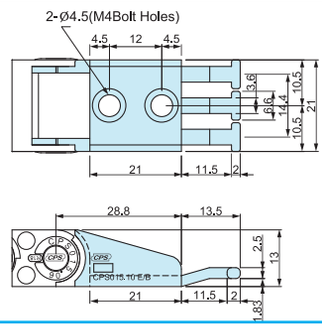
CPS015.10 Fixing point



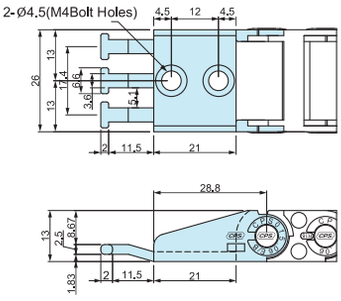
CPS015.15 Moving point



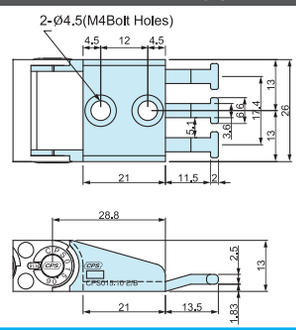
CPS015.15 Fixing point



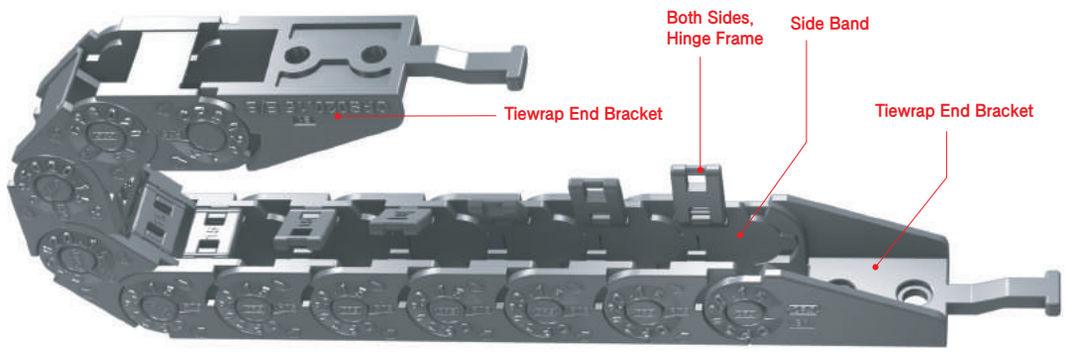
CPS015.20 Moving point

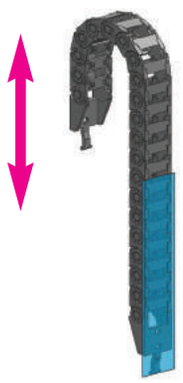


CPS015.20 Fixing point

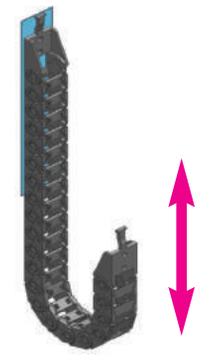


CPS 020

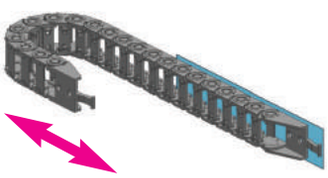




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

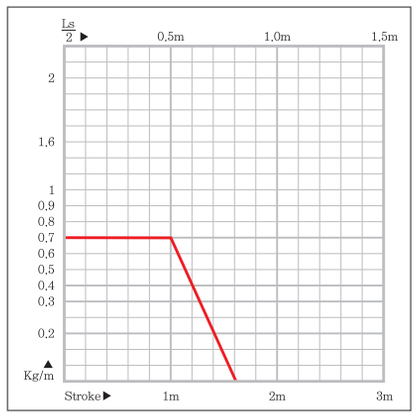
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

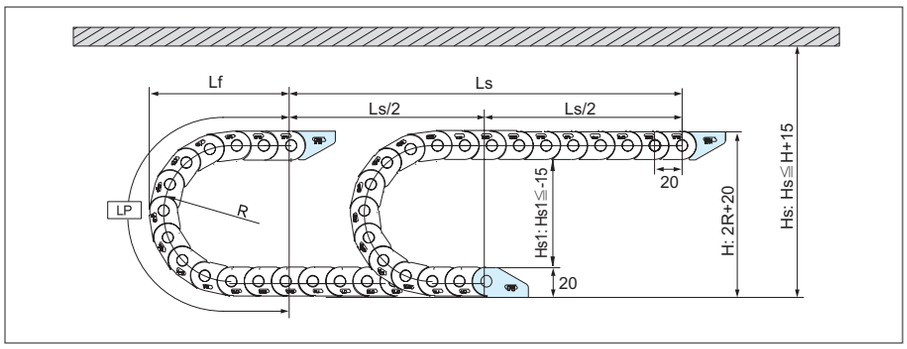
Vertical curve above = max 1.0m
Vertical curve below = max 5.0m
Side Mounted, Unsupported = max 0.5m

Load diagrams self-supporting length



Layout of the chain

Ls: Stroke Hs: Safe Space



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
28	170	78	76
38	200	88	96
48	230	98	116

(Dimensions in mm)

Chain radius, Weight

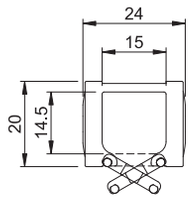
Chain Type	Bending Radius (R)	Weight kg/m
CPS 020.15	28, 38, 48	0.245
CPS 020.20		0.260
CPS 020.30		0.285
CPS 020.40		0.310

(Dimensions in mm)

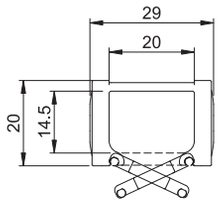
Chain cross section

(Dimensions in mm)

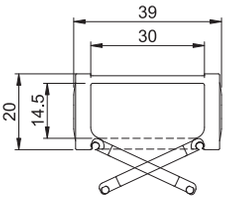
CPS020.15



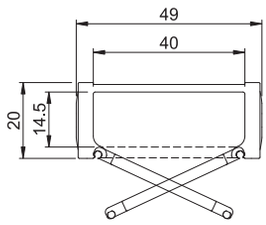
CPS020.20



CPS020.30



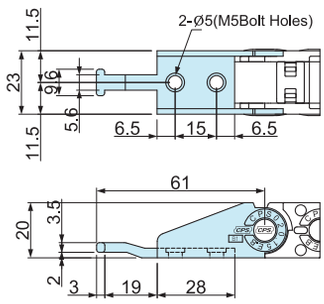
CPS020.40



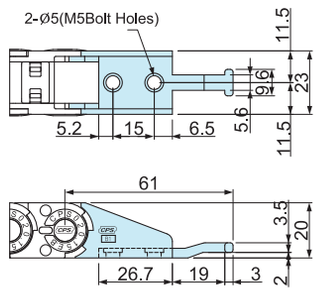
End bracket (Tie wrap type)

(Dimensions in mm)

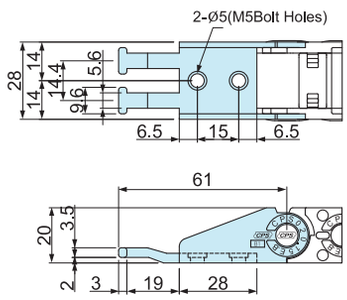
CPS020.15 Moving point



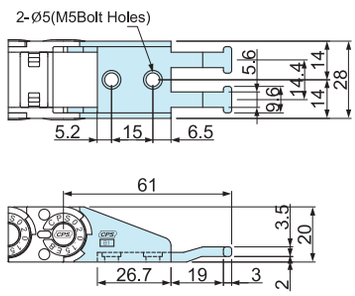
CPS020.15 Fixing point



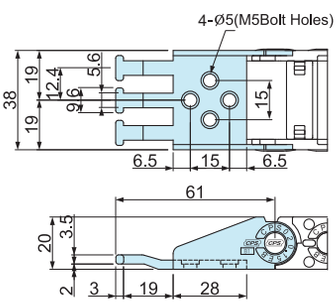
CPS020.20 Moving point



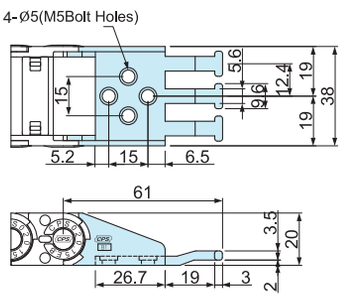
CPS020.20 Fixing point



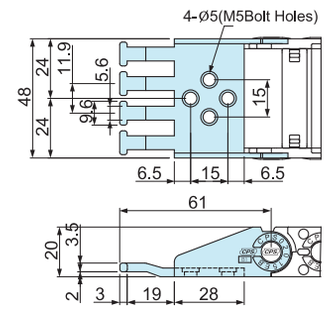
CPS020.30 Moving point



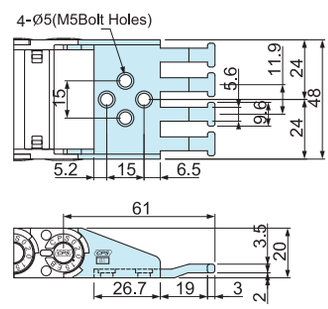
CPS020.30 Fixing point



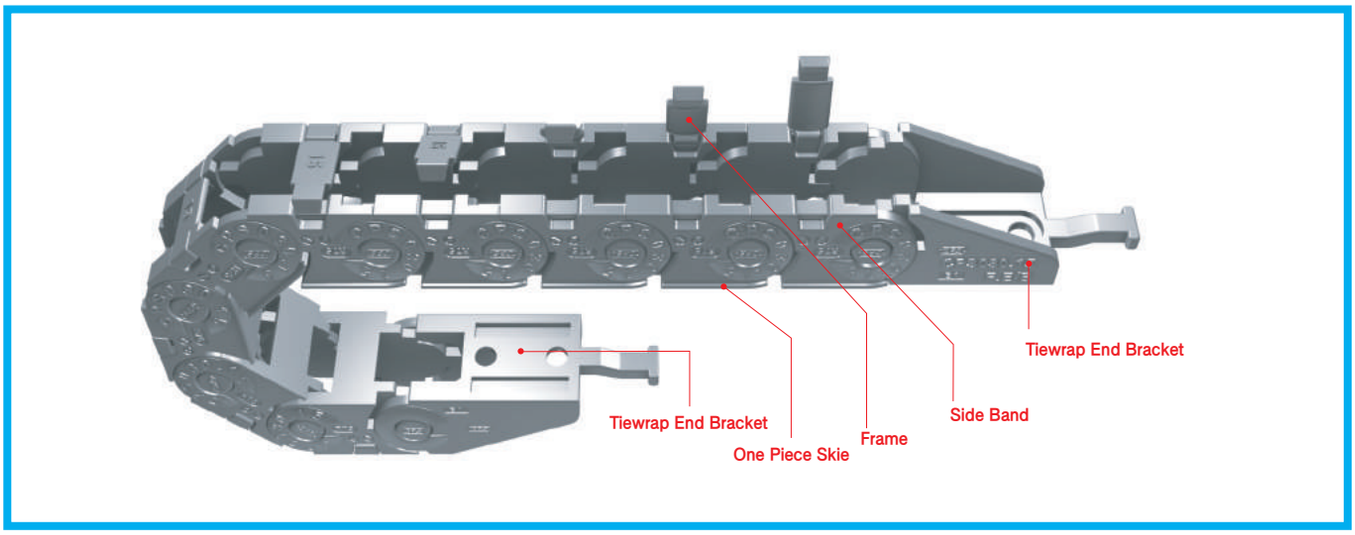
CPS020.40 Moving point

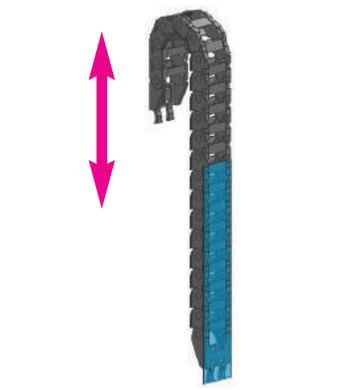


CPS020.40 Fixing point

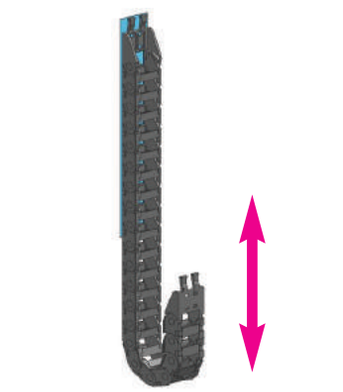


CPS 030

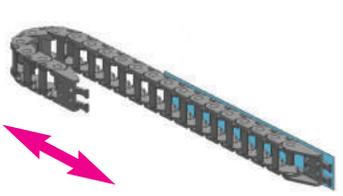




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

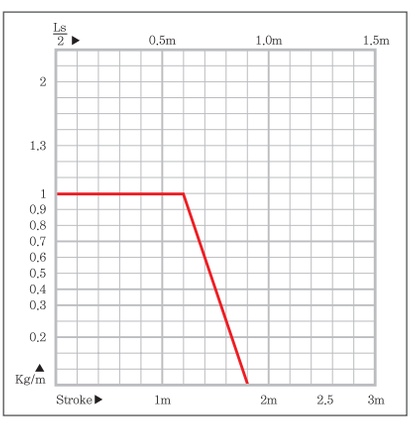
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

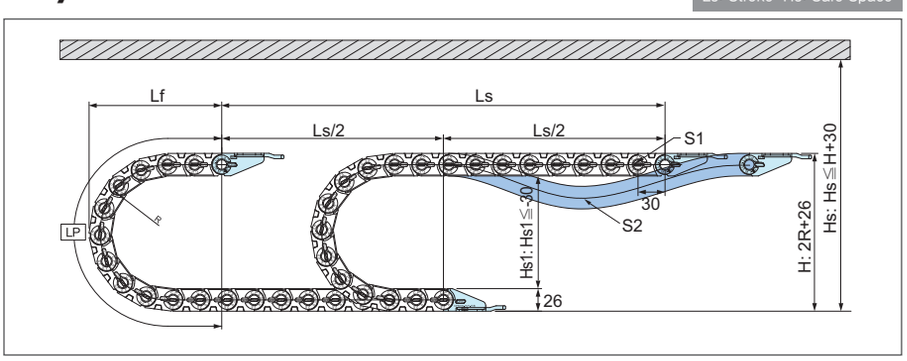
Vertical curve above = max 1.5m
Vertical curve below = max 10.0m
Side Mounted, Unsupported = max 0.6m

Load diagrams self-supporting length



Layout of the chain

Ls: Stroke Hs: Safe Space



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
38	240	110	101
48	271	119	121
75	356	148	175
100	434	173	225

(Dimensions in mm)

Chain radius, Weight

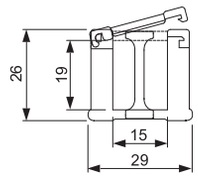
Chain Type	Bending Radius (R)	Weight kg/m
CPS 030.15	38, 48, 75, 100	0.38
CPS 030.25		0.40
CPS 030.35		0.42
CPS 030.50		0.44

(Dimensions in mm)

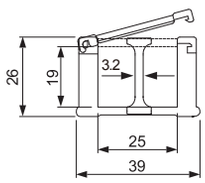
Chain cross section

(Dimensions in mm)

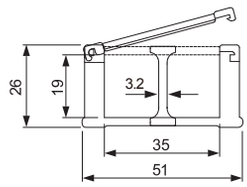
CPS030.15



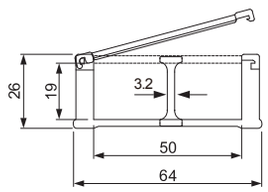
CPS030.25



CPS030.35



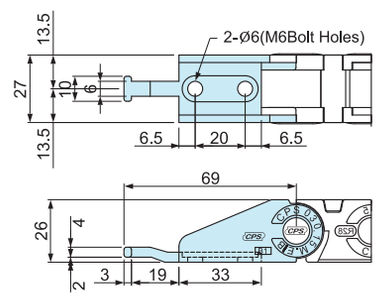
CPS030.50



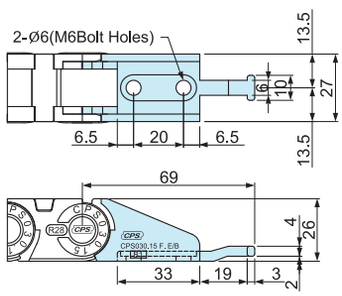
End bracket (Tie wrap type)

(Dimensions in mm)

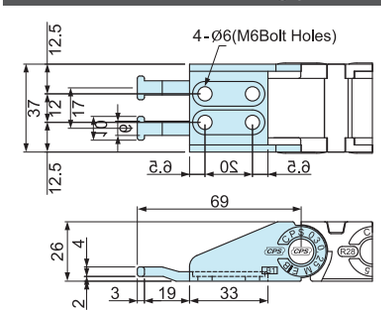
CPS030.15 Moving point



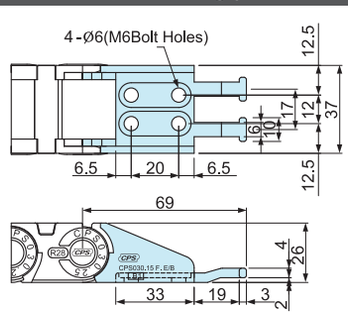
CPS030.15 Fixing point



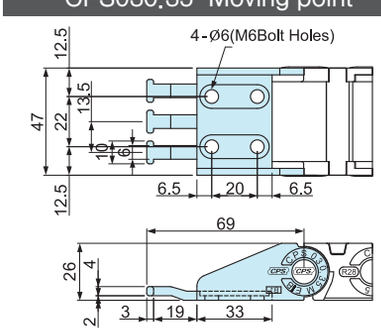
CPS030.25 Moving point



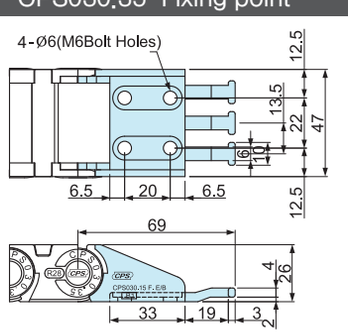
CPS030.25 Fixing point



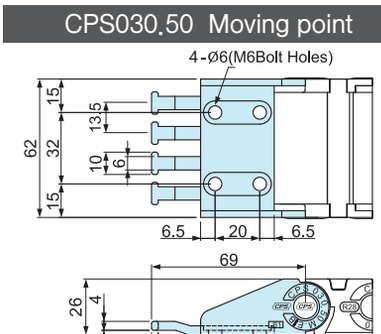
CPS030.35 Moving point



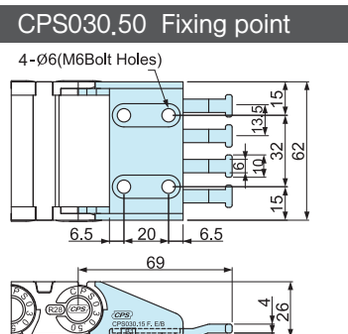
CPS030.35 Fixing point



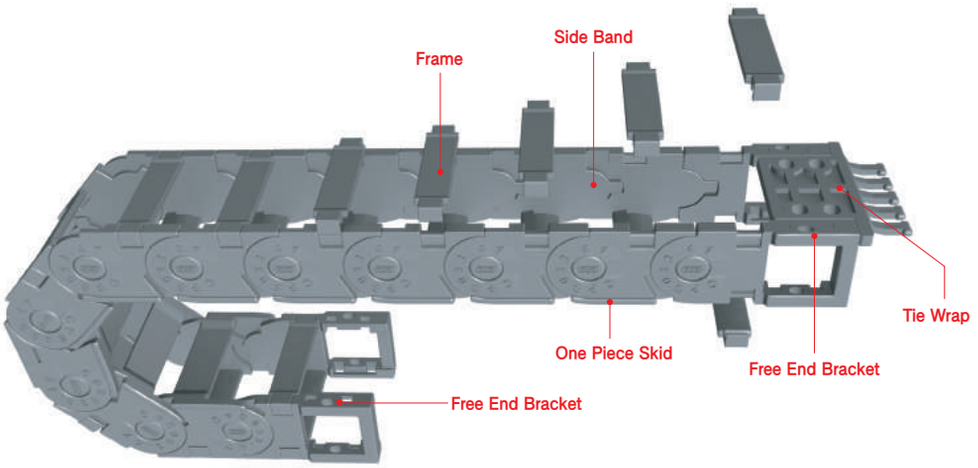
CPS030.50 Moving point

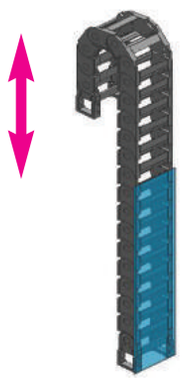


CPS030.50 Fixing point

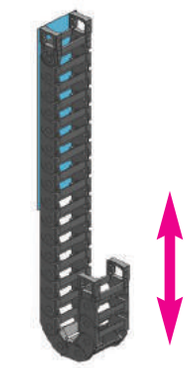


CPS 033

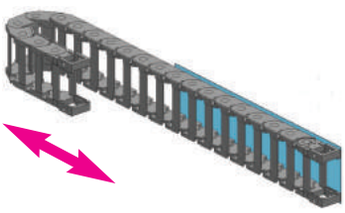




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

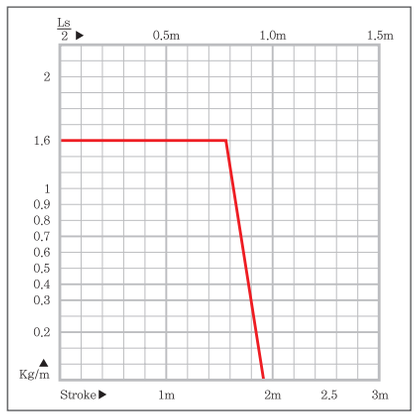
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

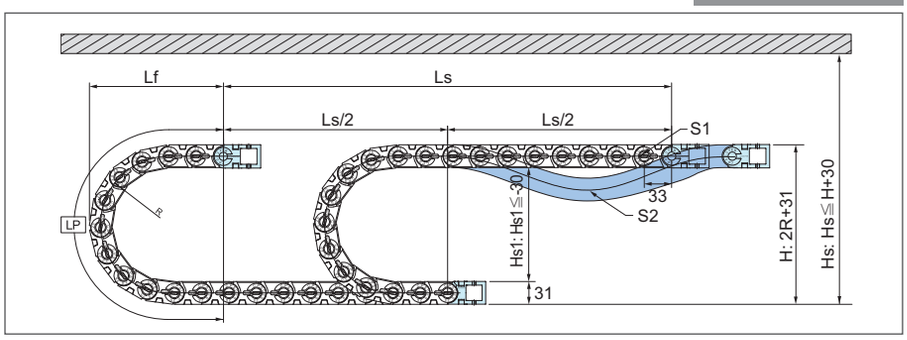
Vertical curve above = max 1.5m
Vertical curve below = max 10.0m
Side Mounted, Unsupported = max 0.6m

Load diagrams self-supporting length



Layout of the chain

Ls: Stroke Hs: Safe Space

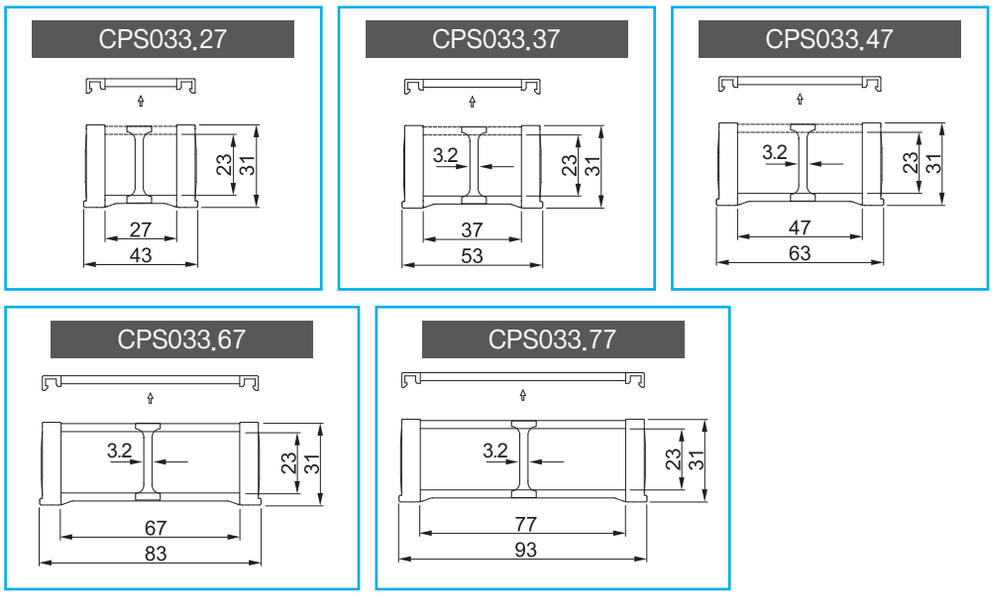


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
35	242	117	101
45	274	127	121
75	368	157	181
100	446	182	231
120	509	202	271

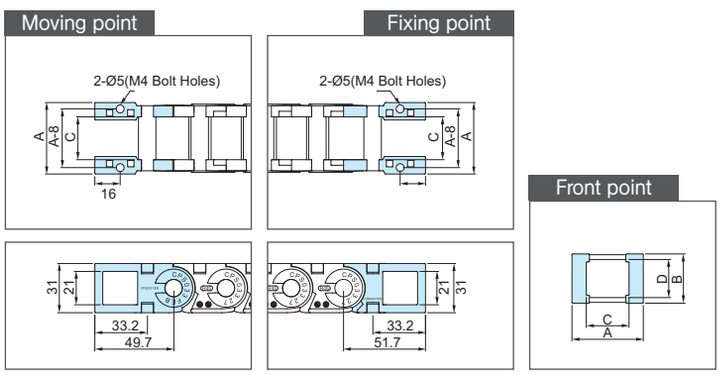
(Dimensions in mm)

Chain cross section

(Dimensions in mm)



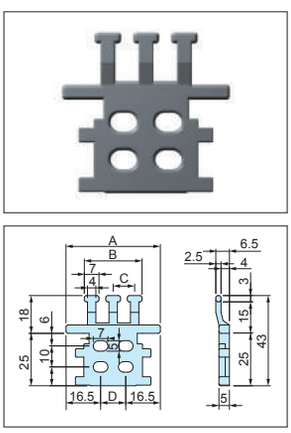
Easy end bracket



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Hole Type
CPS 033	45 55 65 85 95	31	27 37 47 67 77	23	M4 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)

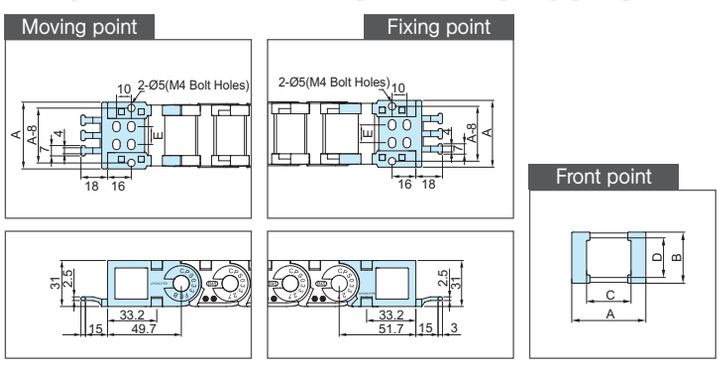


Tie wrap prevents cut off problem of the cable by the twisting and pulling movement.
The tie wrap of this CPS CABLE Chain has two types, separated with bracket type and attached with bracket type.

Chain Type	Ordering No.	A	B	C	D
CPS 033	S-TW033/20CR.27	45.0	27.5	10.20	12.0
	S-TW033/20CR.37	55.0	41.0	8.50	22.0
	S-TW033/20CR.47	65.0	48.0	10.40	32.0
	S-TW033/20CR.67	85.0	68.0	10.00	52.0
	S-TW033/20CR.77	95.0	78.0	8.87	62.0

(Dimensions in mm)

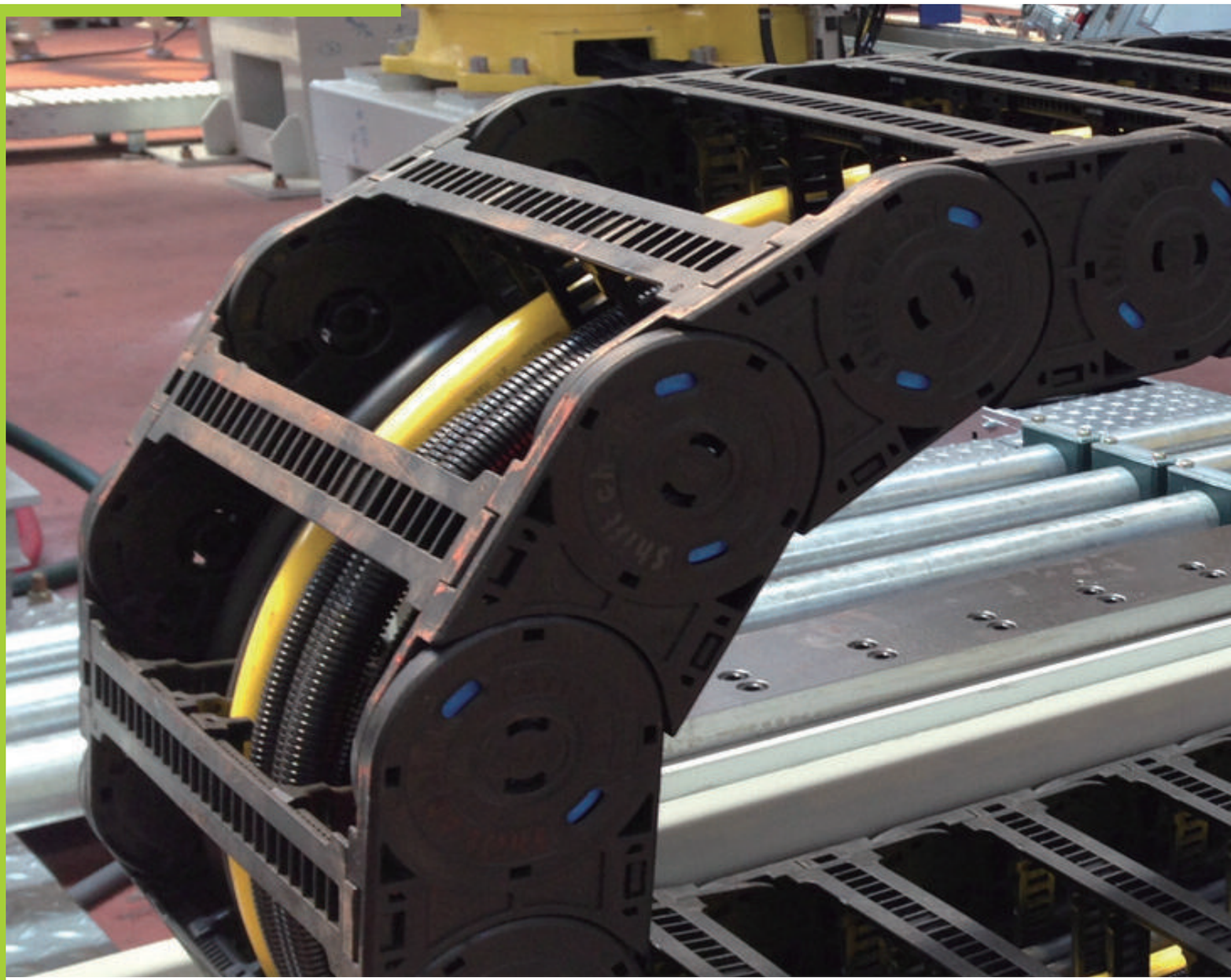
Easy end bracket (Tie wrap type)



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E Hole width	Hole Type
CPS 033	45 55 65 85 95	31	27 37 47 67 77	23	12 22 32 52 62	M4 Bolt Holes

(Dimensions in mm)

Shift Chain



Shift chain®

ST - N : Normal type

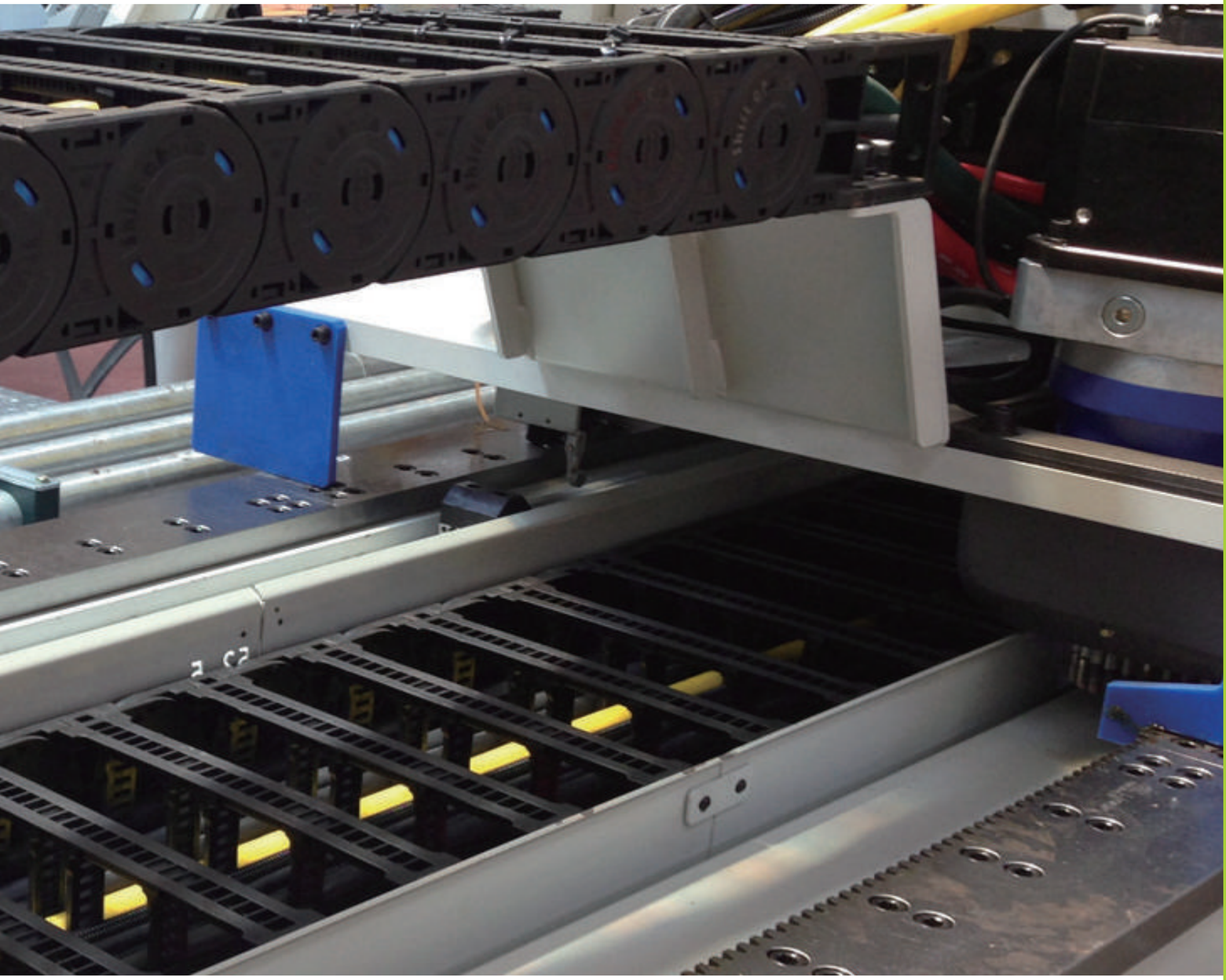
- ▸ST044N C-9
- ▸ST055N C-11
- ▸ST072N C-13
- ▸ST095N C-15
- ▸ST120N C-17
- ▸ST150N C-19

ST - E : Enclosed type

- ▸ST044E C-27
- ▸ST055E C-29
- ▸ST072E C-31
- ▸ST095E C-33
- ▸ST120E C-35
- ▸ST150E C-37

ST - S : Skid type

- ▸ST044S C-43



ST - ES :
Enclosed Skid type

- ST044ES C-51
- ST072ES C-53
- ST095ES C-55
- ST120ES C-57

ST - RS :
Roller Skid type

- ST044RS C-65
- ST072RS C-67
- ST095RS C-69
- ST120RS C-71
- ST150RS C-73

ST - ERS :
Enclosed Roller Skid type

- ST044ERS C-81
- ST072ERS C-83
- ST095ERS C-85
- ST120ERS C-87

Shift Chain - Normal type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	3m/s
Acceleration	10m/s²
Temperature	-30℃ ~+130℃
Special production	ESD, UV
Certificate	CE, ATEX(Ex)

Calculation table

Item	Value
Length of Cable Chain	L + ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

Shift Chain N Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Size A	Size B	Size C	Size D	Frame type	Section-composition
ST 044N	44	50, 70, 90, 120, 150	0.93 0.97 1.00 1.06 1.17 1.30 1.43 1.78 1.94	3	-30 ~ +130	56 71 76 96 121 146 171 196 221	38	35 50 55 75 100 125 150 175 200	26		
ST 055N	55	65, 75, 100, 125, 150, 200	1.12 1.15 1.18 1.23 1.31 1.41 1.51 1.78 1.92	3	-30 ~ +130	56 71 76 96 121 146 171 196 221	52	35 50 55 75 100 125 150 175 200	40		
ST 072N	72	72, 100, 120, 145, 200, 250, 300	2.10 2.20 2.30 2.43 2.51 2.56 2.62 2.66 2.93 3.11 3.21 3.24 3.60	3	-30 ~ +130	82 107 132 157 172 182 197 207 222 232 272 282 332	66	50 75 100 125 140 150 165 175 190 200 240 250 300	45		
ST 095N	95	135, 150, 200, 230, 280, 400	3.11 3.17 3.37 3.49 3.60 3.71 3.79 4.00 4.05 4.31 4.69 5.05	3	-30 ~ +130	113 138 163 188 213 228 238 278 288 338 388 438	82	75 100 125 150 175 190 200 240 250 300 350 400	56		
ST 120N	120	180, 200, 250, 300, 350, 400, 500	4.41 4.53 4.61 4.67 4.78 4.93 5.17 5.41 5.47 5.80 5.88 6.30 6.73 7.07 7.30 8.13 8.30	3	-30 ~ +130	117 142 157 167 192 217 242 282 292 332 342 392 442 492 542 592 642	108	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78		
ST 150N	150	205, 305, 405, 505, 605	5.85 5.96 6.03 6.08 6.18 6.30 6.51 6.72 6.78 7.06 7.14 7.51 7.88 8.18 8.37 9.11 9.26	3	-30 ~ +130	121 146 161 171 196 221 246 286 296 336 346 396 446 496 546 596 646	140	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	110		

(Dimensions in mm)

Ordering

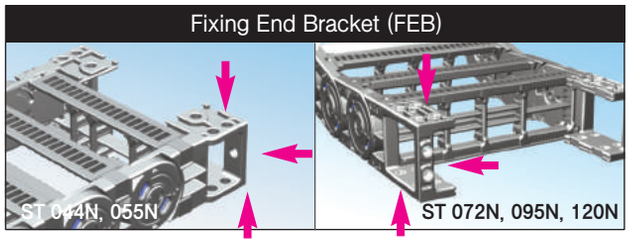
ST 044N. 100. R120 / F - 1500L : 10ST

- Shift Chain
- Normal type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
  - B1, B2 and B3 : ST150N
- Length(mm)
- Q'ty(set)

Bracket type

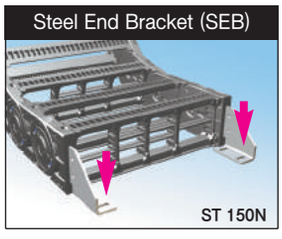
- ST044, ST055, ST072, ST095, ST120

Fixing End Bracket (FEB)

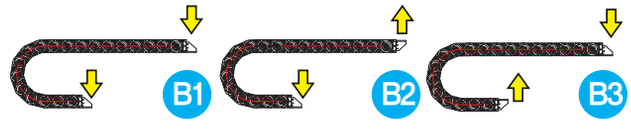


- ST150

Steel End Bracket (SEB)

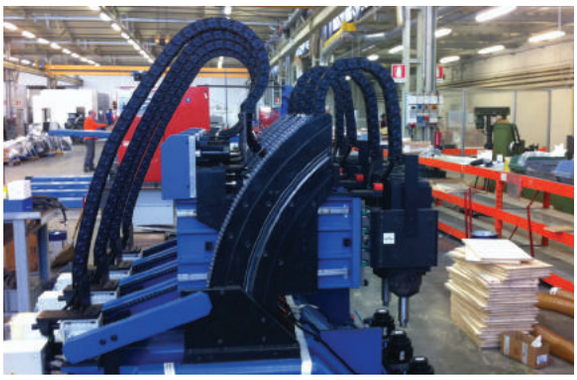


For ST150N, its end parts of cable chain being fixed are used with steel bracket, and it is possible to be installed B1, B2, B3 types of brackets.



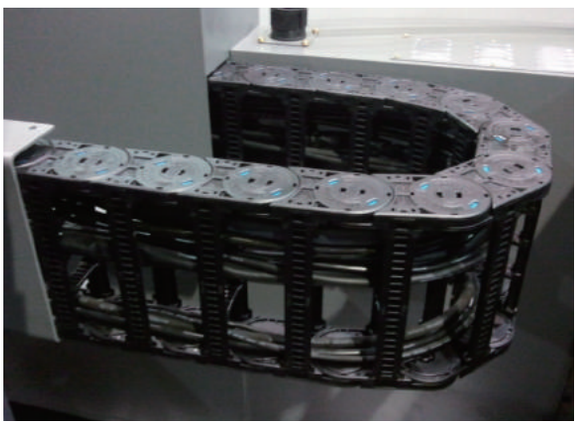
≫ Application of Shift Chain

- Shift Chain can be applied to all kinds of machine tools and factory lines.



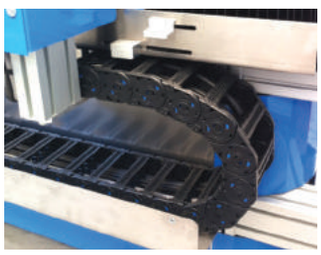
▶ ST 044N **Application:**
Machine tool
Location:
Italy
Remark:
Verious stroke and direction

▶ ST 120N **Application:**
Robot Carriage line
Location:
China
Remark:
Stroke 3 meters



▶ ST 055N **Application:**
Machine tool
Location:
Japan
Remark:
Side mounting

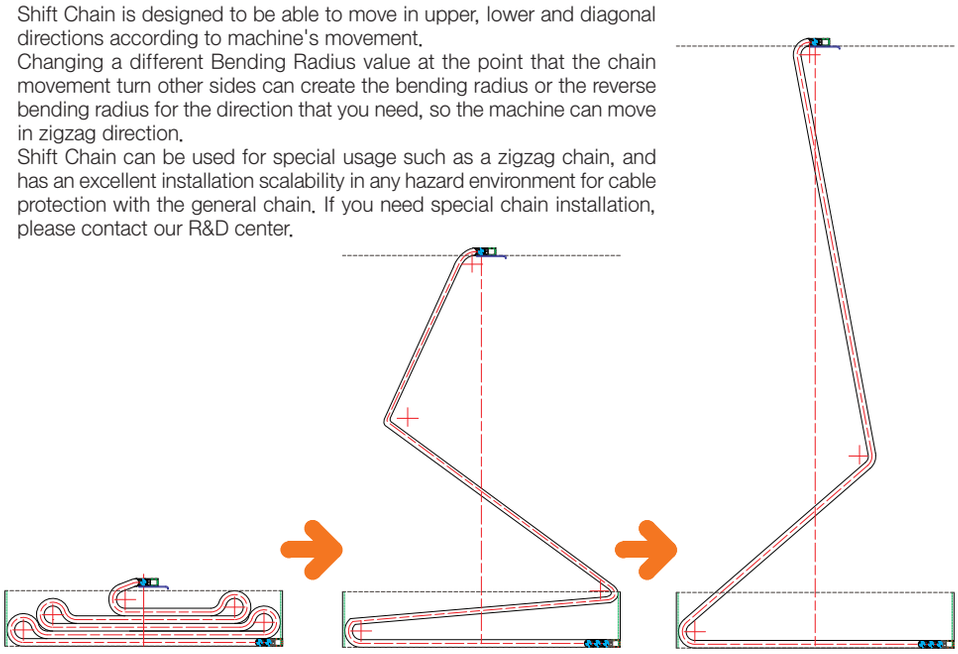
▶ ST 095N
Application:
Steel manufacturing line
Location:
Korea
Remark:
Verious stroke and direction



▶ ST 072N
Application:
Nylon Cloth cutting machine
Location:
Italy
Remark:
Stroke 2.5 meters

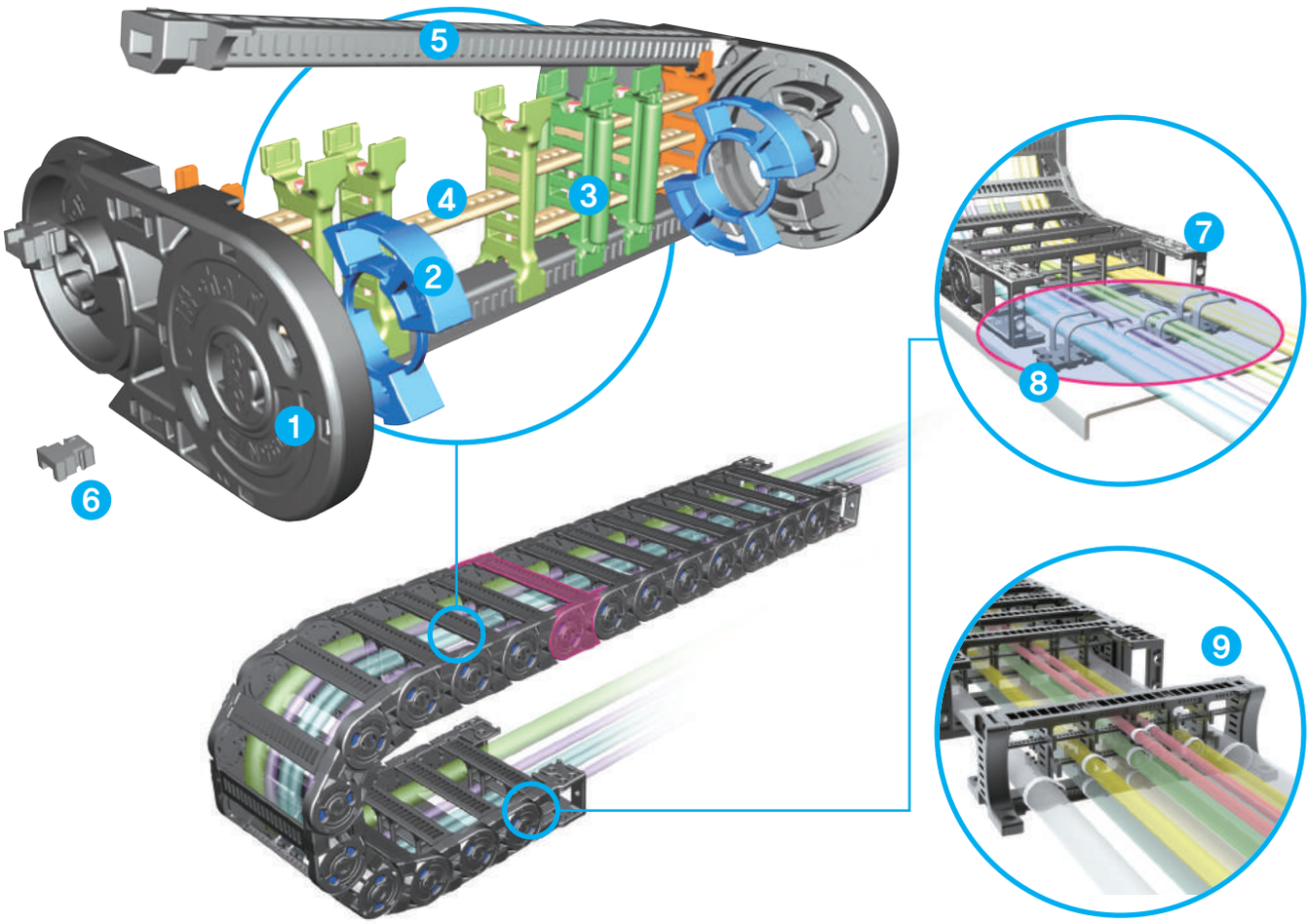
≫ Customized Shift Chain

Shift Chain is designed to be able to move in upper, lower and diagonal directions according to machine's movement.
Changing a different Bending Radius value at the point that the chain movement turn other sides can create the bending radius or the reverse bending radius for the direction that you need, so the machine can move in zigzag direction.
Shift Chain can be used for special usage such as a zigzag chain, and has an excellent installation scalability in any hazard environment for cable protection with the general chain. If you need special chain installation, please contact our R&D center.



Shift Chain - Normal type

≫ Part of Shift Chain Normal type



❶ Side Band (SB)
A unit that connects each side band and between them BR is inserted to strengthen clamping force.

❷ Bending Radius Unit (BR)
A unit that inserted between each side band.
There are 6 supporting points to create durability.

❸ Divider (DV-S, M, R, T)
A unit that divides inserted cables horizontally.

❹ Separator (SP)
A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❺ Frame (Hinged Type) (FR)
Hinged-type frame, open one side, supports connection of both side of side band and have tongue and groove system plate to secure the position of the divider on the frame.

❻ Frame Pin (FP)
The connecting pin for preventing the breakaway of Frame connected at Side Band, combining and fixing the Frame and Side Band. For Shift chain(ST)072N, 092N, 120N, 150N type, one side of the frame is fixed by inserting a fixing pin to prevent frame open, which caused by any external impact. Also, in case of ST044N, ST055N type, an open side of the frame is fixed by Hook-type frame.

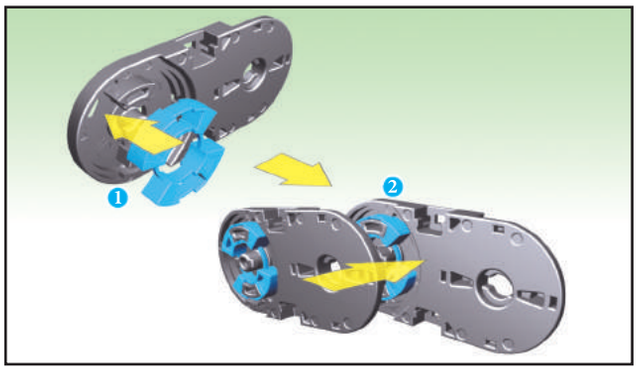
❼ Free End Bracket (FEB)
A unit that connects at last side band (left&right).
It can be fixed stronger using steel washers.

❽ Tie Wrap (TW)
A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.

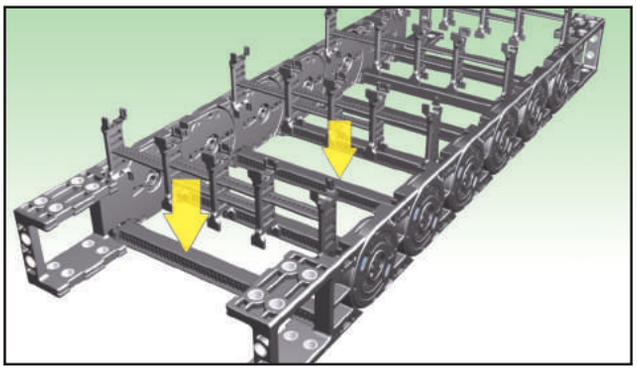
❾ System Tie Wrap (STW)
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisted and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

≫ Assembly procedure of Shift Chain Normal type

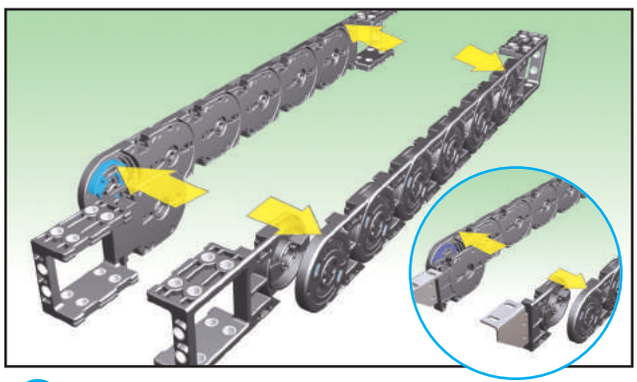
The assembling process of Shift Chain N-Type is like below and users must use rubber hammer with careful combination of Divider and Separator. Be careful of different assembling process depending on product specification such as ST044N, 055N Type, ST072N, 095N, 120N Type, ST150N Type etc.



1 Insert BR unit to each side band, connect the side bands as many as you need, then do the same process to the other side of side band.

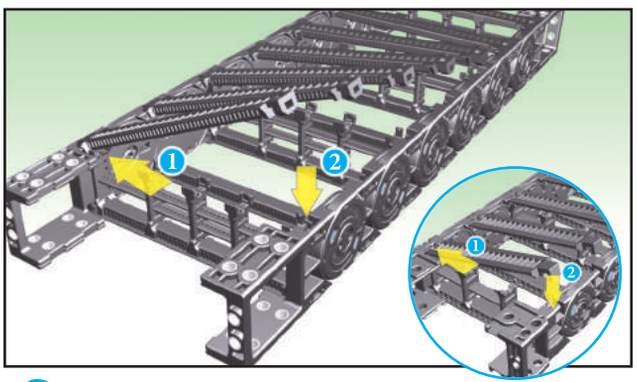


5 Fix the separator and divider patterns to the bottom-side frames as needed.



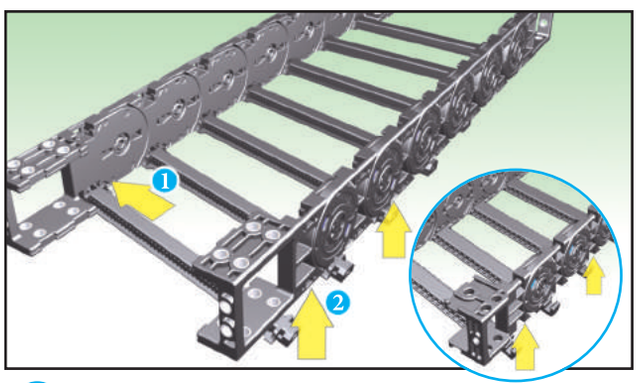
2 Assemble the end brackets on both ends using the same method.

For ST150N, assemble steel brackets on both ends.



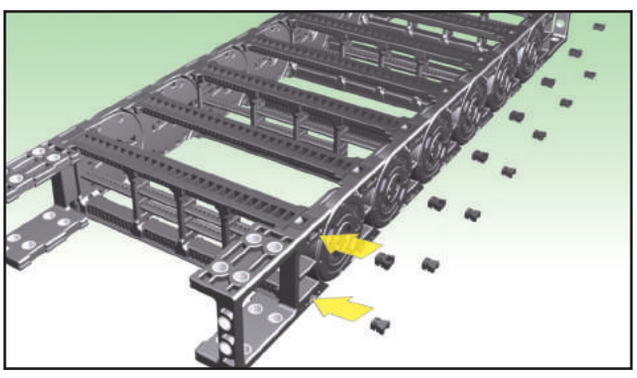
6 Attach frames to one side groove on the side band, and then the other side.

ST044N, 055N frame type.

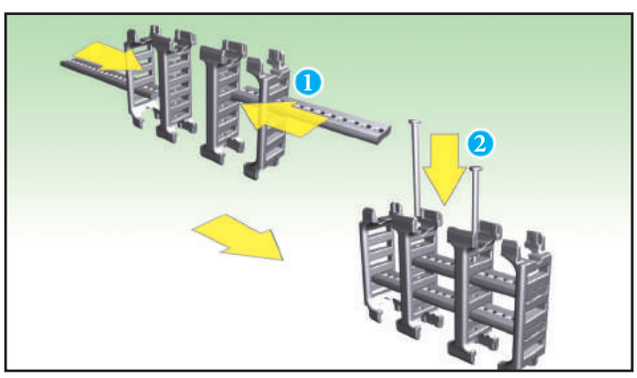


3 Attach frames to one side groove on the side band, and then the other side.

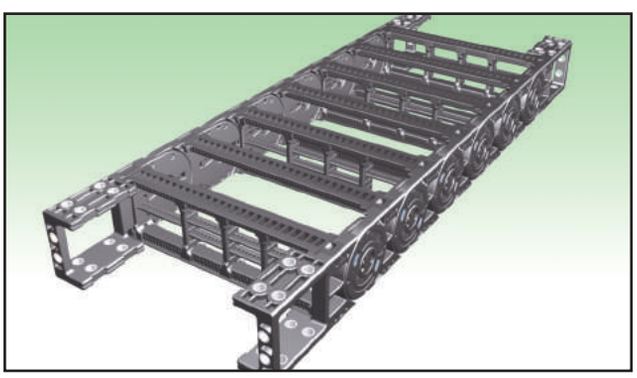
ST 044N, 055N are Hinge Type or Hook Type without frame pin.



7 Insert frame pins to secure the frames and complete carrier. (ST072N, 095N, 120N, 150N are applied with frame pin, and ST044N, 055N are Hinge Type or Hook Type without frame pin.)



4 For ST072N, 095N,120N, and 150N, connect the pin of separator in hole of divider after inserting separator in hole of divider. For ST044N and ST055N, separator fixing pins are not used.



8 Assembled Shift Chain N-Type is assembled.

Shift Chain - Normal type

≫ Part list of Shift Chain Normal type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
ST044N	SIDE BAND	ST-SB044N/E(LH) ST-SB044N/E(RH)	Left side band of ST044N Right side band of ST044N
	BENDING RADIUS	ST-BR044.R50,70,90,120,150	Bending radius unit for side band
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	ST-FEB044N/S	End bracket of ST044N
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
ST055N	SIDE BAND	ST-SB055N/E(LH) ST-SB055N/E(RH)	Left side band of ST055N Right side band of ST055N
	BENDING RADIUS	ST-BR055.R65,75,100,125,150,200	Bending radius unit for side band
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	ST-FEB055N/S	End bracket of ST055N
	DIVIDER	sb-DV035/M sb-DV035/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.55 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 55mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW050/035N.50 S-TW050/035N.75 S-TW050/035N.100 S-TW050/035N.125 S-TW050/035N.150 S-TW050/035N.175 S-TW050/035N.200	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm Tie wrap for end bracket to fix cables, 175mm Tie wrap for end bracket to fix cables, 200mm
	SYSTEM TIE WRAP	sb-DV035/W S-TW.EB035	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

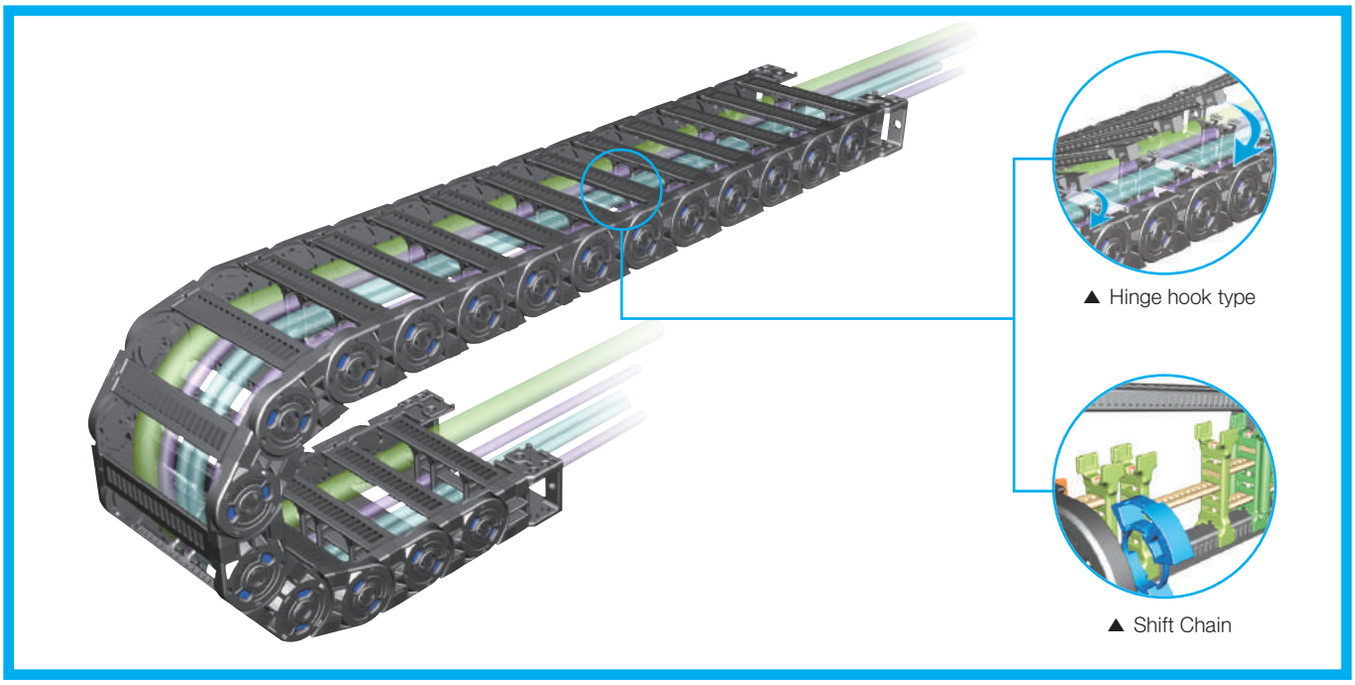
Model	Classification	Part number	Description
ST072N	SIDE BAND	ST-SB072N/E(LH) ST-SB072N/E(RH)	Left side band of ST072N Right side band of ST072N
	BENDING RADIUS	ST-BR055.R65,75,100,125,150,200	Bending radius unit for side band
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR045.50 sb-FR045.75 sb-FR045.100 sb-FR045.125 sb-FR045.140 sb-FR045.150 sb-FR045.165 sb-FR045.175 sb-FR045.190 sb-FR045.200 sb-FR045.240 sb-FR045.250 sb-FR045.300	Frame, 50mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 140mm Frame, 150mm Frame, 165mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 300mm
	FREE END BRACKET	ST-FEB072N/S sb-FEB/WH045	End bracket of ST072N Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S sb-DV045/T sb-DV045/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

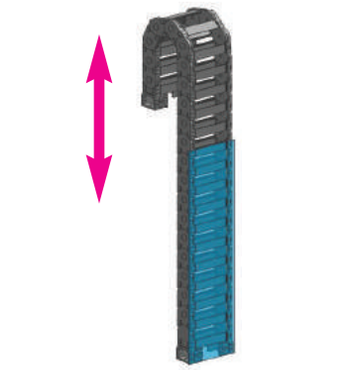
Model	Classification	Part number	Description
ST095N	SIDE BAND	ST-SB095N/E(LH) ST-SB095N/E(RH)	Left side band of ST095N Right side band of ST095N
	BENDING RADIUS	ST-BR055.R65,75,100,125,150,200	Bending radius unit for side band
	FRAME PIN	S-FP/S1	Frame Pin
	FRAME	sb-FR060.75 sb-FR060.100 sb-FR060.125 sb-FR060.150 sb-FR060.175 sb-FR060.190 sb-FR060.200 sb-FR060.230 sb-FR060.250 sb-FR060.300 sb-FR060.350 sb-FR060.400	Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 230mm Frame, 250mm Frame, 300mm Frame, 350mm Frame, 400mm
	FREE END BRACKET	ST-FEB095N/S sb-FEB/WH060	End bracket of ST095N Steel washer for end bracket
	DIVIDER	sb-DV060/M sb-DV060/S sb-DV060/T sb-DV060/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW.EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
ST120N	SIDE BAND	ST-SB120N/E(LH) ST-SB120N/E(RH)	Left side band of ST120N Right side band of ST120N
	BENDING RADIUS	ST-BR120.R180, 200, 250, 300, 350, 400, 500	Bending radius unit for side band
	FRAME PIN	S-FP/S2	Frame Pin
	FRAME	sb-FR075/100.75 sb-FR075/100.100 sb-FR075/100.115 sb-FR075/100.125 sb-FR075/100.150 sb-FR075/100.175 sb-FR075/100.200 sb-FR075/100.240 sb-FR075/100.250 sb-FR075/100.290 sb-FR075/100.300 sb-FR075/100.350 sb-FR075/100.400 sb-FR075/100.450 sb-FR075/100.500 sb-FR075/100.550 sb-FR075/100.600	Frame, 75mm Frame, 100mm Frame, 115mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 290mm Frame, 300mm Frame, 350mm Frame, 400mm Frame, 450mm Frame, 500mm Frame, 550mm Frame, 600mm
	FREE END BRACKET	ST-FEB120N/S sb-FEB/WH075	End bracket of ST120N Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S sb-DV075/T sb-DV075/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW.EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

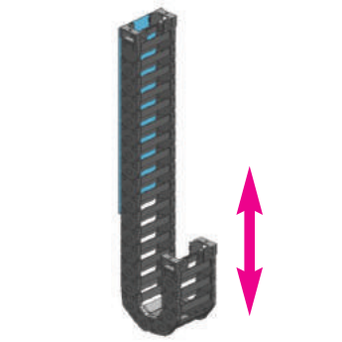
Model	Classification	Part number	Description
ST150N	SIDE BAND	ST-SB150N/E(LH) ST-SB150N/E(RH)	Left side band of ST150N Right side band of ST150N
	BENDING RADIUS	ST-BR150.R205,305,405,505,605	Bending radius unit for side band
	FRAME PIN	S-FP/S2	Frame Pin
	FRAME	sb-FR075/100.75 sb-FR075/100.100 sb-FR075/100.115 sb-FR075/100.125 sb-FR075/100.150 sb-FR075/100.175 sb-FR075/100.200 sb-FR075/100.240 sb-FR075/100.250 sb-FR075/100.290 sb-FR075/100.300 sb-FR075/100.350 sb-FR075/100.400 sb-FR075/100.450 sb-FR075/100.500 sb-FR075/100.550 sb-FR075/100.600	Frame, 75mm Frame, 100mm Frame, 115mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 290mm Frame, 300mm Frame, 350mm Frame, 400mm Frame, 450mm Frame, 500mm Frame, 550mm Frame, 600mm
	STEEL END BRACKET	ST-SEB150N/B1~B2~B3	Steel end bracket of ST150N
	DIVIDER	sb-DV075/M sb-DV075/S sb-DV075/T sb-DV075/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/600.600 SP-PIN100	Separator, 600mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm

ST 044N





Vertical with curve above



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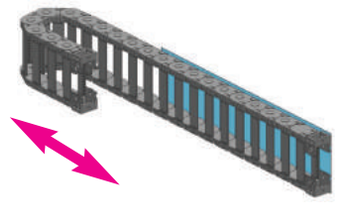


Horizontal application mounted on its side

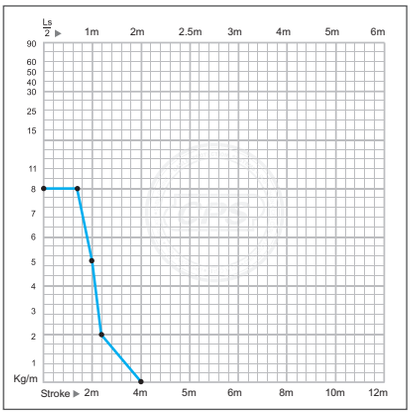
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

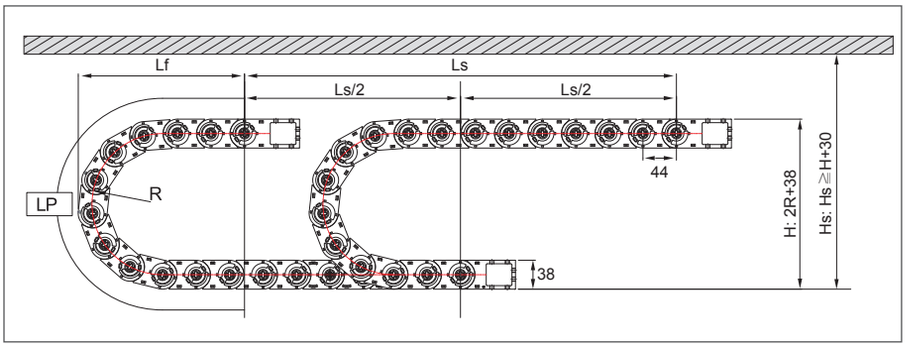
Vertical curve above = max 2.0m
Vertical curve below = max 40m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

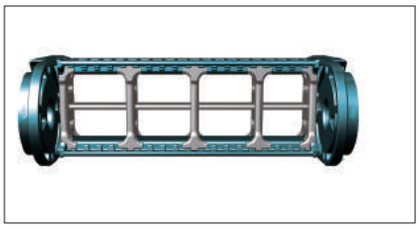
Ls: Stroke Hs: Safe Space

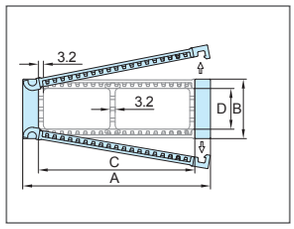


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
50	333	157	138
70	396	177	178
90	459	197	218
120	553	227	278
150	648	257	338

(Dimensions in mm)

Chain cross section



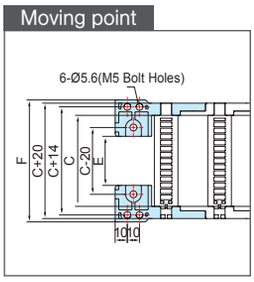


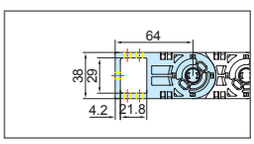
Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 044N	56	38	35	26	0.93
	71		50		0.97
	76		55		1.00
	96		75		1.06
	121		100		1.17
	146		125		1.30
	171		150		1.43
	196		175		1.78
	221		200		1.94

(Dimensions in mm)

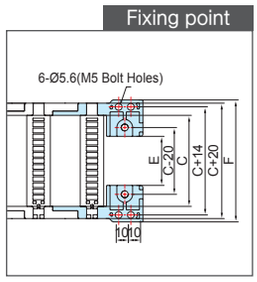
Free end bracket

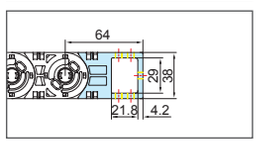
Moving point



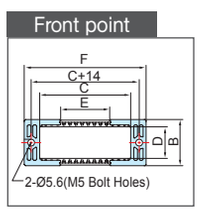


Fixing point





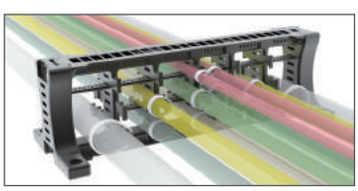
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M.EB Bolt hole width	Hole Type
ST 044N	60.4	38	35	26	0.4	M5 Bolt Holes
	75.4		50		15.4	
	80.4		55		20.4	
	100.4		75		40.4	
	125.4		100		65.4	
	150.4		125		90.4	
	175.4		150		115.4	
	200.4		175		140.4	
	225.4		200		165.4	

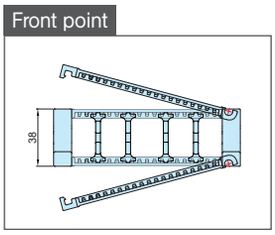
(Dimensions in mm)

System tie wrap (STW)

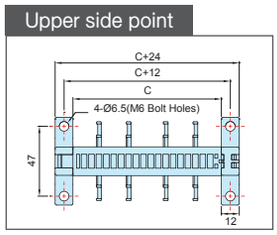


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

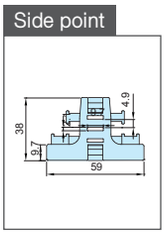
Front point



Upper side point



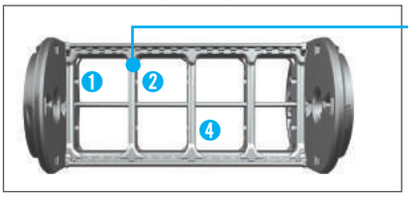
Side point

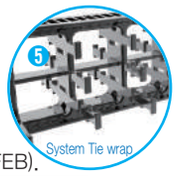


Chain Type	Ordering No.	C Frame	Hole Type
ST 044N	S-TW.EB028.35	35	M6 Bolt Holes
	S-TW.EB028.50	50	
	S-TW.EB028.55	55	
	S-TW.EB028.75	75	
	S-TW.EB028.100	100	
	S-TW.EB028.125	125	
	S-TW.EB028.150	150	
	S-TW.EB028.175	175	
	S-TW.EB028.200	200	

(Dimensions in mm)

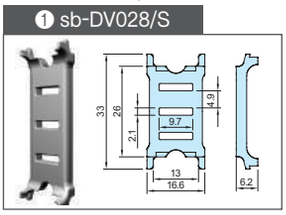
Dividers(DV)



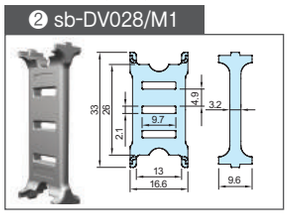


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal Divider.
DV.W : Tie wrap divider for free end bracket(FEB).

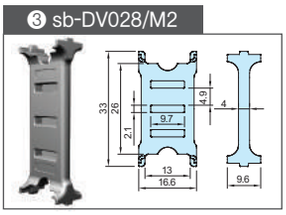
❶ sb-DV028/S



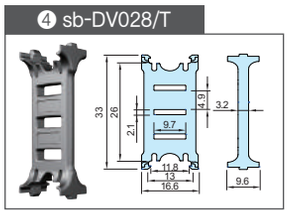
❷ sb-DV028/M1



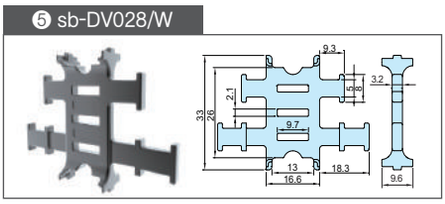
❸ sb-DV028/M2



❹ sb-DV028/T

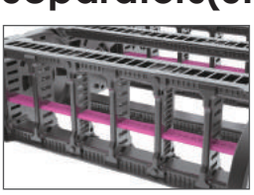


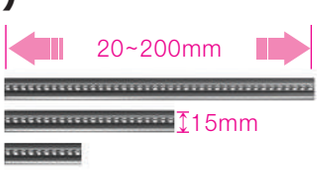
❺ sb-DV028/W



(Dimensions in mm)

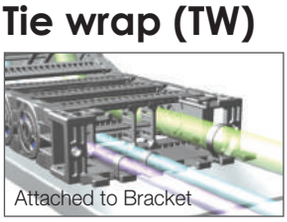
Separators(SP)

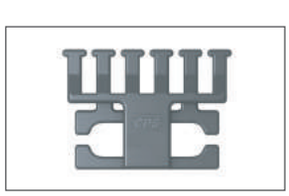


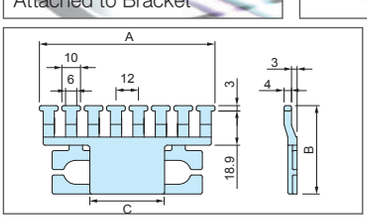


Chain Type	Ordering NO.	Frame
ST 044N	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

Tie wrap (TW)



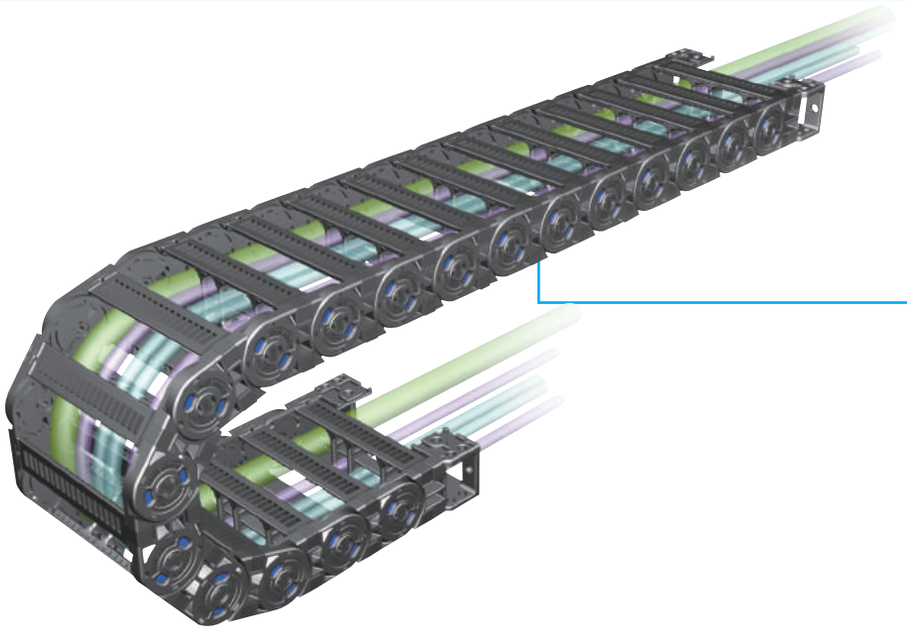


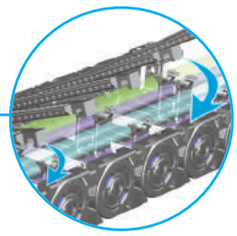


(Dimensions in mm)

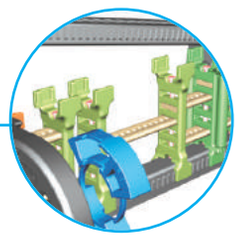
Chain Type	Ordering No.	A	B	C
ST 044N	S-TW036/025CR.35	46	35.4	-
	S-TW036/025CR.50	69	48.9	15
	S-TW036/025CR.55	70	48.9	20
	S-TW036/025CR.75	94	48.9	40
	S-TW036/025CR.100	118	48.9	65
	S-TW036/025CR.125	142	48.9	90

ST 055N

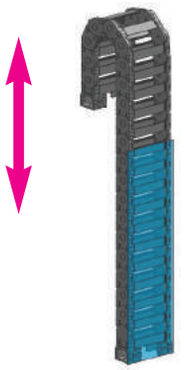




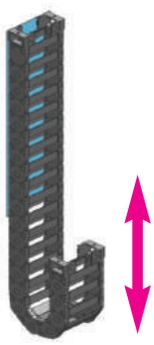
▲ Hinge hook type



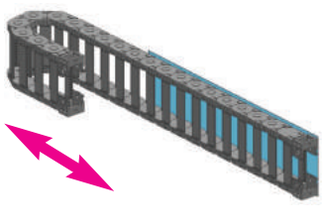
▲ Shift Chain



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

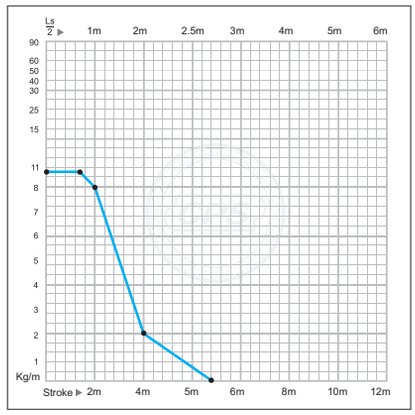
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

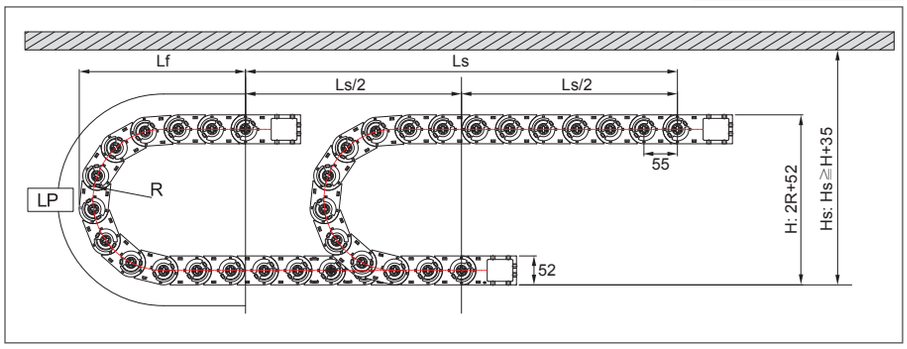
Vertical curve above = max 3.0m
Vertical curve below = max 50m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

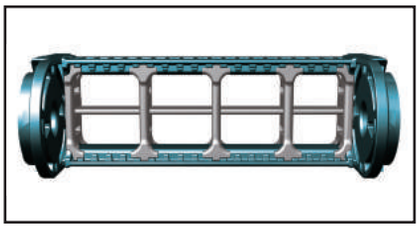
Ls: Stroke Hs: Safe Space

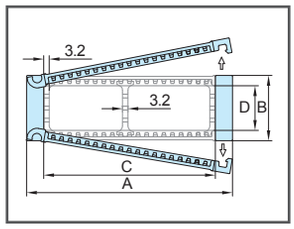


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
65	424	201	182
75	456	211	202
100	535	236	252
125	613	261	302
150	692	286	352
200	849	336	452

(Dimensions in mm)

Chain cross section



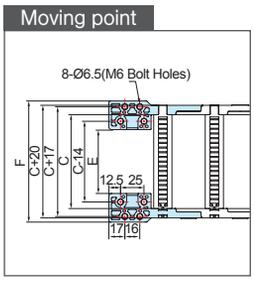


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 055N	56	52	35	40	1.12
	71		50		1.15
	76		55		1.18
	96		75		1.23
	121		100		1.31
	146		125		1.41
	171		150		1.51
	196		175		1.78
	221		200		1.92

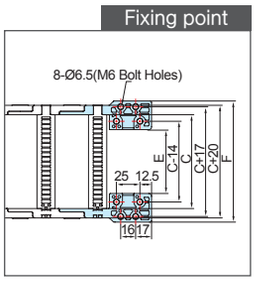
(Dimensions in mm)

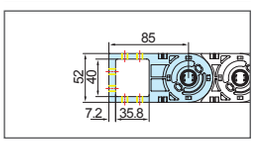
Free end bracket

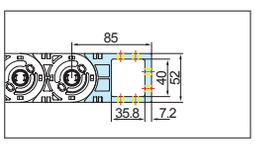
Moving point



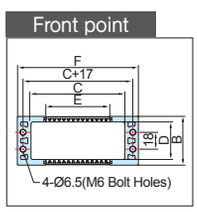
Fixing point







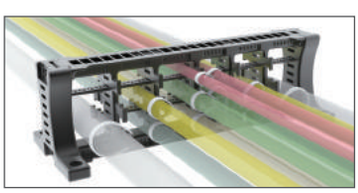
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 055N	64	52	35	40	3	M6 Bolt Holes
	79		50		18	
	84		55		23	
	104		75		43	
	129		100		68	
	154		125		93	
	179		150		118	
	204		175		143	
	229		200		168	

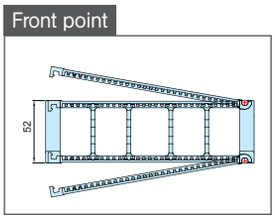
(Dimensions in mm)

System tie wrap (STW)

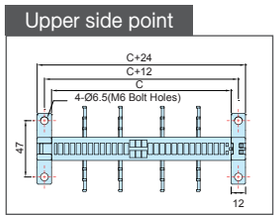


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

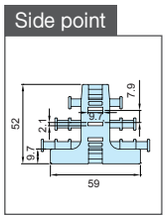
Front point



Upper side point



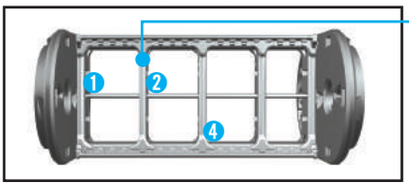
Side point



Chain Type	Ordering No.	C Frame	Hole Type
ST 055N	S-TW.EB035.35	35	M6 Bolt Holes
	S-TW.EB035.50	50	
	S-TW.EB035.55	55	
	S-TW.EB035.75	75	
	S-TW.EB035.100	100	
	S-TW.EB035.125	125	
	S-TW.EB035.150	150	
	S-TW.EB035.175	175	
	S-TW.EB035.200	200	

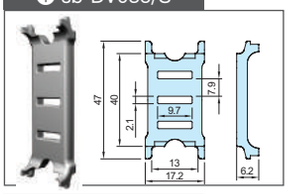
(Dimensions in mm)

Dividers(DV)

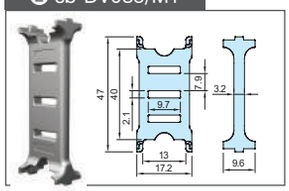


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal Divider.
DV.W : Tie wrap divider for free end bracket(FEB).

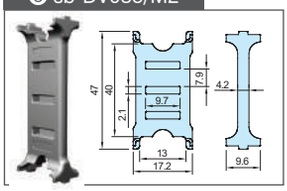
① sb-DV035/S



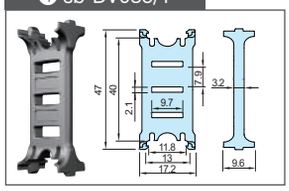
② sb-DV035/M1



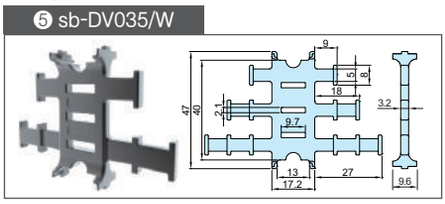
③ sb-DV035/M2



④ sb-DV035/T

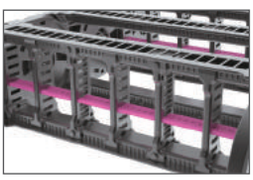


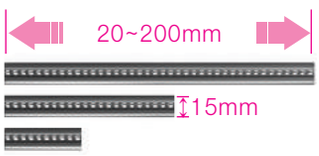
⑤ sb-DV035/W



(Dimensions in mm)

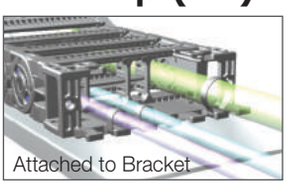
Separators(SP)

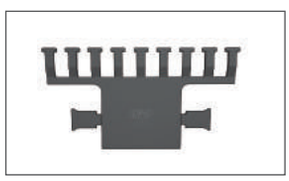


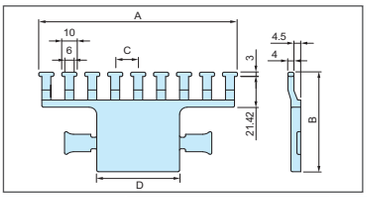


Chain Type	Ordering NO.	Frame
ST 055N	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

Tie wrap (TW)



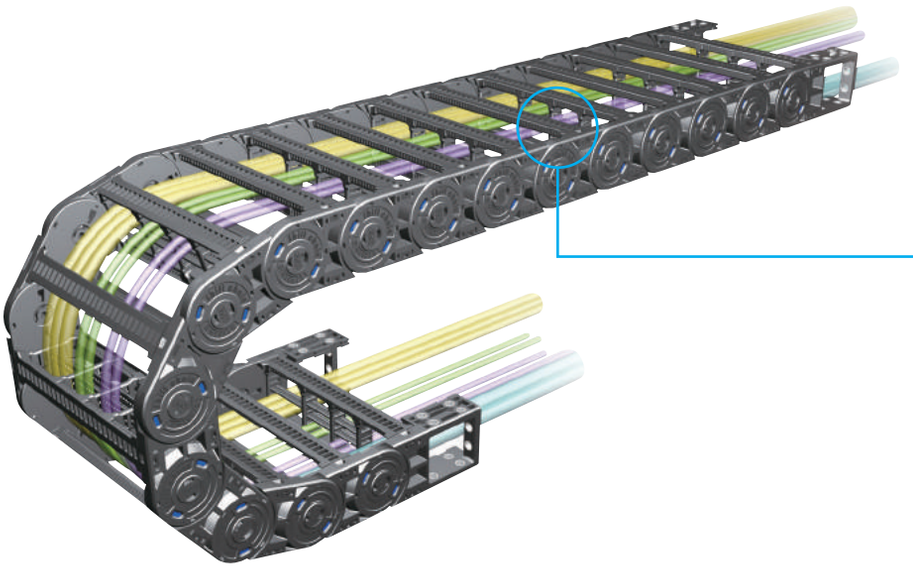


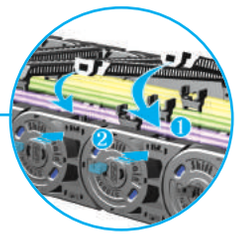


(Dimensions in mm)

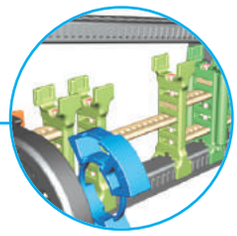
Chain Type	Ordering No.	A	B	C	D
ST 055N	S-TW050/035N.50	82	64.5	12.00	5
	S-TW050/035N.55	82		12.00	10
	S-TW050/035N.75	107		12.13	30
	S-TW050/035N.100	132		15.25	55
	S-TW050/035N.125	157		14.70	80
	S-TW050/035N.150	182		14.35	105
	S-TW050/035N.175	203		12.31	130
	S-TW050/035N.200	232		13.88	155

ST 072N

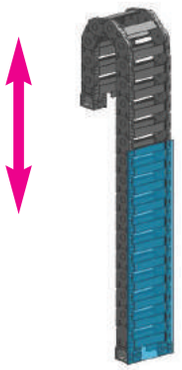




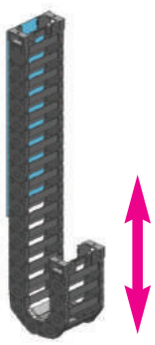
▲ Hinge frame-pin lock type



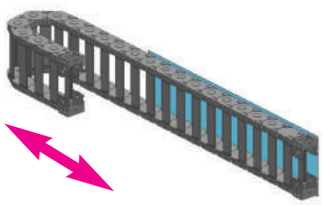
▲ Shift Chain



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

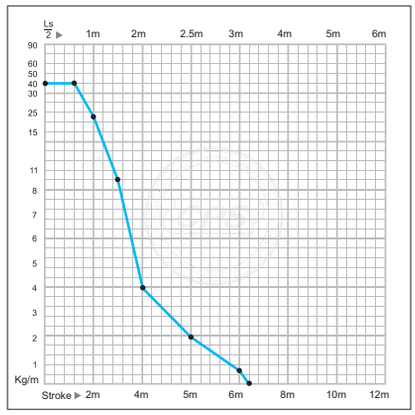
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

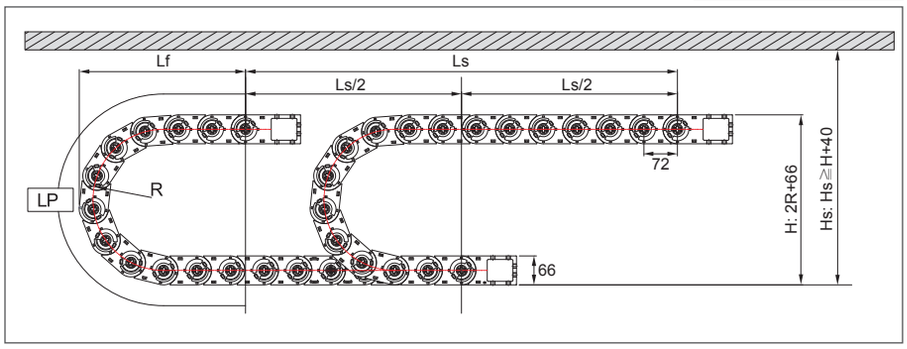
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 2.5m

Load diagrams self-supporting length



Layout of the chain

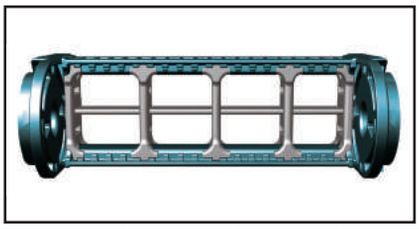
Ls: Stroke Hs: Safe Space

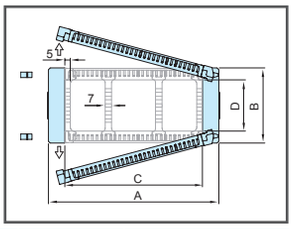


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
72	514	249	210
100	603	277	266
120	665	297	306
145	743	322	356
200	916	377	466
250	1,074	427	566
300	1,230	477	666

(Dimensions in mm)

Chain cross section



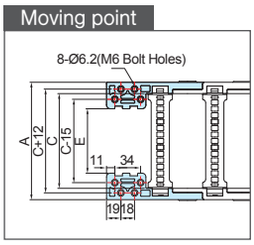


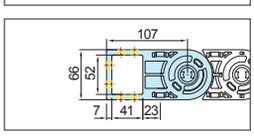
Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 072N	82 107 132 157 172 182 197 207 222 232 272 282 332	66	50 75 100 125 140 150 165 175 190 200 240 250 300	45	2.10 2.20 2.30 2.43 2.51 2.56 2.62 2.66 2.93 3.11 3.21 3.24 3.60

(Dimensions in mm)

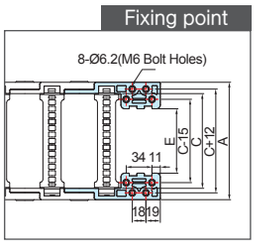
Free end bracket

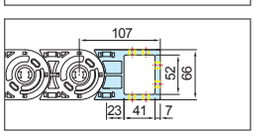
Moving point



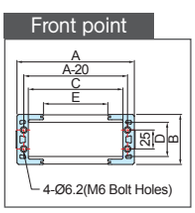


Fixing point





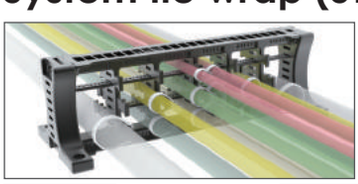
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 072N	82 107 132 157 172 182 197 207 222 232 272 282 332	66	50 75 100 125 140 150 165 175 190 200 240 250 300	45	10 35 60 85 100 110 125 135 150 160 200 210 260	M6 Bolt Holes

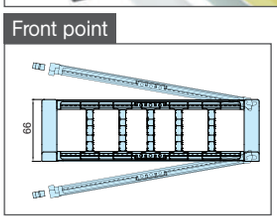
(Dimensions in mm)

System tie wrap (STW)

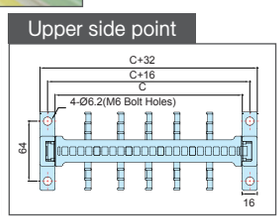


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

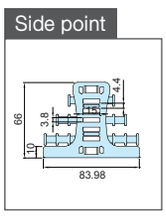
Front point



Upper side point



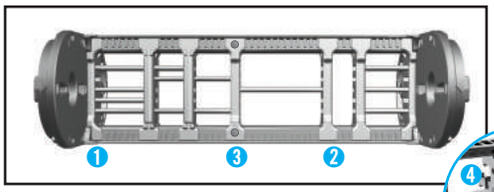
Side point

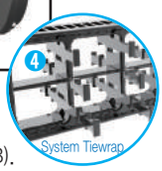


Chain Type	Ordering No.	C Frame	Hole Type
ST 072N	S-TW.EB045.50 S-TW.EB045.75 S-TW.EB045.100 S-TW.EB045.125 S-TW.EB045.140 S-TW.EB045.150 S-TW.EB045.165 S-TW.EB045.175 S-TW.EB045.190 S-TW.EB045.200 S-TW.EB045.240 S-TW.EB045.250 S-TW.EB045.300	50 75 100 125 140 150 165 175 190 200 240 250 300	M6 Bolt Holes

(Dimensions in mm)

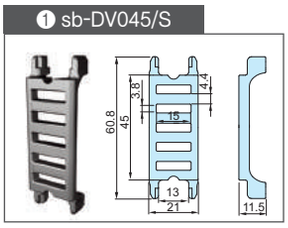
Dividers(DV)



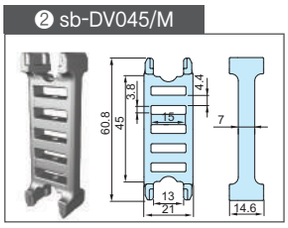


Assemble divider every second frame.
DV.T : Applied to Frame 200~300.
DV.M : Normal Divider.
DV.W : Tie wrap divider for free end bracket(FEB).

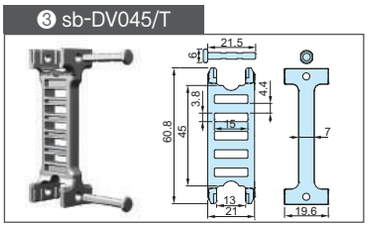
❶ sb-DV045/S



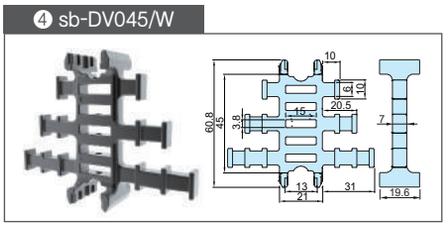
❷ sb-DV045/M



❸ sb-DV045/T

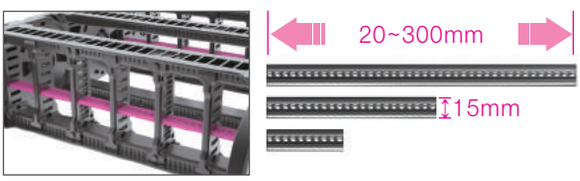


❹ sb-DV045/W



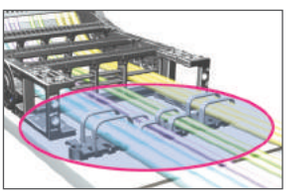
(Dimensions in mm)

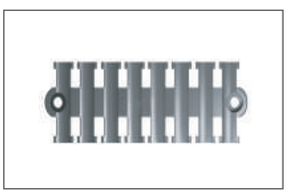
Separators(SP)

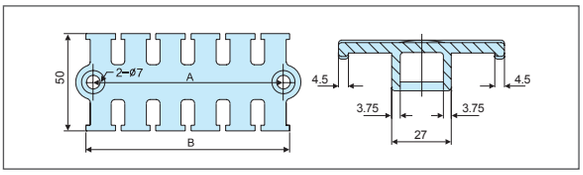


Chain Type	Ordering NO.
ST 072N	sb-SP/400.400

Tie wrap (TW)



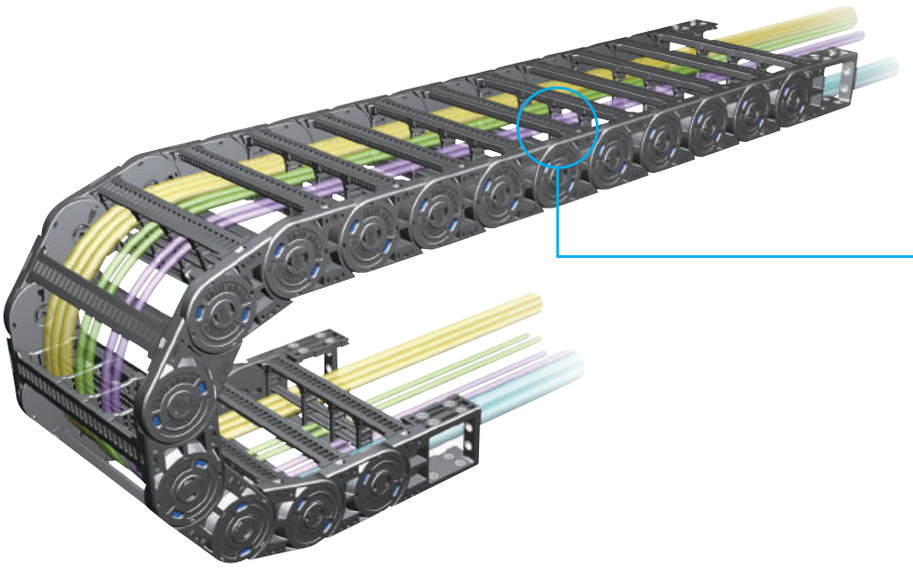


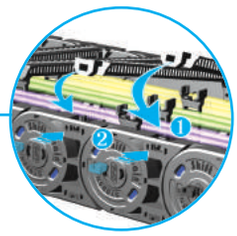


Chain Type	Ordering No.	A	B
ST 072N	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

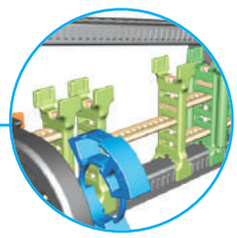
(Dimensions in mm)

ST 095N

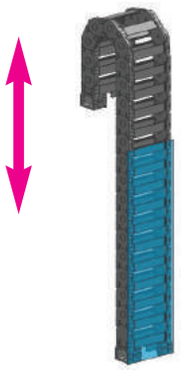




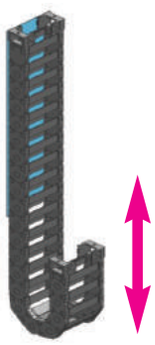
▲ Hinge frame-pin lock type



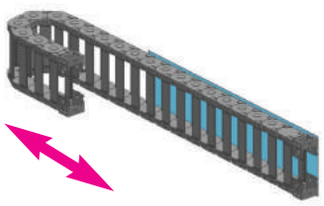
▲ Shift Chain



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

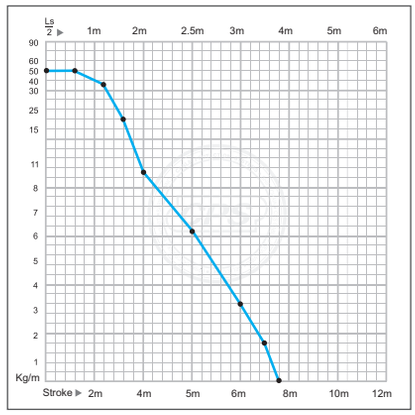
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

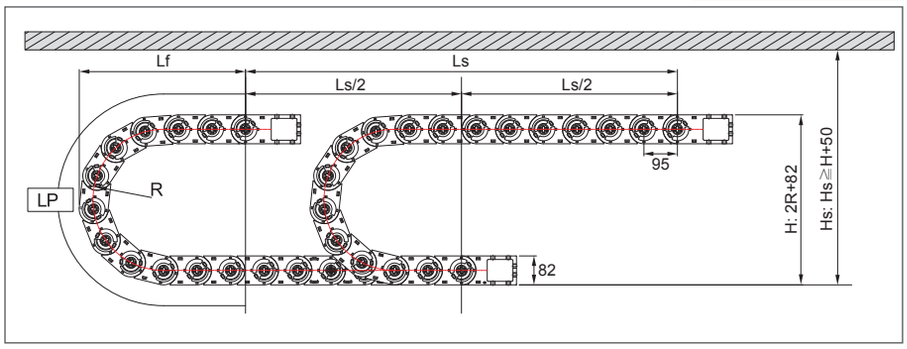
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

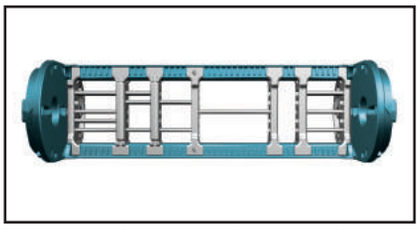
Ls: Stroke Hs: Safe Space

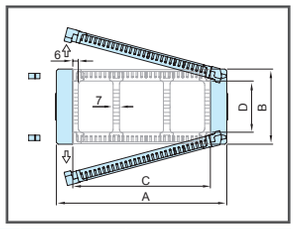


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
135	805	364	352
150	855	374	382
200	1,010	428	482
230	1,110	459	542
280	1,260	505	642
400	1,640	629	882

(Dimensions in mm)

Chain cross section



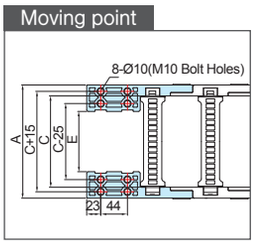


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 095N	113 138 163 188 213 228 238 268 278 288 338 388 438	82	75 100 125 150 175 190 200 230 240 250 300 350 400	56	3.11 3.17 3.37 3.49 3.60 3.71 3.79 3.95 4.00 4.05 4.31 4.69 5.05

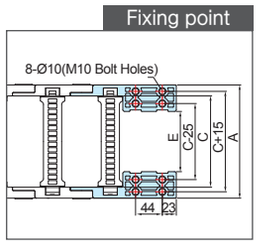
(Dimensions in mm)

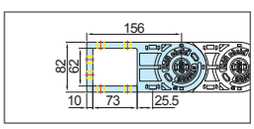
Free end bracket

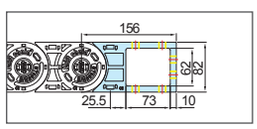
Moving point



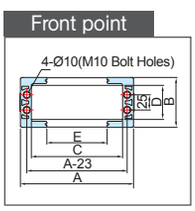
Fixing point







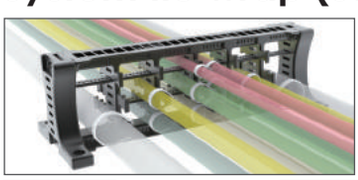
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 095N	113 138 163 188 213 228 238 268 278 288 338 388 438	82	75 100 125 150 175 190 200 230 240 250 300 350 400	56	24 49 74 99 124 139 149 179 189 199 249 299 349	M10 Bolt Holes

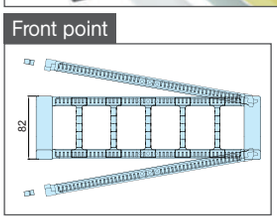
(Dimensions in mm)

System tie wrap (STW)

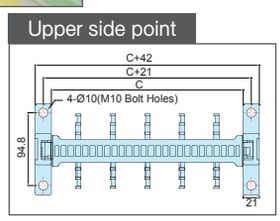


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

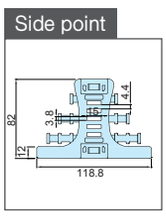
Front point



Upper side point



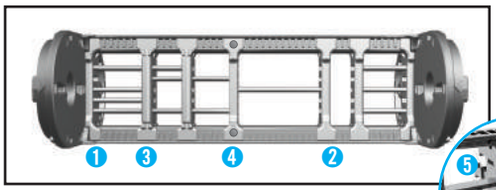
Side point

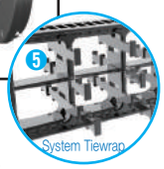


Chain Type	Ordering No.	C Frame	Hole Type
ST 095N	S-TW,EB060,75 S-TW,EB060,100 S-TW,EB060,125 S-TW,EB060,150 S-TW,EB060,175 S-TW,EB060,190 S-TW,EB060,200 S-TW,EB060,230 S-TW,EB060,240 S-TW,EB060,250 S-TW,EB060,300 S-TW,EB060,350 S-TW,EB060,400	75 100 125 150 175 190 200 230 240 250 300 350 400	M10 Bolt Holes

(Dimensions in mm)

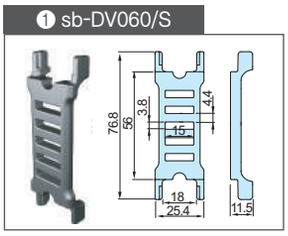
Dividers(DV)



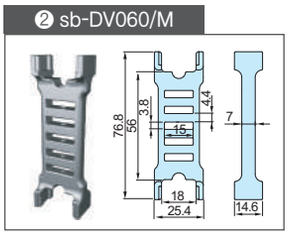


Assemble divider every second frame.
DV.T : Applied to Frame 250~400.
DV.M : Normal Divider.
DV.W : Tie wrap divider for free end bracket(FEB).

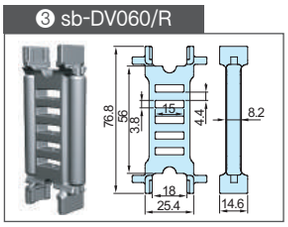
① sb-DV060/S



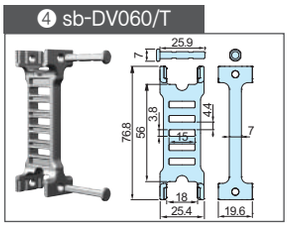
② sb-DV060/M



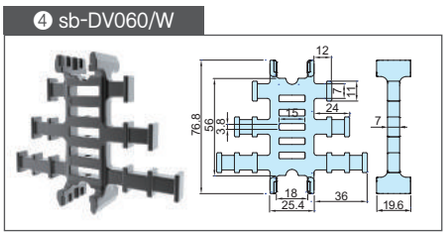
③ sb-DV060/R



④ sb-DV060/T

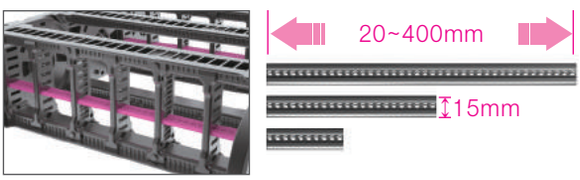


④ sb-DV060/W



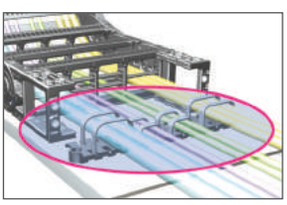
(Dimensions in mm)

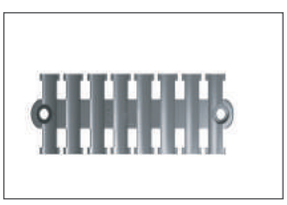
Separators(SP)

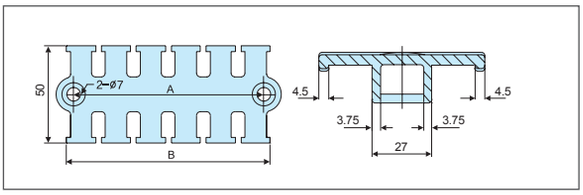


Chain Type	Ordering NO.
ST 095N	sb-SP/400,400

Tie wrap (TW)



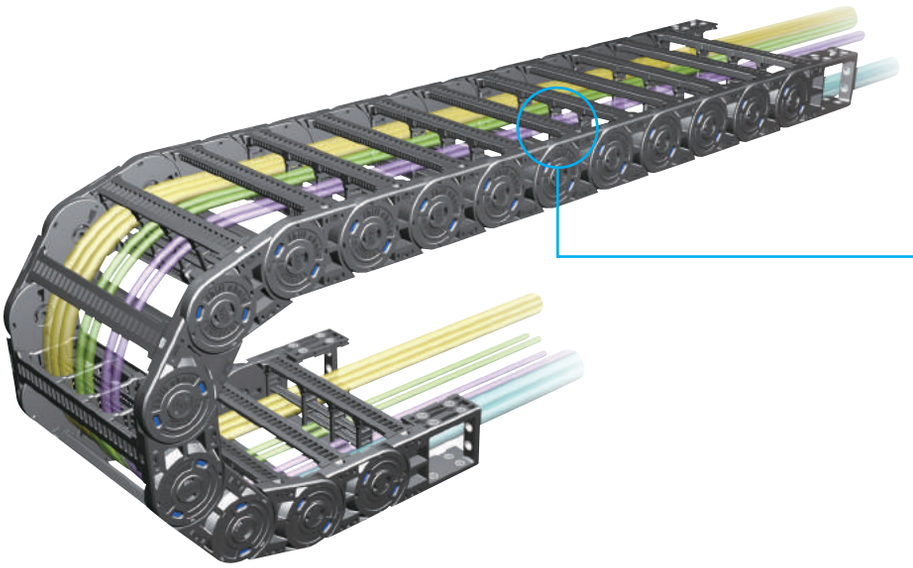


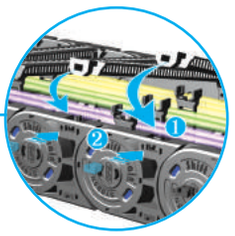


Chain Type	Ordering No.	A	B
ST 095N	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

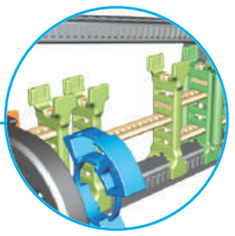
(Dimensions in mm)

ST 120N

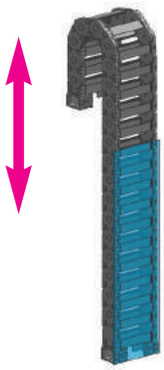




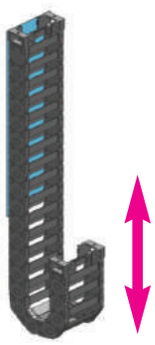
▲ Hinge frame-pin lock type



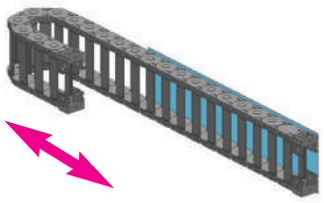
▲ Shift Chain



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

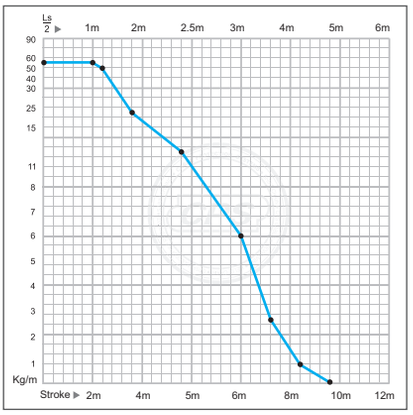
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

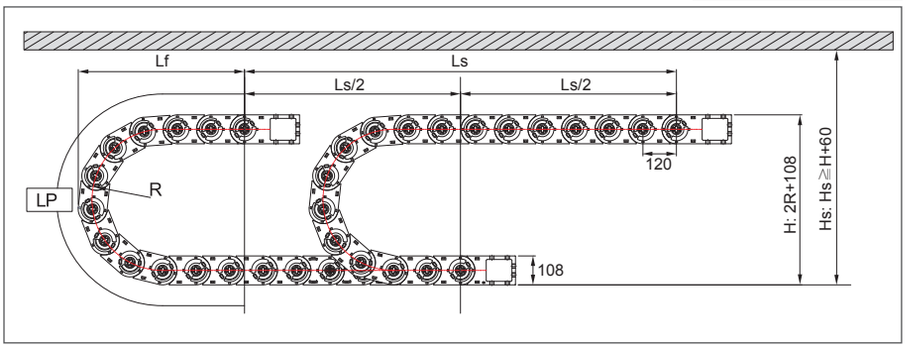
Vertical curve above = max 6.0m
Vertical curve below = max 120m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

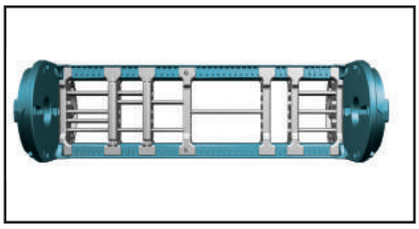
Ls: Stroke Hs: Safe Space

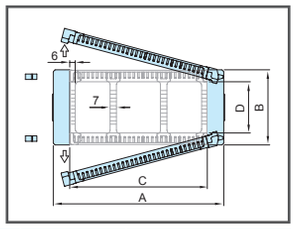


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
180	1,046	474	468
200	1,109	494	508
250	1,266	544	608
300	1,423	594	708
350	1,580	644	808
400	1,737	694	908
500	2,051	794	1,108

(Dimensions in mm)

Chain cross section



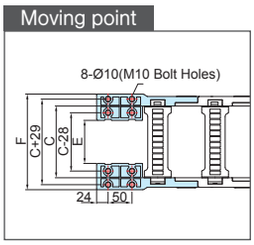


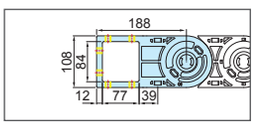
Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 120N	117 142 157 167 192 217 242 282 292 332 342 392 442 492 542 592 642	108	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78	4.41 4.53 4.61 4.67 4.78 4.93 5.17 5.41 5.47 5.80 5.88 6.30 6.73 7.07 7.30 8.13 8.30

(Dimensions in mm)

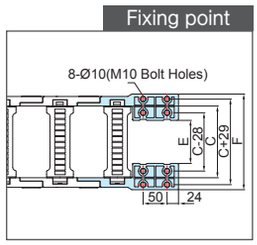
Free end bracket

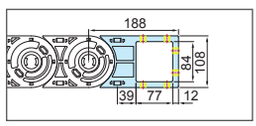
Moving point



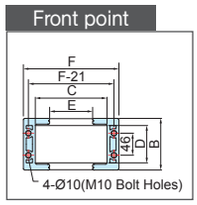


Fixing point





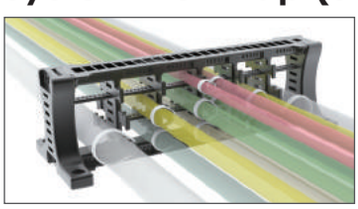
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 120N	125 150 165 175 200 225 250 290 300 340 350 400 450 500 550 600 650	108	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78	15 40 55 65 90 115 140 180 190 230 240 290 340 390 440 490 540	M10 Bolt Holes

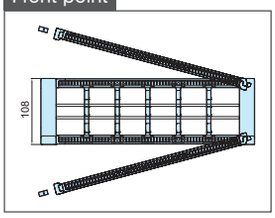
(Dimensions in mm)

System tie wrap (STW)

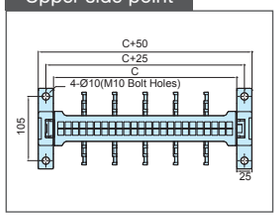


It is a unit to classify each cable for preventing entanglement of cables.
It can either be installed to free end bracket or installed separately according its application environment.

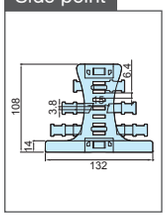
Front point



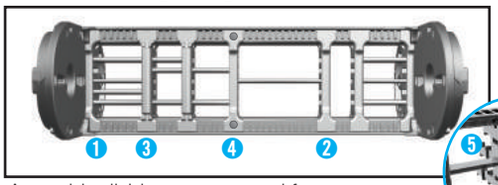
Upper side point

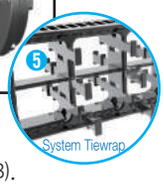


Side point



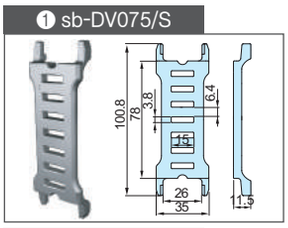
Dividers(DV)



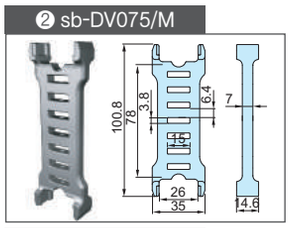


Assemble divider every second frame.
DV.T : Applied to Frame 300~600.
DV.M : Normal Divider.
DV.W : Tie wrap divider for free end bracket(FEB).

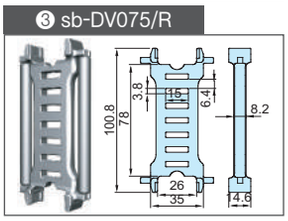
① sb-DV075/S



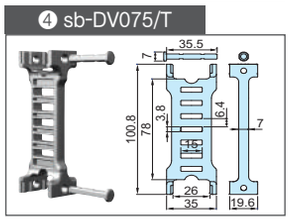
② sb-DV075/M



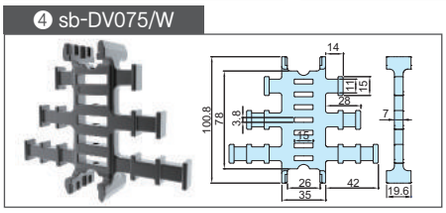
③ sb-DV075/R



④ sb-DV075/T

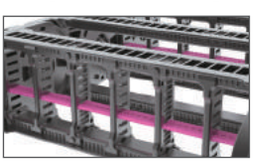


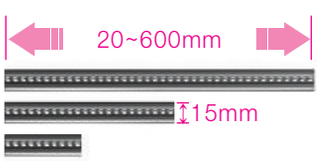
④ sb-DV075/W



(Dimensions in mm)

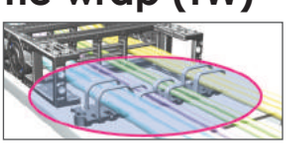
Separators(SP)

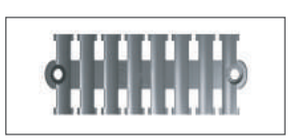


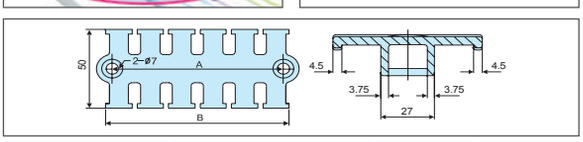


Chain Type	Ordering NO.
ST 120N	sb-SP/600.600

Tie wrap (TW)



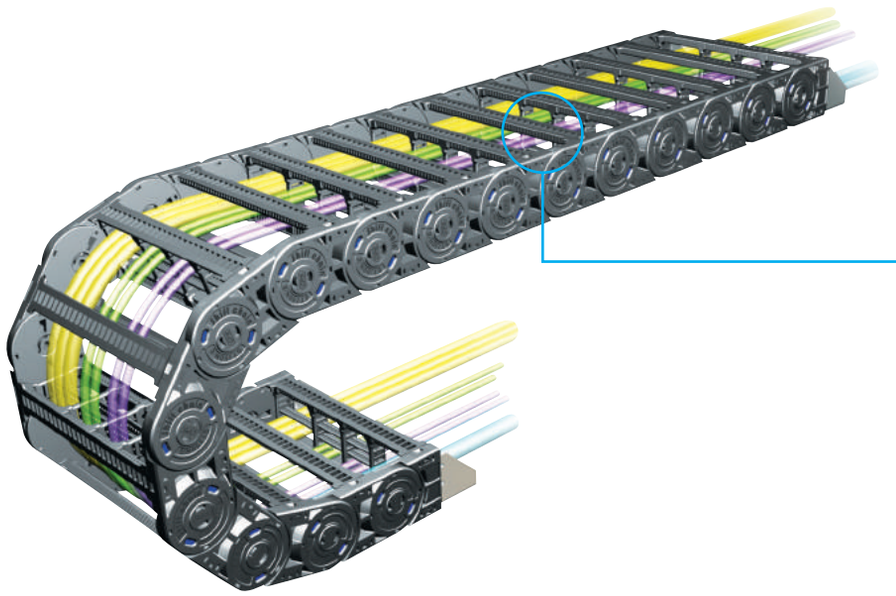


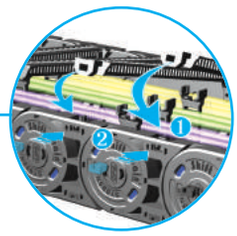


Chain Type	Ordering No.	A	B
ST 120N	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

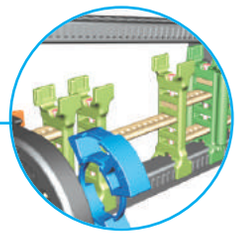
Chain Type	Ordering No.	C Frame	Hole Type
ST 120N	S-TW.EB075.75 S-TW.EB075.100 S-TW.EB075.115 S-TW.EB075.125 S-TW.EB075.150 S-TW.EB075.175 S-TW.EB075.200 S-TW.EB075.240 S-TW.EB075.250 S-TW.EB075.290 S-TW.EB075.300 S-TW.EB075.350 S-TW.EB075.400 S-TW.EB075.450 S-TW.EB075.500 S-TW.EB075.550 S-TW.EB075.600	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	M10 Bolt Holes

ST 150N

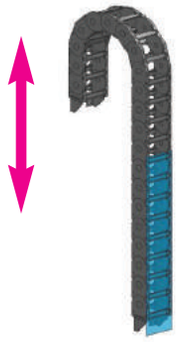




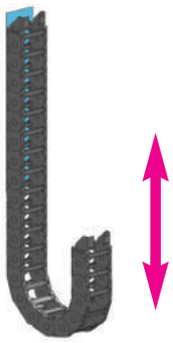
▲ Hinge frame-pin lock type



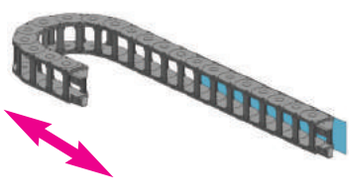
▲ Shift Chain



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

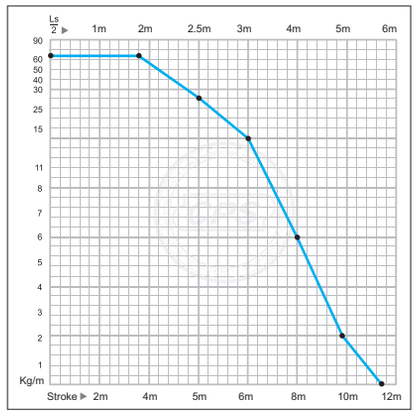
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

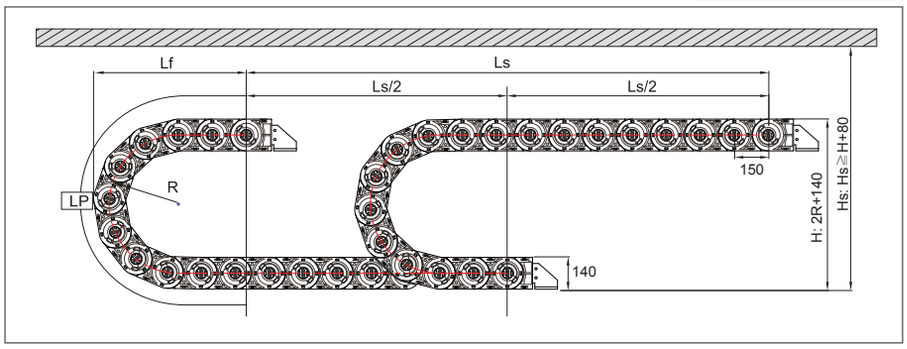
Vertical curve above = max 7.0m
Vertical curve below = max 150m
Side Mounted, Unsupported = max 4.0m

Load diagrams self-supporting length



Layout of the chain

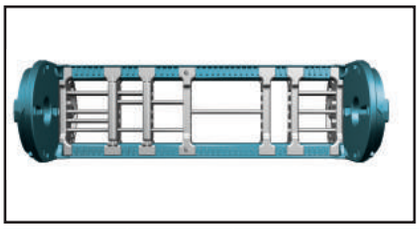
Ls: Stroke Hs: Safe Space

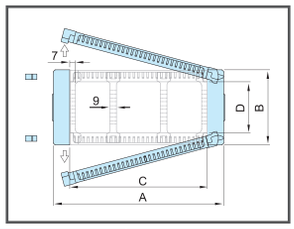


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
205	1,215	561	550
305	1,510	651	750
405	1,807	743	950
505	2,106	835	1,150
605	2,405	928	1,350

(Dimensions in mm)

Chain cross section



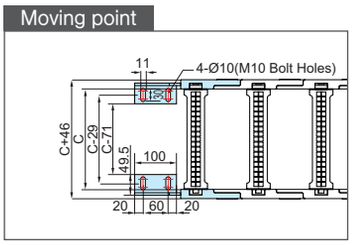


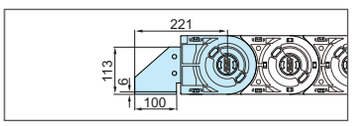
Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 150N	121 146 161 171 196 221 246 286 296 336 346 396 446 496 546 596 646	140	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	110	5.85 5.96 6.03 6.08 6.18 6.30 6.51 6.72 6.78 7.06 7.14 7.51 7.88 8.18 8.37 9.11 9.26

(Dimensions in mm)

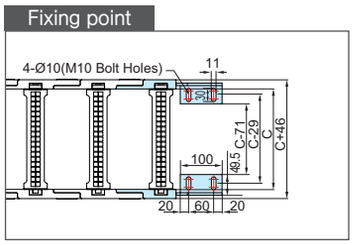
Free end bracket

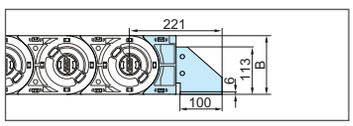
Moving point





Fixing point

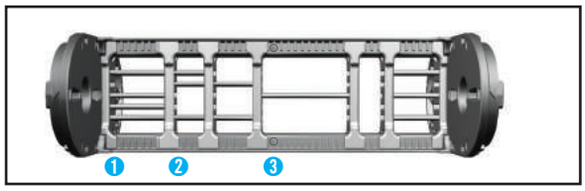




Chain Type	B Height(Outer)	C Frame	D Height(Inner)	Hole Type
ST 150N	140	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	110	M10 Bolt Holes

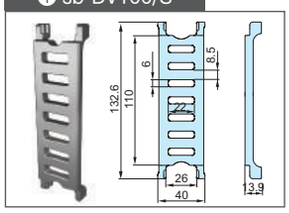
(Dimensions in mm)

Dividers(DV)

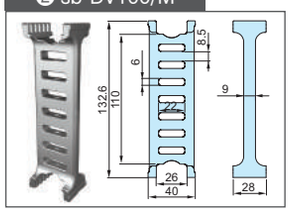


Assemble divider every second frame.
DV.M : Normal Divider.
DV.T : Applied to Frame 300~600.

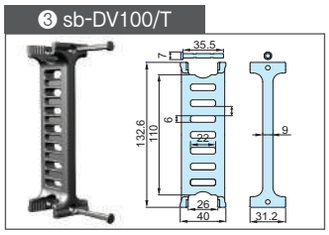
❶ sb-DV100/S



❷ sb-DV100/M

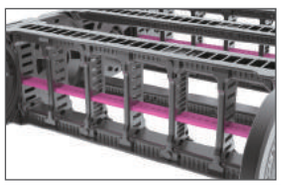


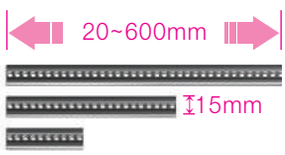
❸ sb-DV100/T



(Dimensions in mm)

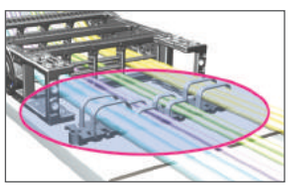
Separators(SP)

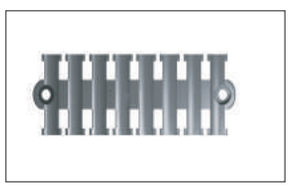


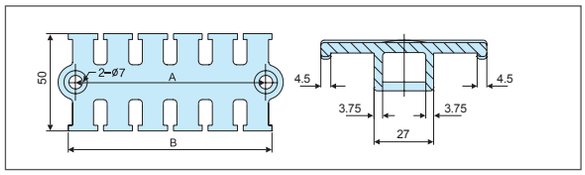


Chain Type	Ordering NO.
ST 150N	sb-SP/600.600

Tie wrap (TW)







Chain Type	Ordering No.	A	B
ST 150N	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

(Dimensions in mm)

Shift Chain - Enclosed type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	3㎧
Acceleration	10㎨
Temperature	-30℃ ~+130℃
Special production	ESD, UV
Certificate	CE, ATEX(Ex)

Dimension table

Shift Chain E Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Size A	Size B	Size C	Size D	Frame type	Section-composition
ST 044E	44	70, 90, 120, 150	1.03 1.21 1.37 1.58	3	-30 ~ +130	56 76 96 121	38	35 55 75 100	24.5		
ST 055E	55	100, 125, 150, 200	1.36 1.56 1.76 1.97 2.21	3	-30 ~ +130	71 96 121 146 171	52	50 75 100 125 150	38.5		
ST 072E	72	120, 145, 200, 250, 300	2.37 2.61 2.85 3.09 3.33	3	-30 ~ +130	82 107 132 157 172 182	66	50 75 100 125 150	44		
ST 095E	95	150, 200, 230, 280, 400	3.55 3.79 4.04 4.29 4.53	3	-30 ~ +130	138 163 188 213 238	82	100 125 150 175 200	55		
ST 120E	120	200, 250, 300, 350, 400, 500	5.79 6.43 7.07 7.71	3	-30 ~ +130	192 242 292 342	108	150 200 250 290 300	76		
ST 150E	150	305, 405, 505, 605	8.16 8.76 10.50 12.33 14.16	3	-30 ~ +130	246 296 346 396 446	141	200 250 300 350 400	110		

(Dimensions in mm)

Calculation table

Item	Value
Length of Cable Chain	L + ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

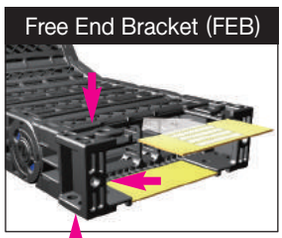
Ordering

ST 044E. 100. R120 / F - 1500L : 10ST

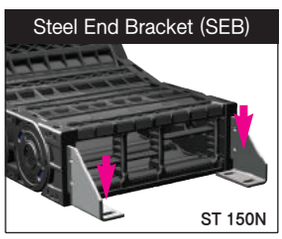
- Shift Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
  - B1, B2 and B3 : ST150E
- Length(mm)
- Q'ty(set)

Bracket type

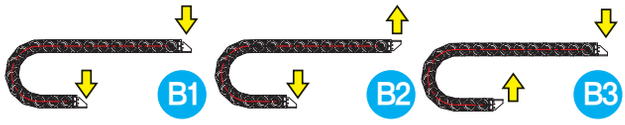
- ST044, ST055, ST072, ST095, ST120



- ST150

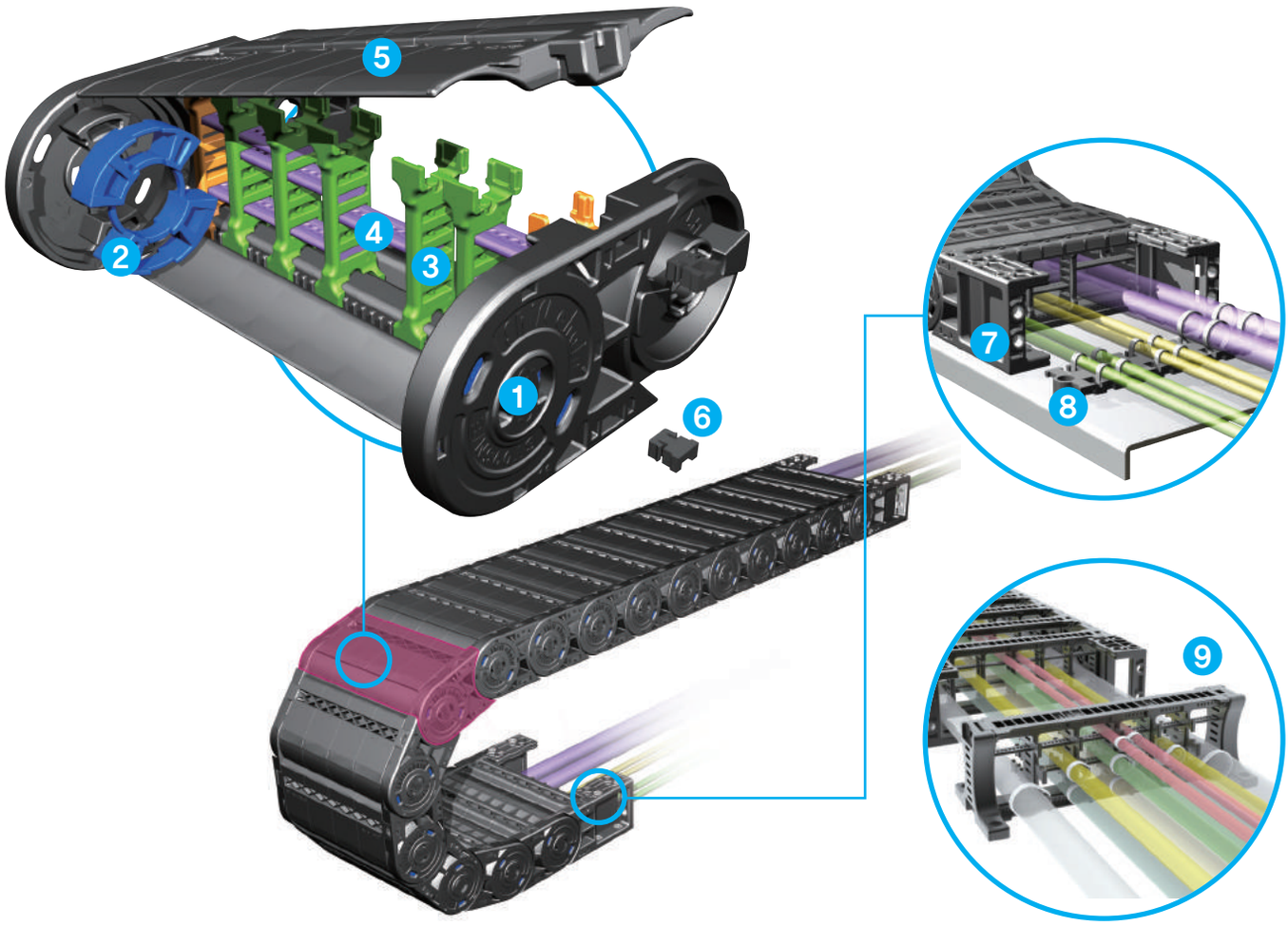


For ST150E, its end parts of cable chain being fixed are used with steel bracket, and it is possible to be installed B1, B2, B3 types of brackets.



Shift Chain - Enclosed type

>> Part of Shift Chain Enclosed type



❶ Side Band (SB)
A unit that connects each side band and between them BR is inserted to strengthen clamping force.

❷ Bending Radius Unit (BR)
A unit that inserted between each side band.
There are 6 supporting points to create durability.

❸ Divider (DV-S, M, R, T)
A unit that divides inserted cables horizontally.

❹ Separator (SP)
A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❺ FRU, FRD
A unit that connects left and right side band and there are 2 types of frame : FRU, FRD.

❻ Frame Pin (FP)
The connecting pin for preventing the breakaway of Frame connected at Side Band, combining and fixing the Frame and Side Band. For Shift chain(ST)072E, 092E, 120E, 150E type, one side of the frame is fixed by inserting a fixing pin to prevent frame open, which caused by any external impact.

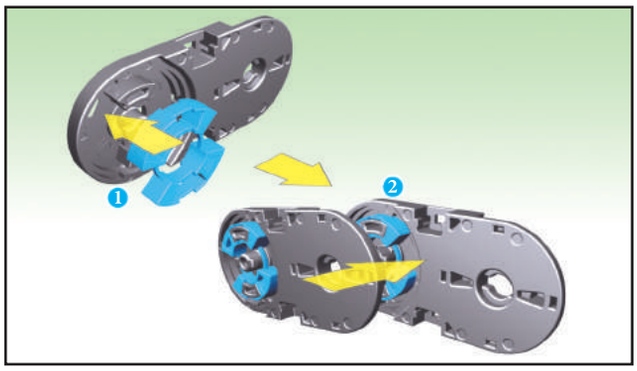
❼ Free End Bracket (FEB)
A unit that connects at last side band (left&right).
It can be fixed stronger using steel washers.

❽ Tie Wrap (TW)
A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.

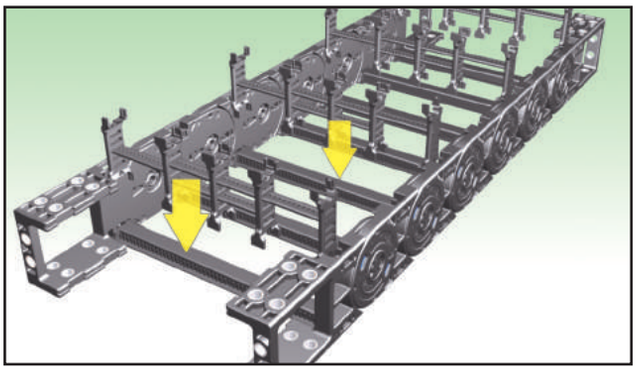
❾ System Tie Wrap (STW)
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisted and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

Assemble procedure of Shift Chain Enclosed type

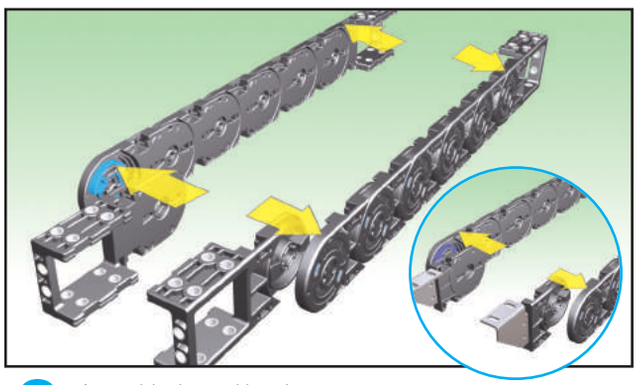
The assembling process of Shift Chain E-Type is like below and you must use rubber hammer with careful combination of Divider and Separator. Be careful of different assembling process depending on product specification such as ST044E, 055E Type, ST072E, 095E, 120E Type, ST150E Type etc.



1 Insert BR unit to each side band, connect the side bands as many as you need, then do the same process to the other side of side band.

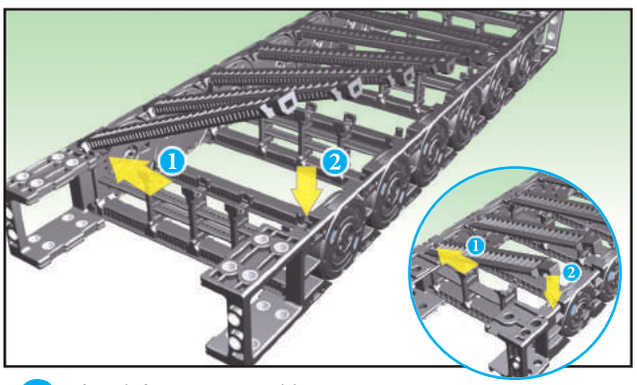


5 Fix the separator and divider patterns to the bottom-side frames as needed.



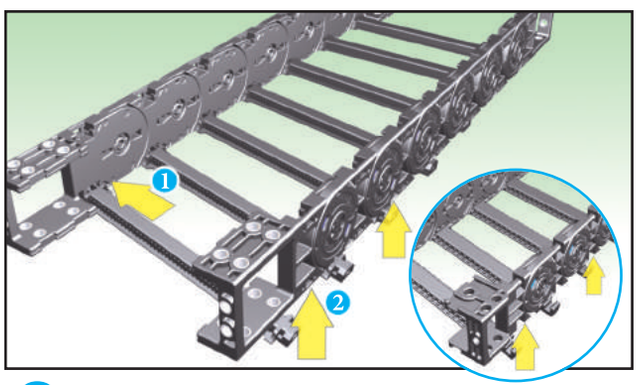
2 Assemble the end brackets on both ends using the same method.

For ST150E, assemble steel brackets on both ends.



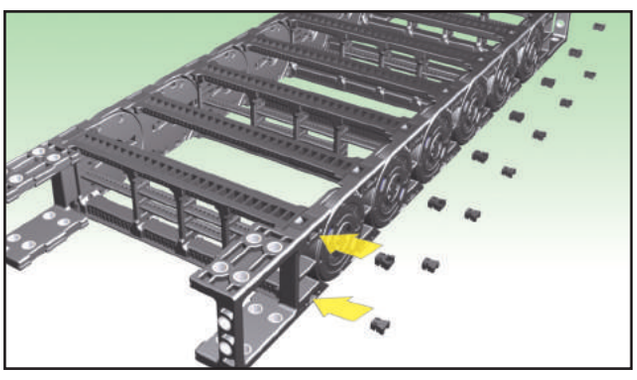
6 Attach frames to one side groove on the side band, and then the other side.

ST044E, 055E frame type.

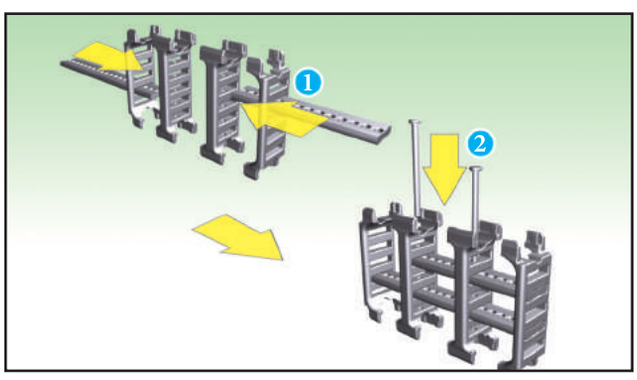


3 Attach frames to one side groove on the side band, and then the other side.

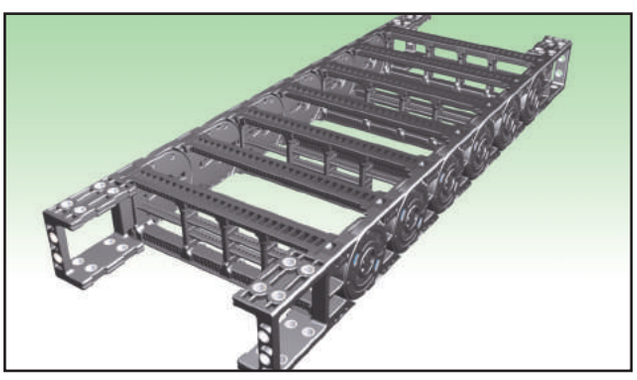
ST 044E, 055E are Hinge Type or Hook Type without frame pin.



7 Insert frame pins to secure the frames and complete carrier. (ST072E, 095E, 120E, 150E are applied with frame pin, and ST044E, 055E are Hinge Type or Hook Type without frame pin.)



4 For ST072E, 095E,120E, and 150E, connect the pin of separator in hole of divider after inserting separator in hole of divider. For ST044E and ST055E, separator fixing pins are not used.



8 Assembled Shift Chain E-Type is assembled.

Shift Chain - Enclosed type

≫ Part list of Shift Chain Enclosed type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
ST044E	SIDE BAND	ST-SB044N/E(LH) ST-SB044N/E(RH)	Left side band of ST044E Right side band of ST044E
	BENDING RADIUS	ST-BR044.R70,90,120,150	Bending radius unit for side band
	FRAME(DOWN) FRAME(UP)	ST-FRD044.35 ST-FRU044.35 ST-FRD044.55 ST-FRU044.55 ST-FRD044.75 ST-FRU044.75 ST-FRD044.100 ST-FRU044.100	Inside frame, 35mm Outside frame, 35mm Inside frame, 55mm Outside frame, 55mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE044.35,55,75,100 ST-FRUFE044.35,55,75,100 ST-FRDME044.35,55,75,100 ST-FRUME044.35,55,75,100	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB044E	End bracket of ST044E
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
ST055E	SIDE BAND	ST-SB055N/E(LH) ST-SB055N/E(RH)	Left side band of ST055E Right side band of ST055E
	BENDING RADIUS	ST-BR055.R100,125,150,200	Bending radius unit for side band
	FRAME(DOWN) FRAME(UP)	ST-FRD055.50 ST-FRU055.50 ST-FRD055.75 ST-FRU055.75 ST-FRD055.100 ST-FRU055.100 ST-FRD055.125 ST-FRU055.125 ST-FRD055.150 ST-FRU055.150	Inside frame, 50mm Outside frame, 50mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE055.75,100,125,150 ST-FRUFE055.75,100,125,150 ST-FRDME055.75,100,125,150 ST-FRUME055.75,100,125,150	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB055E	End bracket of ST055E
	DIVIDER	sb-DV035/M sb-DV035/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm
	TIE WRAP	S-TW036/025CR.50 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125 S-TW036/025CR.150 S-TW036/025CR.175 S-TW036/025CR.200	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm Tie wrap for end bracket to fix cables, 175mm Tie wrap for end bracket to fix cables, 200mm
	SYSTEM TIE WRAP	sb-DV035/W S-TW.EB035	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

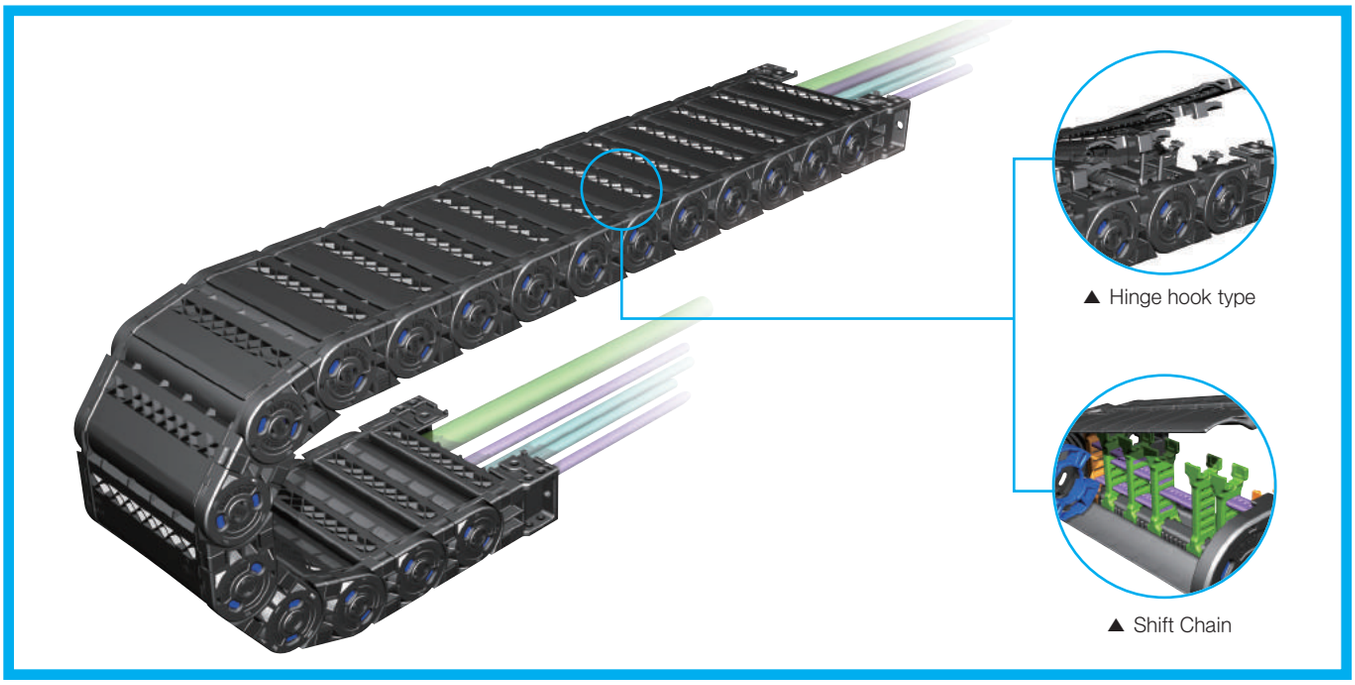
Model	Classification	Part number	Description
ST072E	SIDE BAND	ST-SB072N/E(LH) ST-SB072N/E(RH)	Left side band of ST072E Right side band of ST072E
	BENDING RADIUS	ST-BR072. R120,145,200,250,300	Bending radius unit for side band
	FRAME PIN	S-FP/S1	Frame pin
	FRAME(DOWN) FRAME(UP)	ST-FRD072.50 ST-FRU072.50 ST-FRD072.75 ST-FRU072.75 ST-FRD072.100 ST-FRU072.100 ST-FRD072.125 ST-FRU072.125 ST-FRD072.150 ST-FRU072.150	Inside frame, 50mm Outside frame, 50mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE072.50,75,100,125,150 ST-FRUFE072.50,75,100,125,150 ST-FRDME072.50,75,100,125,150 ST-FRUME072.50,75,100,125,150	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB072E sb-FEB/WH045	End bracket of ST072E Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

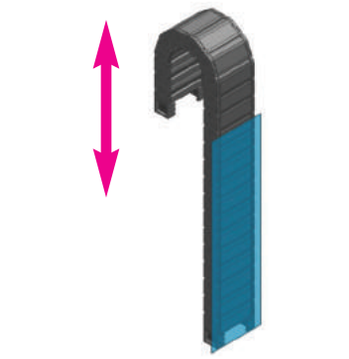
Model	Classification	Part number	Description
ST095E	SIDE BAND	ST-SB095N/E(LH) ST-SB095N/E(RH)	Left side band of ST095N Right side band of ST095N
	BENDING RADIUS	ST-BR095.R150,200,230,280,400	Bending radius unit for side band
	FRAME PIN	S-FP/S1	FRAME PIN
	FRAME(DOWN) FRAME(UP)	ST-FRD095.100 ST-FRU095.100 ST-FRD095.125 ST-FRU095.125 ST-FRD095.150 ST-FRU095.150 ST-FRD095.175 ST-FRU095.175 ST-FRD095.200 ST-FRU095.200	Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm Inside frame, 175mm Outside frame, 175mm Inside frame, 200mm Outside frame, 2000mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE095.100,125,150,175,200 ST-FRUFE095.100,125,150,175,200 ST-FRDME095.100,125,150,175,200 ST-FRUME095.100,125,150,175,200	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB095E sb-FEB/WH060	End bracket of ST095E Steel washer for end bracket
	DIVIDER	sb-DV060/M sb-DV060/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW.EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
ST120E	SIDE BAND	ST-SB120N/E(LH) ST-SB120N/E(RH)	Left side band of ST120N Right side band of ST120N
	BENDING RADIUS	ST-BR120.R200,250,300,350,400,500	Bending radius unit for side band
	FRAME PIN	S-FP/S2	FRAME PIN
	FRAME(DOWN) FRAME(UP)	ST-FRD120.150 ST-FRU120.150 ST-FRD120.200 ST-FRU120.200 ST-FRD120.250 ST-FRU120.250 ST-FRD120.300 ST-FRU120.300	Inside frame, 150mm Outside frame, 150mm Inside frame, 200mm Outside frame, 200mm Inside frame, 250mm Outside frame, 250mm Inside frame, 300mm Outside frame, 300mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE120.150,200,250,300 ST-FRUFE120.150,200,250,300 ST-FRDME120.150,200,250,300 ST-FRUME120.150,200,250,300	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB120E sb-FEB/WH075	End bracket of ST120E Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW.EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

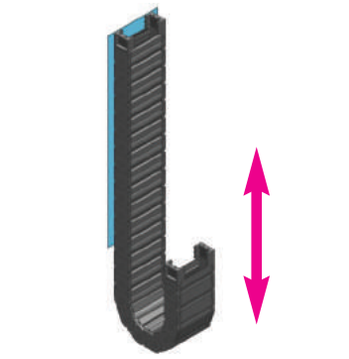
Model	Classification	Part number	Description
ST150E	SIDE BAND	ST-SB150N/E(LH) ST-SB150N/E(RH)	Left side band of ST120N Right side band of ST120N
	BENDING RADIUS	ST-BR150.R305,405,505,605	Bending radius unit for side band
	FRAME PIN	S-FP/S2	FRAME PIN
	FRAME(DOWN) FRAME(UP)	ST-FRD150.200 ST-FRU150.200 ST-FRD150.250 ST-FRU150.250 ST-FRD150.300 ST-FRU150.300 ST-FRD150.350 ST-FRU150.350 ST-FRD150.400 ST-FRU150.400	Inside frame, 200mm Outside frame, 200mm Inside frame, 250mm Outside frame, 250mm Inside frame, 300mm Outside frame, 300mm Inside frame, 350mm Outside frame, 350mm Inside frame, 400mm Outside frame, 400mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE150.200,250,300,350,400 ST-FRUFE150.200,250,300,350,400 ST-FRDME150.200,250,300,350,400 ST-FRUME150.200,250,300,350,400	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	STEEL END BRACKET	ST-SEB150E/B1~B2~B3	Steel end bracket of ST150E
	DIVIDER DIVIDER(SIDE)	sb-DV100/M sb-DV100/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/600.600 SP-PIN100	Separator, 600mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm

ST 044E

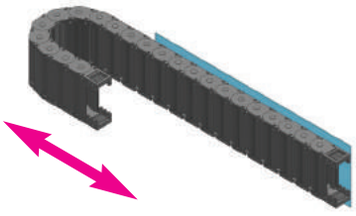




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

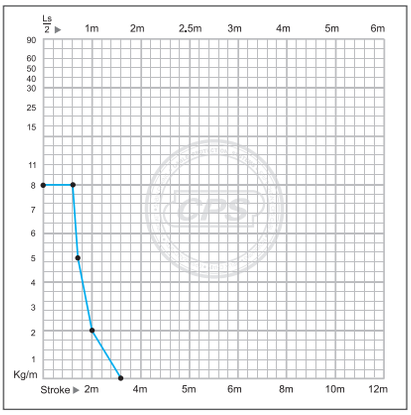
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

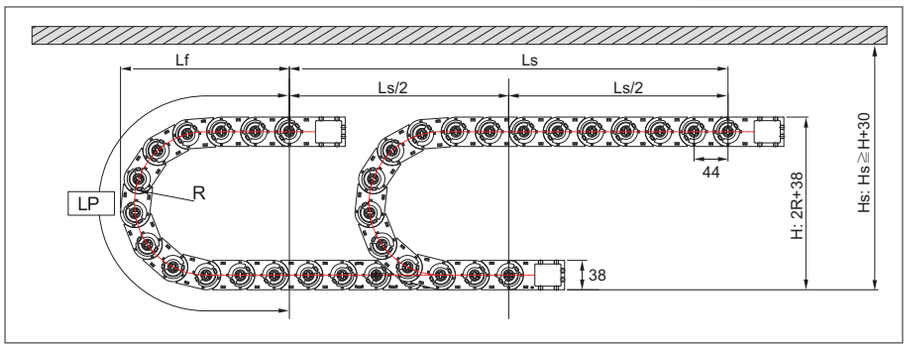
Vertical curve above = max 2.0m
Vertical curve below = max 40m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

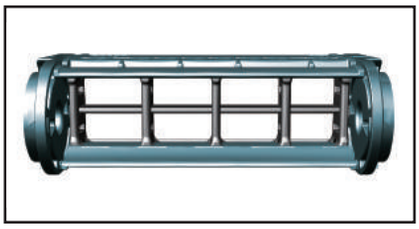
Ls: Stroke Hs: Safe Space

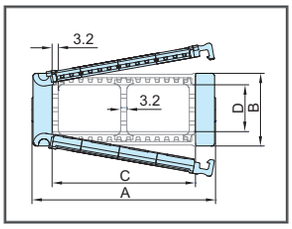


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
70	396	177	178
90	459	197	218
120	553	227	278
150	648	257	338

(Dimensions in mm)

Chain cross section

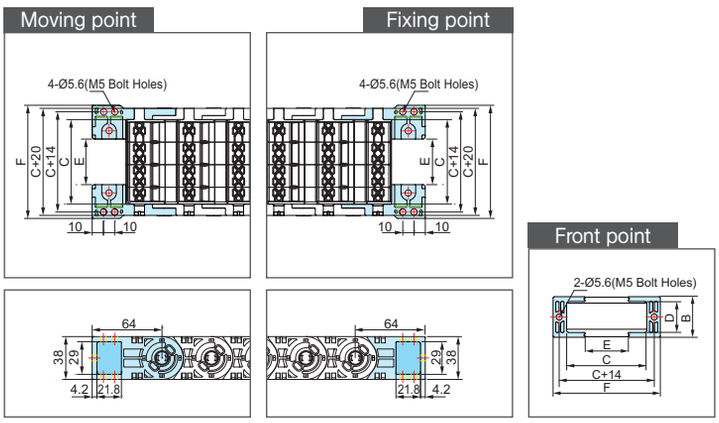




Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 044E	56 76 96 121	38	35 55 75 100	24.5	1.03 1.21 1.37 1.58

(Dimensions in mm)

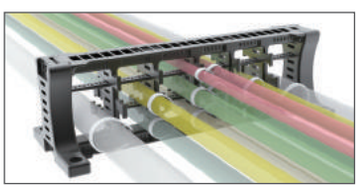
Free end bracket



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M.EB Bolt hole width	Hole Type
ST 044E	60.4 80.4 100.4 125.4	38	35 55 75 100	24.5	0.4 20.4 40.4 65.4	M5 Bolt Holes

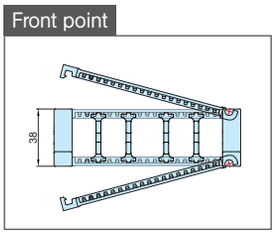
(Dimensions in mm)

System tie wrap (STW)

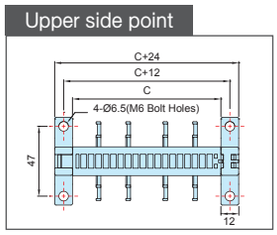


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

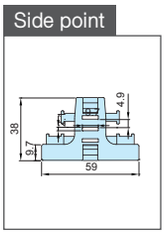
Front point



Upper side point



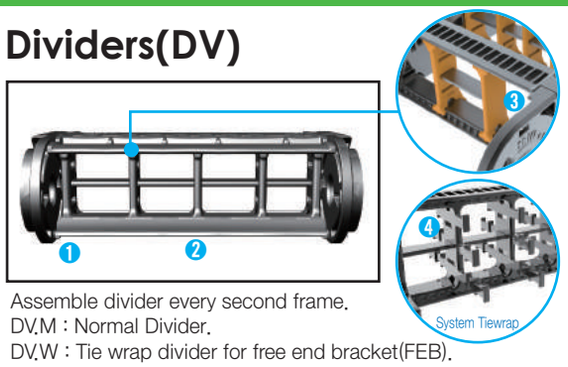
Side point



Chain Type	Ordering No.	C Frame	Hole Type
ST 044E	S-TW.EB028.35 S-TW.EB028.55 S-TW.EB028.75 S-TW.EB028.100	35 55 75 100	M6 Bolt Holes

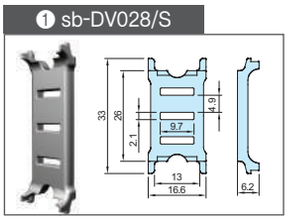
(Dimensions in mm)

Dividers(DV)

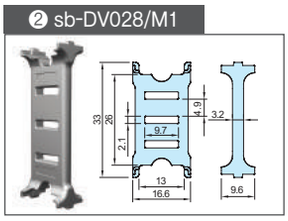


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Tie wrap divider for free end bracket(FEB).

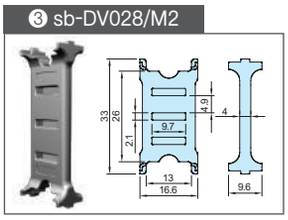
❶ sb-DV028/S



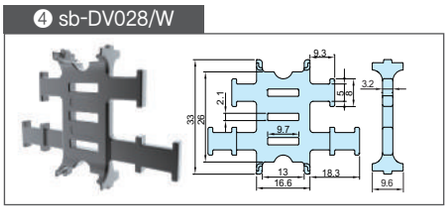
❷ sb-DV028/M1



❸ sb-DV028/M2

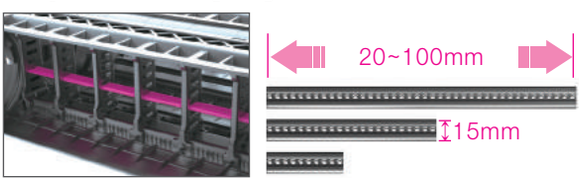


❹ sb-DV028/W



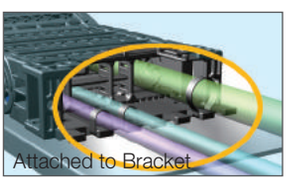
(Dimensions in mm)

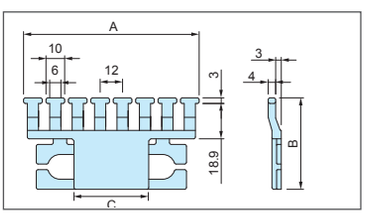
Separators(SP)



Chain Type	Ordering NO.	Frame
ST 044E	S-SP/M.35 S-SP/M.55 S-SP/M.75 S-SP/M.100	35 55 75 100

Tie wrap (TW)

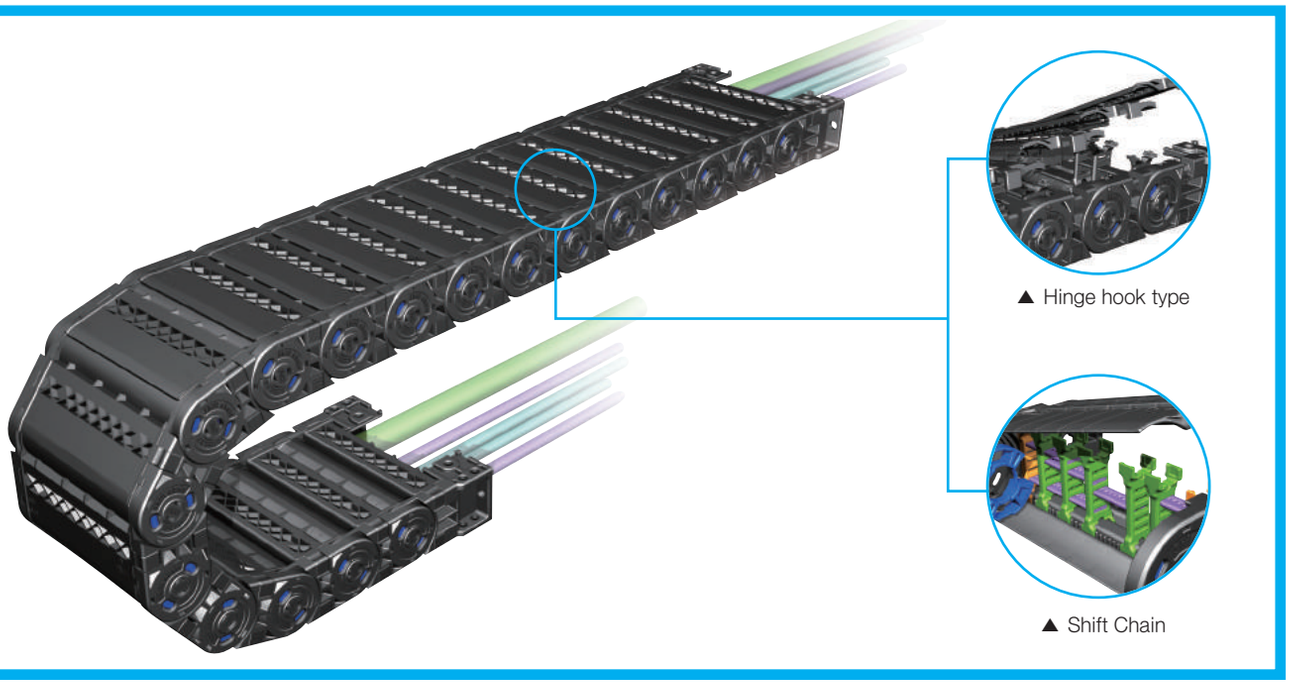


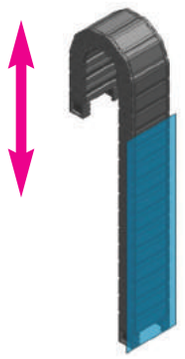


(Dimensions in mm)

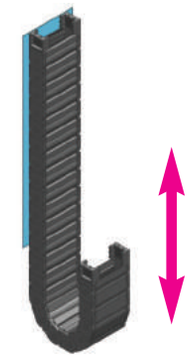
Chain Type	Ordering No.	A	B	C
ST 044E	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100	46 70 94 118	35.4 48.9 48.9 48.9	- 20 40 65

ST 055E

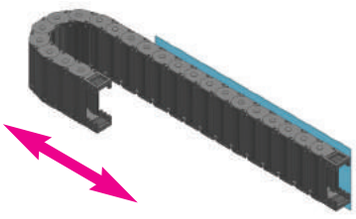




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

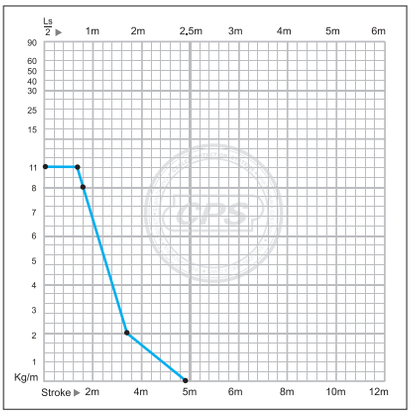
≫ Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

≫ Other installation length

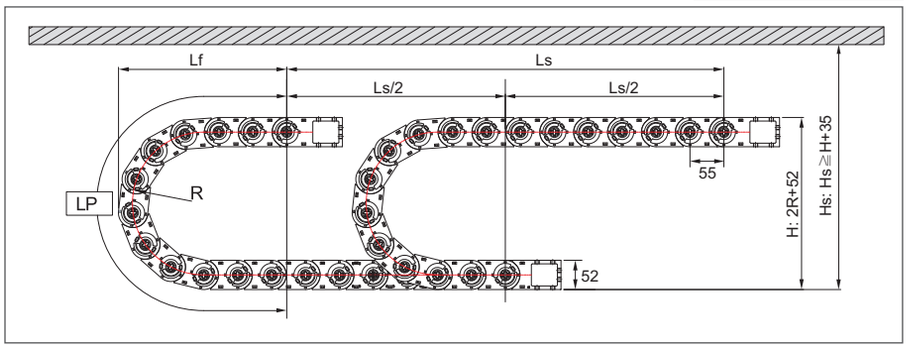
Vertical curve above = max 3.0m
Vertical curve below = max 50m
Side Mounted, Unsupported = max 1.0m

≫ Load diagrams self-supporting length



≫ Layout of the chain

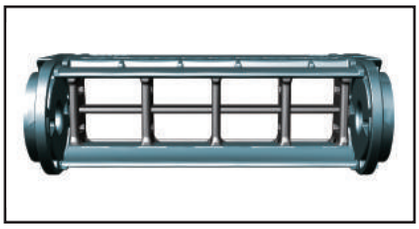
Ls: Stroke Hs: Safe Space

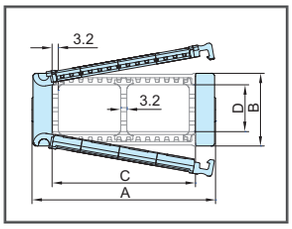


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
100	535	236	252
125	613	261	302
150	692	286	352
200	849	336	452

(Dimensions in mm)

Chain cross section



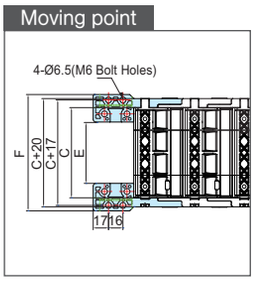


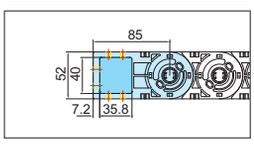
Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 055E	71 96 121 146 171	52	50 75 100 125 150	38.5	1.36 1.56 1.76 1.97 2.21

(Dimensions in mm)

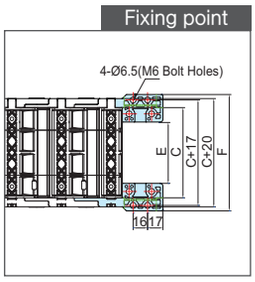
Free end bracket

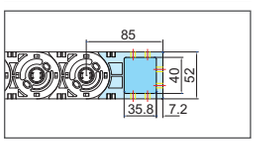
Moving point



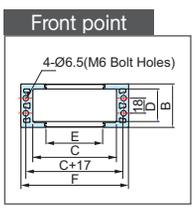


Fixing point





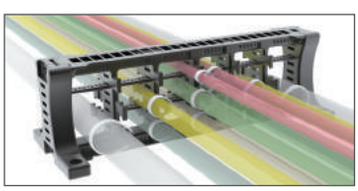
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M.EB Bolt hole width	Hole Type
ST 055E	79 104 129 154 179	52	50 75 100 125 150	38.5	18 43 68 93 118	M6 Bolt Holes

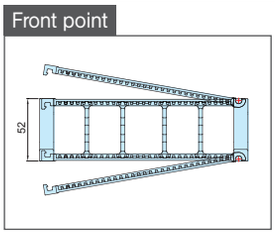
(Dimensions in mm)

System tie wrap (STW)

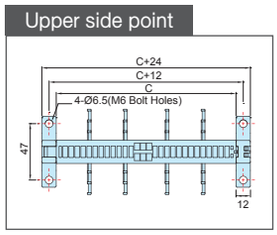


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

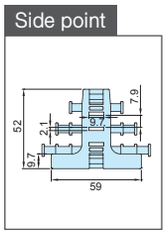
Front point



Upper side point



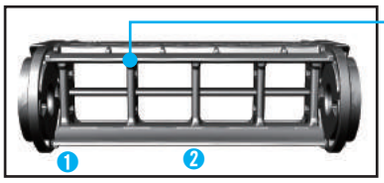
Side point

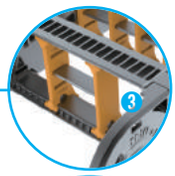


Chain Type	Ordering No.	C Frame	Hole Type
ST 055E	S-TW.EB035.50 S-TW.EB035.75 S-TW.EB035.100 S-TW.EB035.125 S-TW.EB035.150	50 75 100 125 150	M6 Bolt Holes

(Dimensions in mm)

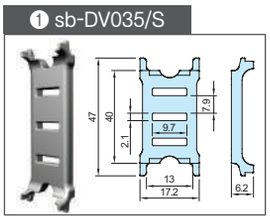
Dividers(DV)



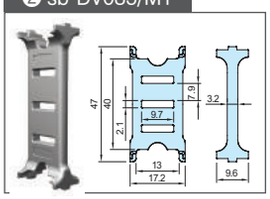


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Tie wrap divider for free end bracket(FEB).

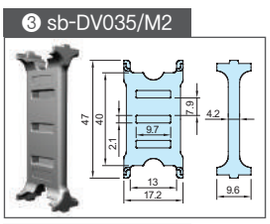
❶ sb-DV035/S



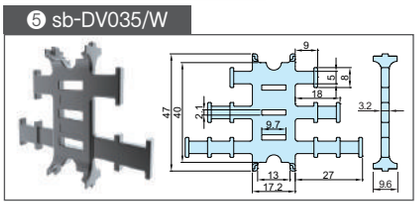
❷ sb-DV035/M1



❸ sb-DV035/M2

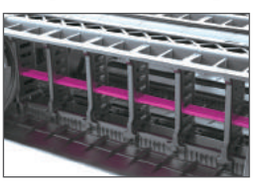


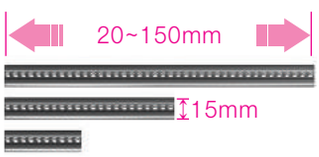
❺ sb-DV035/W



(Dimensions in mm)

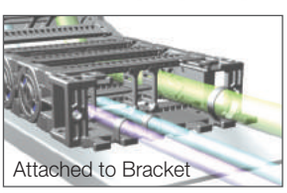
Separators(SP)

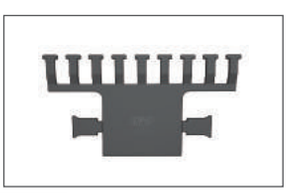


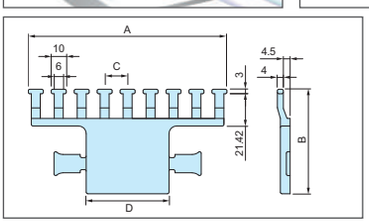


Chain Type	Ordering NO.	Frame
ST 055E	S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150	50 75 100 125 150

Tie wrap (TW)



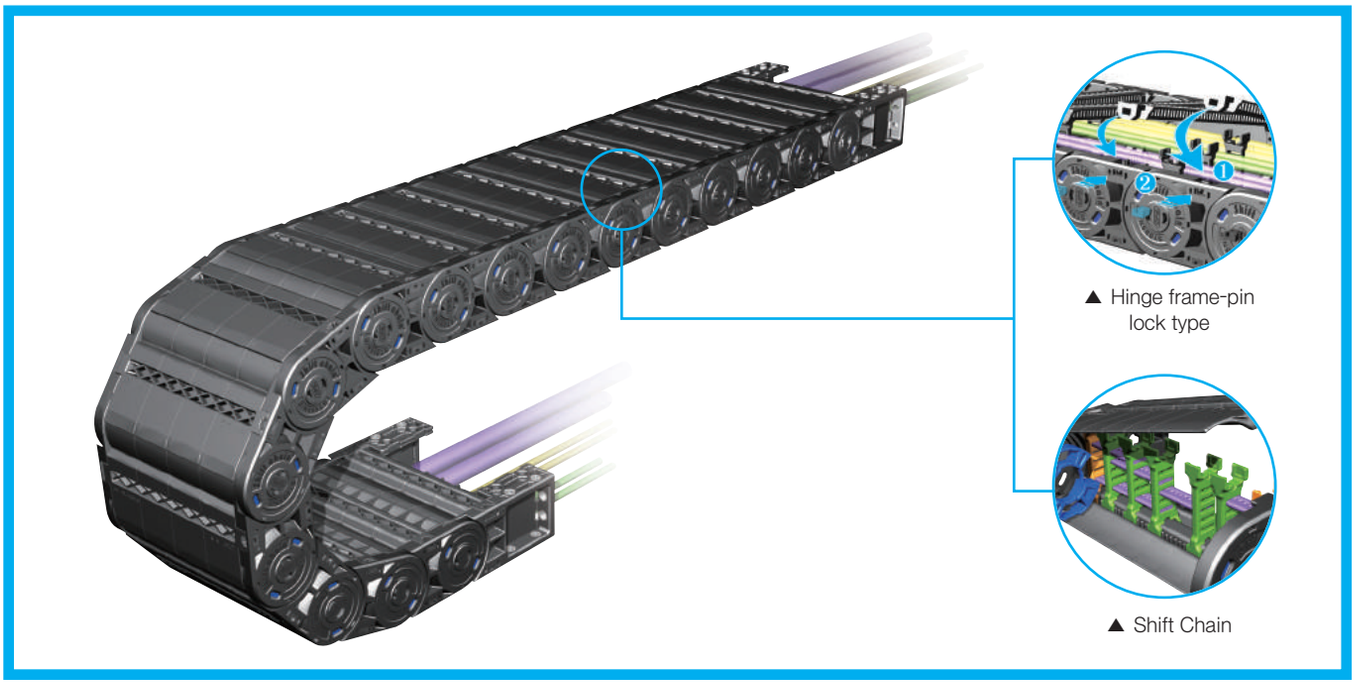


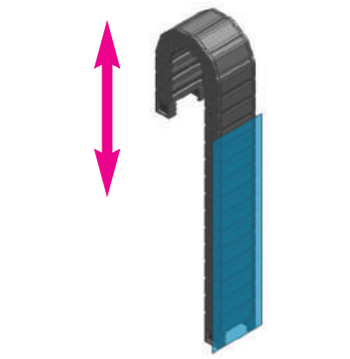


Chain Type	Ordering No.	A	B	C	D
ST 055E	S-TW050/035N.50 S-TW050/035N.75 S-TW050/035N.100 S-TW050/035N.125 S-TW050/035N.150	82 107 132 157 182	64.5	12.00 12.13 15.25 14.70 14.35	5 30 55 80 105

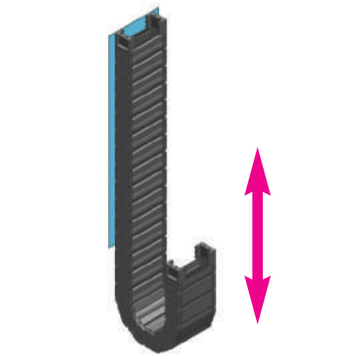
(Dimensions in mm)

ST 072E

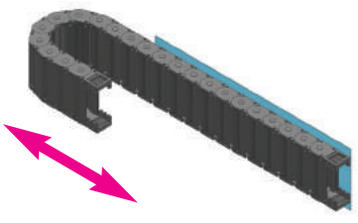




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

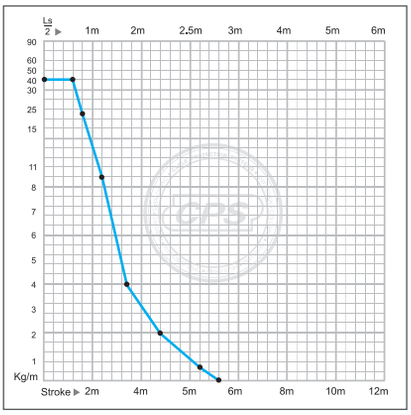
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

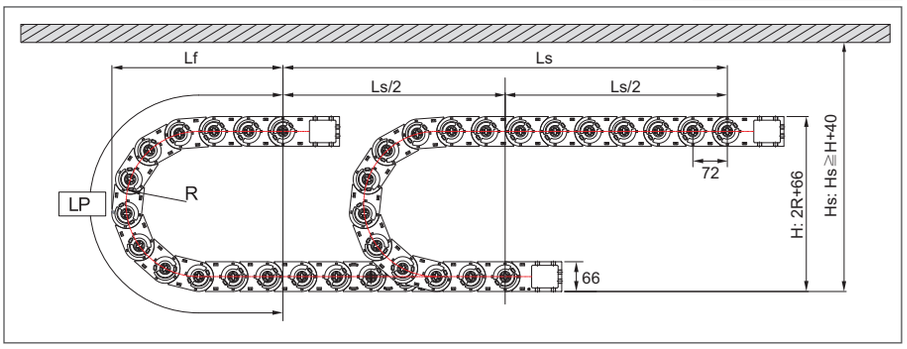
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 2.5m

Load diagrams self-supporting length



Layout of the chain

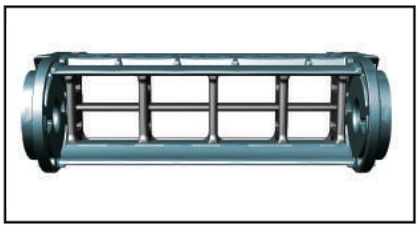
Ls: Stroke Hs: Safe Space

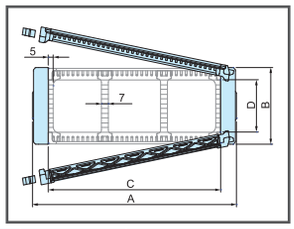


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
120	665	297	306
145	743	322	356
200	916	377	466
250	1,074	427	566
300	1,230	477	666

(Dimensions in mm)

Chain cross section



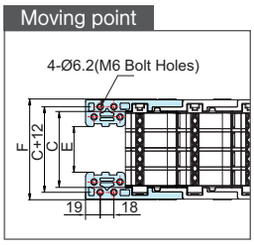


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 072E	82	66	50	44	2.37
	107		75		2.61
	132		100		2.85
	157		125		3.09
	182		150		3.33

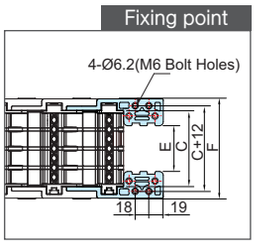
(Dimensions in mm)

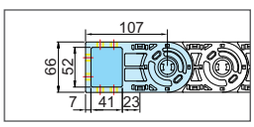
Free end bracket

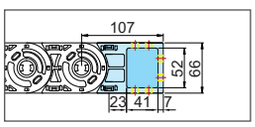
Moving point



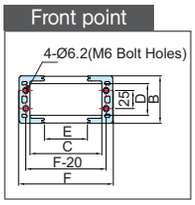
Fixing point







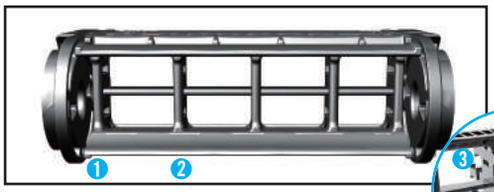
Front point

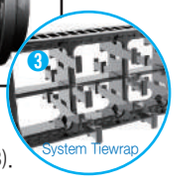


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 072E	82	66	50	44	10	M6 Bolt Holes
	107		75		35	
	132		100		60	
	157		125		85	
	182		150		110	

(Dimensions in mm)

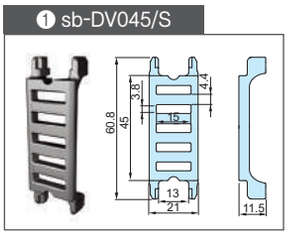
Dividers(DV)



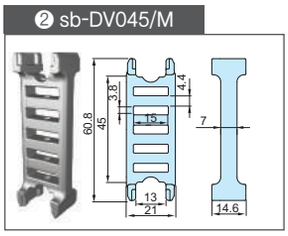


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Tie wrap divider for free end bracket (FEB).

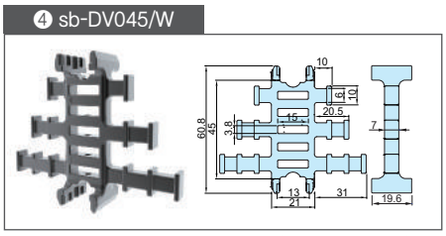
① sb-DV045/S



② sb-DV045/M

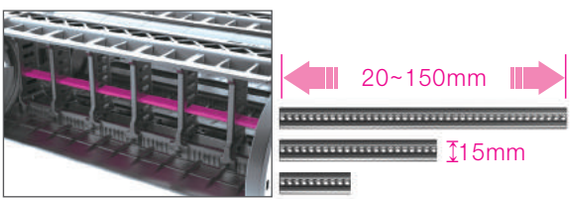


④ sb-DV045/W



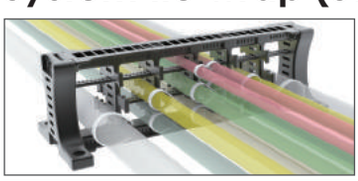
(Dimensions in mm)

Separators(SP)



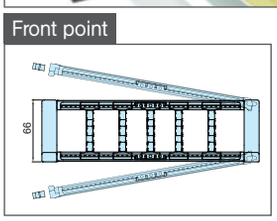
Chain Type	Ordering NO.
ST 072E	sb-SP/400.400

System tie wrap (STW)

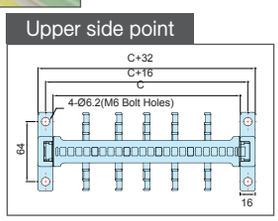


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

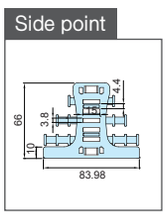
Front point



Upper side point



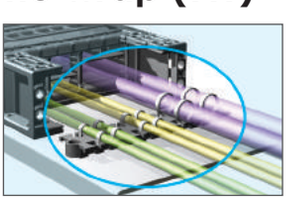
Side point

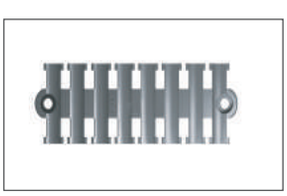


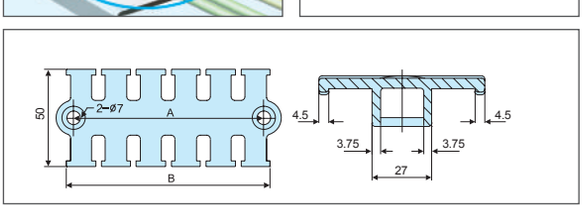
Chain Type	Ordering No.	C Frame	Hole Type
ST 072E	S-TW.EB045.50	50	M6 Bolt Holes
	S-TW.EB045.75	75	
	S-TW.EB045.100	100	
	S-TW.EB045.125	125	
	S-TW.EB045.150	150	

(Dimensions in mm)

Tie wrap (TW)



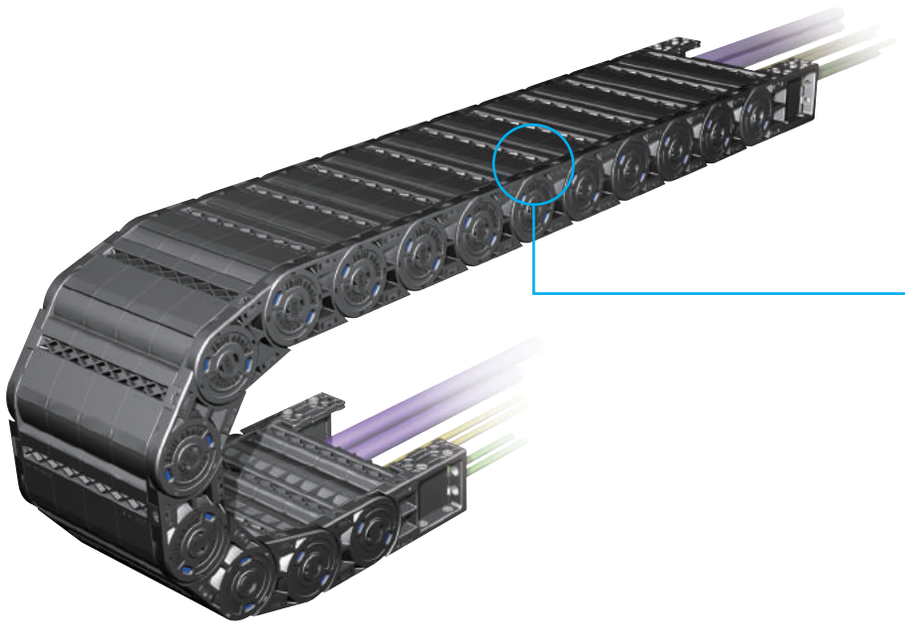


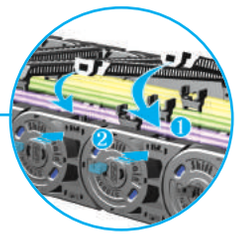


Chain Type	Ordering No.	A	B
ST 072E	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

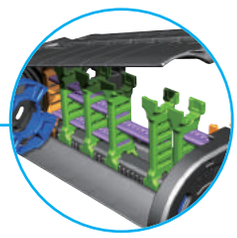
(Dimensions in mm)

ST 095E

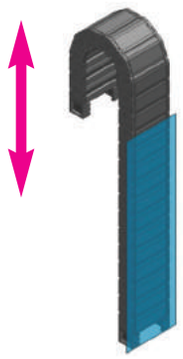




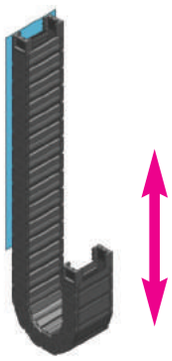
▲ Hinge frame-pin lock type



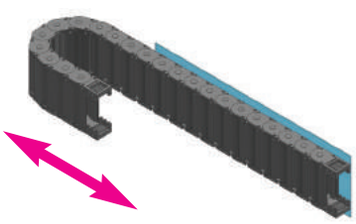
▲ Shift Chain



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

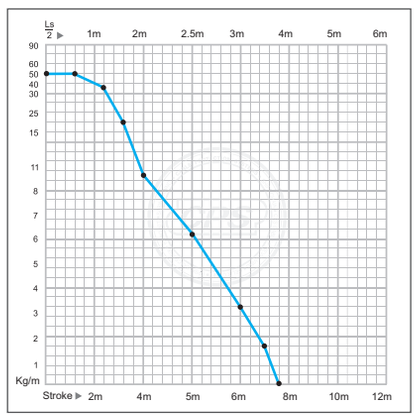
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

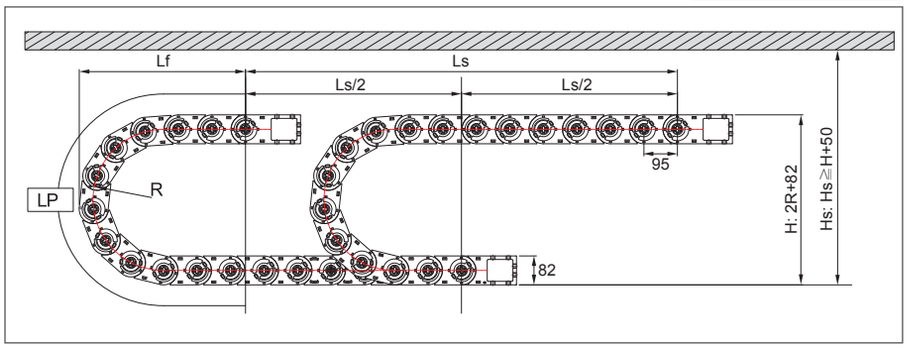
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

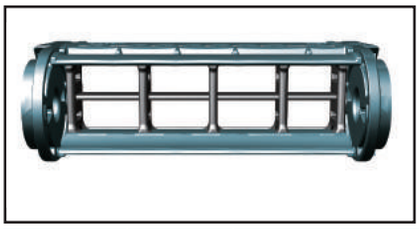
Ls: Stroke Hs: Safe Space

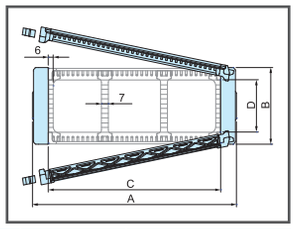


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
150	855	374	382
200	1,010	428	482
230	1,110	459	542
280	1,260	505	642
400	1,640	629	882

(Dimensions in mm)

Chain cross section



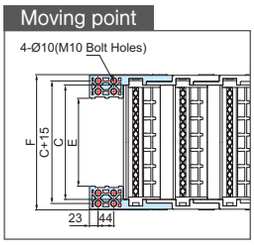


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 095E	138 163 188 213 238	82	100 125 150 175 200	55	3.55 3.79 4.04 4.29 4.53

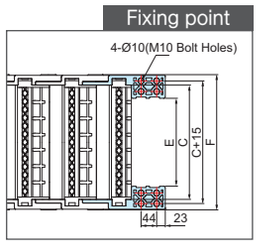
(Dimensions in mm)

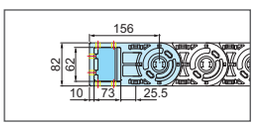
Free end bracket

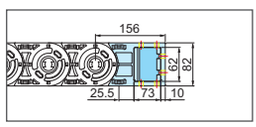
Moving point



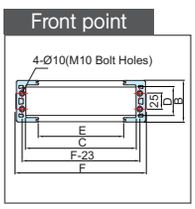
Fixing point







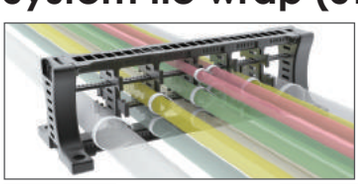
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 095E	138 163 188 213 238	82	100 125 150 175 200	55	49 74 99 124 149	M10 Bolt Holes

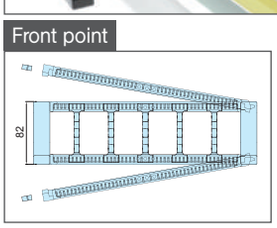
(Dimensions in mm)

System tie wrap (STW)

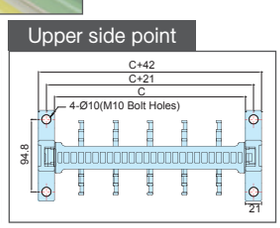


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

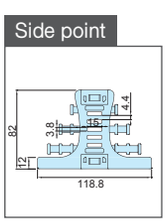
Front point



Upper side point



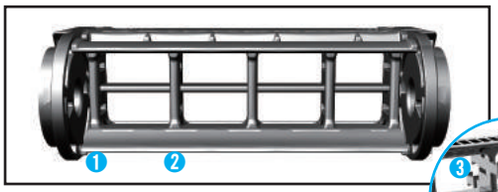
Side point



Chain Type	Ordering No.	C Frame	Hole Type
ST 095E	S-TW.EB060.100 S-TW.EB060.125 S-TW.EB060.150 S-TW.EB060.175 S-TW.EB060.200	100 125 150 175 200	M10 Bolt Holes

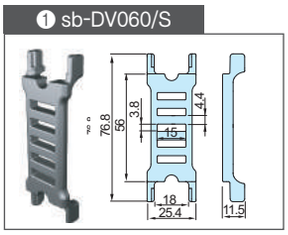
(Dimensions in mm)

Dividers(DV)

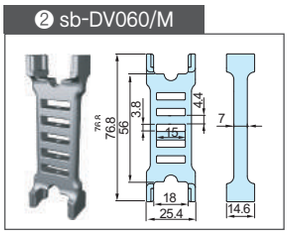


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

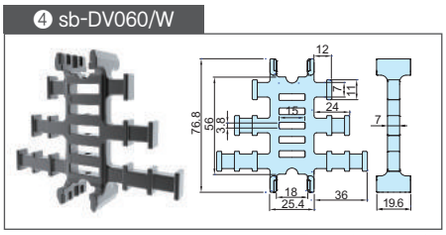
① sb-DV060/S



② sb-DV060/M

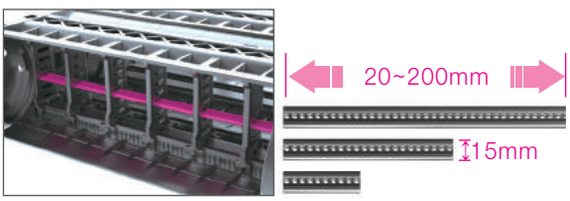


④ sb-DV060/W



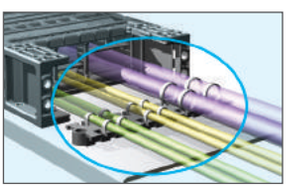
(Dimensions in mm)

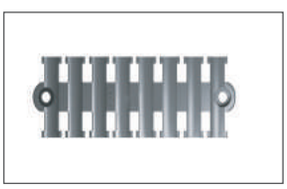
Separators(SP)

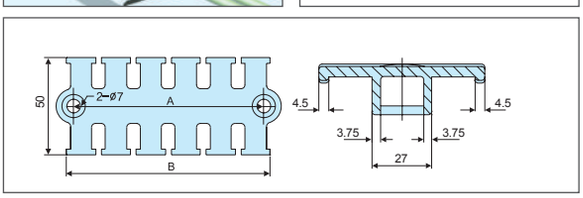


Chain Type	Ordering NO.
ST 095E	sb-SP/400.400

Tie wrap (TW)



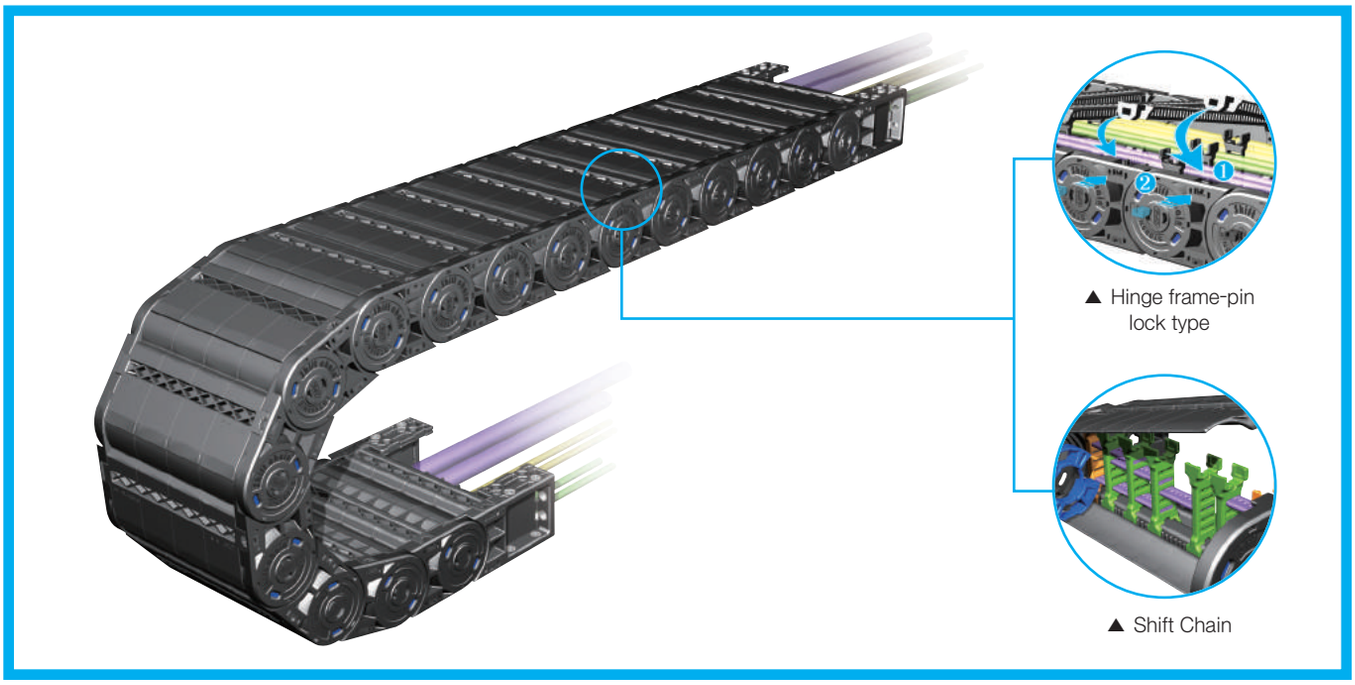


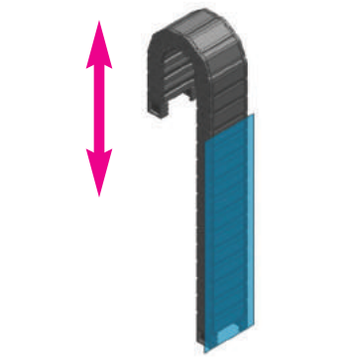


Chain Type	Ordering No.	A	B
ST 095E	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

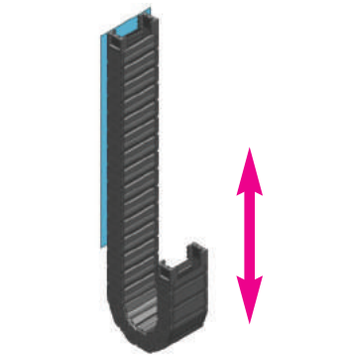
(Dimensions in mm)

ST 120E

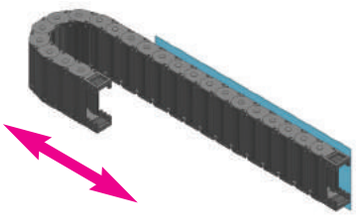




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

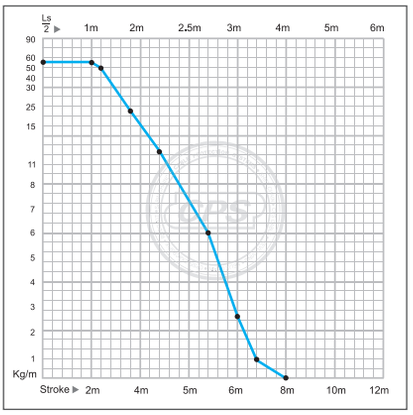
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

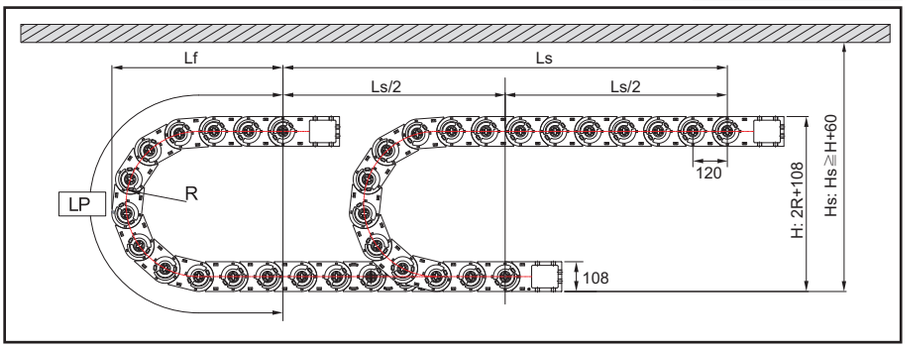
Vertical curve above = max 6.0m
Vertical curve below = max 120m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

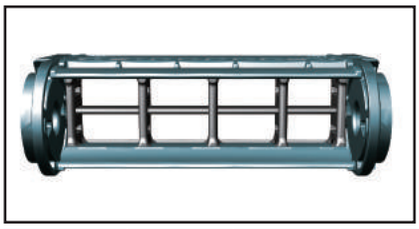
Ls: Stroke Hs: Safe Space

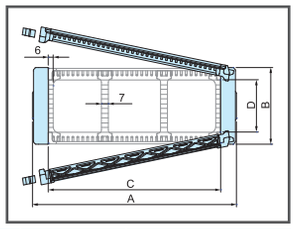


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
200	1,109	494	508
250	1,266	544	608
300	1,423	594	708
350	1,580	644	808
400	1,737	694	908
500	2,051	794	1,108

(Dimensions in mm)

Chain cross section



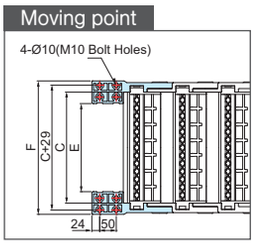


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 120E	192 242 292 342	108	150 200 250 300	76	5.79 6.43 7.07 7.71

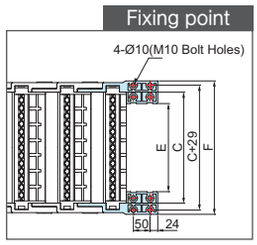
(Dimensions in mm)

Free end bracket

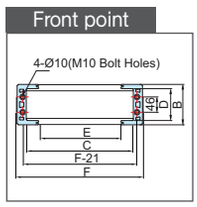
Moving point



Fixing point



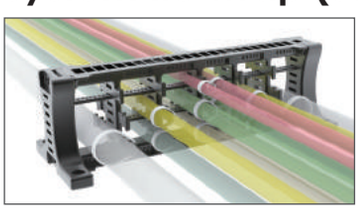
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 120E	200 250 300 350	108	150 200 250 300	76	90 140 190 240	M10 Bolt Holes

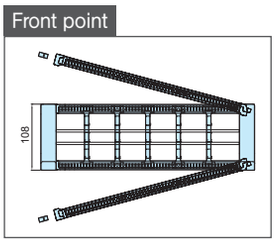
(Dimensions in mm)

System tie wrap (STW)

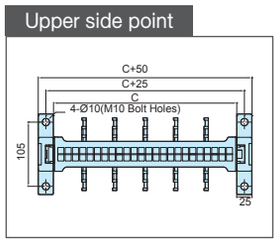


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

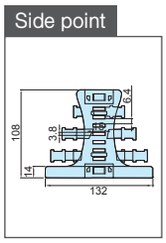
Front point



Upper side point

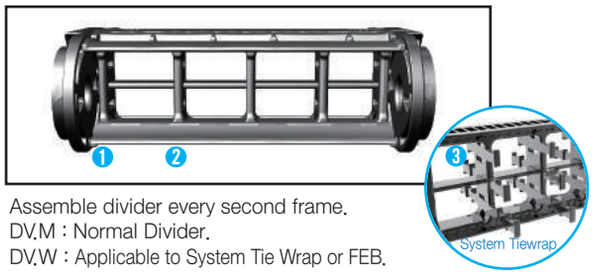


Side point



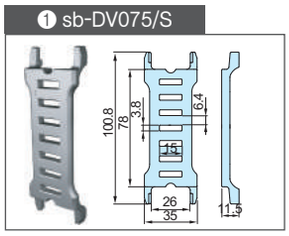
Chain Type	Ordering No.	C Frame	Hole Type
ST 120E	S-TW.EB075.150 S-TW.EB075.200 S-TW.EB075.250 S-TW.EB075.300	150 200 250 300	M10 Bolt Holes

Dividers(DV)

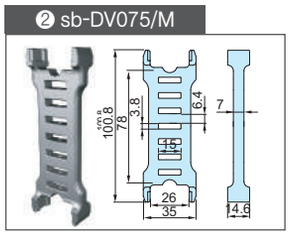


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

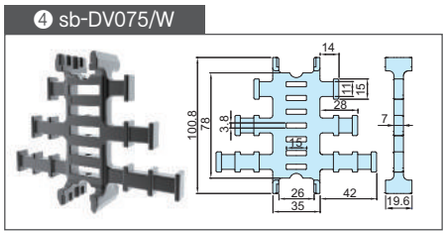
❶ sb-DV075/S



❷ sb-DV075/M

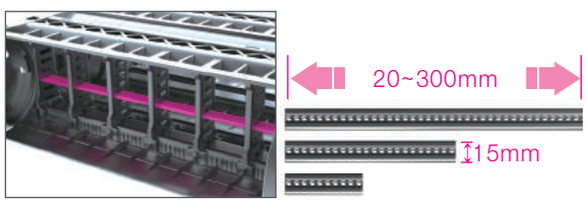


❹ sb-DV075/W



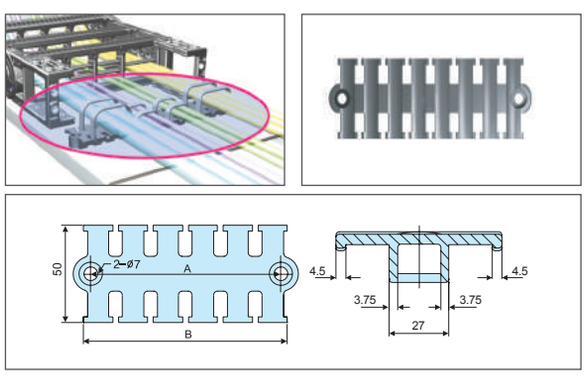
(Dimensions in mm)

Separators(SP)



Chain Type	Ordering NO.
ST 120E	sb-SP/400.400

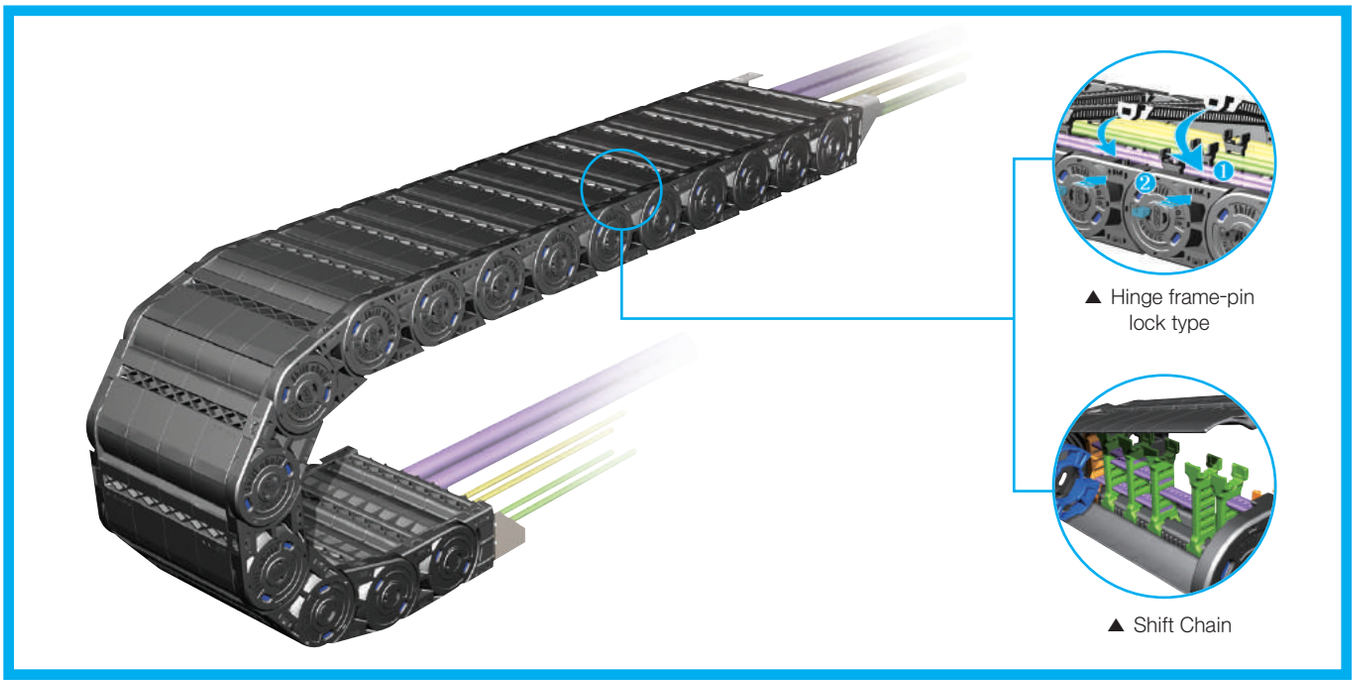
Tie wrap (TW)

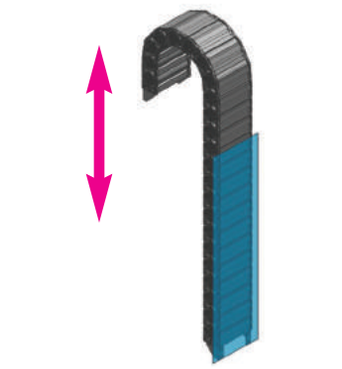


Chain Type	Ordering No.	A	B
ST 120E	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

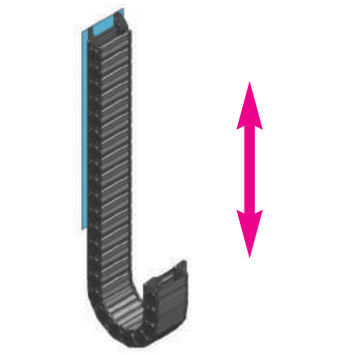
(Dimensions in mm)

ST 150E

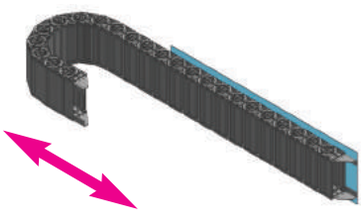




Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

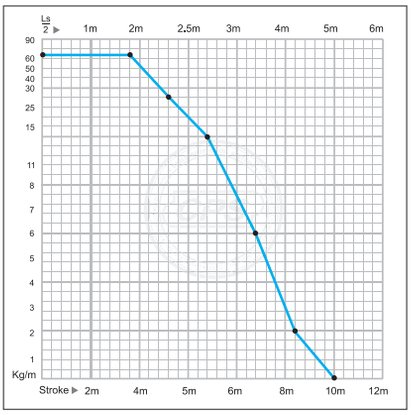
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

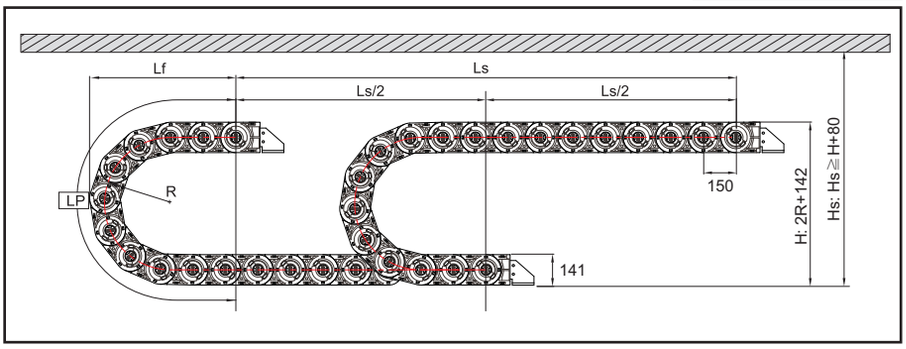
Vertical curve above = max 7.0m
Vertical curve below = max 150m
Side Mounted, Unsupported = max 4.0m

Load diagrams self-supporting length



Layout of the chain

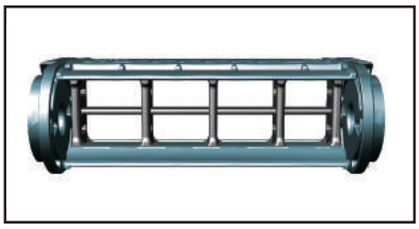
Ls: Stroke Hs: Safe Space

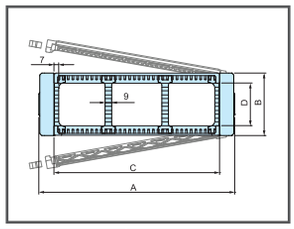


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
305	1,510	651	752
405	1,807	743	952
505	2,106	835	1,152
605	2,405	928	1,352

(Dimensions in mm)

Chain cross section

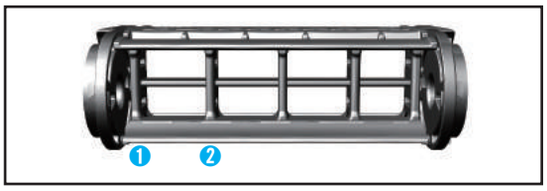




Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 150E	246 296 346 396 446	141	200 250 300 350 400	110	8.16 8.76 10.50 12.33 14.16

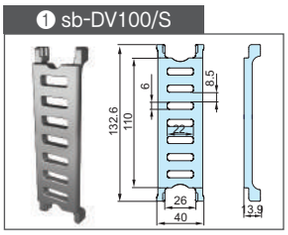
(Dimensions in mm)

Dividers(DV)

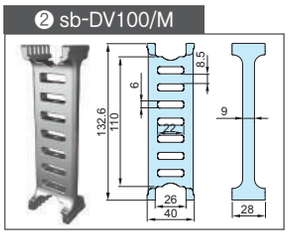


Assemble divider every second frame.
DV.M : Normal Divider.

❶ sb-DV100/S



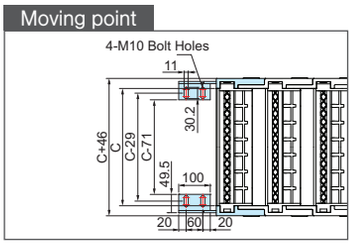
❷ sb-DV100/M



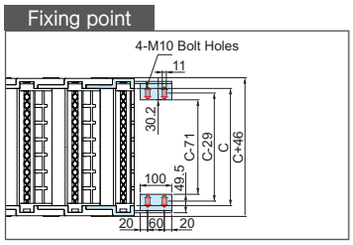
(Dimensions in mm)

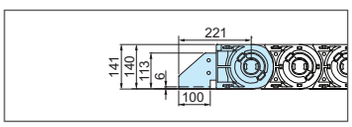
Free end bracket

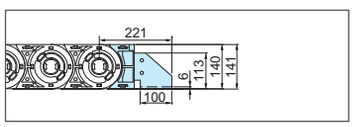
Moving point



Fixing point



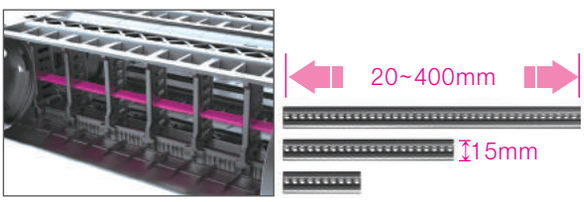




Chain Type	B Height(Outer)	C Frame	D Height(Inner)	Hole Type
ST 150E	141	200 250 300 350 400	110	M10 Bolt Holes

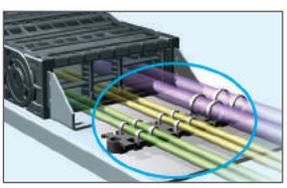
(Dimensions in mm)

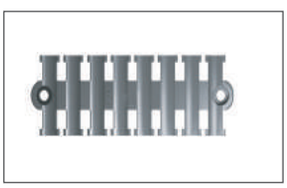
Separators(SP)

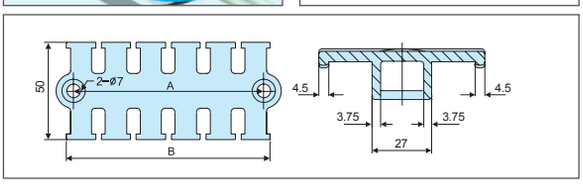


Chain Type	Ordering NO.
ST 150E	sb-SP/600.600

Tie wrap (TW)







Chain Type	Ordering No.	A	B
ST 150E	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

(Dimensions in mm)

Shift Chain - Skid type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	3m/s
Acceleration	10m/s²
Temperature	-30℃ ~+130℃
Certificate	CE, ATEX(Ex)

Calculation table

Item	Value
Length of Cable Chain	L + ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

Shift Chain S Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Size A	Size B	Size C	Size D	Frame type	Section Composition
ST 044S	44	70, 90, 120, 150	1.03 1.08 1.10 1.17 1.26 1.40 1.52 1.81 1.98	3	-30 ~ +130	74 89 94 114 139 164 189 214 239	38.5	35 50 55 75 100 125 150 175 200	26		

(Dimensions in mm)

Ordering

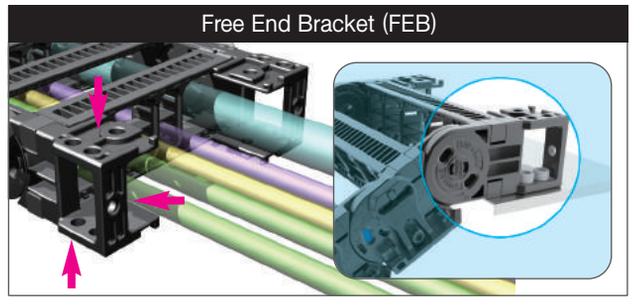
ST 044S. 100. R120 / F - 1500L : 10ST

- Shift Chain
- Skid type (S)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

Bracket type

- ST044

Free End Bracket (FEB)



≫ Part list of Shift Chain Skid type

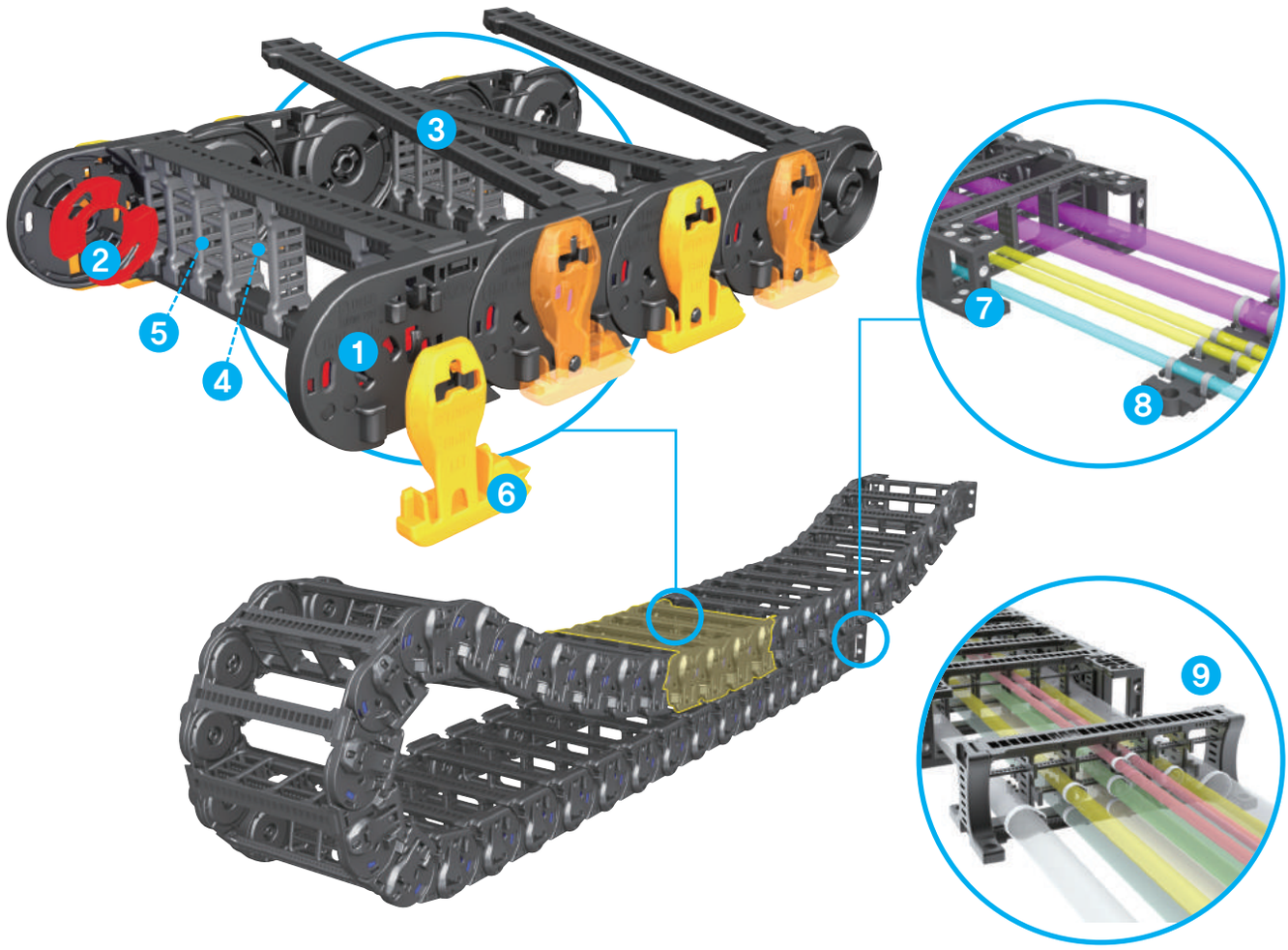
- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
ST044S	SIDE BAND	ST-SB044S(LH) ST-SB044S(RH)	Left side band of ST044S Right side band of ST044S
	BENDING RADIUS	ST-BRS044.R70,90,120,150	Bending radius unit for side band
	SKID	ST-SK044S(LH) ST-SK044S(RH)	Skid for long travel(Applied to side band)
	FRAME FRAME(UP)	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	End bracket of ST044S	End bracket of ST044S
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Shift Chain - Skid type

≫ Part of Shift Chain Skid type



❶ Side Band (SB)
A unit that connects each side band and between them BR is inserted to strengthen clamping force.

❷ Bending Radius Unit (BR)
A unit that inserted between each side band.
There are 6 supporting points to create durability.

❺ Frame (Hinged Type) (FR)
Hinged-type frame, open one side, supports connection of both side of side band and have tongue and groove system plate to secure the position of the divider on the frame.

❹ Separator (SP)
A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❺ Divider (DV-S, M, R, T)
A unit that divides inserted cables horizontally.

❻ Skid
A unit that minimizes friction between upper and lower cable chain.

❼ Free End Bracket (FEB)
A unit that connects at last side band (left&right).
It can be fixed stronger using steel washers.

❽ Tie Wrap (TW)
A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.

❾ System Tie Wrap (STW)
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisted and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

≫ Assembly procedure of Shift Chain Skid type

Assembly procedure of Shift chain S-type is as follows. The assembling process of shift Chain S-type is like below and you must use rubber hammer with careful combination of Divider and Separator. (Disassembly process for repair and replacement are in reverse order)

1

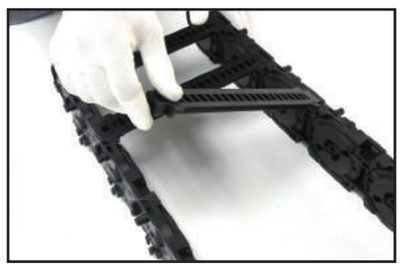
Insert BR Unit into each Side Band.
(Side Band is divided into right and left side according to the direction.)

2

Continue to insert BR Unit into Side Band as you want to make it. Assemble Side Band which is inserted BR Unit as above.

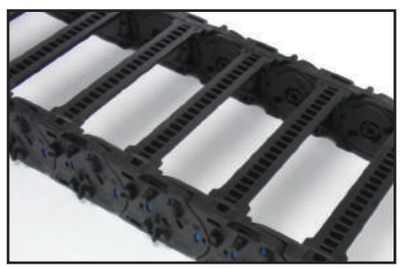
3

Continue to connect each Side Band as long as you want to make it.
Connect the Side Band as many as you need.



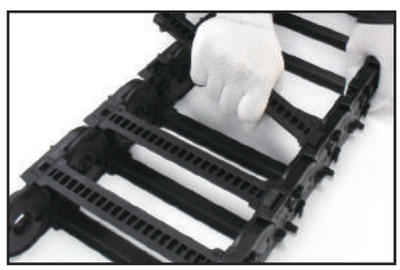
4

Connect right and left link with specified frame.
(Put Hinge Type frame in the hole of Side Band)



5

Insert frame pin onto connected each Frame and side of Side Band to be made tightly. (To devide inner room, insert divider which is connected with separator.

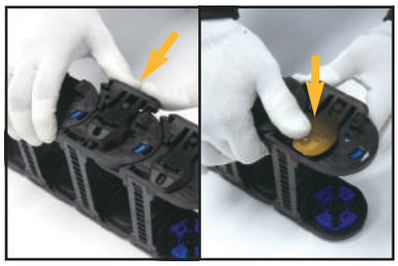


6

Assemble opposite frame as same procedure.

7

Insert Skid to the protruding side of Side Band.

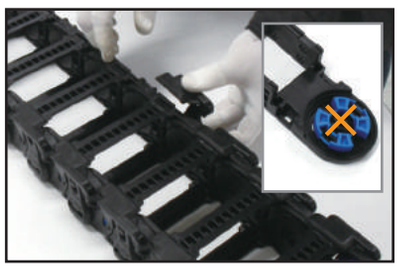


8

When inserting a Skid, push tightly to the home of Side Band until you hear "click"(Skid is divided each direction like right and left.)

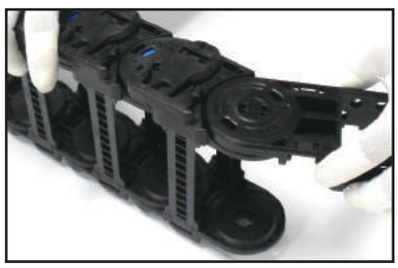
9

Assembly the Skid on the entire connected Side Band as same way.



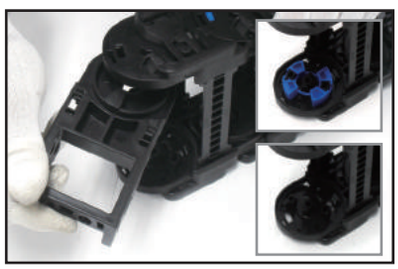
10

Assembly the Skid on the entire connected opposit side as well. Do not insert a BR Unit to M.FEB. (M.FEB will be making a turn to up and down)



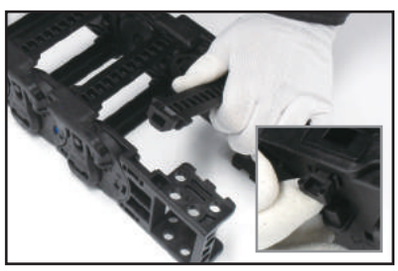
11

Assembly M.FEB to be corrective each direction such as right
and left.



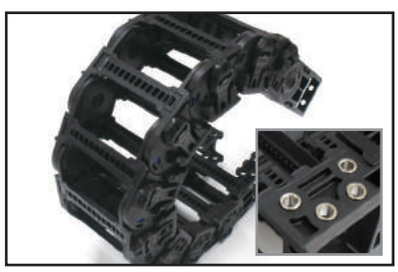
12

Assembly F.FEB to be suitable each direction such as right and left.
(Do not insert a BR Unit for the Side Band which is connected with F.FEB)



13

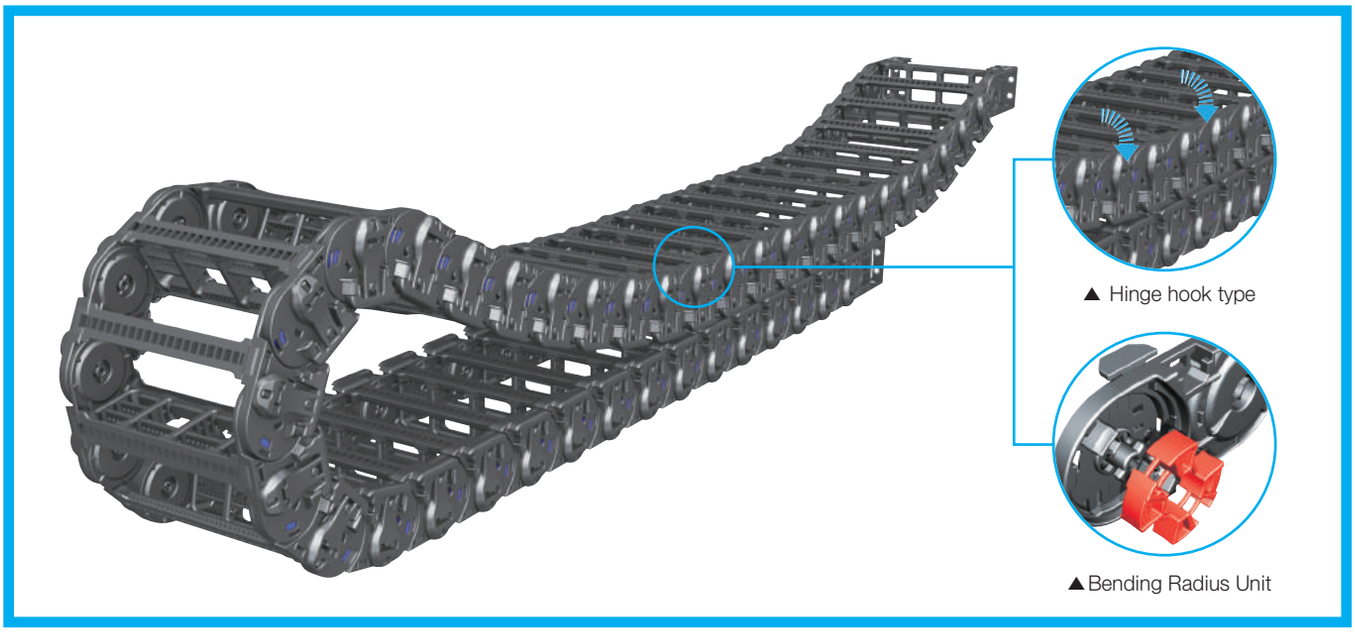
Assembly a specified frame in M.FEB and F.FEB. (Hinge is inserted into RH direction of FEB)
Insert Frame pin into connected frame and side of FEB.



14

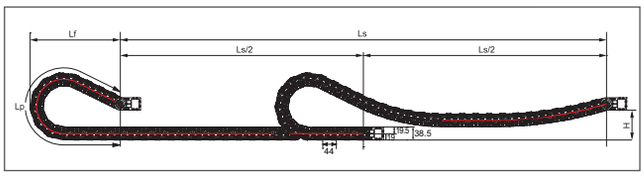
Insert steel washers into FEB according to fixing direction.

ST 044S



Layout of the chain

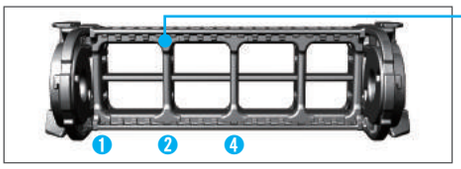
Ls: Stroke

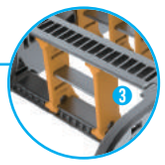


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
70	544	249	110
90	662	289	
120	926	393	
150	1,190	497	

(Dimensions in mm)

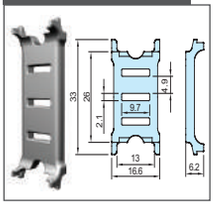
Dividers(DV)



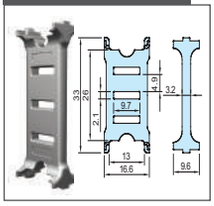


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

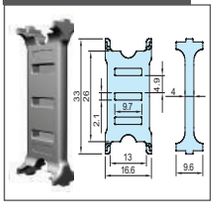
❶ sb-DV028/S



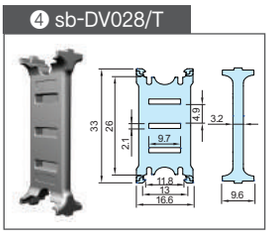
❷ sb-DV028/M1



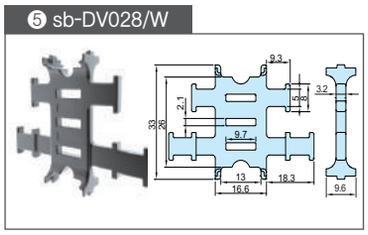
❸ sb-DV028/M2



❹ sb-DV028/T

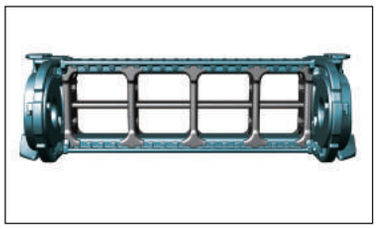


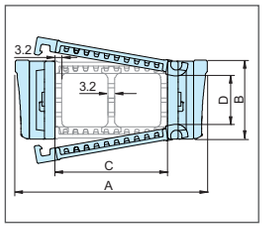
❺ sb-DV028/W



(Dimensions in mm)

Chain cross section

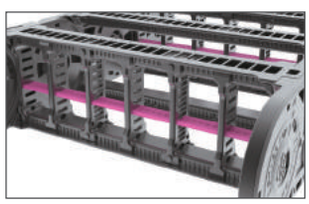


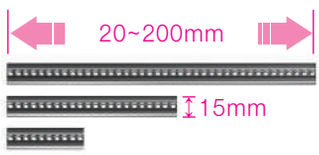


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 044S	74	38.5	35	26	1.03
	89		50		1.08
	94		55		1.10
	114		75		1.17
	139		100		1.26
	164		125		1.40
	189		150		1.52
	214		175		1.81
	239		200		1.98

(Dimensions in mm)

Separators(SP)



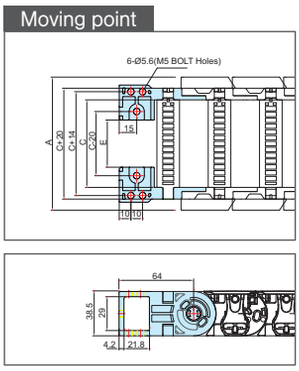


Chain Type	Ordering NO.	Frame
ST 044S	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

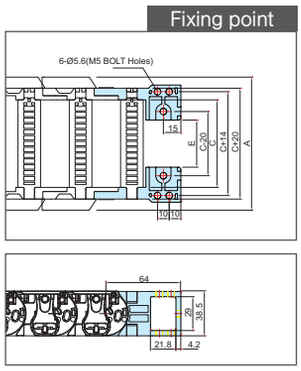
(Dimensions in mm)

Free end bracket

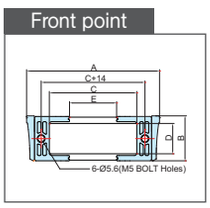
Moving point



Fixing point



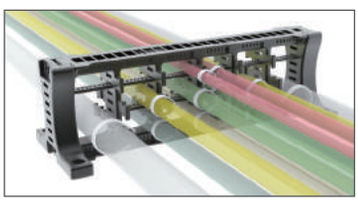
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M.EB Bolt hole width	Hole Type
ST 044S	74 89 94 114 139 164 189 214 239	38.5	35 50 55 75 100 125 150 175 200	26	0.4 15.4 20.4 40.4 65.4 90.4 115.4 140.4 165.4	M5 Bolt Holes

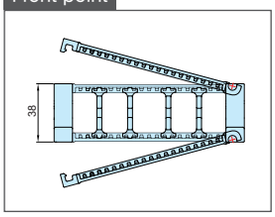
(Dimensions in mm)

System tie wrap (STW)

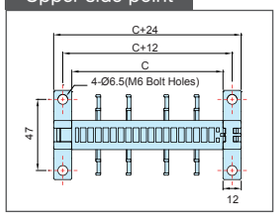


It is a unit to classify each cable for preventing entanglement of cables.
It can either be installed to free end bracket or installed separately according its application environment.

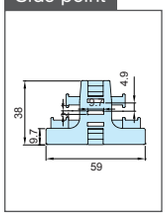
Front point



Upper side point



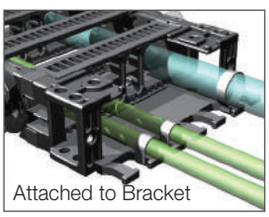
Side point

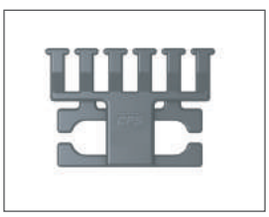


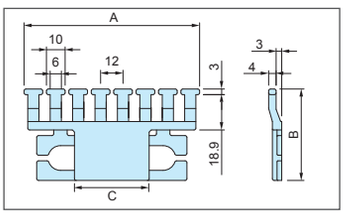
Chain Type	Ordering No.	C Frame	Hole Type
ST 044S	S-TW.EB028.35 S-TW.EB028.50 S-TW.EB028.55 S-TW.EB028.75 S-TW.EB028.100 S-TW.EB028.125 S-TW.EB028.150 S-TW.EB028.175 S-TW.EB028.200	35 50 55 75 100 125 150 175 200	M6 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





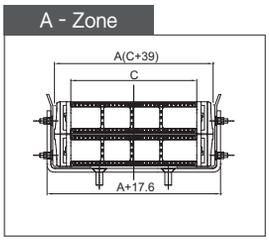


Chain Type	Ordering No.	A	B	C
ST 044S	S-TW036/025CR.35	46	35.4	-
	S-TW036/025CR.50	69	48.9	15
	S-TW036/025CR.55	70	48.9	20
	S-TW036/025CR.75	94	48.9	40
	S-TW036/025CR.100	118	48.9	65
	S-TW036/025CR.125	142	48.9	90

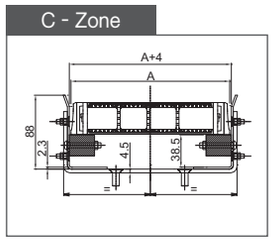
(Dimensions in mm)

Guide channel

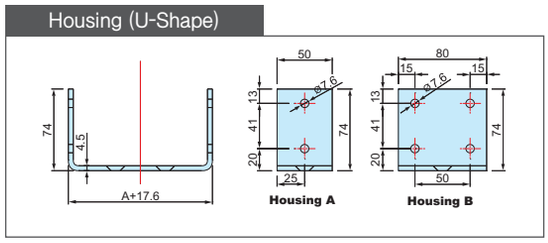
A - Zone



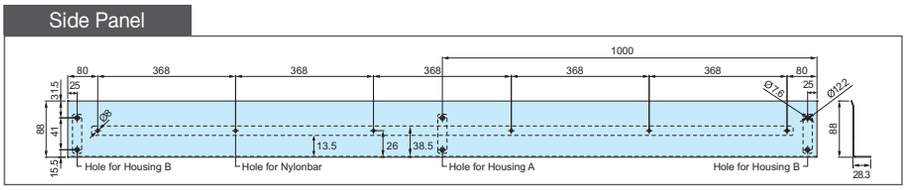
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Shift Chain - Enclosed skid type

>> General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	3㎧
Acceleration	10㎧
Temperature	-30℃ ~+130℃
Certificate	CE, ATEX(Ex)

>> Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

Shift Chain ES Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Clearance A	Clearance B	Clearance C	Clearance D	Frame style	Divider possible with frame
ST 044ES	44	70, 90, 120, 150	1.18 1.37 1.53 1.74	3	-30 ~ +130	74 94 114 139	38.5	35 55 75 100	26		
ST 072ES	72	120, 145, 200, 250, 300	2.77 3.01 3.25 3.49 3.73	3	-30 ~ +130	105 130 155 180 205	71.8	50 75 100 125 150	44		
ST 095ES	95	150, 200, 230, 280, 400	4.16 4.41 4.65 4.90 5.15	3	-30 ~ +130	162 187 212 237 262	89	100 125 150 175 200	55		
ST 120ES	120	200, 250, 300, 350, 400, 500	6.28 6.92 7.56 8.20	3	-30 ~ +130	218 268 318 368	115	150 200 250 290 300	76		

(Dimensions in mm)

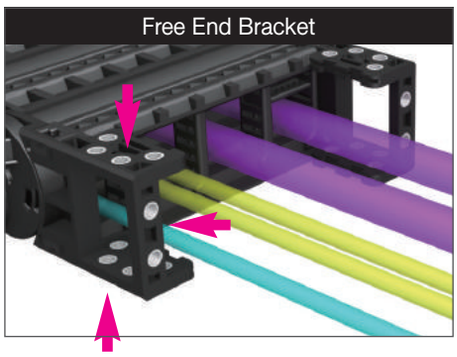
Ordering

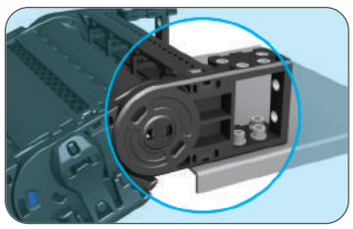
ST 044ES. 100. R120 / F - 1500L : 10ST

- Shift Chain
- Enclosed skid type (ES)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

Bracket type

- ST044, ST072, ST095, ST120





▶ BR should not be inserted in the joint of side band and Free End Bracket of moving bracket.
▶ Normal Frame, not FRU/FRD, is inserted into M.FEB.

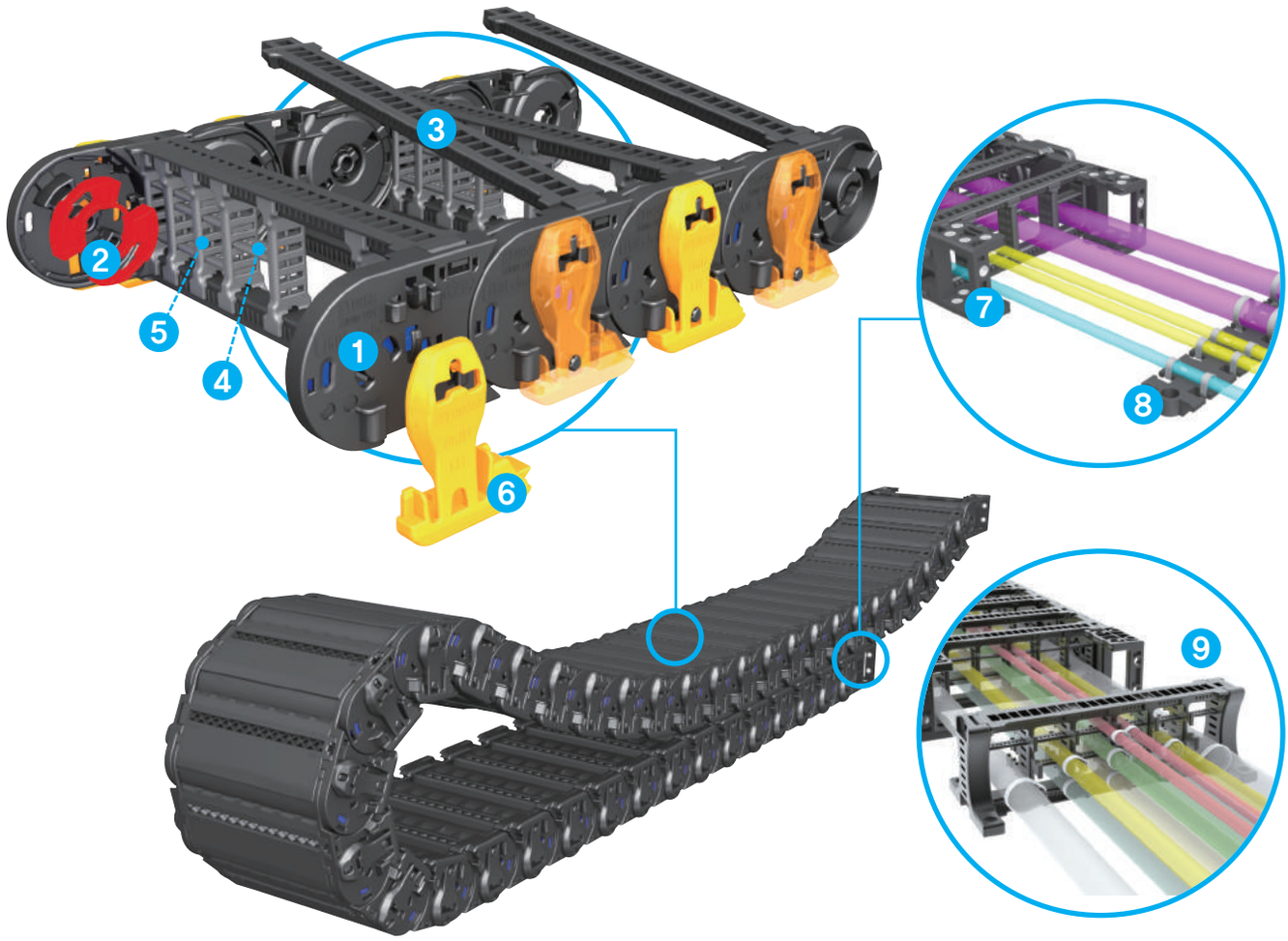
Application of CPS mini Chain

- Shift Chain Enclosed Skid type can be applied to all kinds of machine tools and factory lines.

▶ **ST 095ES**
Application:
Steel manufacturing line
Location:
Korea
Remark:
Stroke : 20meters

Shift Chain - Enclosed skid type

≫ Part of Shift Chain Enclosed skid type



❶ Side Band (SB)
A unit that connects each side band and between them BR is inserted to strengthen clamping force.

❷ Bending Radius Unit (BR)
A unit that inserted between each side band.
There are 6 supporting points to create durability.

❸ FRU, FRD
[FRU(D) Enclosed type applicable]
A unit that connects left and right side band and there are 2 types of frame : FRU, FRD.

❹ Separator (SP)
A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❺ Divider (DV-S, M, R, T)
A unit that divides inserted cables horizontally.

❻ Skid
A unit that minimizes friction between upper and lower cable chain.

❼ Free End Bracket (FEB)
A unit that connects at last side band (left&right).
It can be fixed stronger using steel washers.

❽ Tie Wrap (TW)
A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.

❾ System Tie Wrap (STW)
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisted and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

Assembly procedure of Shift Chain Enclosed Skid type

Assembly procedure of Shift chain ES-type is as follows. The assembling process of shift Chain ES-type is like below and users must use rubber hammer with careful combination of Divider and Separator. (Disassembly process for repair and replacement is in reverse order)

1

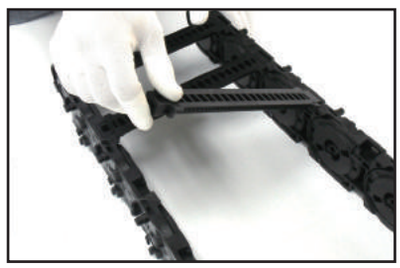
Insert BR Unit into each Side Band.
(Side Band is divided into right and left side according to the direction.)

2

Continue to insert BR Unit into Side Band as you want to make it. Assemble Side Band which is inserted BR Unit as above.

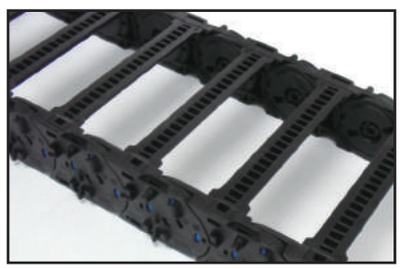
3

Continue to connect each Side Band as long as you want to make it.
Connect the Side Band as many as you need.



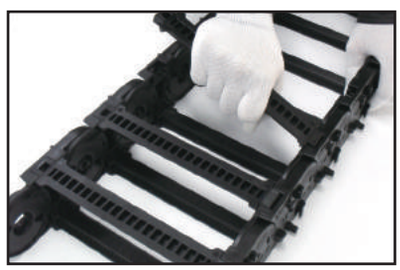
4

Connect right and left link with specified frame.
(Put Hinge Type frame in the hole of Side Band)



5

Insert frame pin onto connected each Frame and side of Side Band to be made tightly. (To devide inner room, insert divider which is connected with separator.

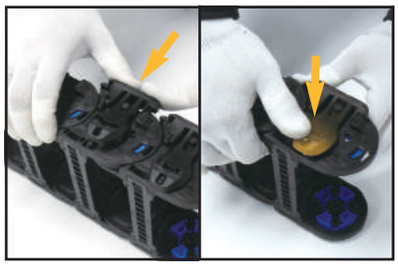


6

Assemble opposite frame as same procedure.

7

Insert Skid to the protruding side of Side Band.

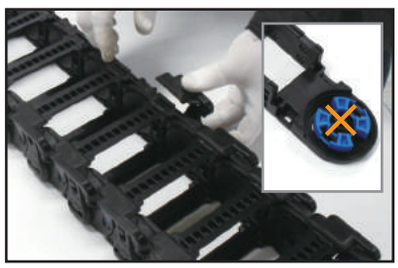


8

When inserting a Skid, push tightly to the home of Side Band until you hear "click"(Skid is divided each direction like right and left.)

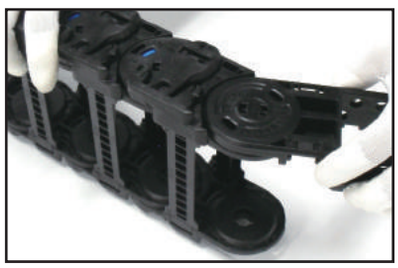
9

Assembly the Skid on the entire connected Side Band as same way.



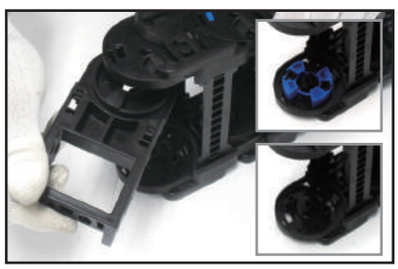
10

Assembly the Skid on the entire connected opposit side as well. Do not insert a BR Unit to M.FEB. (M.FEB will be making a turn to up and down)



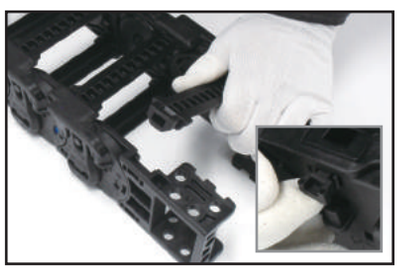
11

Assembly M.FEB to be corrective each direction such as right
and left.



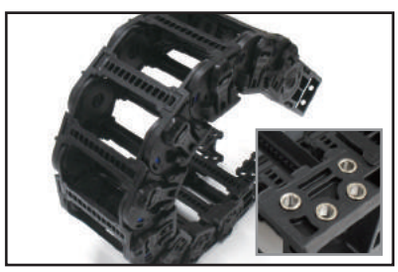
12

Assembly F.FEB to be suitable each direction such as right and left.
(Do not insert a BR Unit for the Side Band which is connected with F.FEB)



13

Assembly a specified frame in M.FEB and F.FEB. (Hinge is inserted into RH direction of FEB)
Insert Frame pin into connected frame and side of FEB.



14

Insert steel washers into FEB according to fixing direction.

Shift Chain - Enclosed skid type

≫ Part of Shift Chain Enclosed skid type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

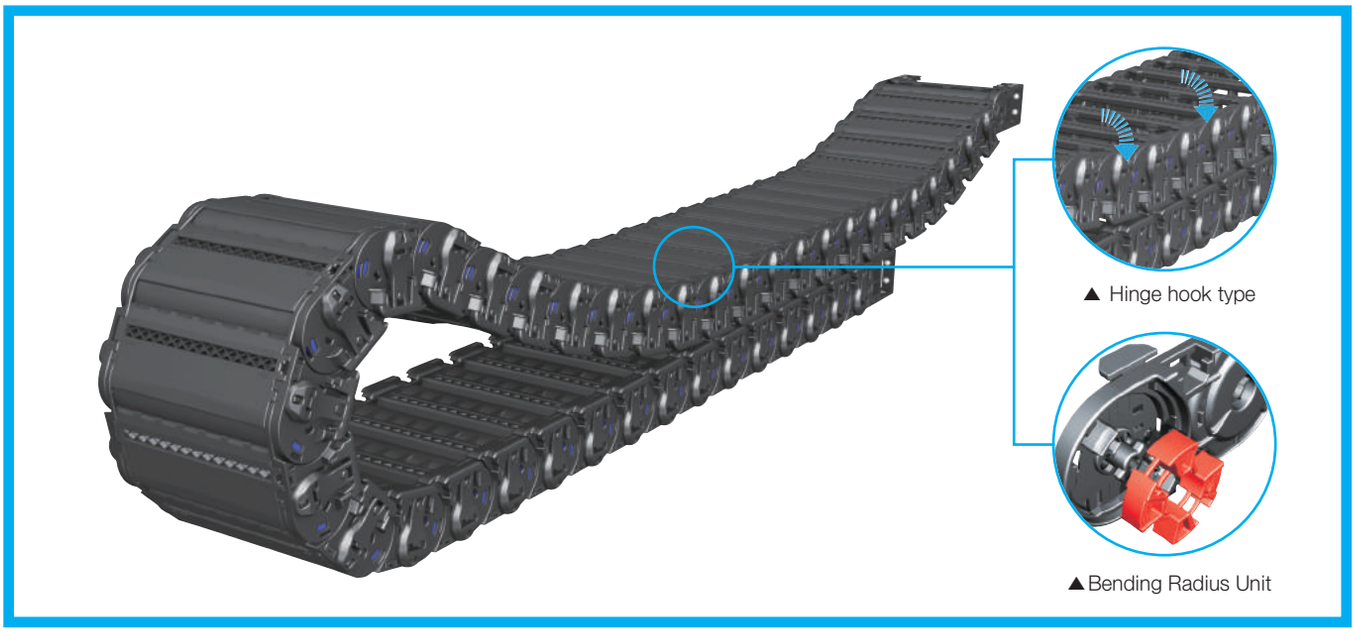
Model	Classification	Part number	Description
ST044ES	SIDE BAND	ST-SB044S(LH) ST-SB044S(RH)	Left side band of ST044S Right side band of ST044S
	BENDING RADIUS	ST-BRS044.R70, 90, 120, 150	Bending radius unit for side band
	SKID	ST-SK044S(LH) ST-SK044S(RH)	Skid for long travel(Applied to side band)
	FRAME(DOWN) FRAME(UP)	ST-FRD044.35 ST-FRU044.35 ST-FRD044.55 ST-FRU044.55 ST-FRD044.75 ST-FRU044.75 ST-FRD044.100 ST-FRU044.100	Inside frame, 35mm Outside frame, 35mm Inside frame, 55mm Outside frame, 55mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE044.35,55,75,100 ST-FRUFE044.35,55,75,100 ST-FRDME044.35,55,75,100 ST-FRUME044.35,55,75,100	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB044E	End bracket of ST044E
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
ST072ES	SIDE BAND	ST-SB072S(LH) ST-SB072S(RH)	Left side band of ST072S Right side band of ST072S
	BENDING RADIUS	ST-BRS072. R120,145,200,250,300	Bending radius unit for side band
	SKID	ST-SK072S(LH) ST-SK072S(RH)	Skid for long travel(Applied to side band)
	FRAME PIN	S-FP/S1	Frame pin
	FRAME(DOWN) FRAME(UP)	ST-FRD072.50 ST-FRU072.50 ST-FRD072.75 ST-FRU072.75 ST-FRD072.100 ST-FRU072.100 ST-FRD072.125 ST-FRU072.125 ST-FRD072.150 ST-FRU072.150	Inside frame, 50mm Outside frame, 50mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE072.50,75,100,125,150 ST-FRUFE072.50,75,100,125,150 ST-FRDME072.50,75,100,125,150 ST-FRUME072.50,75,100,125,150	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB072 sb-FEB/WH045	End bracket of ST072E Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
ST095ES	SIDE BAND	ST-SB095S(LH) ST-SB095S(RH)	Left side band of ST095S Right side band of ST095S
	BENDING RADIUS	ST-BR095.R150,200,230,280,400	Bending radius unit for side band
	SKID	ST-SK095S(LH) ST-SK095S(RH)	Skid for long travel(Applied to side band)
	FRAME PIN	S-FP/S1	Frame pin
	FRAME(DOWN) FRAME(UP)	ST-FRD095.100 ST-FRU095.100 ST-FRD095.125 ST-FRU095.125 ST-FRD095.150 ST-FRU095.150 ST-FRD095.175 ST-FRU095.175 ST-FRD095.200 ST-FRU095.200	Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm Inside frame, 175mm Outside frame, 175mm Inside frame, 200mm Outside frame, 200mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE095.100,125,150,175,200 ST-FRUFE095.100,125,150,175,200 ST-FRDME095.100,125,150,175,200 ST-FRUME095.100,125,150,175,200	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB095 sb-FEB/WH060	End bracket of ST072E Steel washer for end bracket
	DIVIDER	sb-DV060/M sb-DV060/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW.EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

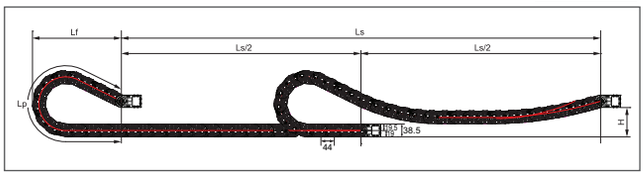
Model	Classification	Part number	Description
ST120ES	SIDE BAND	ST-SB120S(LH) ST-SB120S(RH)	Left side band of ST120E Right side band of ST120E
	BENDING RADIUS	ST-BR120.R180,200,250,300,350,400,500	Bending radius unit for side band
	SKID	ST-SK120S(LH) ST-SK120S(RH)	Skid for long travel(Applied to side band)
	FRAME PIN	S-FP/S2	Frame pin
	FRAME(DOWN) FRAME(UP)	ST-FRD120.150 ST-FRU120.150 ST-FRD120.200 ST-FRU120.200 ST-FRD120.250 ST-FRU120.250 ST-FRD120.300 ST-FRU120.300	Inside frame, 150mm Outside frame, 150mm Inside frame, 200mm Outside frame, 200mm Inside frame, 250mm Outside frame, 250mm Inside frame, 300mm Outside frame, 300mm
	FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRDFE120.150,200,250,300 ST-FRUFE120.150,200,250,300 ST-FRDME120.150,200,250,300 ST-FRUME120.150,200,250,300	Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB120E sb-FEB/WH075	End bracket of ST120E Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW.EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

ST 044ES



Layout of the chain

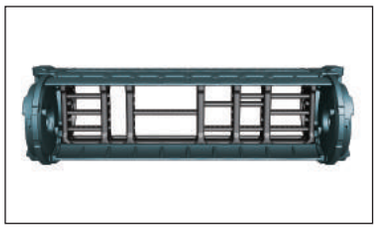
Ls: Stroke

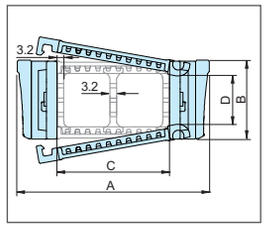


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
70 90 120 150	544 662 926 1,190	249 289 393 497	110

(Dimensions in mm)

Chain cross section

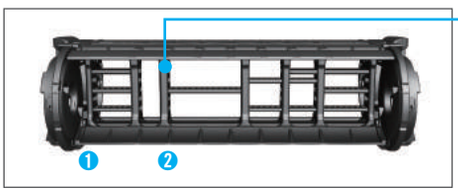


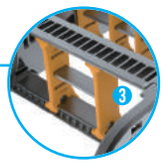


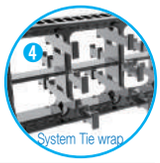
Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 044ES	74 94 114 139	38.5	35 55 75 100	26	1.18 1.37 1.53 1.74

(Dimensions in mm)

Dividers(DV)

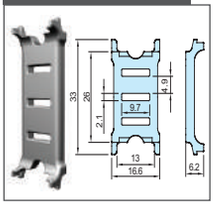




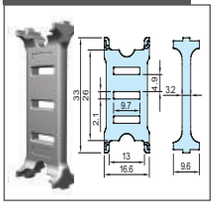


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

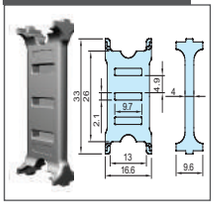
❶ sb-DV028/S



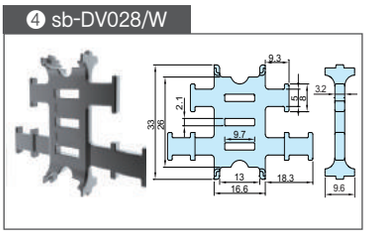
❷ sb-DV028/M1



❸ sb-DV028/M2

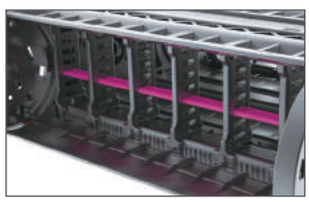


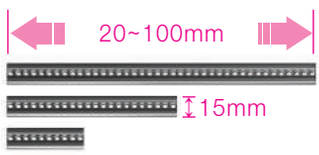
❹ sb-DV028/W



(Dimensions in mm)

Separators(SP)



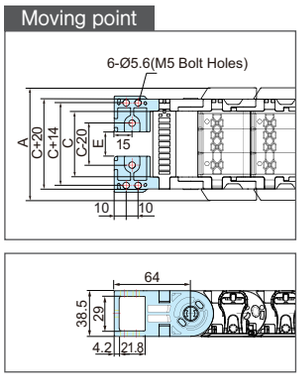


Chain Type	Ordering NO.	Frame
ST 044ES	S-SP/M.35 S-SP/M.55 S-SP/M.75 S-SP/M.100	35 55 75 100

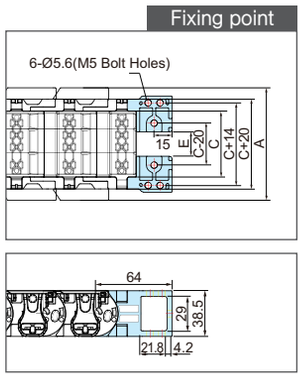
(Dimensions in mm)

Free end bracket

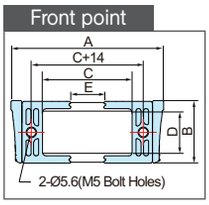
Moving point



Fixing point



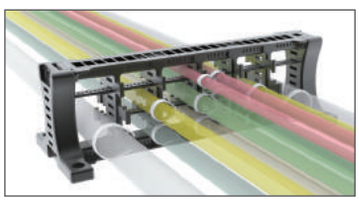
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 044ES	74 94 114 139	38.5	35 55 75 100	26	0.4 20.4 40.4 65.4	M5 Bolt Holes

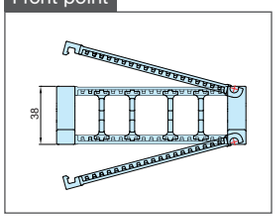
(Dimensions in mm)

System tie wrap (STW)

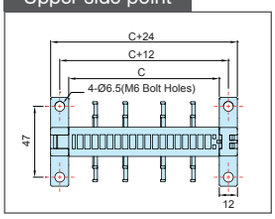


It is a unit to classify each cable for preventing entanglement of cables.
It can either be installed to free end bracket or installed separately according its application environment.

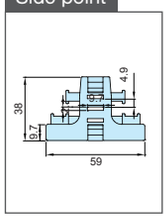
Front point



Upper side point



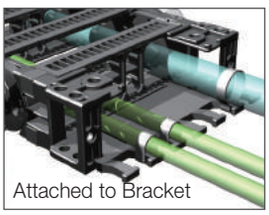
Side point

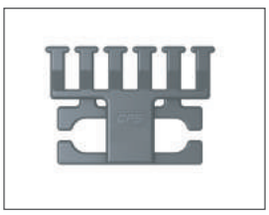


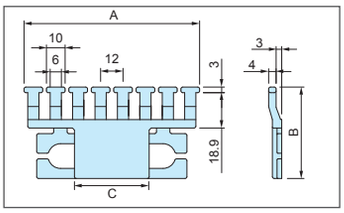
Chain Type	Ordering No.	C Frame	Hole Type
ST 044ES	S-TW.EB028.35 S-TW.EB028.55 S-TW.EB028.75 S-TW.EB028.100	35 55 75 100	M6 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





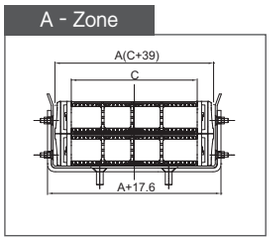


Chain Type	Ordering No.	A	B	
ST 044ES	S-TW036/025CR.35	46	35.4	-
	S-TW036/025CR.55	70	48.9	20
	S-TW036/025CR.75	94	48.9	40
	S-TW036/025CR.100	118	48.9	65

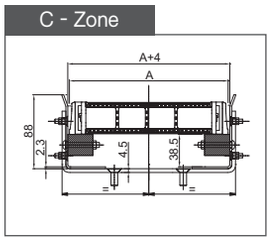
(Dimensions in mm)

Guide channel

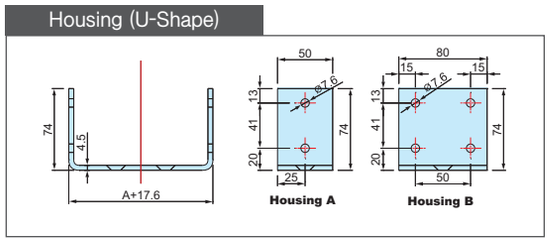
A - Zone



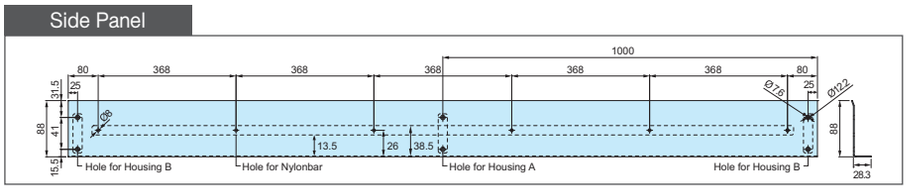
C - Zone



Housing (U-Shape)

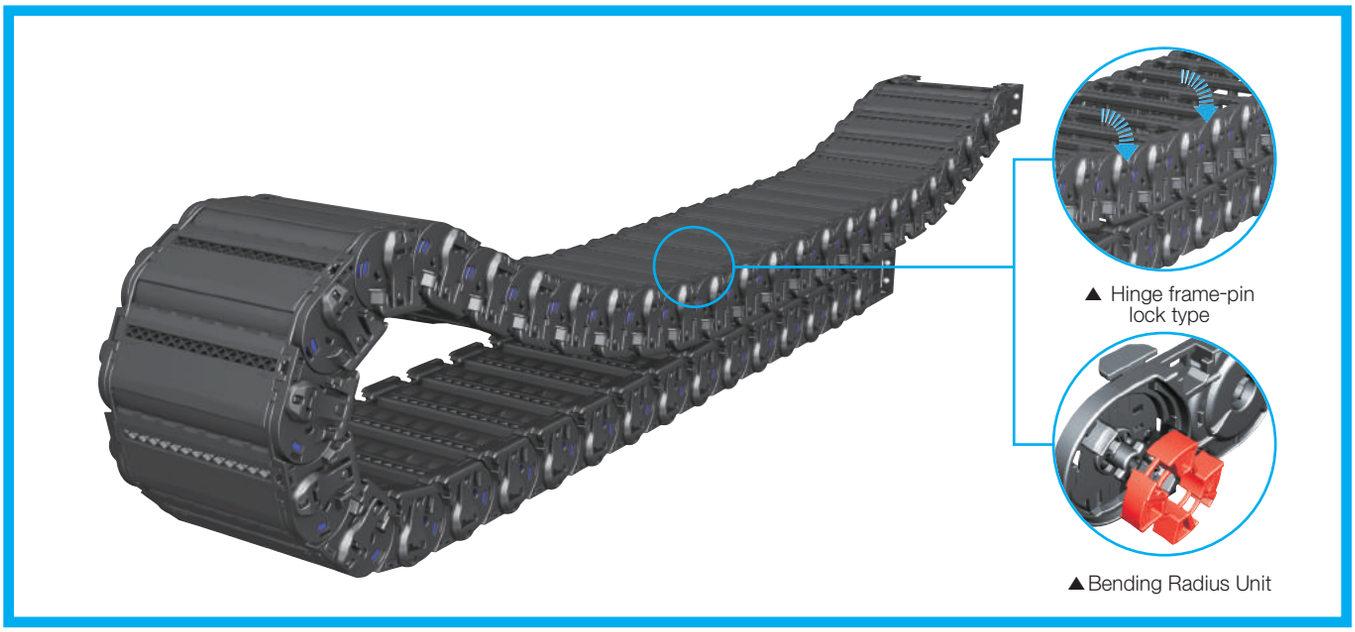


Side Panel



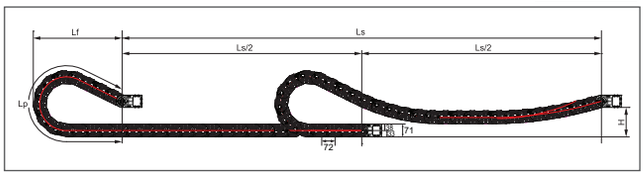
(Dimensions in mm)

ST 072ES



Layout of the chain

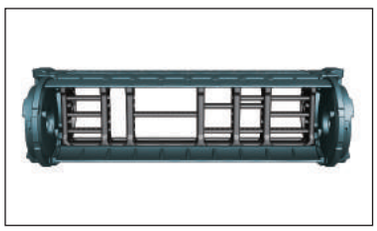
Ls: Stroke

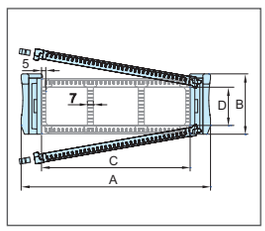


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
120	917	420	180
145	1,063	470	
200	1,400	580	
250	1,840	752	
300	2,280	924	

(Dimensions in mm)

Chain cross section

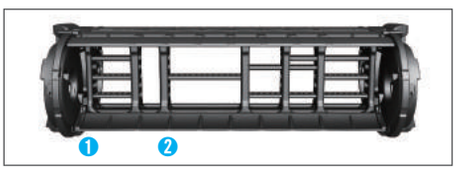




Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 072ES	105	71.8	50	44	2.77
	130		75		3.01
	155		100		3.25
	180		125		3.49
	205		150		3.73

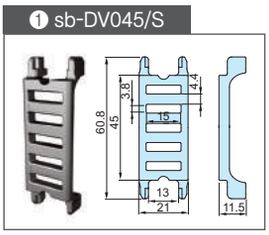
(Dimensions in mm)

Dividers(DV)

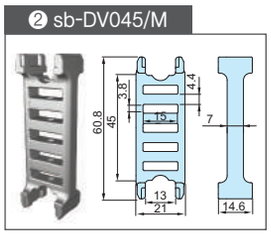


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

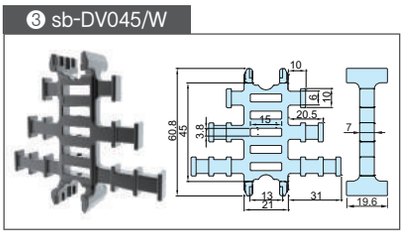
❶ sb-DV045/S



❷ sb-DV045/M

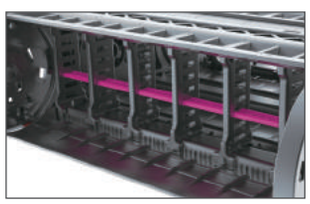


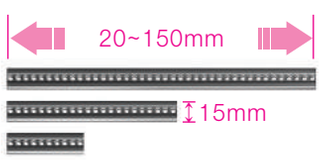
❸ sb-DV045/W



(Dimensions in mm)

Separators(SP)

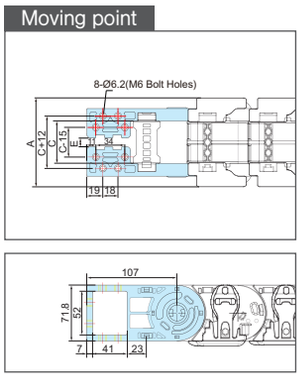




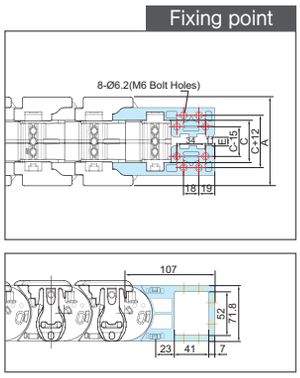
Chain Type	Ordering NO.
ST 072ES	sb-SP/400.400

Free end bracket

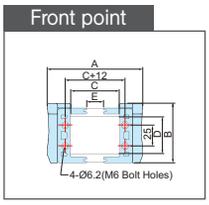
Moving point



Fixing point



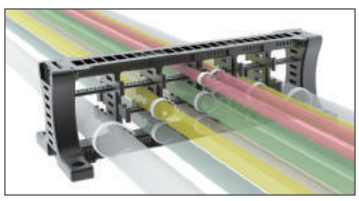
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 072ES	105 130 155 180 205	71.8	50 75 100 125 150	44	10 35 60 85 110	M6 Bolt Holes

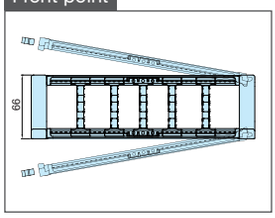
(Dimensions in mm)

System tie wrap (STW)

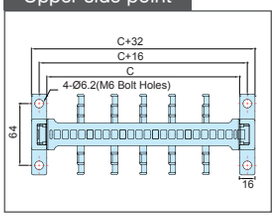


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

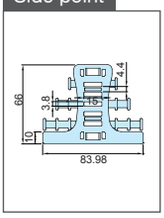
Front point



Upper side point



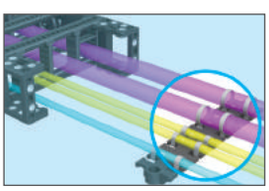
Side point

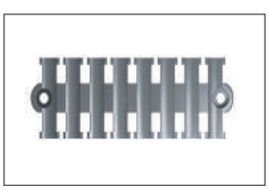


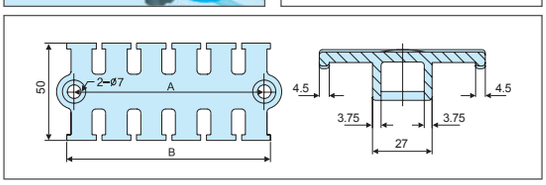
Chain Type	Ordering No.	C Frame	Hole Type
ST 072ES	S-TW.EB045.50 S-TW.EB045.75 S-TW.EB045.100 S-TW.EB045.125 S-TW.EB045.150	50 75 100 125 150	M6 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





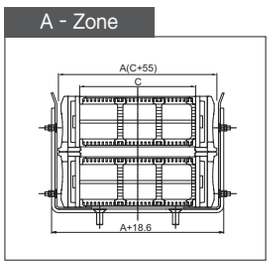


Chain Type	Ordering No.	A	B
ST 072ES	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

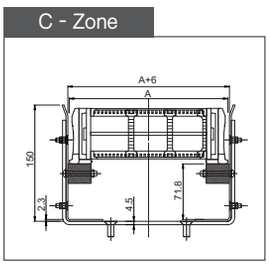
(Dimensions in mm)

Guide channel

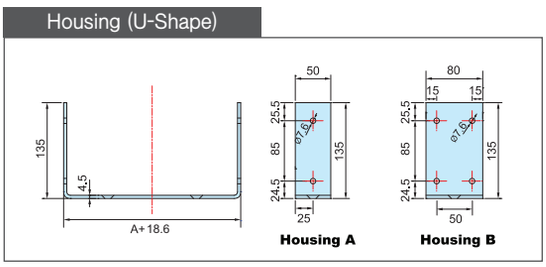
A - Zone



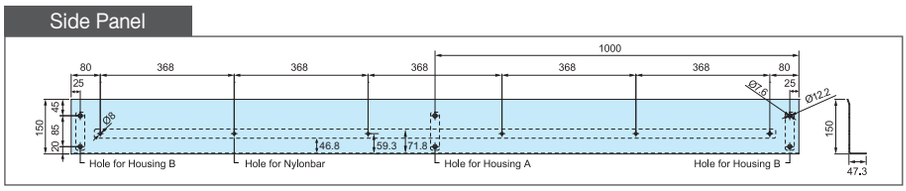
C - Zone



Housing (U-Shape)

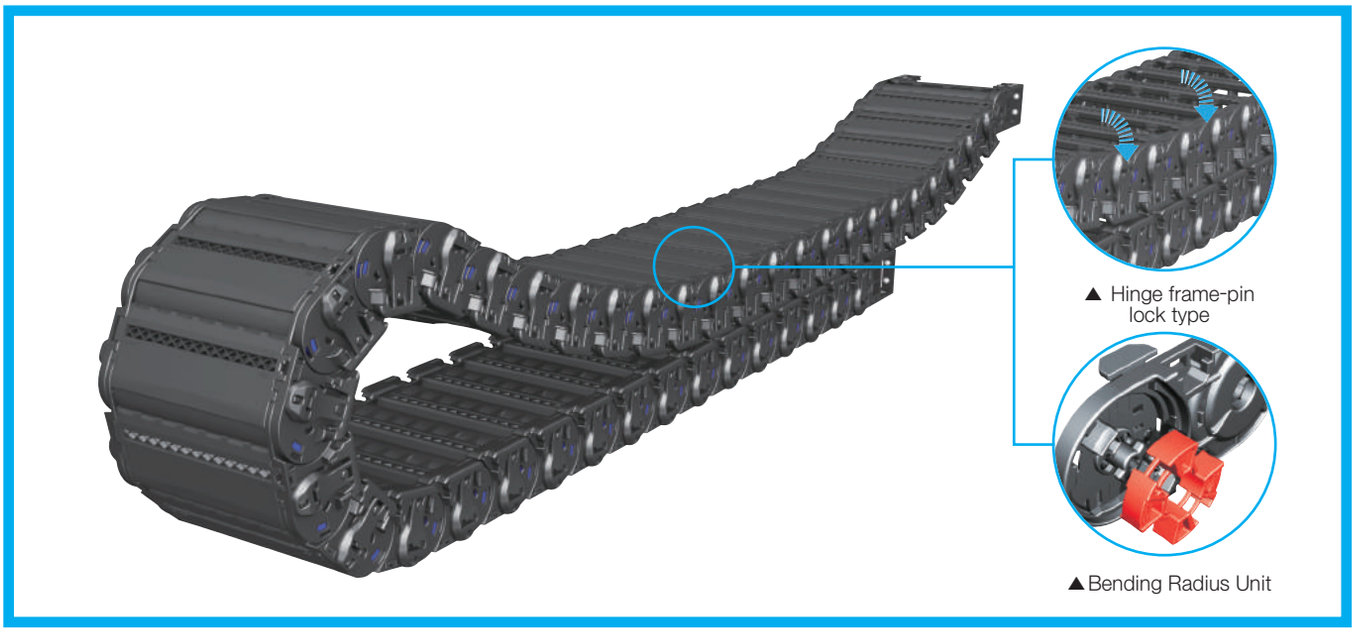


Side Panel



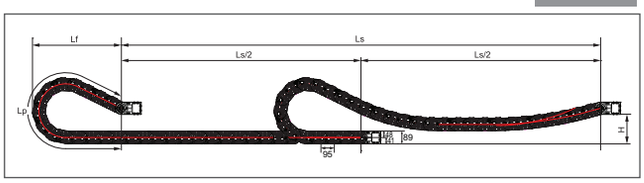
(Dimensions in mm)

ST 095ES



Layout of the chain

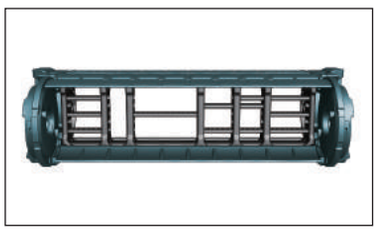
Ls: Stroke

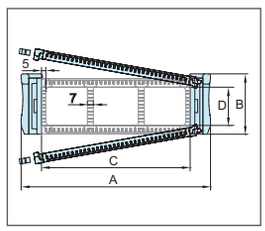


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
150	1,178	534	210
200	1,479	634	
230	1,666	694	
280	2,146	889	
400	3,232	1,319	

(Dimensions in mm)

Chain cross section

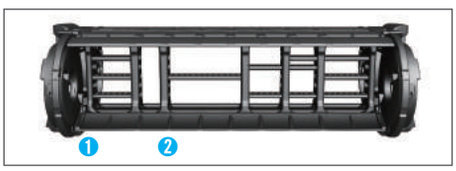


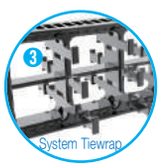


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 095ES	162	89	100	55	4.16
	187		125		4.41
	212		150		4.65
	237		175		4.90
	262		200		5.15

(Dimensions in mm)

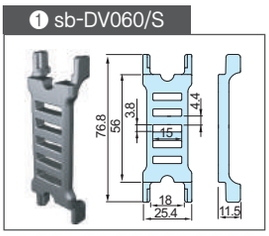
Dividers(DV)



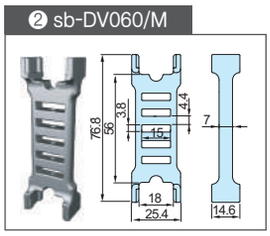


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

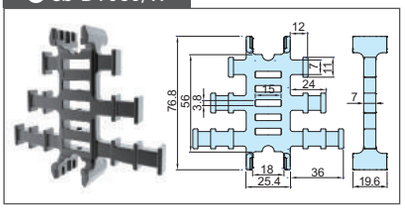
❶ sb-DV060/S



❷ sb-DV060/M

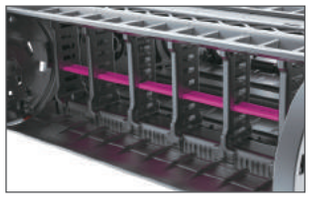


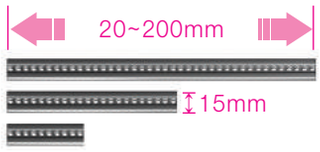
❸ sb-DV060/W



(Dimensions in mm)

Separators(SP)



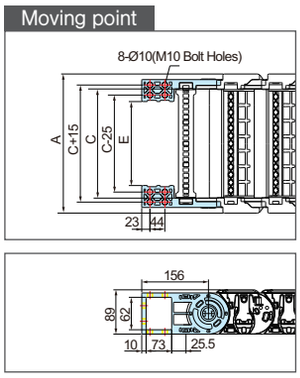


Chain Type	Ordering NO.
ST 095ES	sb-SP/400.400

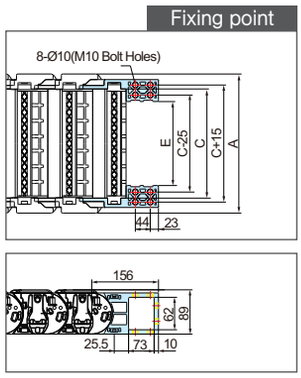
(Dimensions in mm)

Free end bracket

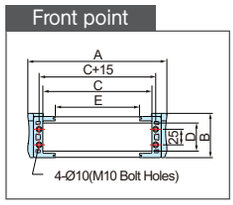
Moving point



Fixing point



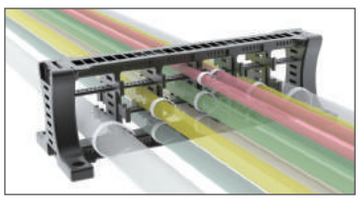
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 095ES	162 187 212 237 262	89	100 125 150 175 200	55	49 74 99 124 149	M10 Bolt Holes

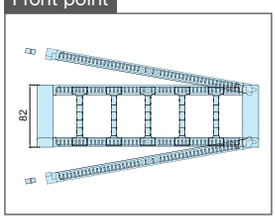
(Dimensions in mm)

System tie wrap (STW)

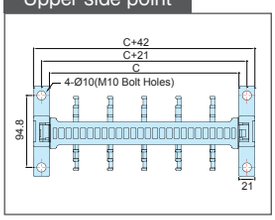


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

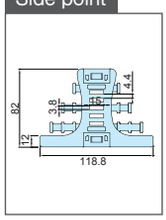
Front point



Upper side point



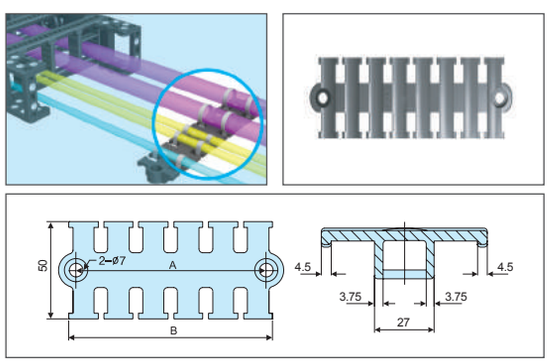
Side point



Chain Type	Ordering No.	C Frame	Hole Type
ST 095ES	S-TW.EB060.100 S-TW.EB060.125 S-TW.EB060.150 S-TW.EB060.175 S-TW.EB060.200	100 125 150 175 200	M10 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)

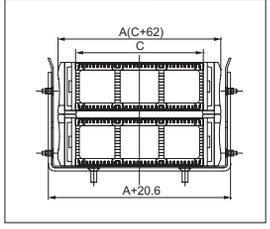


Chain Type	Ordering No.	A	B
ST 095ES	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

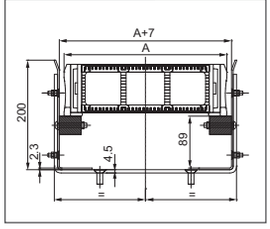
(Dimensions in mm)

Guide channel

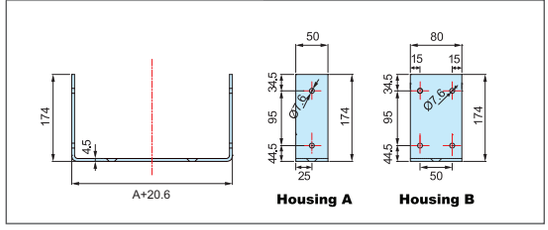
A - Zone



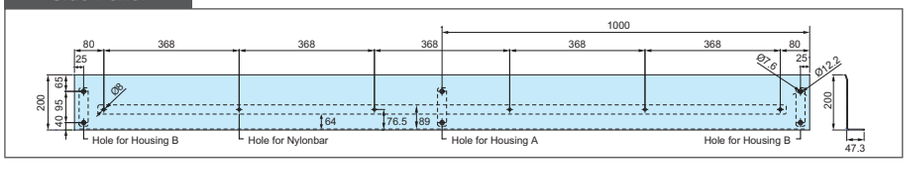
C - Zone



Housing (U-Shape)

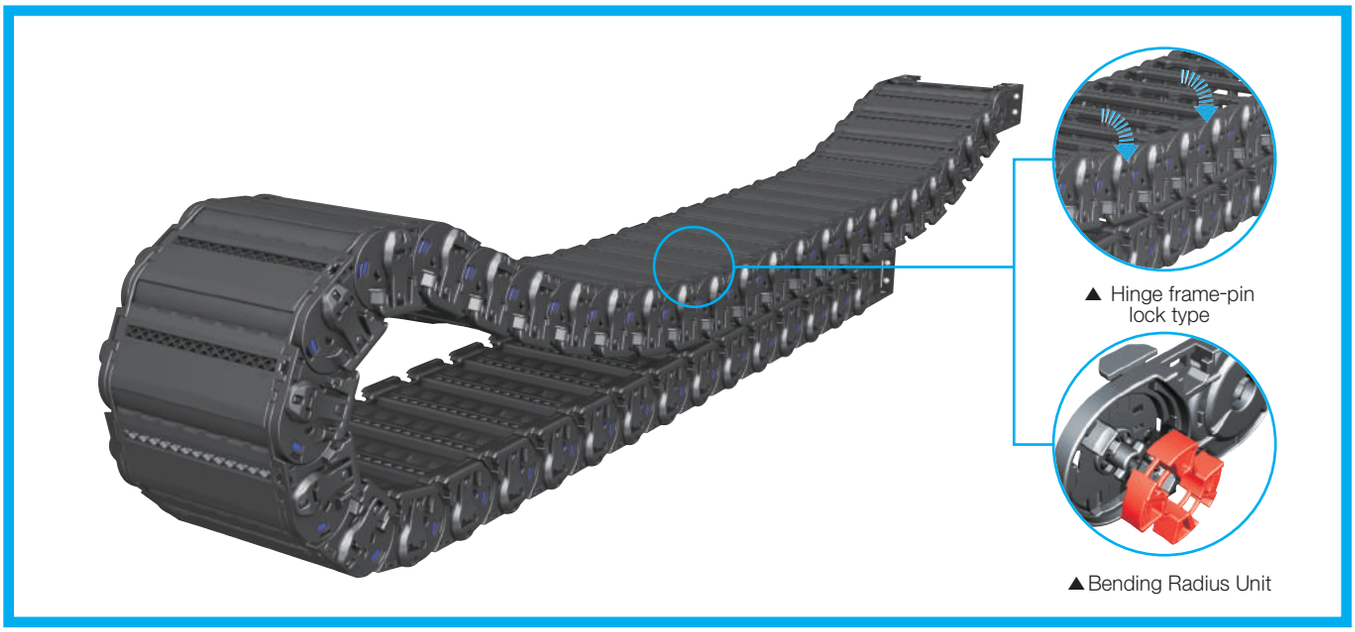


Side Panel



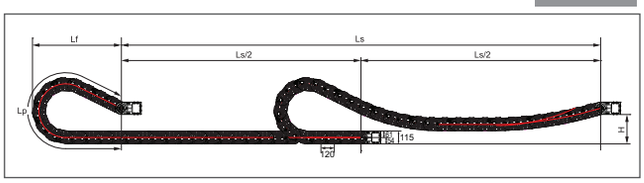
(Dimensions in mm)

ST 120ES



Layout of the chain

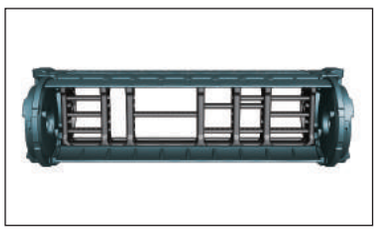
Ls: Stroke

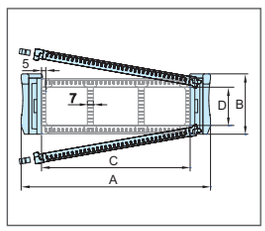


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
200	1,559	694	260
250	1,864	794	
300	2,178	894	
350	2,701	1,114	
400	3,225	1,334	
500	4,062	1,654	

(Dimensions in mm)

Chain cross section

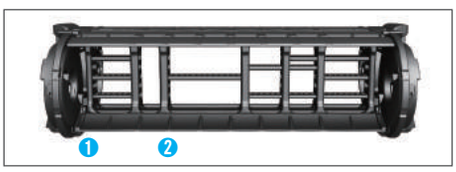


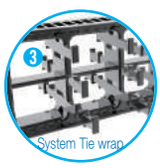


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 120ES	218	115	150	76	6.28
	268		200		6.92
	318		250		7.56
	368		300		8.20

(Dimensions in mm)

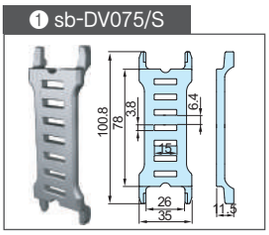
Dividers(DV)



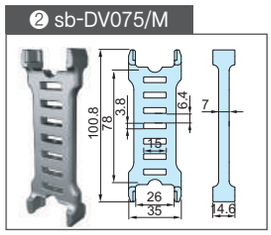


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

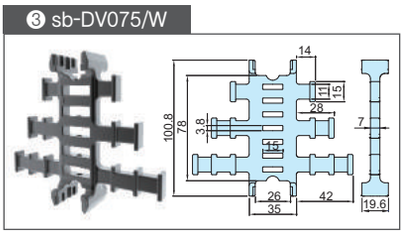
❶ sb-DV075/S



❷ sb-DV075/M

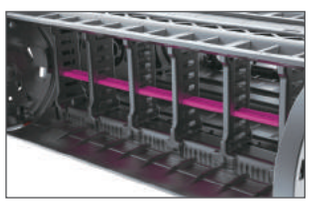


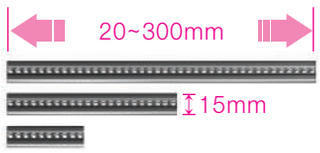
❸ sb-DV075/W



(Dimensions in mm)

Separators(SP)



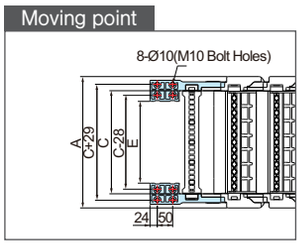


Chain Type	Ordering NO.
ST 120ES	sb-SP/400.400

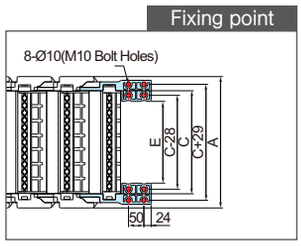
(Dimensions in mm)

Free end bracket

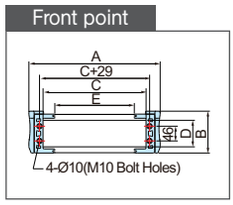
Moving point



Fixing point



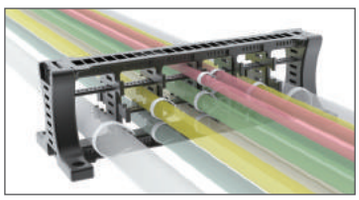
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 120ES	218 268 318 368	115	150 200 250 300	76	90 140 190 240	M10 Bolt Holes

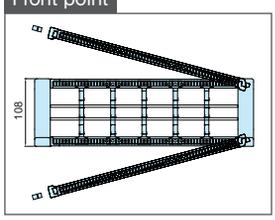
(Dimensions in mm)

System tie wrap (STW)

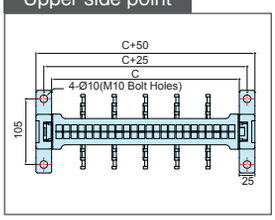


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

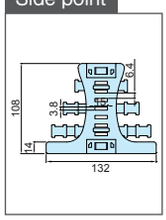
Front point



Upper side point



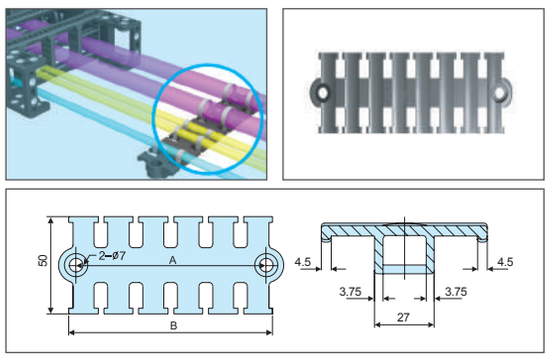
Side point



Chain Type	Ordering No.	C Frame	Hole Type
ST 120ES	S-TW.EB075.150 S-TW.EB075.200 S-TW.EB075.250 S-TW.EB075.300	150 200 250 300	M10 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)

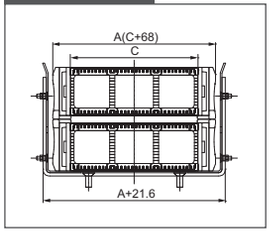


Chain Type	Ordering No.	A	B
ST 120ES	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

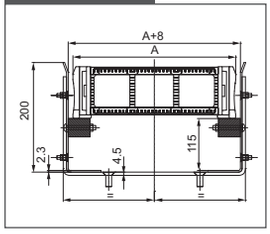
(Dimensions in mm)

Guide channel

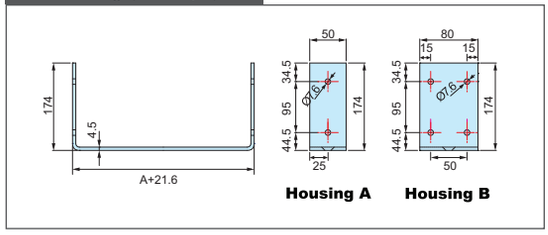
A - Zone



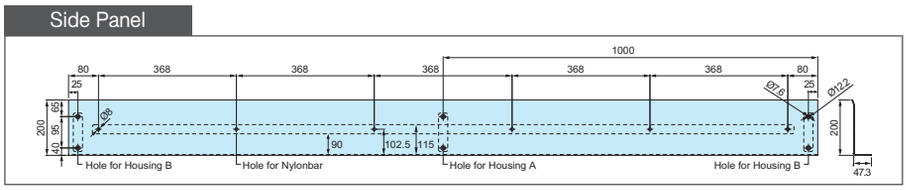
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Shift Chain - Roller skid type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	3m/s
Acceleration	10m/s²
Temperature	-30℃ ~+130℃
Certificate	CE, ATEX(Ex)

Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

Shift Chain S Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Clearance A	B	C	D	Frame style	Divider possible with frame
ST 044RS	44	70, 90, 120, 150	1.09 1.15 1.17 1.24 1.33 1.47 1.59 1.88 2.05	3	-30 ~ +130	73 88 93 113 138 163 188 213 238	40.5	35 50 55 75 100 125 150 175 200	26		
ST 072RS	72	100, 120, 145, 200, 250, 300	2.59 2.67 2.77 2.91 3.02 3.05 3.12 3.17 3.42 3.59 3.91 3.99 4.34	3	-30 ~ +130	104 129 154 179 194 204 219 229 244 254 294 304 354	69	50 75 100 125 140 150 165 175 190 200 240 250 300	45		
ST 095RS	95	135, 150, 200, 230, 280, 400	3.48 3.55 3.73 3.84 3.96 4.07 4.14 4.36 4.41 4.67 5.03 5.43	3	-30 ~ +130	143 168 193 218 243 258 268 308 318 368 418 468	90	75 100 125 150 175 190 200 240 250 300 350 400	56		
ST 120RS	120	180, 200, 250, 300, 350, 400, 500	4.75 4.87 4.96 5.02 5.10 5.28 5.52 5.76 5.82 6.16 6.25 6.67 6.96 7.42 7.65 8.49 8.66	3	-30 ~ +130	143 168 183 193 218 243 268 308 318 358 368 418 468 518 568 618 668	117	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78	 	
ST 150RS	150	305, 405, 505, 605	7.87 7.98 8.06 8.11 8.18 8.34 8.55 8.76 8.81 9.11 9.18 9.55 9.98 10.21 10.41 11.14 11.29	3	-30 ~ +130	162 187 202 212 237 262 287 327 337 377 387 437 487 537 587 637 687	145	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	110	 	

(Dimensions in mm)

Ordering

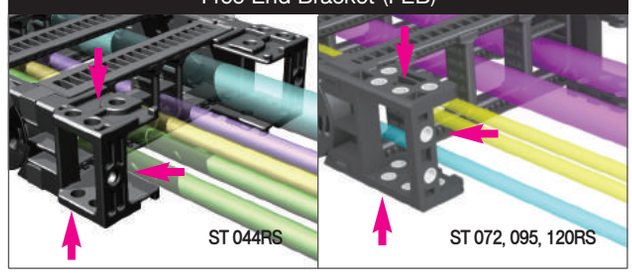
ST 044RS. 100. R120 / F - 1500L : 10ST

- Shift Chain
- Roller skid type (RS)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
  - B1, B2 and B3 : ST150RS
- Length(mm)
- Q'ty(set)

Bracket type

- ST044, ST072, ST095, ST120

Free End Bracket (FEB)



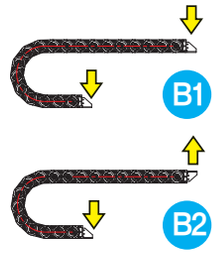
▶ BR should not be inserted in the joint of last side band and Free End Bracket.

- ST150

Steel End Bracket (SEB)

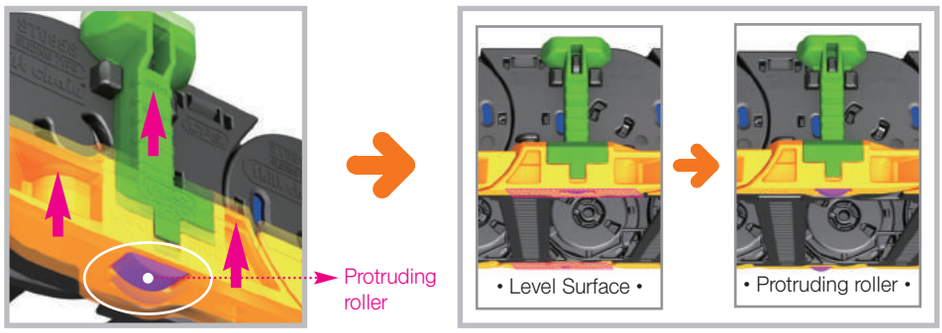
▶ In case of applying 'RS Type', BR should not be inserted into the side band which is in combination with SEB.

For ST150RS, its end parts of cable chain being fixed are used with steel bracket, and it is possible to be installed B1, B2 types of brackets.

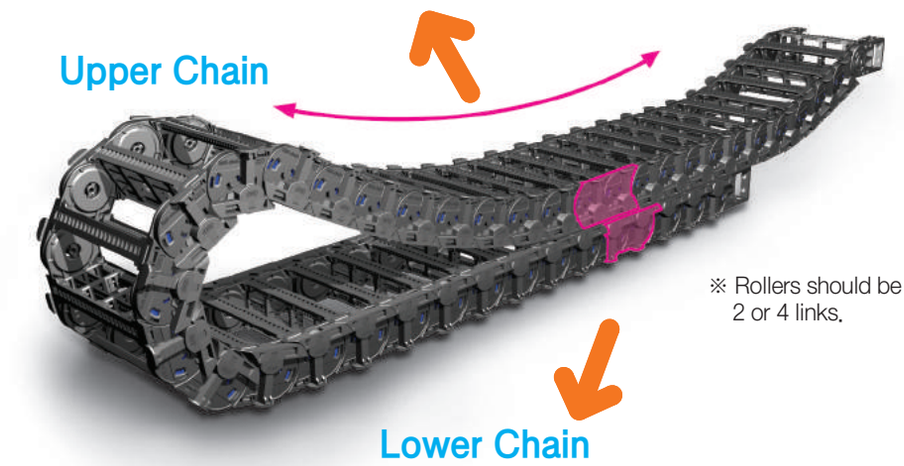


≫ Characteristics of Shift Roller Skid Type

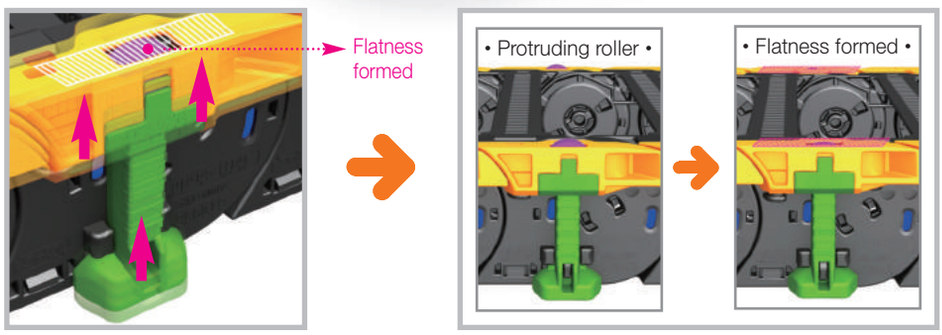
- Roller Skid Performance Property



Principle of skid motion :
The protruding Roller is performed as a wheel when Roller mounted skid is touched on lower chain. This principle makes it possible to move fast in long-distance travel without friction.



※ Rollers should be applied every 2 or 4 links.



The support lifts Skid(Roller-Skid, Skid) and makes the surface flat, when the cable chain which includes cables is contacted on the surface of bottom of guide channel.

≫ Application of Shift Chain

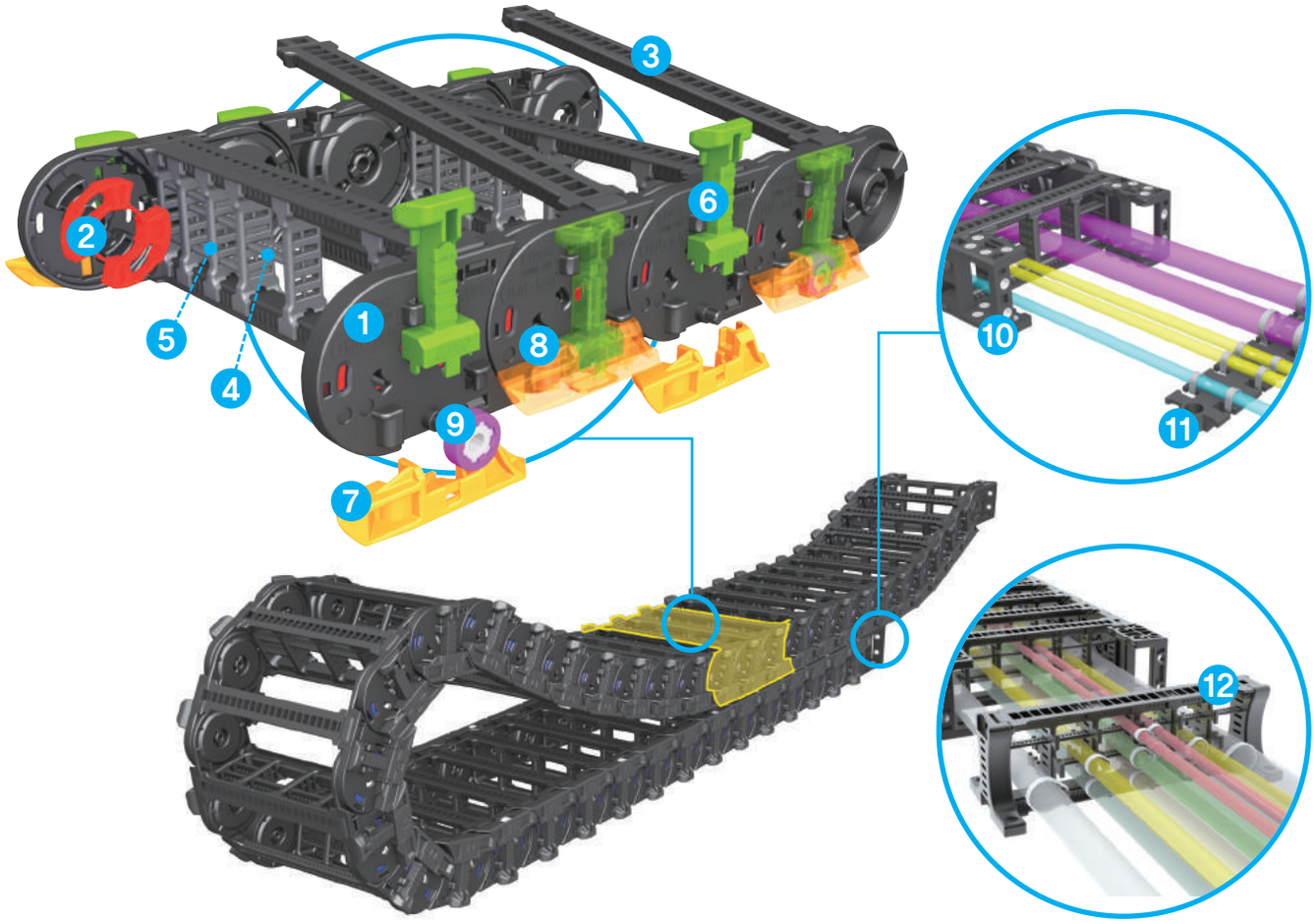
- Shift Chain Roller Skid type can be applied to all kinds of machine tools and factory lines.

▶ **ST 120RS**
Application:
Thermoeletric power plant
Location:
Korea
Remark:
Stroke : 198meters

▶ **ST 072RS**
Application:
Transmission Line
Location:
Korea
Remark:
Stroke : 24meters

Shift Chain - Roller skid type

>> Part of Shift Chain Roller skid type



❶ Side Band (SB)
A unit that connects each side band and between them BR is inserted to strengthen clamping force.

❷ Bending Radius Unit (BR)
A unit that inserted between each side band.
There are 6 supporting points to create durability.

❸ Frame (Hinged Type) (FR)
Hinged-type frame, open one side, supports connection of both side of side band and have tongue and groove system plate to secure the position of the divider on the frame.

❹ Separator (SP)
A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❺ Divider (DV-S, M, R, T)
A unit that divides inserted cables horizontally.

❻ Support
A unit that supports skid & roller skid which makes skid& roller skid move up and down.

❼❽ Skid, Roller Skid
Skid : A unit that minimizes friction between upper and lower cable chain.
Roller Skid : A unit that minimizes friction between upper and lower chain. while roller is combined type..

❾ Roller
A unit that minimizes friction between upper and lower cable chain.
It contains bearing in the core.

❿ Free End Bracket (FEB)
A unit that connects at last side band (left&right).
It can be fixed stronger using steel washers.

⓫ Tie Wrap (TW)
A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.

⓬ System Tie Wrap (STW)
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisted and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

Assembly procedure of Shift Chain Roller skid type

Assembly procedure of Shift chain RS-type is as follows. The assembling process of shift Chain RS-type is like below and users must use rubber hammer with careful combination of Divider and Separator. (Disassembly process for repair and replacement is in reverse order)

1

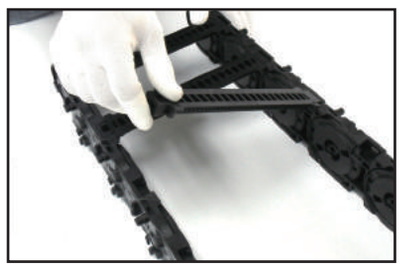
Insert BR Unit into each Side Band.
(Side Band is divided into right and left side according to the direction.)

2

Continue to insert BR Unit into Side Band as you want to make it. Assemble Side Band which is inserted BR Unit as above.

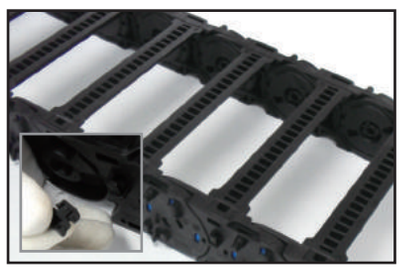
3

Continue to connect each Side Band as long as you want to make it.
Connect the Side Band as many as you need.



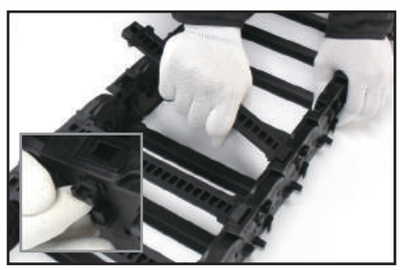
4

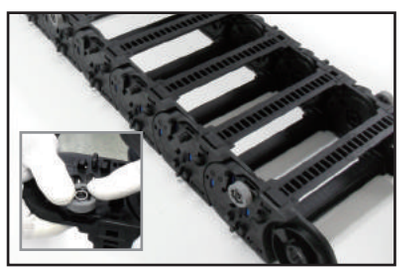
Connect right and left link with specified frame.
(Put Hinge Type frame in the hole of Side Band)



5

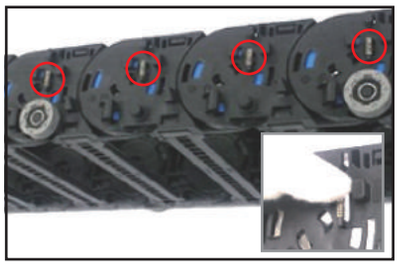
Insert Frame Pin onto connected each Frame and side of Side Band to be made tightly.(to devide inner room, insert divider which is connected with separator.
Assemble opposite frame as same procedure.





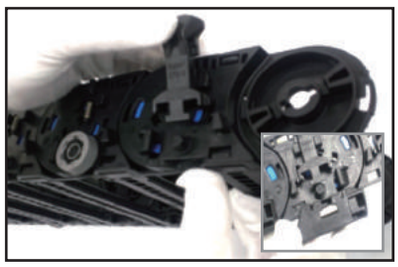
6

Install a Roller in the protruding side of Side Band to be placed one roller per 4 link.



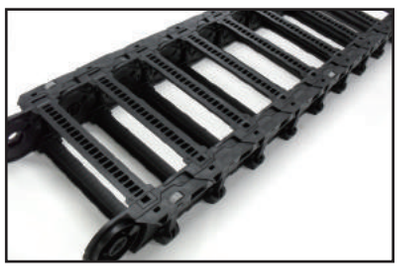
7

When inserting a support, push tightly into groove of Side Band until you hear "click".
(Support is only one direction without right and left side)



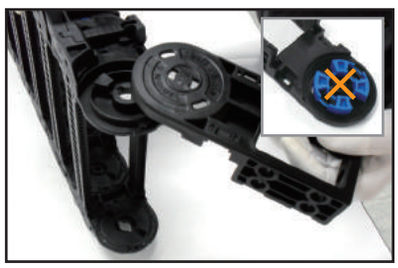
8

Insert normal type Skid into the side of Side Band which is not assembled a roller.
Assemble roller type Skid and normal type Skid for the each side of Side Band.



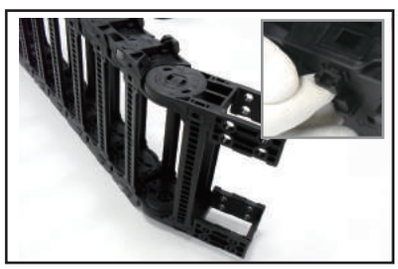
9

Assemble skid and support into opposite side of Side Band as same way.
(Check whether assembled skid is working well by pushing your hand)



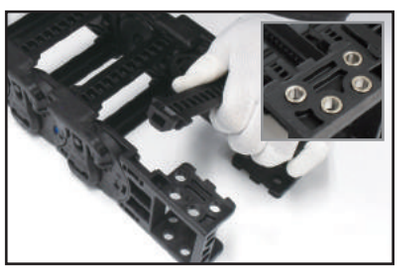
10

Do not insert a BR Unit for M.FEB. (M.FEB will be making a turn to up and down) Assembly M.FEB for being correct direction like right and left.



11

Assembly specified frame in M.FEB. (Hinge is inserted into RH direction of FEB)
Insert Frame pin into connected Frame and side of FEB.



12

Assembly F.FEB for being correct direction like right and left.(Do not insert a BR for the side band which is connected with F.FEB)
Insert reinforcement washers into FEB according to fixing direction.

13

Completion.

Shift Chain - Roller skid type

≫ Part of Shift Chain Roller skid type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
ST044RS	SIDE BAND	ST-SB044S(LH) ST-SB044S(RH)	Left side band of ST044S Right side band of ST044S
	BENDING RADIUS	ST-BRS044.R50,70,90,120,150	Bending radius unit for side band
	SKID	ST-SK044RS(LH-N) ST-SK044RS(LH-N) ST-SK044RS(RH-N) ST-SK044RS(RH-R)	Skid for long travel(Applied to side band)
	SPRING	ST-SPR044	Spring with roller
	SUPPORT	ST-SUP044	Supporter to fix skid unit
	ROLLER	ST-RL044	Roller for long travel(Applied to side band)
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	ST-FEB044N/S	End bracket of ST044S
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side sectionEnd bracket of ST044S
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

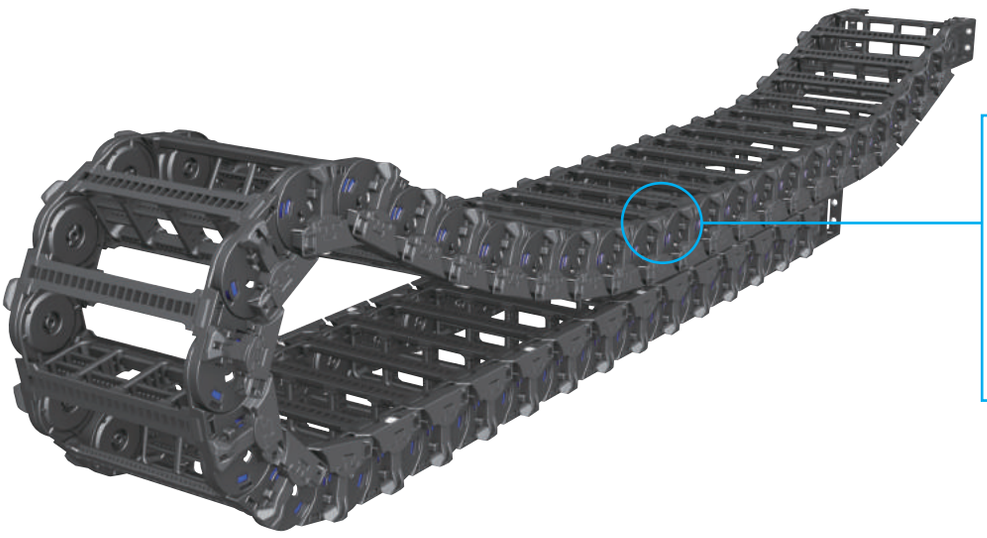
Model	Classification	Part number	Description
ST072RS	SIDE BAND	ST-SB072N/E(LH) ST-SB072N/E(RH)	Left side band of ST072S Right side band of ST072S
	BENDING RADIUS	ST-BRS072.R72,100,120,145,200,250,300	Bending radius unit for side band
	SKID	ST-SK072RS(LH-N) ST-SK072RS(LH-R) ST-SK072RS(RH-N) ST-SK072RS(RH-R)	Skid for long travel(Applied to side band)
	SPRING	ST-SPR072	Spring with roller
	SUPPORT	ST-SUP072	Supporter to fix skid unit
	ROLLER BEARING	ST-RL072/95	Roller for long travel(Applied to side band)
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR045.50 sb-FR045.75 sb-FR045.100 sb-FR045.125 sb-FR045.140 sb-FR045.150 sb-FR045.165 sb-FR045.175 sb-FR045.190 sb-FR045.200 sb-FR045.240 sb-FR045.250 sb-FR045.300	Frame, 50mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 140mm Frame, 150mm Frame, 165mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 300mm
	FREE END BRACKET	ST-FEB044N/S	End bracket of ST044S
	DIVIDER	sb-DV045/M sb-DV045/S sb-DV045/T sb-DV045/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

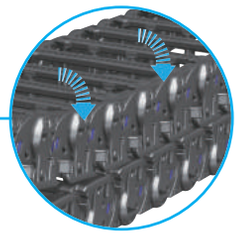
Model	Classification	Part number	Description
ST095RS	SIDE BAND	ST-SB072N/E(LH) ST-SB072N/E(RH)	Left side band of ST095S Right side band of ST095S
	BENDING RADIUS	ST-BRS095,R135,150,200,230,280,400	Bending radius unit for side band
	SKID	ST-SK095RS(LH-N) ST-SK095RS(LH-R) ST-SK095RS(RH-N) ST-SK095RS(RH-R)	Bending radius unit for side band
	SPRING	ST-SPR095	Spring with roller
	SUPPORT	ST-SUP095	Supporter to fix skid unit
	ROLLER BEARING	ST-RL072/095	Roller for long travel(Applied to side band)
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR060.75 sb-FR060.100 sb-FR060.125 sb-FR060.150 sb-FR060.175 sb-FR060.190 sb-FR060.200 sb-FR060.230 sb-FR060.250 sb-FR060.300 sb-FR060.350 sb-FR060.400	Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 230mm Frame, 250mm Frame, 300mm Frame, 350mm Frame, 400mm
	FREE END BRACKET	ST-FEB095N/S sb-FEB/WH060	End bracket of ST095S Steel washer for end bracket
	DIVIDER	sb-DV060/M sb-DV060/S sb-DV060/T sb-DV060/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400,400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW.EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
ST120RS	SIDE BAND	ST-SB120N/E(LH) ST-SB120N/E(RH)	Left side band of ST120S Right side band of ST120S
	BENDING RADIUS	ST-BRS120,R180,200,250,300,350,400,500	Bending radius unit for side band
	SKID	ST-SK120RS(LH-N) ST-SK120RS(LH-R) ST-SK120RS(RH-N) ST-SK120RS(RH-R)	Bending radius unit for side band
	SPRING	ST-SPR120	Spring with roller
	SUPPORT	ST-SUP120	Supporter to fix skid unit
	ROLLER BEARING	ST-RL120	Roller for long travel(Applied to side band)
	FRAME PIN	S-FP/S2	Frame pin
	FRAME	sb-FR075/100.75 sb-FR075/100.100 sb-FR075/100.115 sb-FR075/100.125 sb-FR075/100.150 sb-FR075/100.175 sb-FR075/100.200 sb-FR075/100.240 sb-FR075/100.250 sb-FR075/100.290 sb-FR075/100.300 sb-FR075/100.350 sb-FR075/100.400 sb-FR075/100.450 sb-FR075/100.500 sb-FR075/100.550 sb-FR075/100.600	Frame, 75mm Frame, 100mm Frame, 115mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 290mm Frame, 300mm Frame, 350mm Frame, 400mm Frame, 450mm Frame, 500mm Frame, 550mm Frame, 600mm
	FREE END BRACKET	ST-FEB120N/S sb-FEB/WH075	End bracket of ST120N Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S sb-DV075/T sb-DV075/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400,400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW.EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

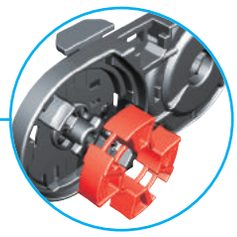
Model	Classification	Part number	Description
ST150RS	SIDE BAND	ST-SB150N/E(LH) ST-SB150N/E(RH)	Left side band of ST150S Right side band of ST150S
	BENDING RADIUS	ST-BRS150,R205,305,405,505,605	Bending radius unit for side band
	SKID	ST-SK150RS(LH-N) ST-SK150RS(LH-R) ST-SK150RS(RH-N) ST-SK150RS(RH-R)	Bending radius unit for side band
	SPRING	ST-SUP150RS	Spring with roller
	SUPPORT	ST-SUP150	Supporter to fix skid unit
	ROLLER BEARING	ST-RL150	Roller for long travel(Applied to side band)
	FRAME PIN	S-FP/S2	Frame pin
	FRAME	sb-FR075/100.75 sb-FR075/100.100 sb-FR075/100.115 sb-FR075/100.125 sb-FR075/100.150 sb-FR075/100.175 sb-FR075/100.200 sb-FR075/100.240 sb-FR075/100.250 sb-FR075/100.290 sb-FR075/100.300 sb-FR075/100.350 sb-FR075/100.400 sb-FR075/100.450 sb-FR075/100.500 sb-FR075/100.550 sb-FR075/100.600	Frame, 75mm Frame, 100mm Frame, 115mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 290mm Frame, 300mm Frame, 350mm Frame, 400mm Frame, 450mm Frame, 500mm Frame, 550mm Frame, 600mm
	STEEL END BRACKET	ST-SEB150N/B1~B2~B3	Steel end bracket of ST150S
	DIVIDER	sb-DV100/M sb-DV100/S sb-DV100/T sb-DV100/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/600,600 SP-PIN100	Separator, 600mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm

ST 044RS





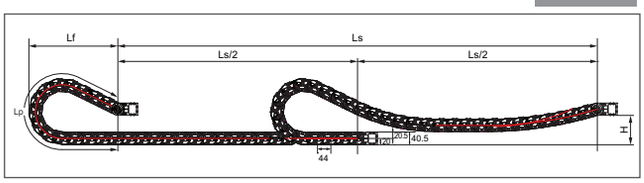
▲ Hinge hook type



▲Bending Radius Unit

Layout of the chain

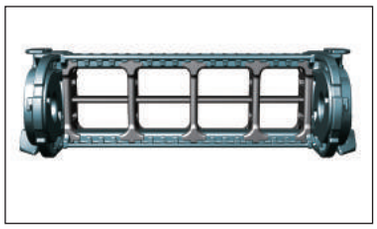
Ls: Stroke

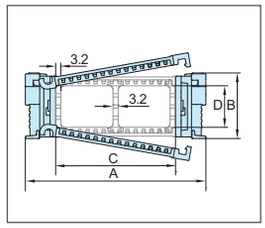


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
70	544	249	110
90	662	289	
120	926	393	
150	1,190	497	

(Dimensions in mm)

Chain cross section

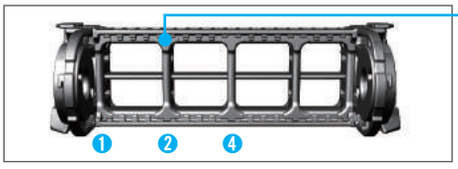


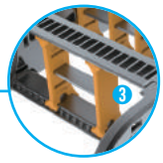


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 044RS	73	40.5	35	26	1.09
	88		50		1.15
	93		55		1.17
	113		75		1.24
	138		100		1.33
	163		125		1.47
	188		150		1.59
	213		175		1.88
	238		200		2.05

(Dimensions in mm)

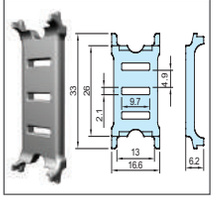
Dividers(DV)



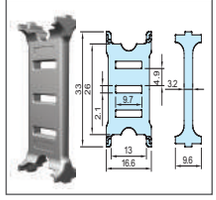


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

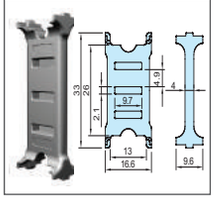
❶ sb-DV028/S



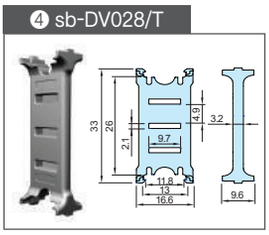
❷ sb-DV028/M1



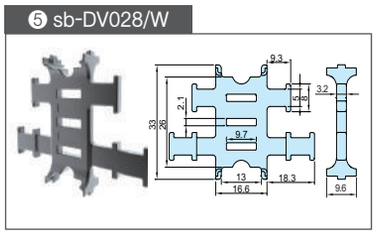
❸ sb-DV028/M2



❹ sb-DV028/T

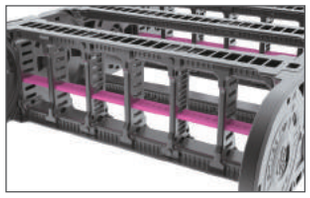


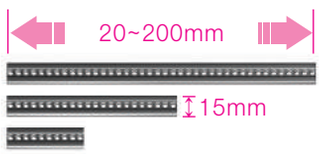
❺ sb-DV028/W



(Dimensions in mm)

Separators(SP)



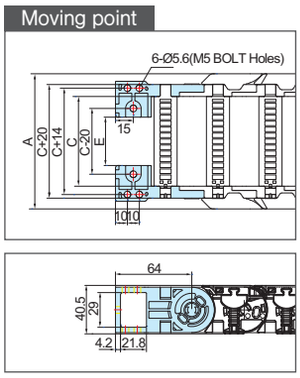


Chain Type	Ordering NO.	Frame
ST 044RS	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

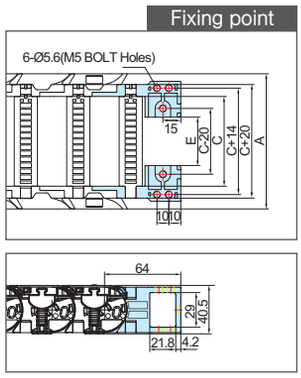
(Dimensions in mm)

Free end bracket

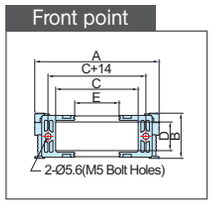
Moving point



Fixing point



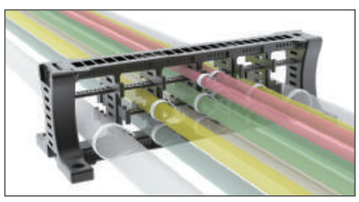
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 044RS	73 88 93 113 138 163 188 213 238	40.5	35 50 55 75 100 125 150 175 200	26	0.4 15.4 20.4 40.4 65.4 90.4 115.4 140.4 165.4	M5 Bolt Holes

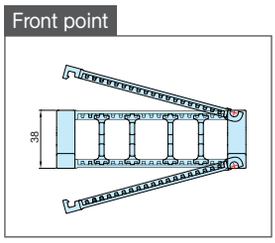
(Dimensions in mm)

System tie wrap (STW)

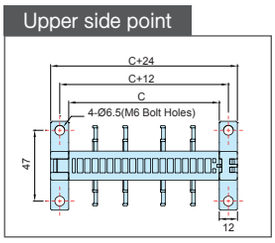


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

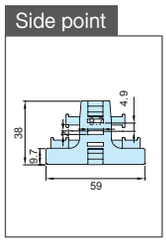
Front point



Upper side point



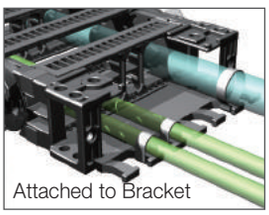
Side point

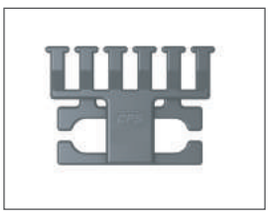


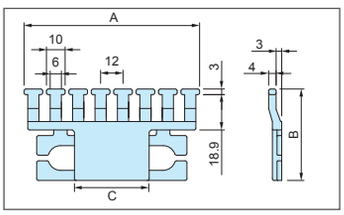
Chain Type	Ordering No.	C Frame	Hole Type
ST 044RS	S-TW.EB028.35 S-TW.EB028.50 S-TW.EB028.55 S-TW.EB028.75 S-TW.EB028.100 S-TW.EB028.125 S-TW.EB028.150 S-TW.EB028.175 S-TW.EB028.200	35 50 55 75 100 125 150 175 200	M6 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





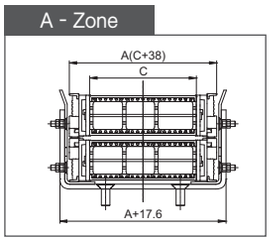


Chain Type	Ordering No.	A	B	
ST 044RS	S-TW036/025CR.35	46	35.4	-
	S-TW036/025CR.50	69	48.9	15
	S-TW036/025CR.55	70	48.9	20
	S-TW036/025CR.75	94	48.9	40
	S-TW036/025CR.100	118	48.9	65
	S-TW036/025CR.125	142	48.9	90

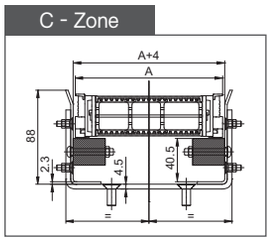
(Dimensions in mm)

Guide channel

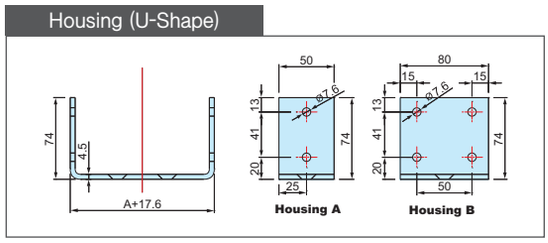
A - Zone



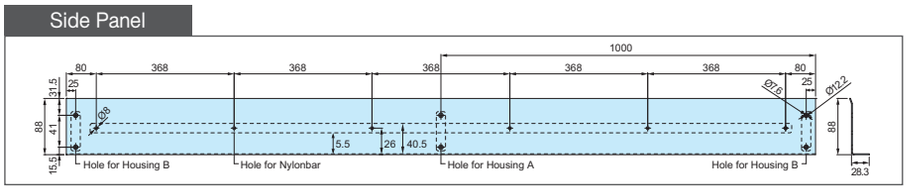
C - Zone



Housing (U-Shape)

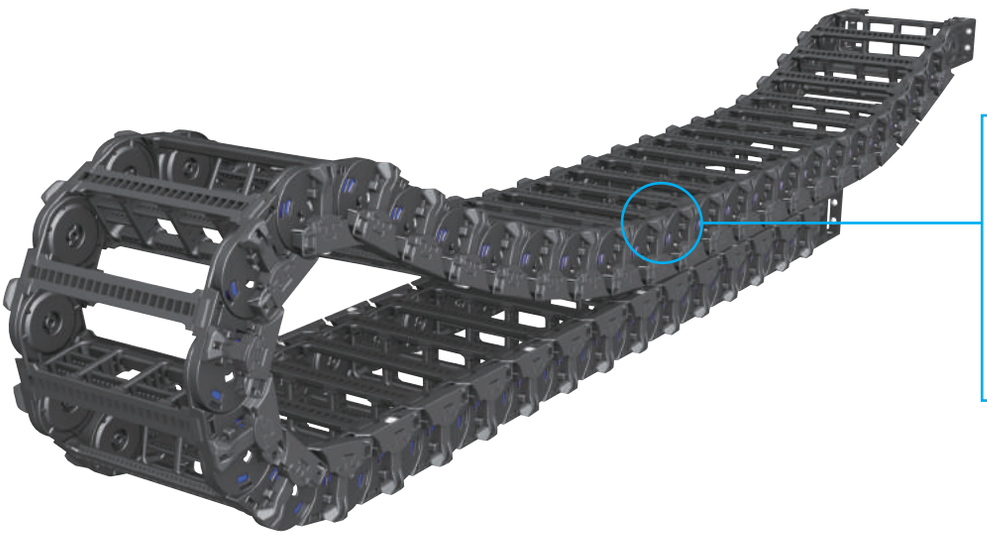


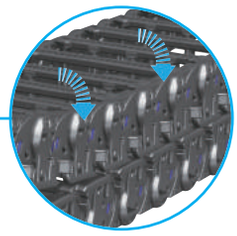
Side Panel



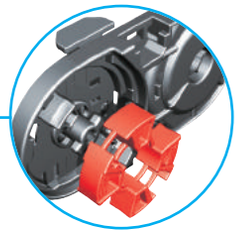
(Dimensions in mm)

ST 072RS





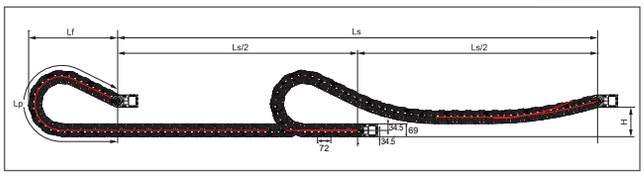
▲ Hinge frame-pin lock type



▲Bending Radius Unit

Layout of the chain

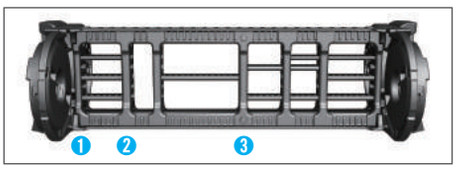
Ls: Stroke



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
100	806	380	180
120	917	420	
145	1,063	470	
200	1,400	580	
250	1,840	752	
300	2,280	924	

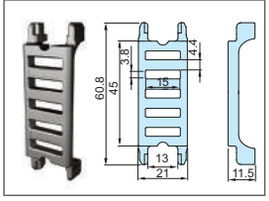
(Dimensions in mm)

Dividers(DV)

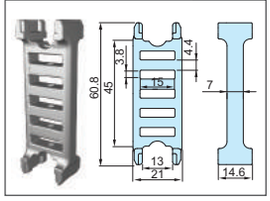


Assemble divider every second frame.
DV.T : Applied to Frame 200~300.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

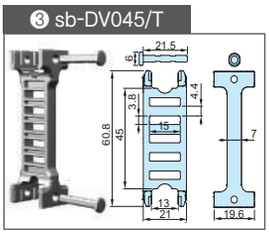
❶ sb-DV045/S



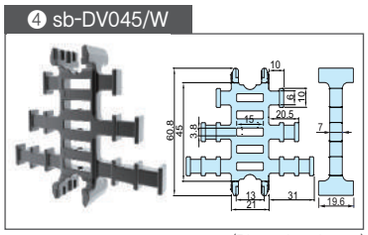
❷ sb-DV045/M



❸ sb-DV045/T

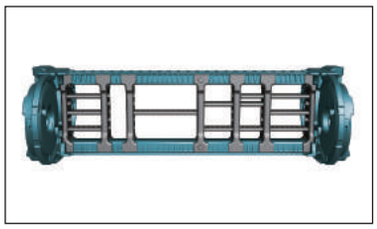


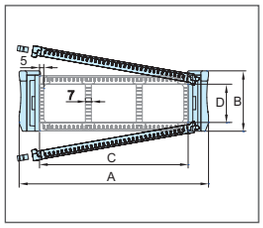
❹ sb-DV045/W



(Dimensions in mm)

Chain cross section

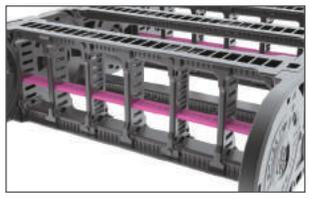


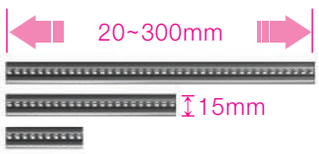


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 072RS	104	69	50	45	2.59
	129		75		2.67
	154		100		2.77
	179		125		2.91
	194		140		3.02
	204		150		3.05
	219		165		3.12
	229		175		3.17
	244		190		3.42
	254		200		3.59
	294		240		3.91
	304		250		3.99
	354		300		4.34

(Dimensions in mm)

Separators(SP)



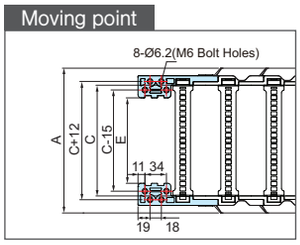


Chain Type	Ordering NO.
ST 072RS	sb-SP/400.400

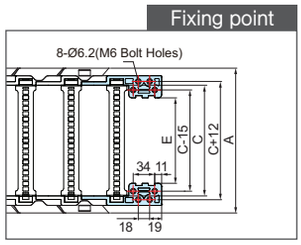
(Dimensions in mm)

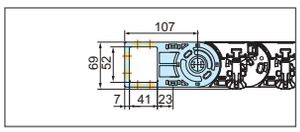
Free end bracket

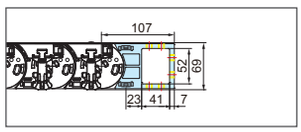
Moving point



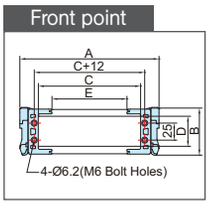
Fixing point







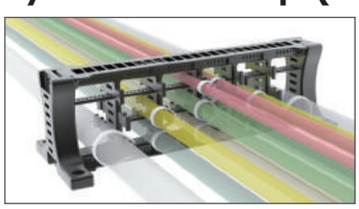
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 072RS	104 129 154 179 194 204 219 229 244 254 294 304 354	69	50 75 100 125 140 150 165 175 190 200 240 250 300	45	10 35 60 85 100 110 125 135 150 160 200 210 260	M6 Bolt Holes

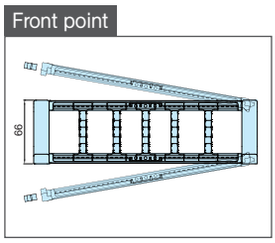
(Dimensions in mm)

System tie wrap (STW)

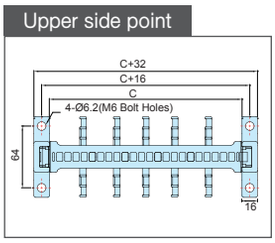


It is a unit to classify each cable for preventing entanglement of cables.
It can either be installed to free end bracket or installed separately according its application environment.

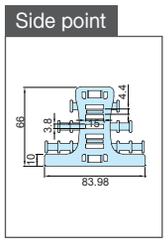
Front point



Upper side point



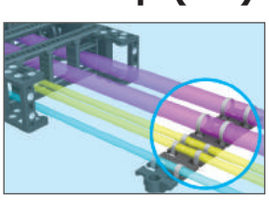
Side point

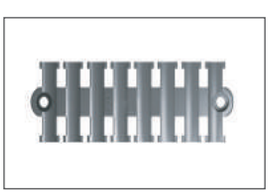


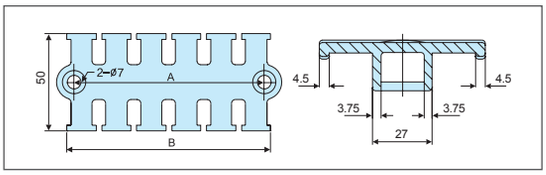
Chain Type	Ordering No.	C Frame	Hole Type
ST 072RS	S-TW.EB045.50 S-TW.EB045.75 S-TW.EB045.100 S-TW.EB045.125 S-TW.EB045.140 S-TW.EB045.150 S-TW.EB045.165 S-TW.EB045.175 S-TW.EB045.190 S-TW.EB045.200 S-TW.EB045.240 S-TW.EB045.250 S-TW.EB045.300	50 75 100 125 140 150 165 175 190 200 240 250 300	M6 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





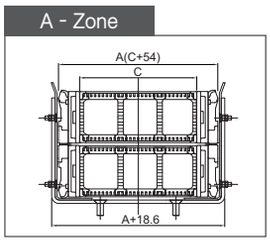


Chain Type	Ordering No.	A	B
ST 072RS	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

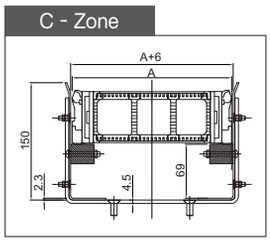
(Dimensions in mm)

Guide channel

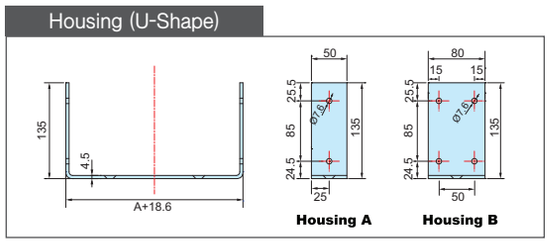
A - Zone



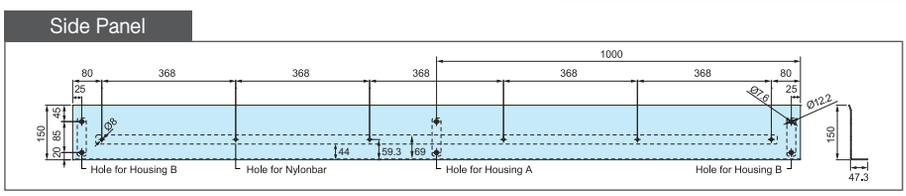
C - Zone



Housing (U-Shape)

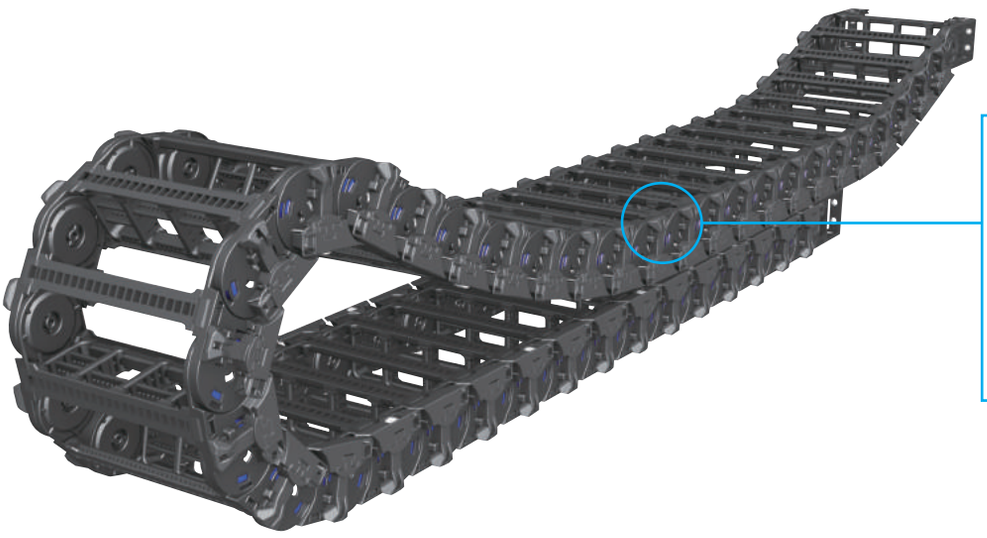


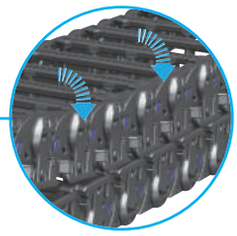
Side Panel



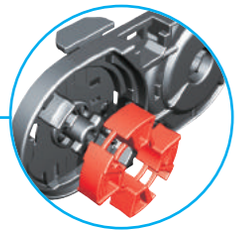
(Dimensions in mm)

ST 095RS





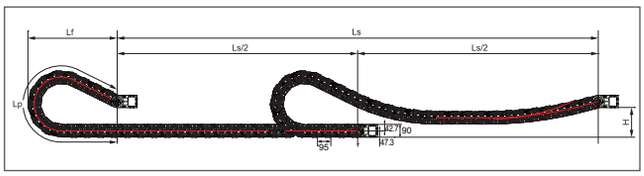
▲ Hinge frame-pin lock type



▲Bending Radius Unit

Layout of the chain

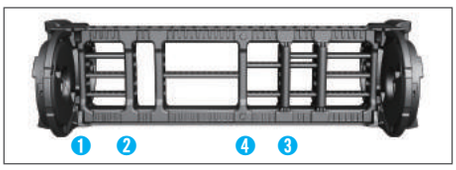
Ls: Stroke



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
135	1,091	504	210
150	1,178	534	
200	1,479	634	
230	1,666	694	
280	2,146	889	
400	3,232	1,319	

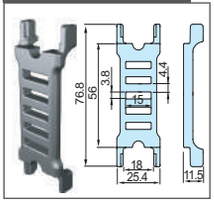
(Dimensions in mm)

Dividers(DV)

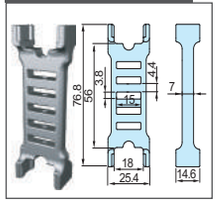


Assemble divider every second frame.
DV.T : Applied to Frame 250~400.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

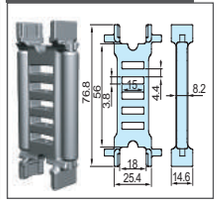
❶ sb-DV060/S



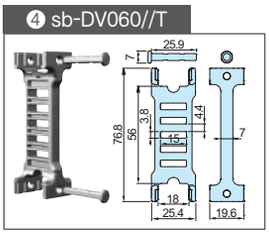
❷ sb-DV060/M



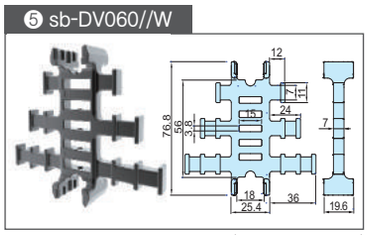
❸ sb-DV060/R



❹ sb-DV060//T

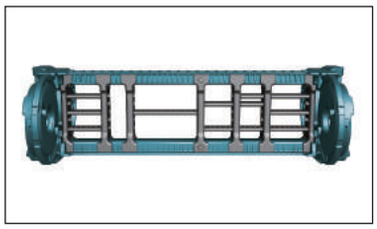


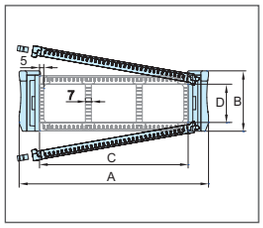
❺ sb-DV060//W



(Dimensions in mm)

Chain cross section

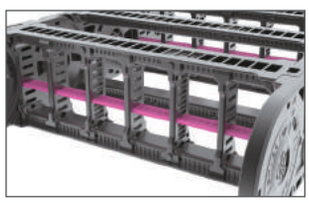


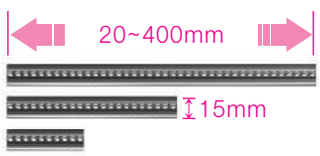


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 095RS	143	90	75	56	3.48
	168		100		3.55
	193		125		3.73
	218		150		3.84
	243		175		3.96
	258		190		4.07
	268		200		4.14
	298		230		4.30
	308		240		4.36
	318		250		4.41
	368		300		4.67
	418		350		5.03
	468		400		5.43

(Dimensions in mm)

Separators(SP)



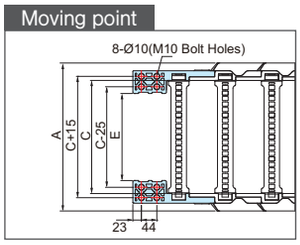


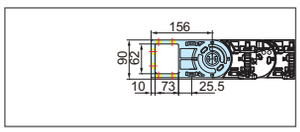
Chain Type	Ordering NO.
ST 095RS	sb-SP/400.400

(Dimensions in mm)

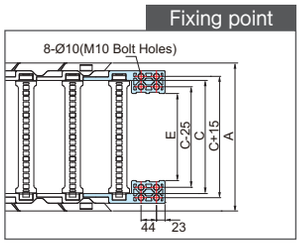
Free end bracket

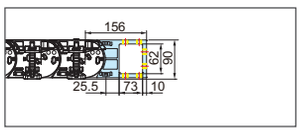
Moving point



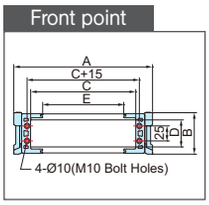


Fixing point





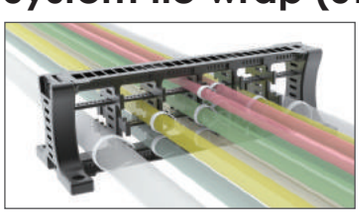
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 095RS	143 168 193 218 243 258 268 298 308 318 368 418 468	90	75 100 125 150 175 190 200 230 240 250 300 350 400	56	24 49 74 99 124 139 149 179 189 199 249 299 349	M10 Bolt Holes

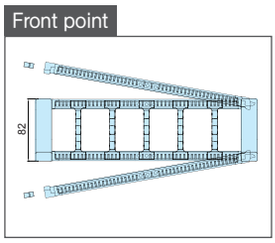
(Dimensions in mm)

System tie wrap (STW)

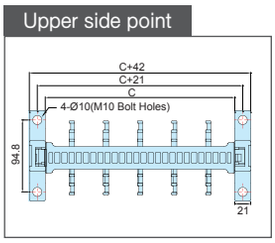


It is a unit to classify each cable for preventing entanglement of cables.
It can either be installed to free end bracket or installed separately according its application environment.

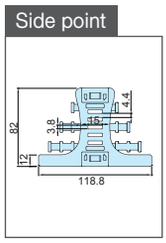
Front point



Upper side point



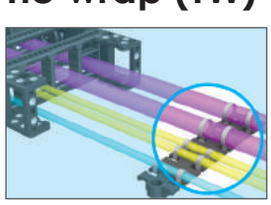
Side point

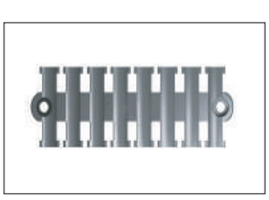


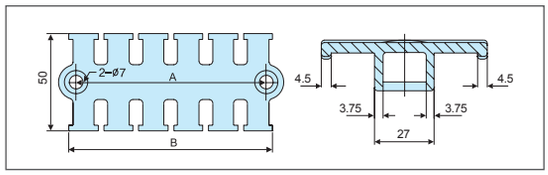
Chain Type	Ordering No.	C Frame	Hole Type
ST 095RS	S-TW.EB060.75 S-TW.EB060.100 S-TW.EB060.125 S-TW.EB060.150 S-TW.EB060.175 S-TW.EB060.190 S-TW.EB060.200 S-TW.EB060.230 S-TW.EB060.240 S-TW.EB060.250 S-TW.EB060.300 S-TW.EB060.350 S-TW.EB060.400	75 100 125 150 175 190 200 230 240 250 300 350 400	M10 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





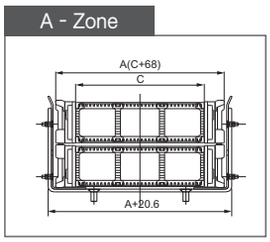


Chain Type	Ordering No.	A	B
ST 095RS	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

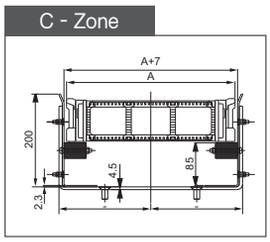
(Dimensions in mm)

Guide channel

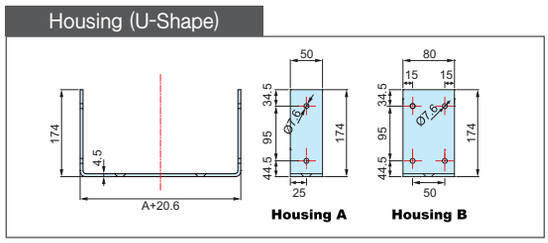
A - Zone



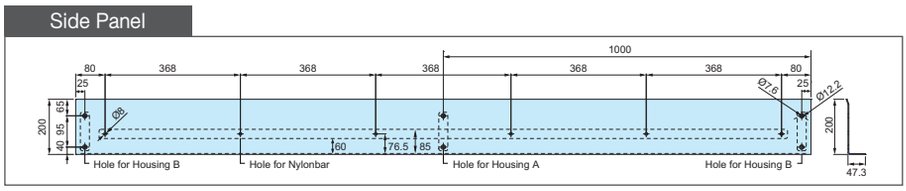
C - Zone



Housing (U-Shape)

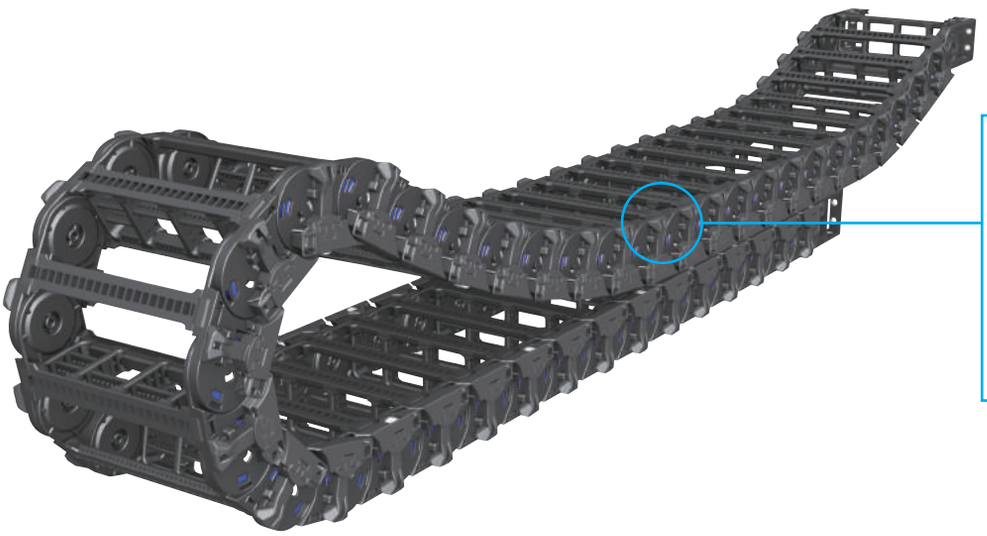


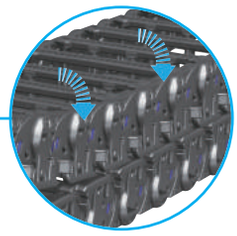
Side Panel



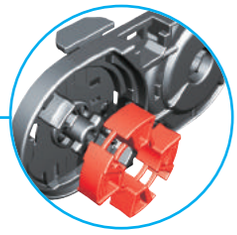
(Dimensions in mm)

ST 120RS





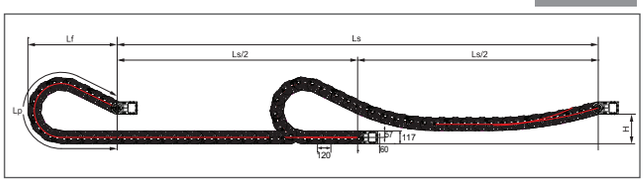
▲ Hinge frame-pin lock type



▲Bending Radius Unit

Layout of the chain

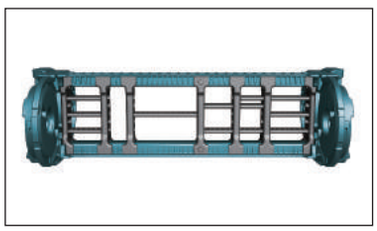
Ls: Stroke

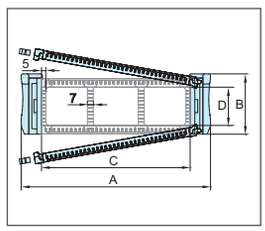


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
180	1,441	654	
200	1,559	694	
250	1,864	794	
300	2,178	894	260
350	2,701	1,114	
400	3,225	1,334	
500	4,062	1,654	

(Dimensions in mm)

Chain cross section

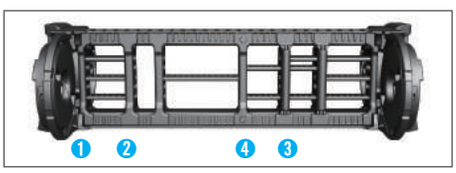




Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 120RS	143	117	75	78	4.75
	168		100		4.87
	183		115		4.96
	193		125		5.02
	218		150		5.10
	243		175		5.28
	268		200		5.52
	308		240		5.76
	318		250		5.82
	358		290		6.16
	368		300		6.25
	418		350		6.67
	468		400		6.96
	518		450		7.42
	568		500		7.65
	618		550		8.49
	668		600		8.66

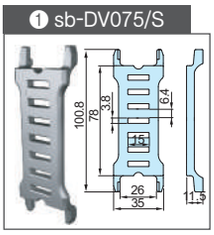
(Dimensions in mm)

Dividers(DV)

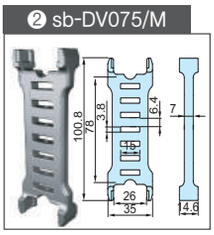


Assemble divider every second frame.
DV.T : Applied to Frame 300~600.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

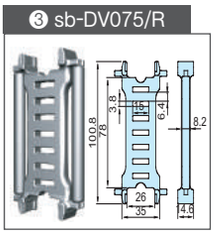
❶ sb-DV075/S



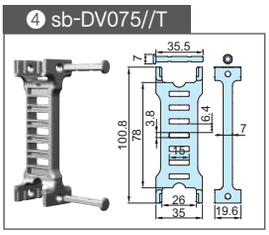
❷ sb-DV075/M



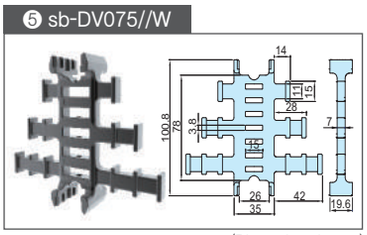
❸ sb-DV075/R



❹ sb-DV075//T

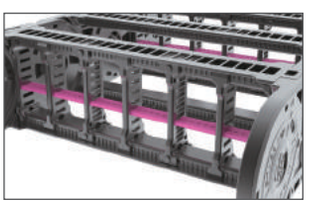


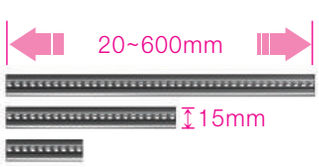
❺ sb-DV075//W



(Dimensions in mm)

Separators(SP)



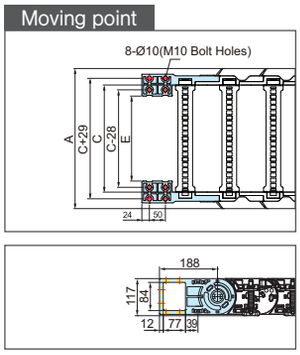


Chain Type	Ordering NO.
ST 120RS	sb-SP/600.600

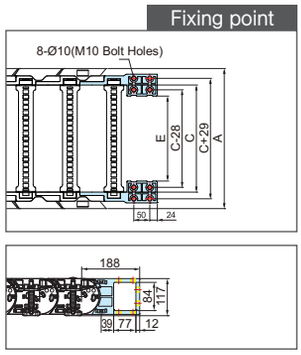
(Dimensions in mm)

Free end bracket

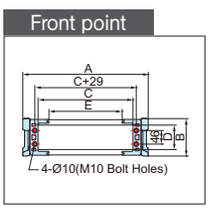
Moving point



Fixing point



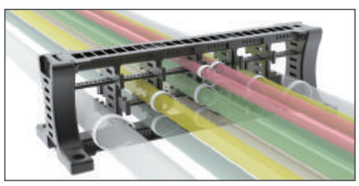
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 120RS	143 168 183 193 218 243 268 308 318 358 368 418 468 518 568 618 668	117	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78	15 40 55 65 90 115 140 180 190 230 240 290 340 390 440 490 540	M10 Bolt Holes

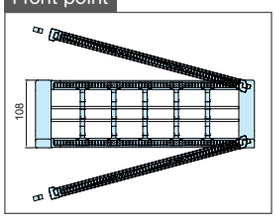
(Dimensions in mm)

System tie wrap (STW)

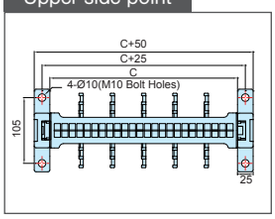


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

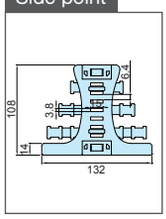
Front point



Upper side point



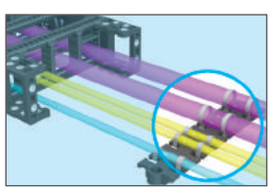
Side point

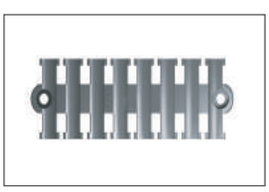


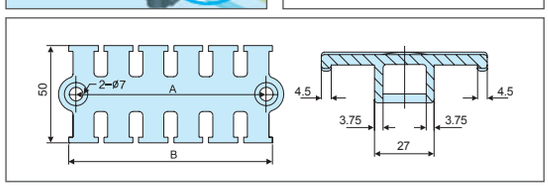
Chain Type	Ordering No.	C Frame	Hole Type
ST 120RS	S-TW.EB075.75 S-TW.EB075.100 S-TW.EB075.115 S-TW.EB075.125 S-TW.EB075.150 S-TW.EB075.175 S-TW.EB075.200 S-TW.EB075.240 S-TW.EB075.250 S-TW.EB075.290 S-TW.EB075.300 S-TW.EB075.350 S-TW.EB075.400 S-TW.EB075.450 S-TW.EB075.500 S-TW.EB075.550 S-TW.EB075.600	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	M10 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





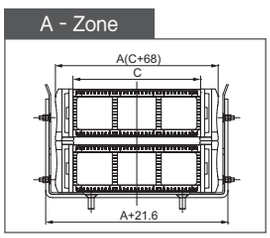


Chain Type	Ordering No.	A	B
ST 120RS	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

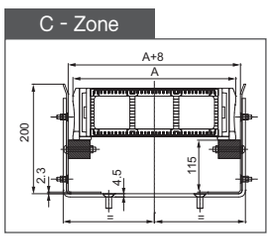
(Dimensions in mm)

Guide channel

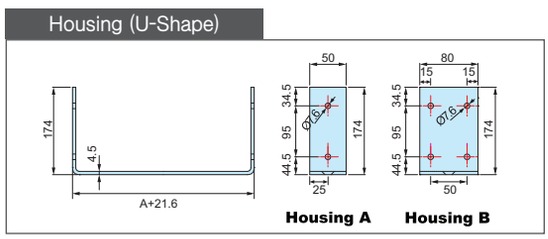
A - Zone



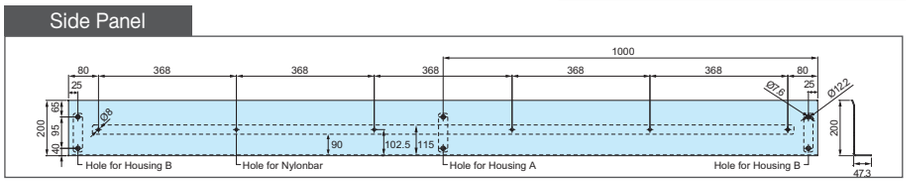
C - Zone



Housing (U-Shape)

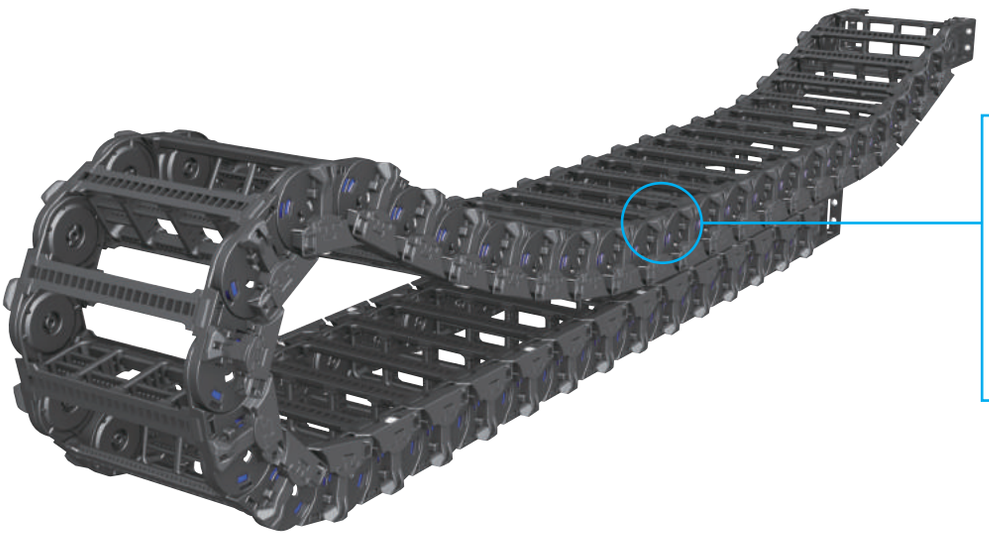


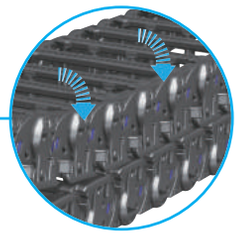
Side Panel



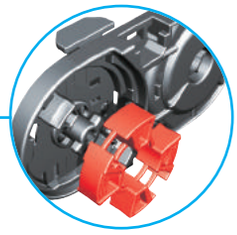
(Dimensions in mm)

ST 150RS





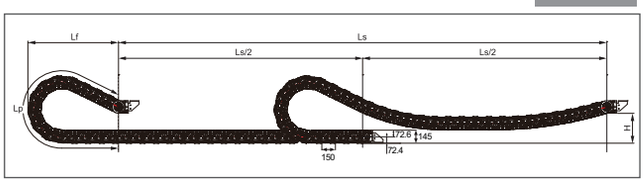
▲ Hinge frame-pin lock type



▲Bending Radius Unit

Layout of the chain

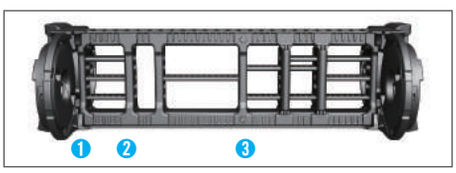
Ls: Stroke



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
305	2,272	985	400
405	3,161	1,335	
505	4,050	1,685	
605	4,940	2,035	

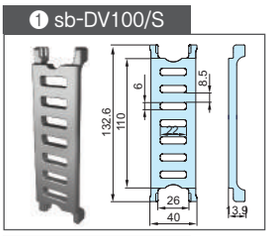
(Dimensions in mm)

Dividers(DV)

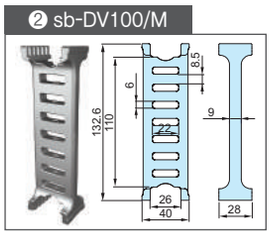


Assemble divider every second frame.
DV.M : Normal Divider.
DV.T : Applied to Frame 300~600.

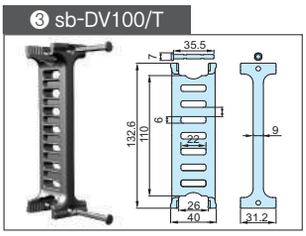
❶ sb-DV100/S



❷ sb-DV100/M

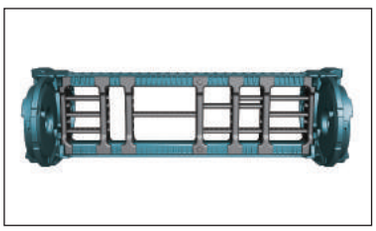


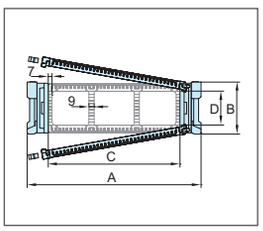
❸ sb-DV100/T



(Dimensions in mm)

Chain cross section

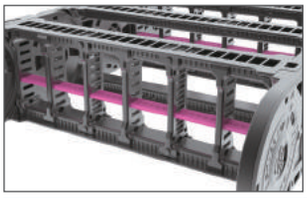


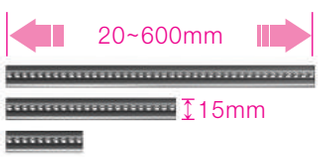


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 150RS	162	145	75	110	7.87
	187		100		7.98
	202		115		8.06
	212		125		8.11
	237		150		8.18
	262		175		8.34
	287		200		8.55
	327		240		8.76
	337		250		8.81
	377		290		9.11
	387		300		9.18
	437		350		9.55
	487		400		9.98
	537		450		10.21
	587		500		10.41
	637		550		11.14
	687		600		11.29

(Dimensions in mm)

Separators(SP)



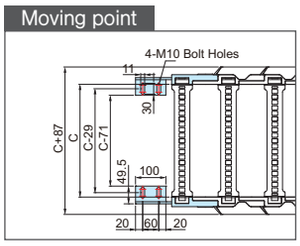


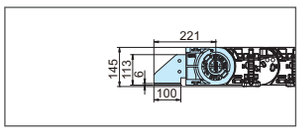
Chain Type	Ordering NO.
ST 150RS	sb-SP/600.600

(Dimensions in mm)

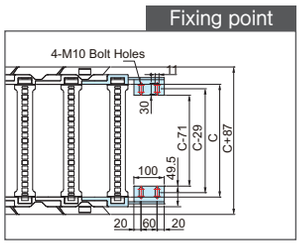
Free end bracket

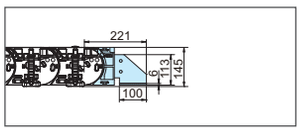
Moving point





Fixing point

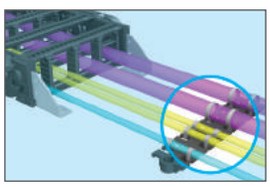


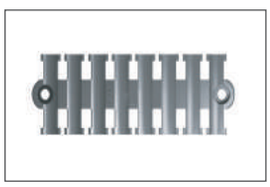


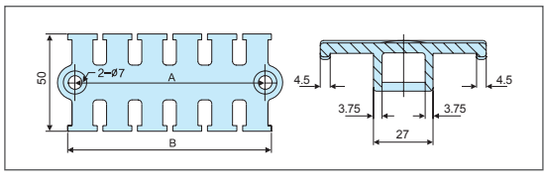
Chain Type	B Height(Outer)	C Frame	D Height(Inner)	Hole Type
ST 150RS	145	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	110	M10 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





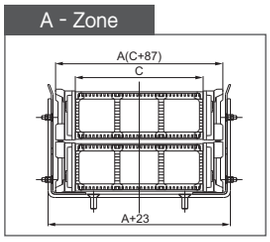


Chain Type	Ordering No.	A	B
ST 150RS	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

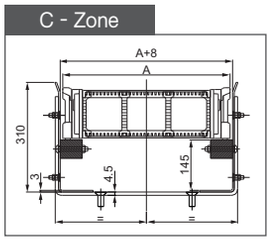
(Dimensions in mm)

Guide channel

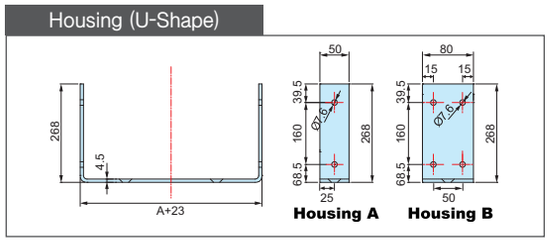
A - Zone



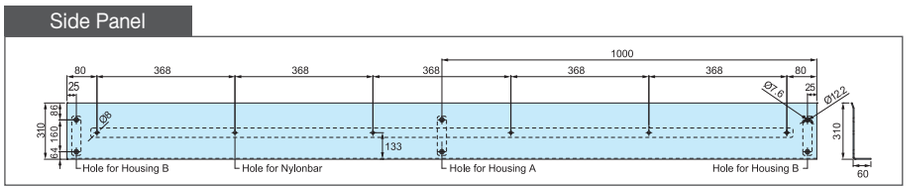
C - Zone



Housing (U-Shape)

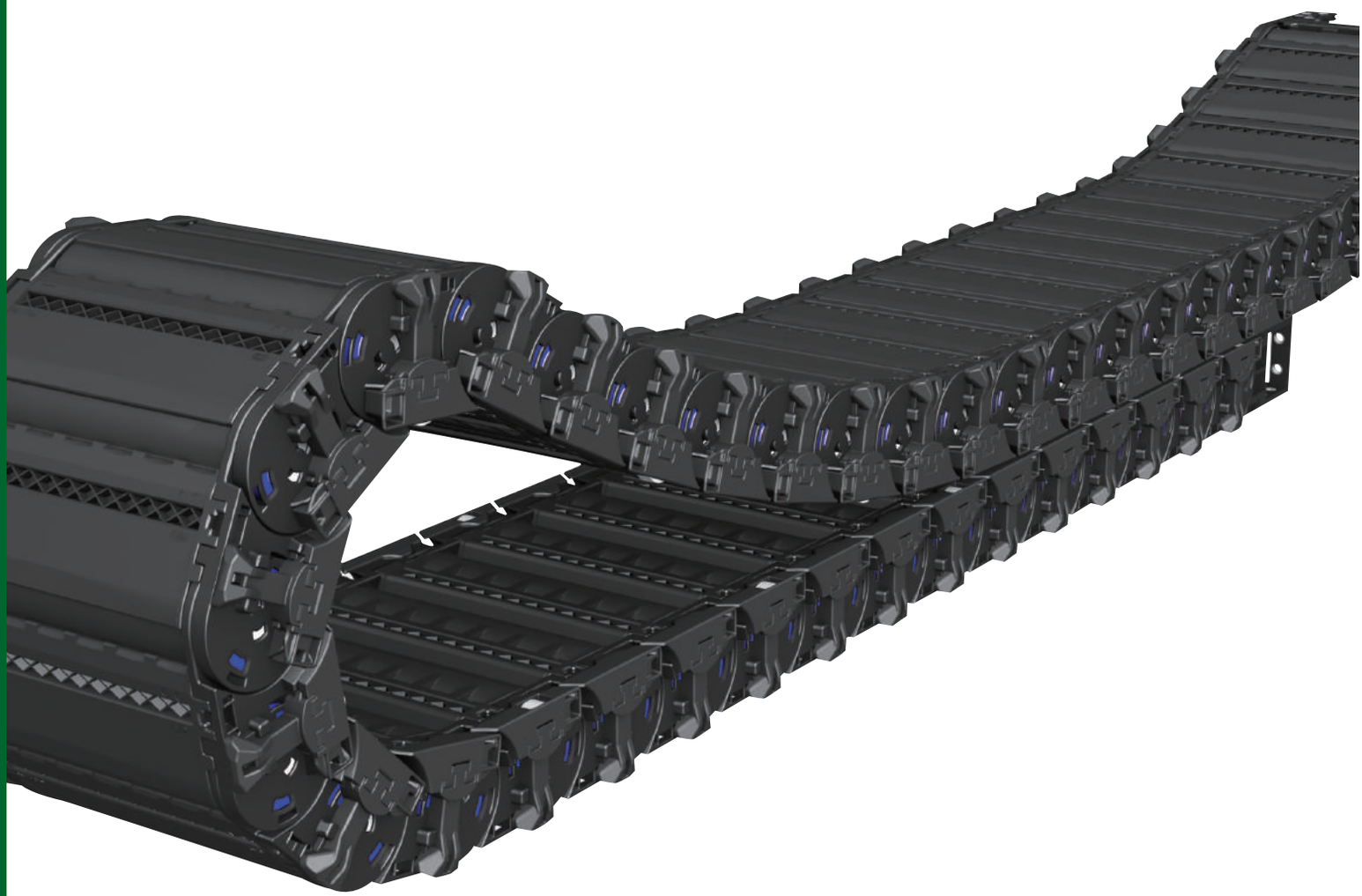


Side Panel



(Dimensions in mm)

Shift Chain - Enclosed roller skid type



General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	3㎧
Acceleration	10㎧
Temperature	-30℃ ~+130℃
Certificate	CE, ATEX(Ex)

Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

Shift Chain ERS Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Clearance A	Clearance B	Clearance C	Clearance D	Frame style	Divider possible with frame
ST 044ERS	44	70, 90, 120, 150	1.07 1.16 1.23 1.33	3	-30 ~ +130	73 93 113 138	40.5	35 55 75 100	24.5		
ST 072ERS	72	120, 145, 200, 250, 300	2.53 2.65 2.77 2.89 3.01	3	-30 ~ +130	104 129 154 179 204	69	50 75 100 125 150	44		
ST 095ERS	95	150, 200, 230, 280, 400	4.20 4.45 4.70 4.95 5.19	3	-30 ~ +130	168 193 218 243 268	85	100 125 150 175 200	55		
ST 120ERS	120	200, 250, 300, 350, 400, 500	5.17 5.48 5.78 6.09	3	-30 ~ +130	218 268 318 368	112	150 200 250 300	76		
ST 150ERS	150	305, 405, 505, 605	10.23 10.84 11.45 12.06 12.67	3	-30 ~ +130	287 337 387 437 487	145	200 250 300 350 400	110		

(Dimensions in mm)

Ordering

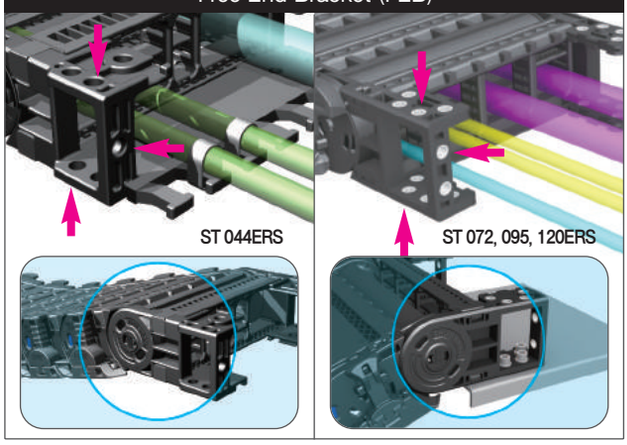
ST 044ERS. 100. R120 / F - 1500L : 10ST

- Shift Chain
- Enclosed roller skid type (ERS)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

Bracket type

- ST044, ST072, ST095, ST120

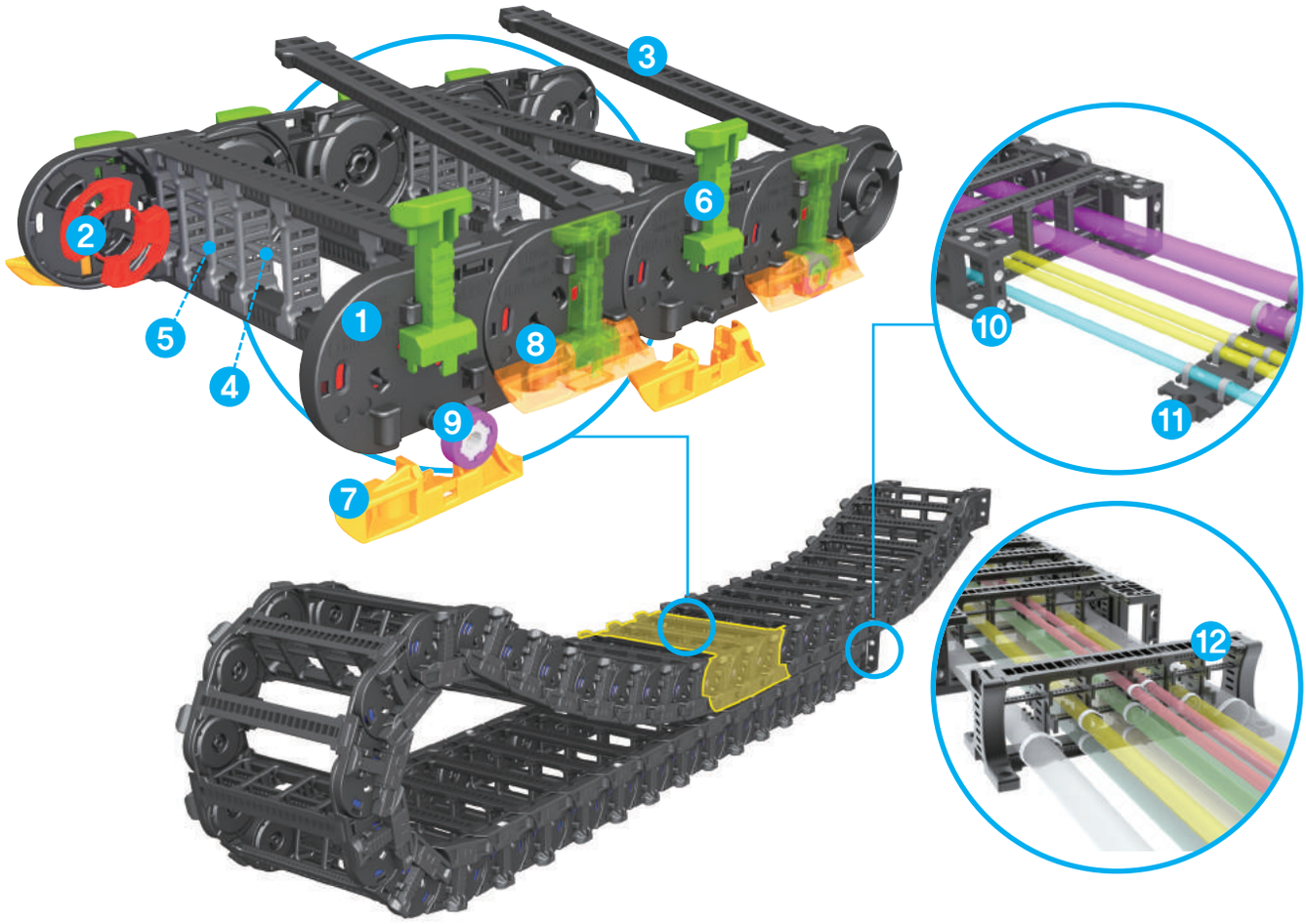
Free End Bracket (FEB)



▶ BR should not be inserted in the joint of side band and Free End Bracket.
▶ Normal Frame, not FRU/FRD, is inserted into Free End Bracket.

Shift Chain - Enclosed roller skid type

≫ Part of Shift Chain Enclosed Roller skid type



❶ Side Band (SB)
A unit that connects each side band and between them BR is inserted to strengthen clamping force.

❷ Bending Radius Unit (BR)
A unit that inserted between each side band.
There are 6 supporting points to create durability.

❸ FRU, FRD
[FRU(D) Enclosed type applicable]
A unit that connects left and right side band and there are 2 types of frame : FRU, FRD.

❹ Separator (SP)
A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❺ Divider (DV-S, M, R, T)
A unit that divides inserted cables horizontally.

❻ Support
A unit that supports skid & roller skid which makes skid& roller skid move up and down.

❼❽ Skid, Roller Skid
Skid : A unit that minimizes friction between upper and lower cable chain.
Roller Skid : A unit that minimizes friction between upper and lower chain. while roller is combined type..

❾ Roller
A unit that minimizes friction between upper and lower cable chain.
It contains bearing in the core.

❿ Free End Bracket (FEB)
A unit that connects at last side band (left&right).
It can be fixed stronger using steel washers.

⓫ Tie Wrap (TW)
A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.

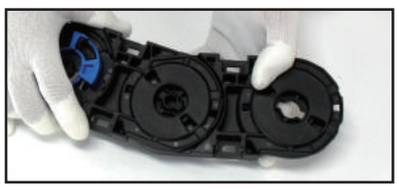
⓬ System Tie Wrap (STW)
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisted and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

≫ Assembly procedure of Shift Chain Enclosed Roller skid type

Assembly procedure of Shift chain ERS-type is as follows. The assembling process of shift Chain ERS-type is like below and users must use rubber hammer with careful combination of Divider and Separator. (Disassembly process for repair and replacement is in reverse order)

1

Insert BR Unit into each Side Band.
(Side Band is divided into right and left side according to the direction.)



2

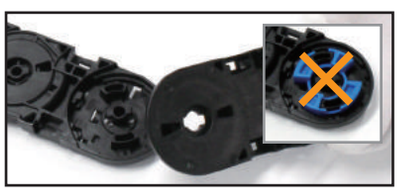
Continue to insert BR Unit into Side Band as you want to make it. Assembly Side Band which is inserted BR Unit as above.

3

Continue to connect each Side Band as long as you want to make it.

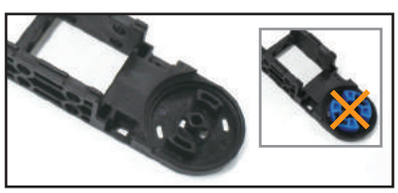
4

Connect the Side Band as many as you need.



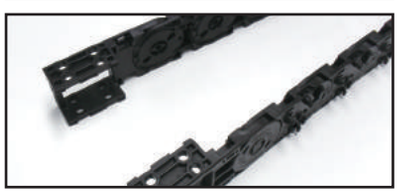
5

Assemble the F.FEB according to the direction of right and left side. (Do not insert the BR Unit to Side Band connected to F.FEB.Side of F.FEB is not enclosed.)



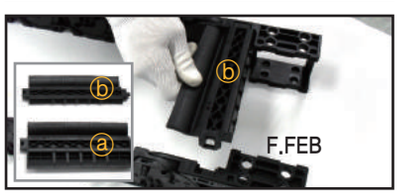
6

Do not insert a BR to M.FEB.
(M.FEB will be making a turn to up and down.)



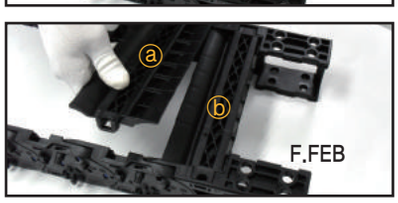
7

Assemble the M.FEB according to the direction of right and left side.
(Side of M.FEB is not enclosed.)



8

Insert one ⓑ Shaped-FRD into F.FEB. (ⓐ: Normal FRD ⓑ: Built-up only for F.FEB)Find one ⓑ shaped-FRD and insert it with the hinge facing RH direction, as above.

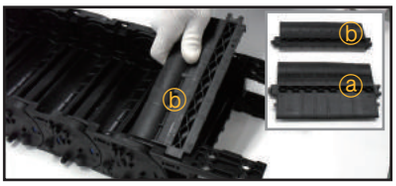


9

Continue to insert the FRD(ⓐ: Normal FRD) with the hinge facing RH direction. (Assemble the from F.FEB to M.FEB in order.)

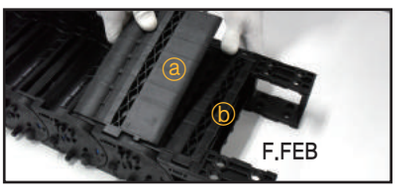
10

Insert the frame as many as you need and insert them one by one with the hinge facing. RH direction, as above. (M.FEB is not turned to up and down when FRD assembling)



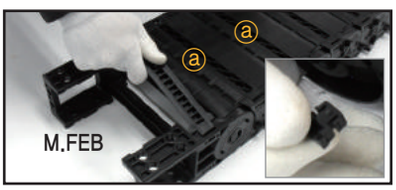
11

Insert the ⓑ shaped-FRD inserted to F.FEB and insert it with the hinge facing RH direction, as above. (ⓐ: Normal FRD ⓑ: Built-up only for F.FEB) Insert the divider with separator to divide the inside of chain.



12

Continue to insert the FRU(ⓐ: Normal FRU) with the hinge facing RH direction. (Assemble the from F.FEB to M.FEB in order.)

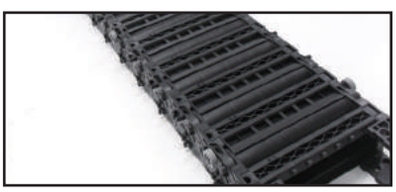


13

Insert ⓐ Normal FRU as many as you need and insert them one by one with the hinge facing RH direction, as above. Insert Frame-pin into the hole which is seen where the end of FRU and Side Band meet. (M.FEB is not turning to up and down when FRU assembling.)

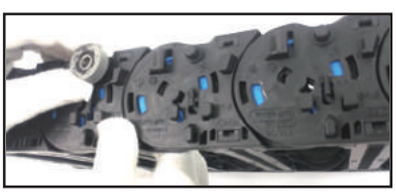
14

Insert Roller into mounted Side Band.



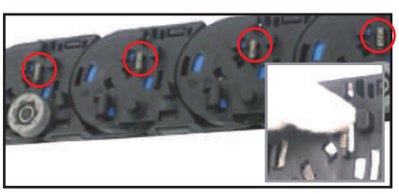
15

Continue to insert Roller into Side Band.
Basically, you insert one roller per 4 Link.



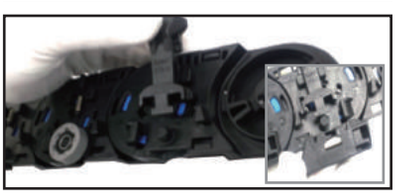
16

Insert Roller Skid into Side Band where roller inserted in.
Skid is divided into Roller Skid (Skid with mount for roller) and normal Skid. (Skid without mount)



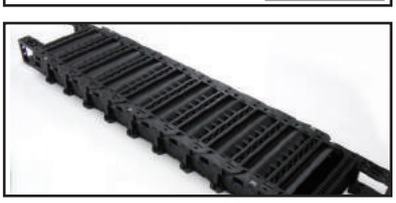
17

Insert support into groove of side band until you hear the "click". (Same support for both LH and RH.)



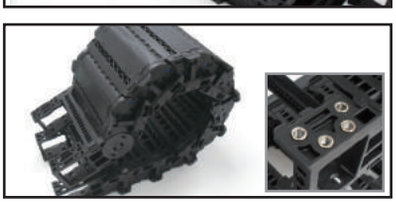
18

Insert a normal Skid into Side Band which is not inserted a roller.



19

Insert Skid and Support into all Side Band links. (Check that Skid is working up-and-down properly when you push the assembled Skids by hands.)



20

Insert steel washers into M.FEB and F.FEB.

Shift Chain - Enclosed roller skid type

≫ Part of Shift Chain Enclosed Roller skid type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

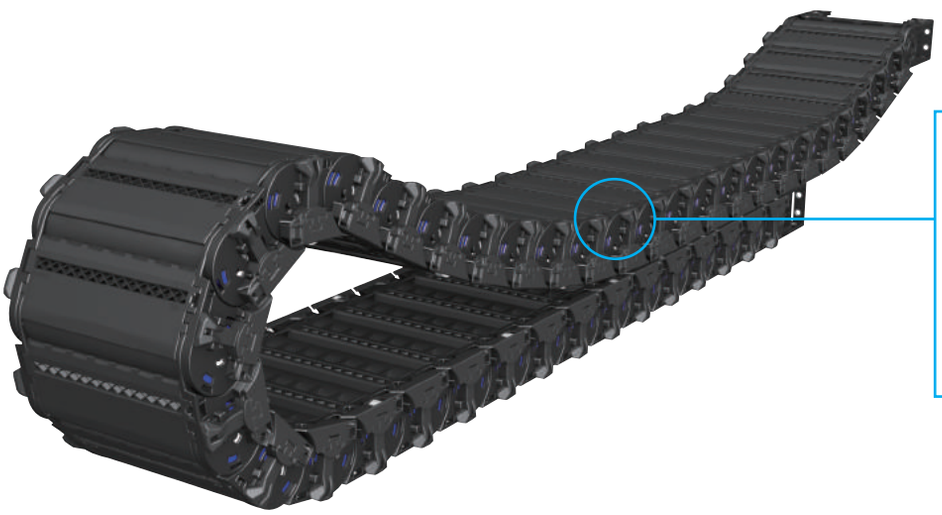
Model	Classification	Part number	Description
ST044ERS	SIDE BAND	ST-SB044S(LH) ST-SB044S(RH)	Left side band of ST044S Right side band of ST044S
	BENDING RADIUS	ST-BRS044.R70, 90, 120, 150	Bending radius unit for side band
	SKID	ST-SK044RS(LH-N) ST-SK044RS(LH-R) ST-SK044RS(RH-N) ST-SK044RS(RH-R)	Skid for long travel(Applied to side band)
	SPRING	ST-SPR044	Supporter to fix skid unit
	SUPPORT	ST-SUP044	Spring with roller
	ROLLER	ST-RL044	Roller for long travel(Applied to side band)
	FRAME(DOWN) FRAME(UP) FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRD044.35 ST-FRU044.35 ST-FRD044.55 ST-FRU044.55 ST-FRD044.75 ST-FRU044.75 ST-FRD044.100 ST-FRU044.100 ST-FRDFE044.35,55,75,100 ST-FRUFE044.35,55,75,100 ST-FRDME044.35,55,75,100 ST-FRUME044.35,55,75,100	Inside frame, 35mm Outside frame, 35mm Inside frame, 55mm Outside frame, 55mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB044E	End bracket of ST044E
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

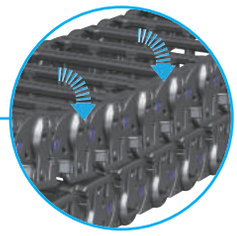
Model	Classification	Part number	Description
ST072ERS	SIDE BAND	ST-SB072S(LH) ST-SB072S(RH)	Left side band of ST072S Right side band of ST072S
	BENDING RADIUS	ST-BRS072. R120,145,200,250,300	Bending radius unit for side band
	SKID	ST-SK072RS(LH-N) ST-SK072RS(LH-R) ST-SK072RS(RH-N) ST-SK072RS(RH-R)	Skid for long travel(Applied to side band)
	SPRING	ST-SPR072	Supporter to fix skid unit
	SUPPORT	ST-SUP072	Spring with roller
	ROLLER	ST-RL072	Roller for long travel(Applied to side band)
	FRAME PIN	S-FP/S1	Frame pin
	FRAME(DOWN) FRAME(UP) FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRD072.50 ST-FRU072.50 ST-FRD072.75 ST-FRU072.75 ST-FRD072.100 ST-FRU072.100 ST-FRD072.125 ST-FRU072.125 ST-FRD072.150 ST-FRU072.150 ST-FRDFE072.50,75,100,125,150 ST-FRUFE072.50,75,100,125,150 ST-FRDME072.50,75,100,125,150 ST-FRUME072.50,75,100,125,150	Inside frame, 50mm Outside frame, 50mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB072 sb-FEB/WH045	End bracket of ST072E Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
ST095ERS	SIDE BAND	ST-SB095S(LH) ST-SB095S(RH)	Left side band of ST095S Right side band of ST095S
	BENDING RADIUS	ST-BR095.R150,200,230,280,400	Bending radius unit for side band
	SKID	ST-SK095RS(LH-N) ST-SK095RS(LH-R) ST-SK095RS(RH-N) ST-SK095RS(RH-R)	Skid for long travel(Applied to side band)
	SPRING	ST-SPR095	Supporter to fix skid unit
	SUPPORT	ST-SUP095	Spring with roller
	ROLLER	ST-RL095	Roller for long travel(Applied to side band)
	FRAME PIN	S-FP/S1	Frame pin
	FRAME(DOWN) FRAME(UP) FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRD095.100 ST-FRU095.100 ST-FRD095.125 ST-FRU095.125 ST-FRD095.150 ST-FRU095.150 ST-FRD095.175 ST-FRU095.175 ST-FRD095.200 ST-FRU095.200 ST-FRDFE095.100,125,150,175,200 ST-FRUFE095.100,125,150,175,200 ST-FRDME095.100,125,150,175,200 ST-FRUME095.100,125,150,175,200	Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm Inside frame, 175mm Outside frame, 175mm Inside frame, 200mm Outside frame, 200mm Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB095E	End bracket of ST095E
	DIVIDER	sb-DV060/M sb-DV060/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW.EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

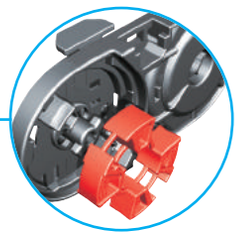
Model	Classification	Part number	Description
ST120ERS	SIDE BAND	ST-SB120S(LH) ST-SB120S(RH)	Left side band of ST120E Right side band of ST120E
	BENDING RADIUS	ST-BR120.R180,200,250,300,350,400,500	Bending radius unit for side band
	SKID	ST-SK120RS(LH-N) ST-SK120RS(LH-R) ST-SK120RS(RH-N) ST-SK120RS(RH-R)	Skid for long travel(Applied to side band)
	SPRING	ST-SPR120 ST-SUP120	Supporter to fix skid unit
	SUPPORT	ST-SUP120	Spring with roller
	ROLLER	ST-RL120	Roller for long travel(Applied to side band)
	FRAME PIN	S-FP/S2	Frame pin
	FRAME(DOWN) FRAME(UP) FRAME(DOWN-FIXING END) FRAME(UP-FIXING END) FRAME(DOWN-MOVING END) FRAME(UP-MOVING END)	ST-FRD120.150 ST-FRU120.150 ST-FRD120.200 ST-FRU120.200 ST-FRD120.250 ST-FRU120.250 ST-FRD120.300 ST-FRU120.300 ST-FRDFE120.150,200,250,300 ST-FRUFE120.150,200,250,300 ST-FRDME120.150,200,250,300 ST-FRUME120.150,200,250,300	Inside frame, 150mm Outside frame, 150mm Inside frame, 200mm Outside frame, 200mm Inside frame, 250mm Outside frame, 250mm Inside frame, 300mm Outside frame, 300mm Inside half-frame for fixing end bracket Outside half-frame for fixing end bracket Inside half-frame for moving end bracket Outside half-frame for moving end bracket
	FREE END BRACKET	ST-FEB120E sb-FEB/WH075	End bracket of ST120E Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S	Normal divider To fix separstors at the both side section
	SEPARATOR	sb-SP/400.400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW.EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

ST 044ERS





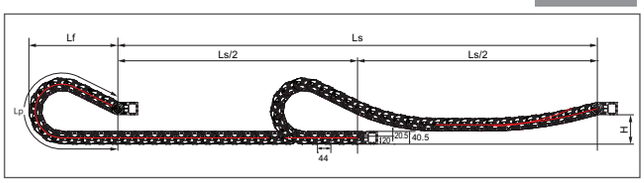
▲ Hinge hook type



▲Bending Radius Unit

Layout of the chain

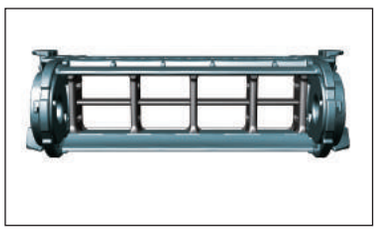
Ls: Stroke

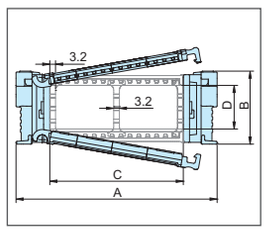


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
70	544	249	110
90	662	289	
120	926	393	
150	1,190	497	

(Dimensions in mm)

Chain cross section

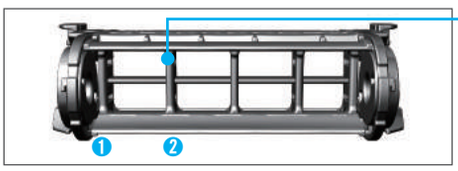


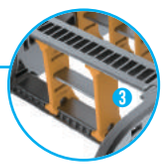


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 044ERS	73	40.5	35	24.5	1.07
	93		55		1.16
	113		75		1.23
	138		100		1.33

(Dimensions in mm)

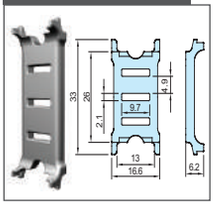
Dividers(DV)



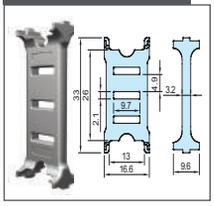


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

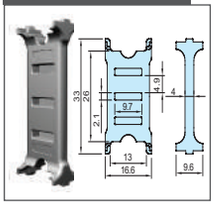
❶ sb-DV028/S



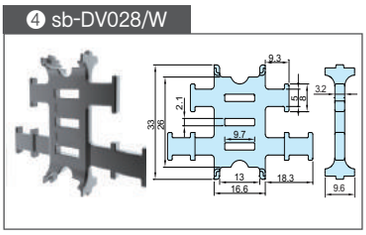
❷ sb-DV028/M1



❸ sb-DV028/M2

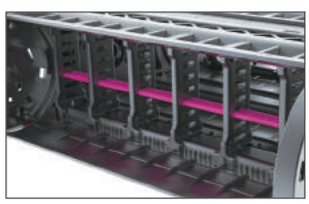


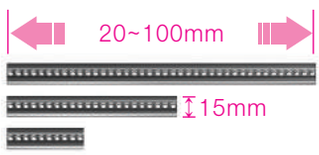
❹ sb-DV028/W



(Dimensions in mm)

Separators(SP)



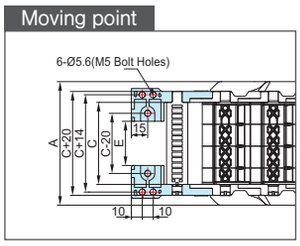


Chain Type	Ordering NO.	Frame
ST 044ERS	S-SP/M.35	35
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100

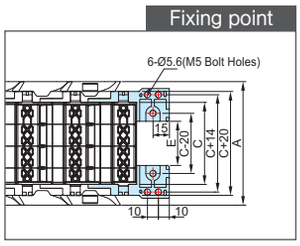
(Dimensions in mm)

Free end bracket

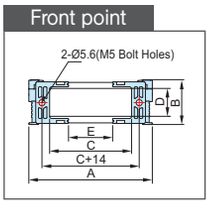
Moving point



Fixing point



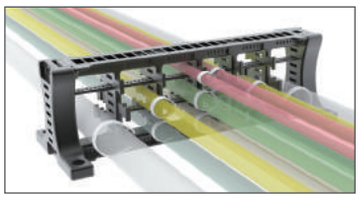
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 044ERS	73 93 113 138	40.5	35 55 75 100	24.5	0.4 20.4 40.4 65.4	M5 Bolt Holes

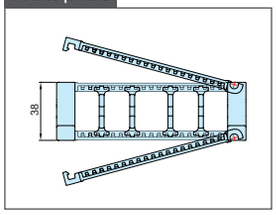
(Dimensions in mm)

System tie wrap (STW)

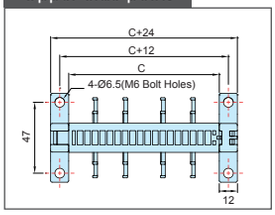


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

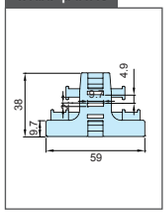
Front point



Upper side point



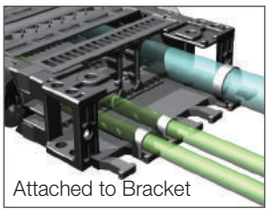
Side point



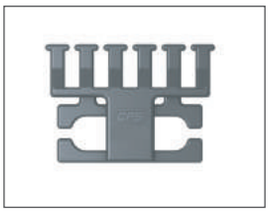
Chain Type	Ordering No.	C Frame	Hole Type
ST 044ERS	S-TW.EB028.35 S-TW.EB028.55 S-TW.EB028.75 S-TW.EB028.100	35 55 75 100	M6 Bolt Holes

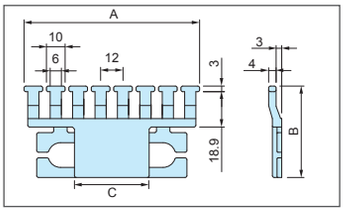
(Dimensions in mm)

Tie wrap (TW)



Attached to Bracket



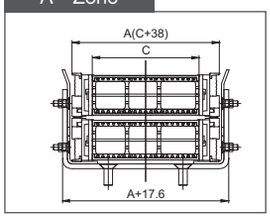


Chain Type	Ordering No.	A	B	
ST 044ERS	S-TW036/025CR.35	46	35.4	-
	S-TW036/025CR.55	70	48.9	20
	S-TW036/025CR.75	94	48.9	40
	S-TW036/025CR.100	118	48.9	65

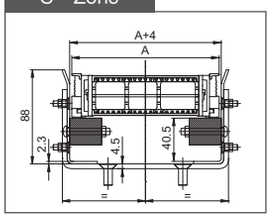
(Dimensions in mm)

Guide channel

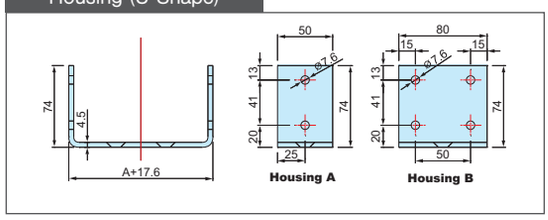
A - Zone



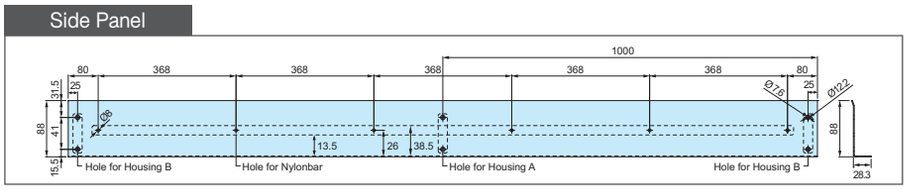
C - Zone



Housing (U-Shape)

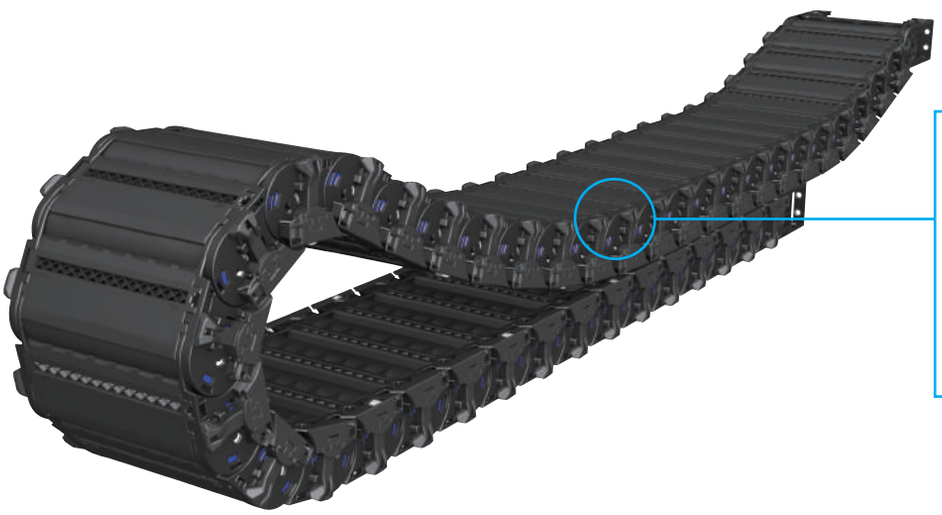


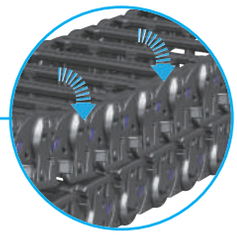
Side Panel



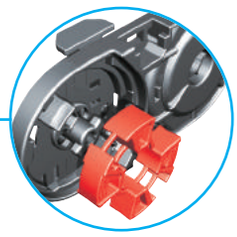
(Dimensions in mm)

ST 072ERS





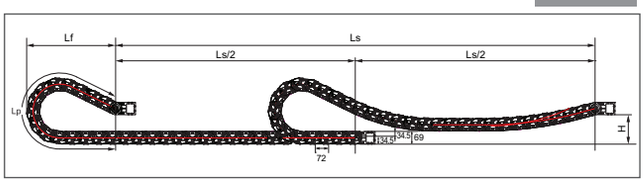
▲ Hinge hook type



▲Bending Radius Unit

Layout of the chain

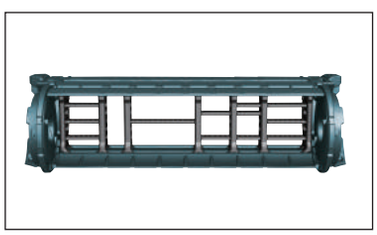
Ls: Stroke

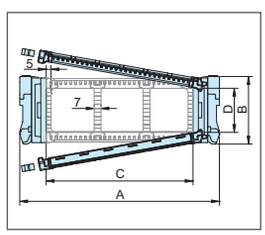


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
120	917	420	180
145	1,063	470	
200	1,400	580	
250	1,840	752	
300	2,280	924	

(Dimensions in mm)

Chain cross section

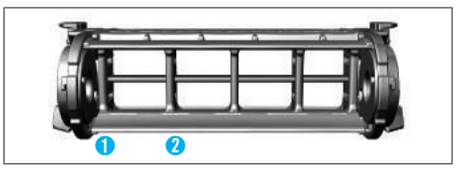


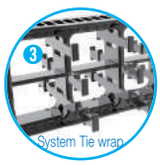


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 072ERS	104	69	50	44	2.53
	129		75		2.65
	154		100		2.77
	179		125		2.89
	204		150		3.01

(Dimensions in mm)

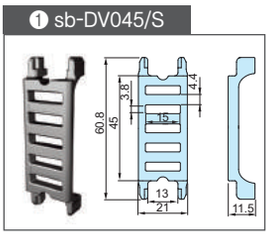
Dividers(DV)



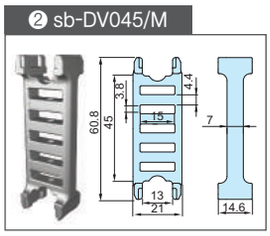


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

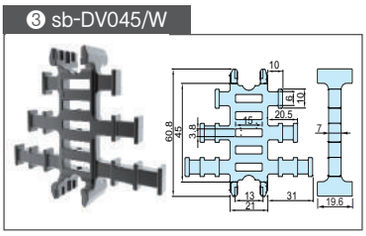
❶ sb-DV045/S



❷ sb-DV045/M

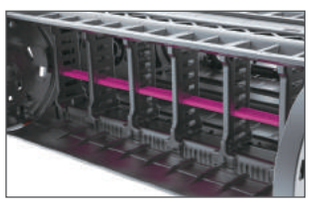


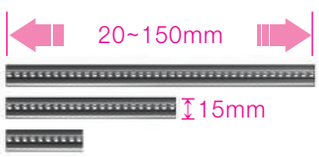
❸ sb-DV045/W



(Dimensions in mm)

Separators(SP)

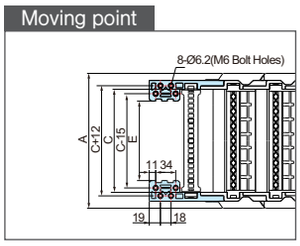




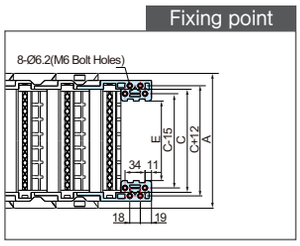
Chain Type	Ordering NO.
ST 072ERS	sb-SP/400.400

Free end bracket

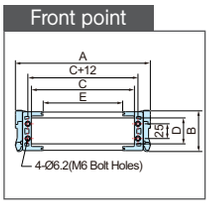
Moving point



Fixing point



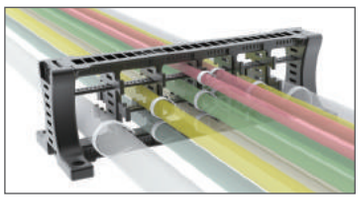
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 072ERS	104 129 154 179 204	69	50 75 100 125 150	44	10 35 60 85 110	M6 Bolt Holes

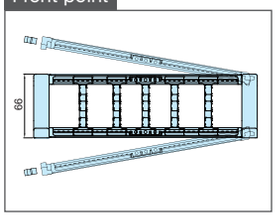
(Dimensions in mm)

System tie wrap (STW)

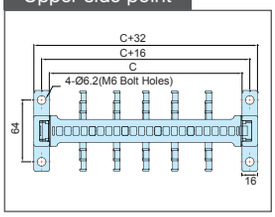


It is a unit to classify each cable for preventing entanglement of cables.
It can either be installed to free end bracket or installed separately according its application environment.

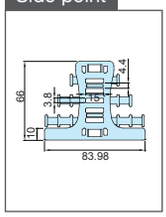
Front point



Upper side point



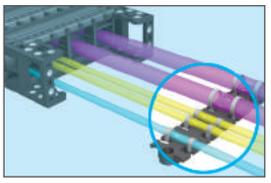
Side point

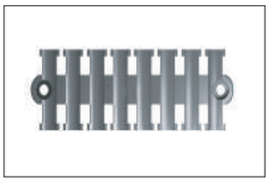


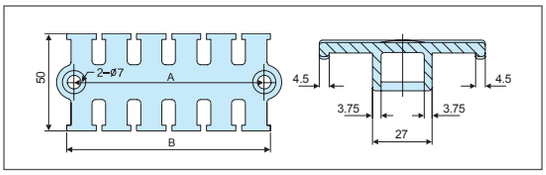
Chain Type	Ordering No.	C Frame	Hole Type
ST 072ERS	S-TW.EB045.50 S-TW.EB045.75 S-TW.EB045.100 S-TW.EB045.125 S-TW.EB045.150	50 75 100 125 150	M6 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





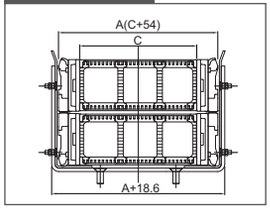


Chain Type	Ordering No.	A	B
ST 072ERS	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

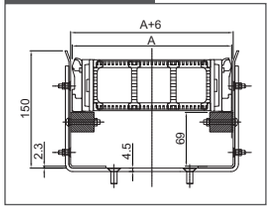
(Dimensions in mm)

Guide channel

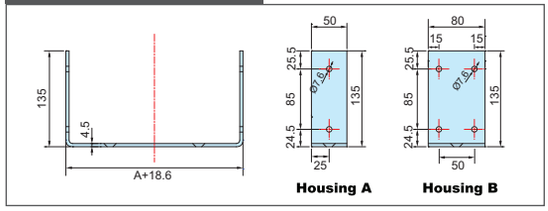
A - Zone



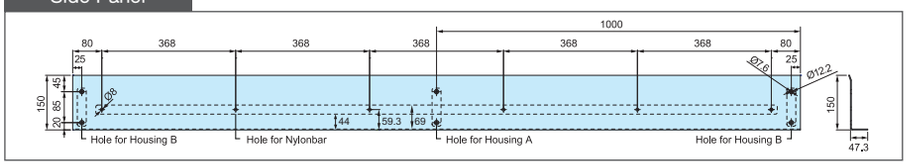
C - Zone



Housing (U-Shape)

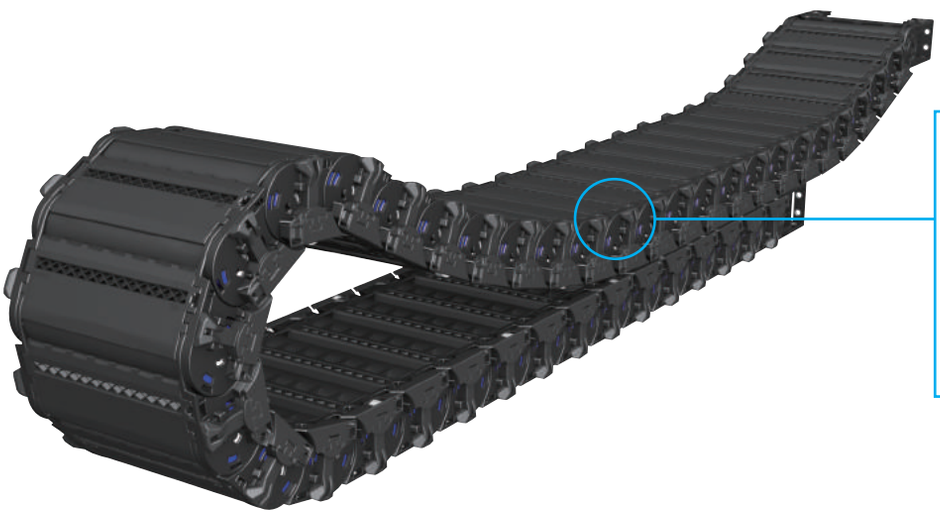


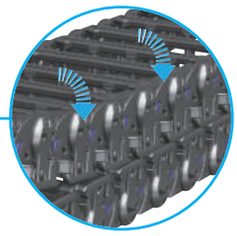
Side Panel



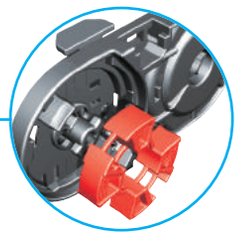
(Dimensions in mm)

ST 095ERS





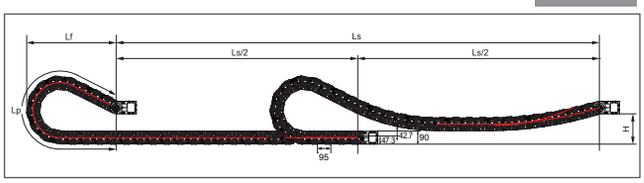
▲ Hinge hook type



▲Bending Radius Unit

Layout of the chain

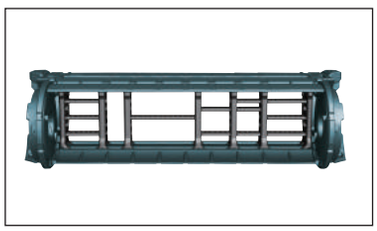
Ls: Stroke

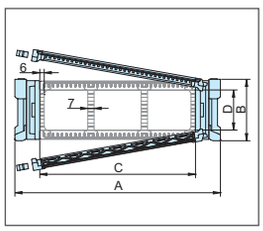


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
150	1,178	534	210
200	1,479	634	
230	1,666	694	
280	2,146	889	
400	3,232	1,319	

(Dimensions in mm)

Chain cross section

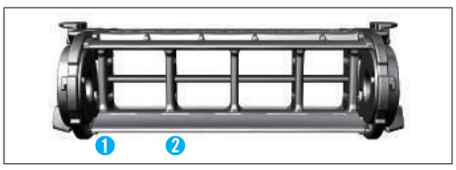




Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 095ERS	168	90	100	55	4.20
	193		125		4.45
	218		150		4.70
	243		175		4.95
	268		200		5.19

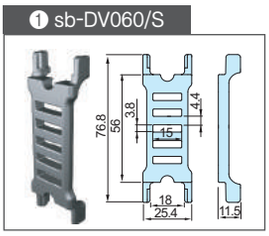
(Dimensions in mm)

Dividers(DV)

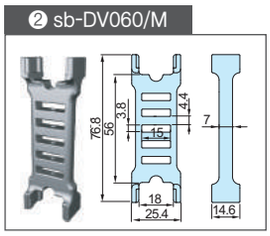


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

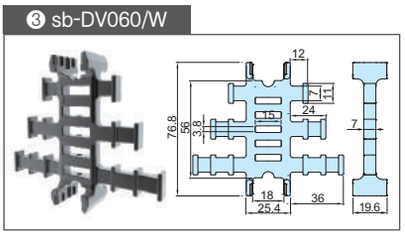
❶ sb-DV060/S



❷ sb-DV060/M

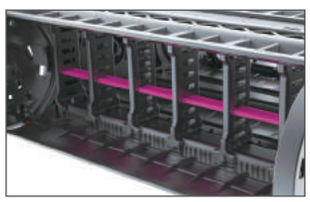


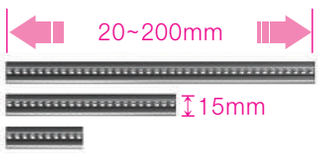
❸ sb-DV060/W



(Dimensions in mm)

Separators(SP)

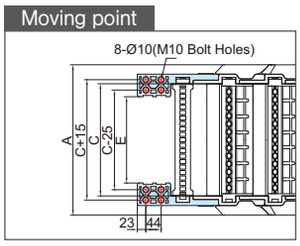




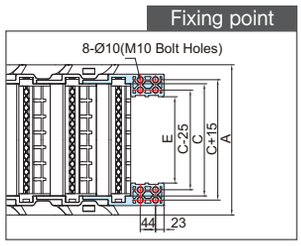
Chain Type	Ordering NO.
ST 095ERS	sb-SP/400.400

Free end bracket

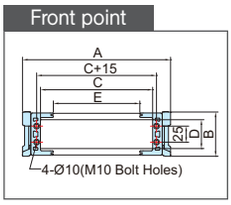
Moving point



Fixing point



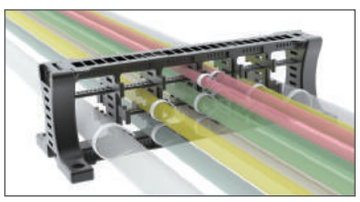
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 095ERS	168 193 218 243 268	90	100 125 150 175 200	55	49 74 99 124 149	M10 Bolt Holes

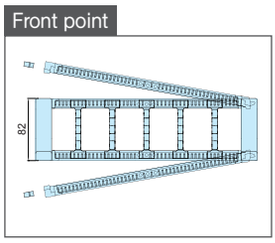
(Dimensions in mm)

System tie wrap (STW)

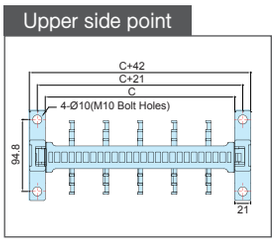


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

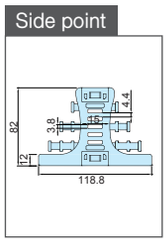
Front point



Upper side point



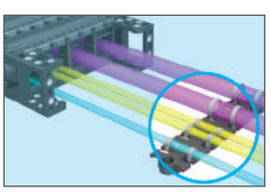
Side point

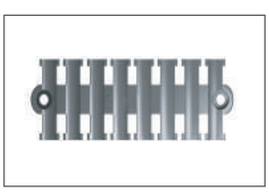


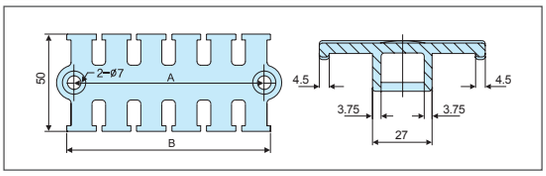
Chain Type	Ordering No.	C Frame	Hole Type
ST 095ERS	S-TW.EB060.100 S-TW.EB060.125 S-TW.EB060.150 S-TW.EB060.175 S-TW.EB060.200	100 125 150 175 200	M10 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





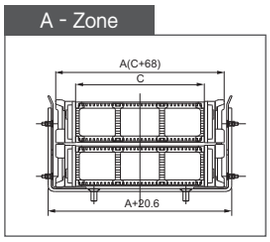


Chain Type	Ordering No.	A	B
ST 095ERS	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

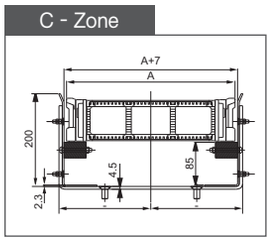
(Dimensions in mm)

Guide channel

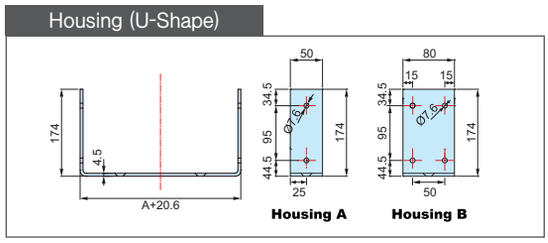
A - Zone



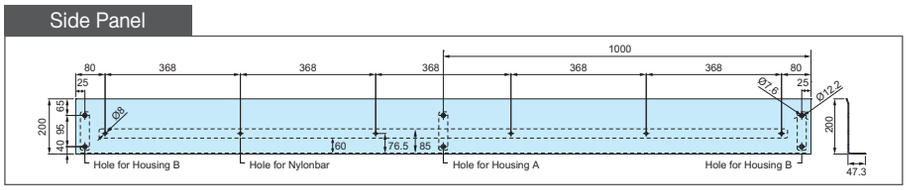
C - Zone



Housing (U-Shape)

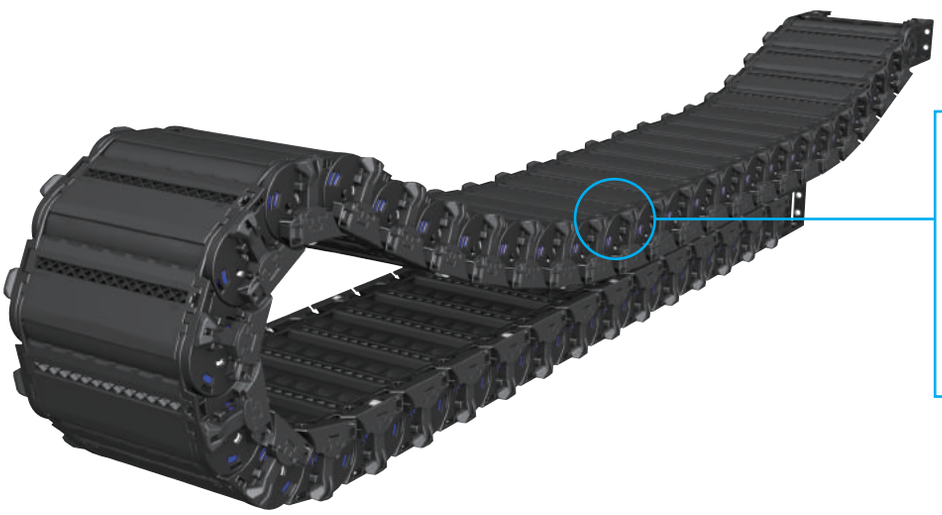


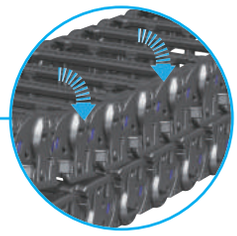
Side Panel



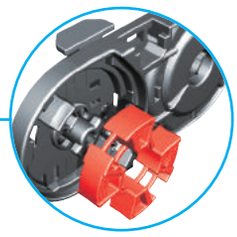
(Dimensions in mm)

ST 120ERS





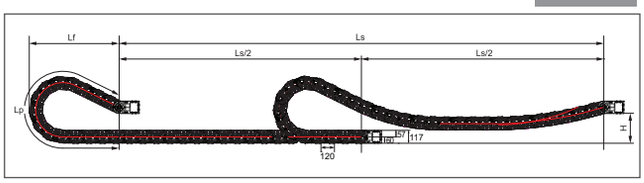
▲ Hinge hook type



▲Bending Radius Unit

Layout of the chain

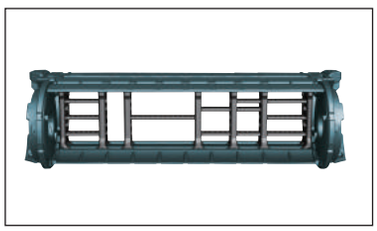
Ls: Stroke

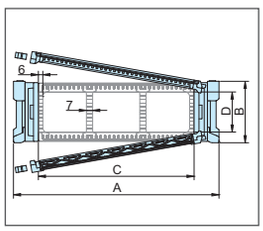


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
200	1,559	694	260
250	1,864	794	
300	2,178	894	
350	2,701	1,114	
400	3,225	1,334	
500	4,062	1,654	

(Dimensions in mm)

Chain cross section

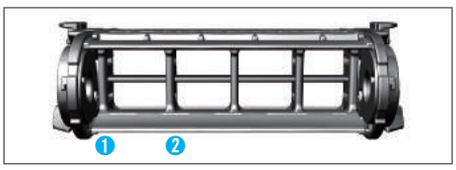




Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
ST 120ERS	218	117	150	76	5.17
	268		200		5.48
	318		250		5.78
	368		300		6.09

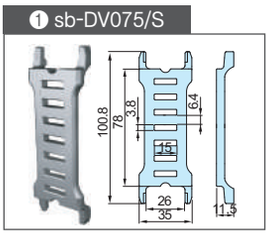
(Dimensions in mm)

Dividers(DV)

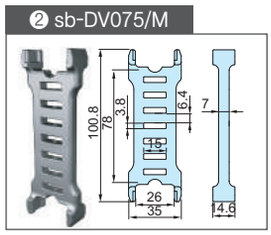


Assemble divider every second frame.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

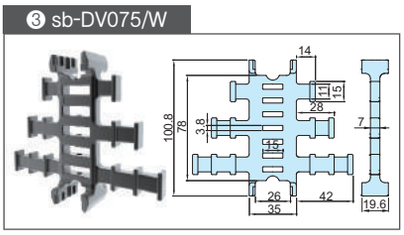
❶ sb-DV075/S



❷ sb-DV075/M

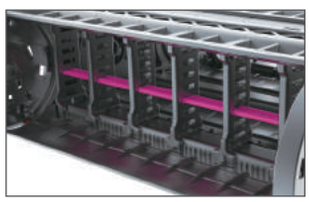


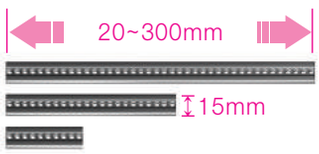
❸ sb-DV075/W



(Dimensions in mm)

Separators(SP)

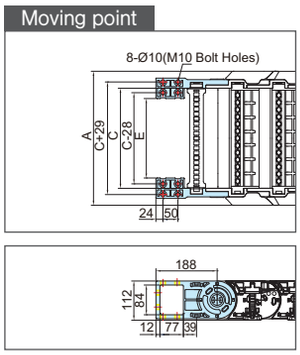




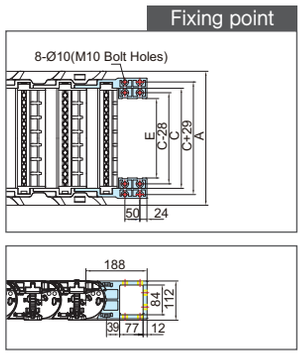
Chain Type	Ordering NO.
ST 120ERS	sb-SP/400.400

Free end bracket

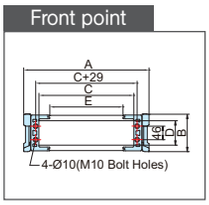
Moving point



Fixing point



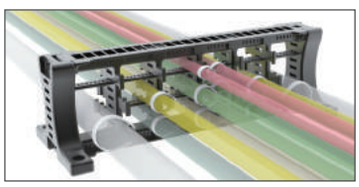
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
ST 120ERS	218 268 318 368	117	150 200 250 300	76	90 140 190 240	M10 Bolt Holes

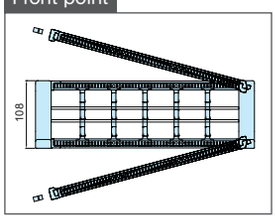
(Dimensions in mm)

System tie wrap (STW)

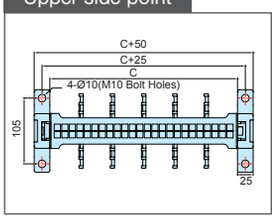


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

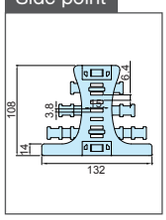
Front point



Upper side point



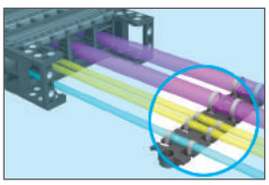
Side point

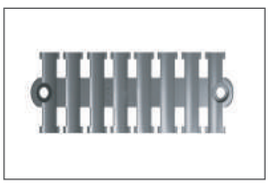


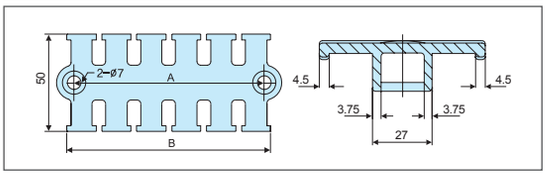
Chain Type	Ordering No.	C Frame	Hole Type
ST 120ERS	S-TW.EB075.150 S-TW.EB075.200 S-TW.EB075.250 S-TW.EB075.300	150 200 250 300	M10 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





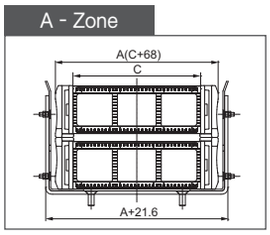


Chain Type	Ordering No.	A	B
ST 120ERS	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

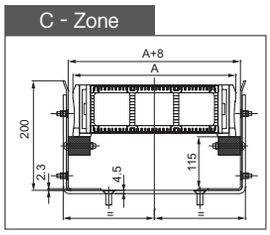
(Dimensions in mm)

Guide channel

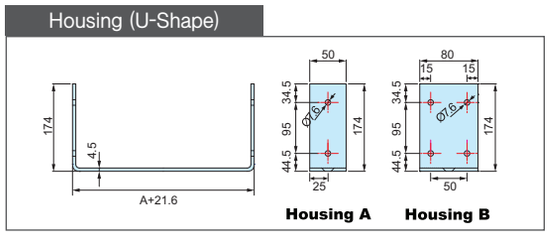
A - Zone



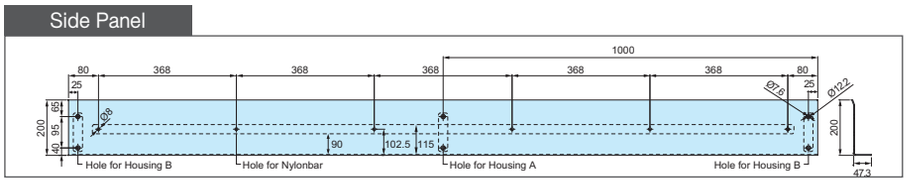
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

sabin Chain

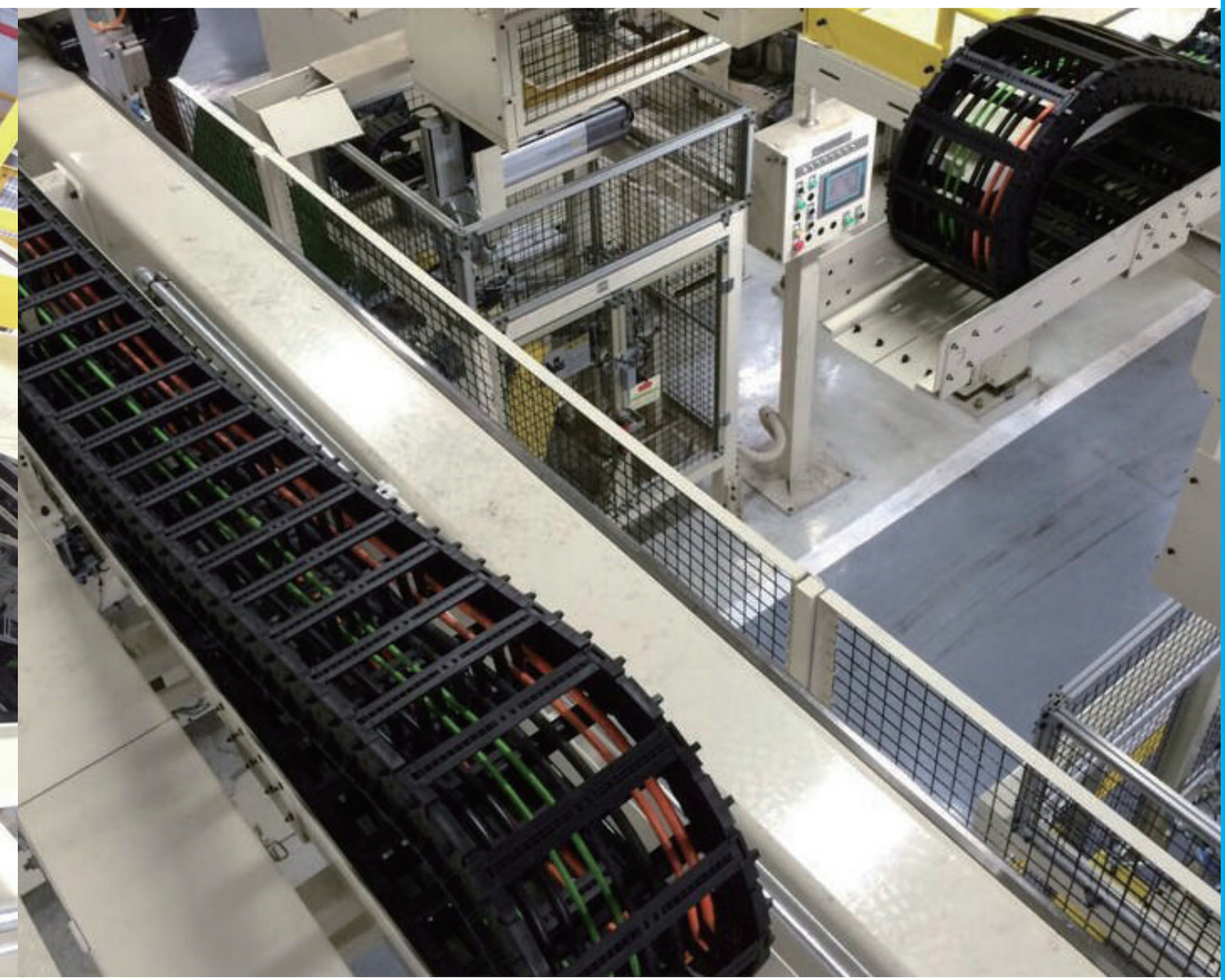
Sabin chain®

asb - CR :
Clean Room type

- asb028CR D-9
- asb035CR D-11
- asb045CR D-13

nsb - CR :
Clean Room type

- nsb020CR D-21
- nsb022CR D-23
- nsb028CR D-25
- nsb035CR D-27
- nsb045CR D-29
- nsb060CR D-31
- nsb075CR D-33



nsb - N :
Normal type

▸nsb028N	D-41
▸nsb035N	D-43
▸nsb045N	D-45
▸nsb060N	D-47
▸nsb075N	D-49

nsb - E :
Enclosed type

▸nsb028E	D-55
▸nsb035E	D-57
▸nsb045E	D-59
▸nsb060E	D-61
▸nsb075E	D-63

nsb - S :
Sliding type

▸nsb050S	D-73
▸nsb065S	D-75
▸nsb080S	D-77

asb Chain - Clean room type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Noise level	37dB(DIN EN 61672-1) with asb 035CR Type
Speed	5m/s
Acceleration	15m/s²
Temperature	-30℃ ~+130℃
Special production	ESD, UV, Customized color
Certificate	CE, IPA, ATEX(Ex), TUV

Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

asb Chain **CR Type**	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Size A	Size B	Size C	Size D	Frame style	Section - composition
asb 028CR asb 028CR.L	28	50, 70, 90, 120, 150	0.90 0.98 1.02 1.12 1.27 1.41 1.59 1.74 1.84	5	-30 ~ +130	55 70 75 95 120 145 170 195 220	38	35 50 55 75 100 125 150 175 200	26		
asb 035CR asb 035CR.L	35	75, 100, 125, 150, 200	1.00 1.06 1.09 1.17 1.29 1.39 1.53 1.65 1.73	5	-30 ~ +130	55 70 75 95 120 145 170 195 220	52	35 50 55 75 100 125 150 175 200	40		
asb 045CR asb 045CR.L	45	72, 100, 120, 140, 200, 250, 300	2.59 2.74 2.90 3.11 3.23 3.31 3.41 3.48 3.90 4.18 4.64 4.76 5.32	5	-30 ~ +130	80 105 130 155 170 180 195 205 220 230 270 280 330	70	50 75 100 125 140 150 165 175 190 200 240 250 300	49		

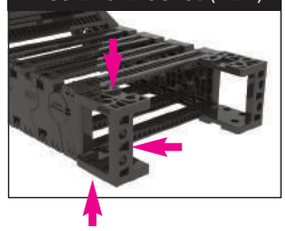
Ordering

asb 028CR. 075. R70 / F - 1000L : 10ST

- Sabin Chain
- Clean Room (CR/CR.L)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

Bracket type

Free End Bracket (FEB)



(Dimensions in mm)

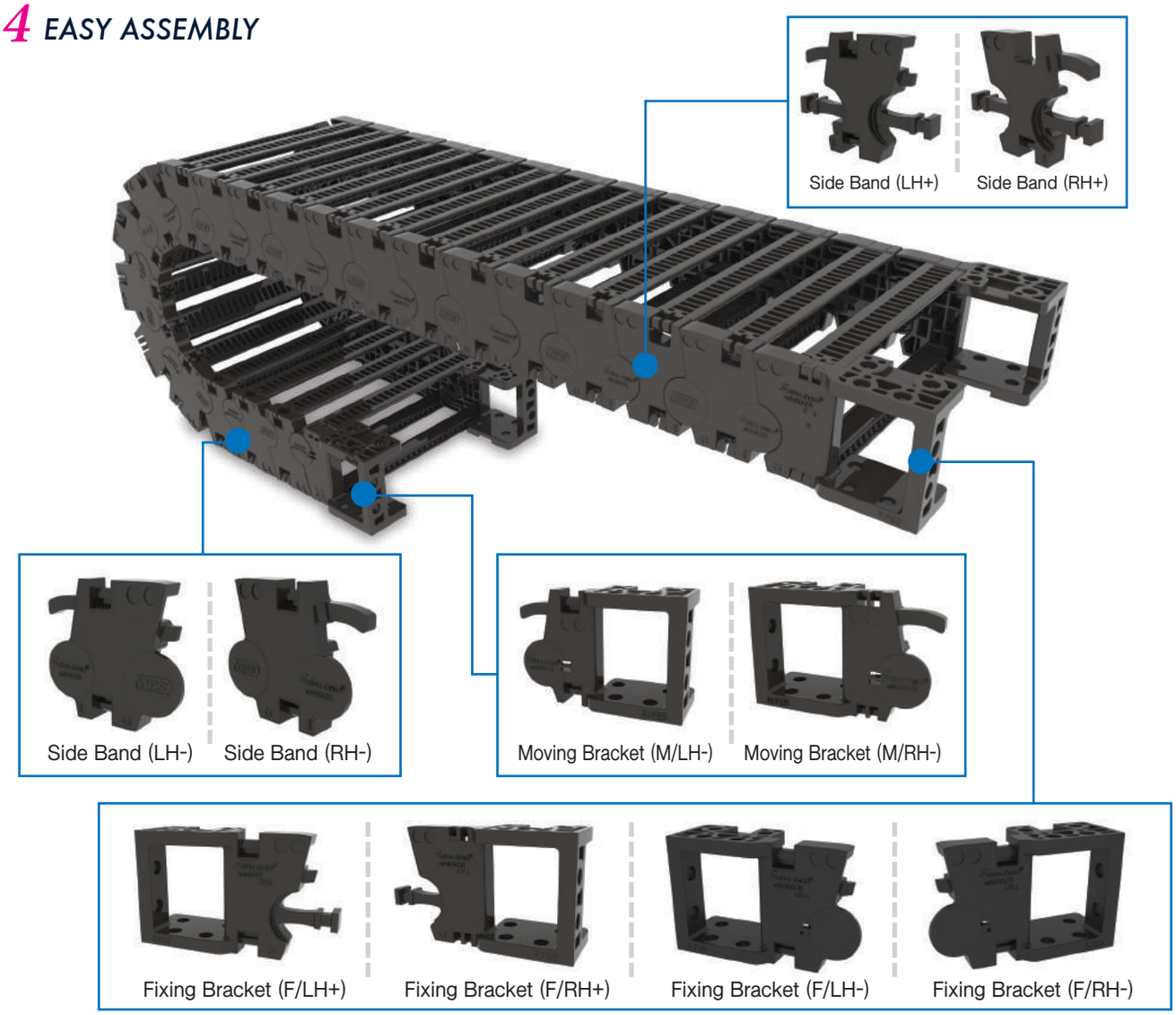
≫ Characteristics of asb Chain Cleanroom

1 *THE QUIETEST CABLE CHAIN!*

2 *LOW DUST FOR CLEANROOM AREA!*

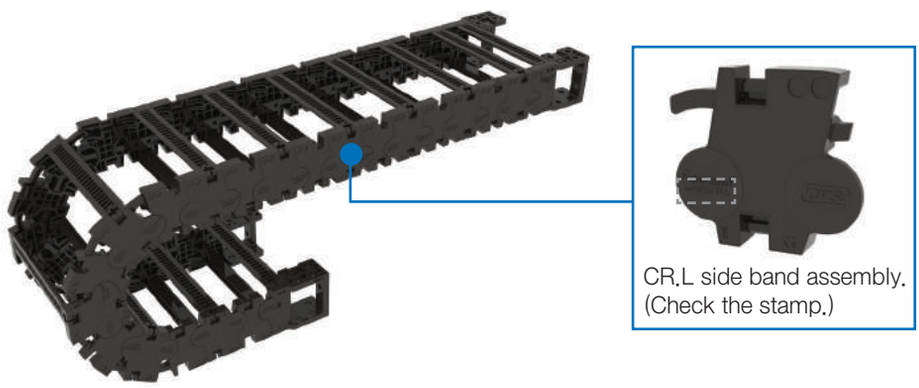
3 *NEXT GENERATION CHAIN WITH ORIGINAL TECHNOLOGY!*

4 *EASY ASSEMBLY*



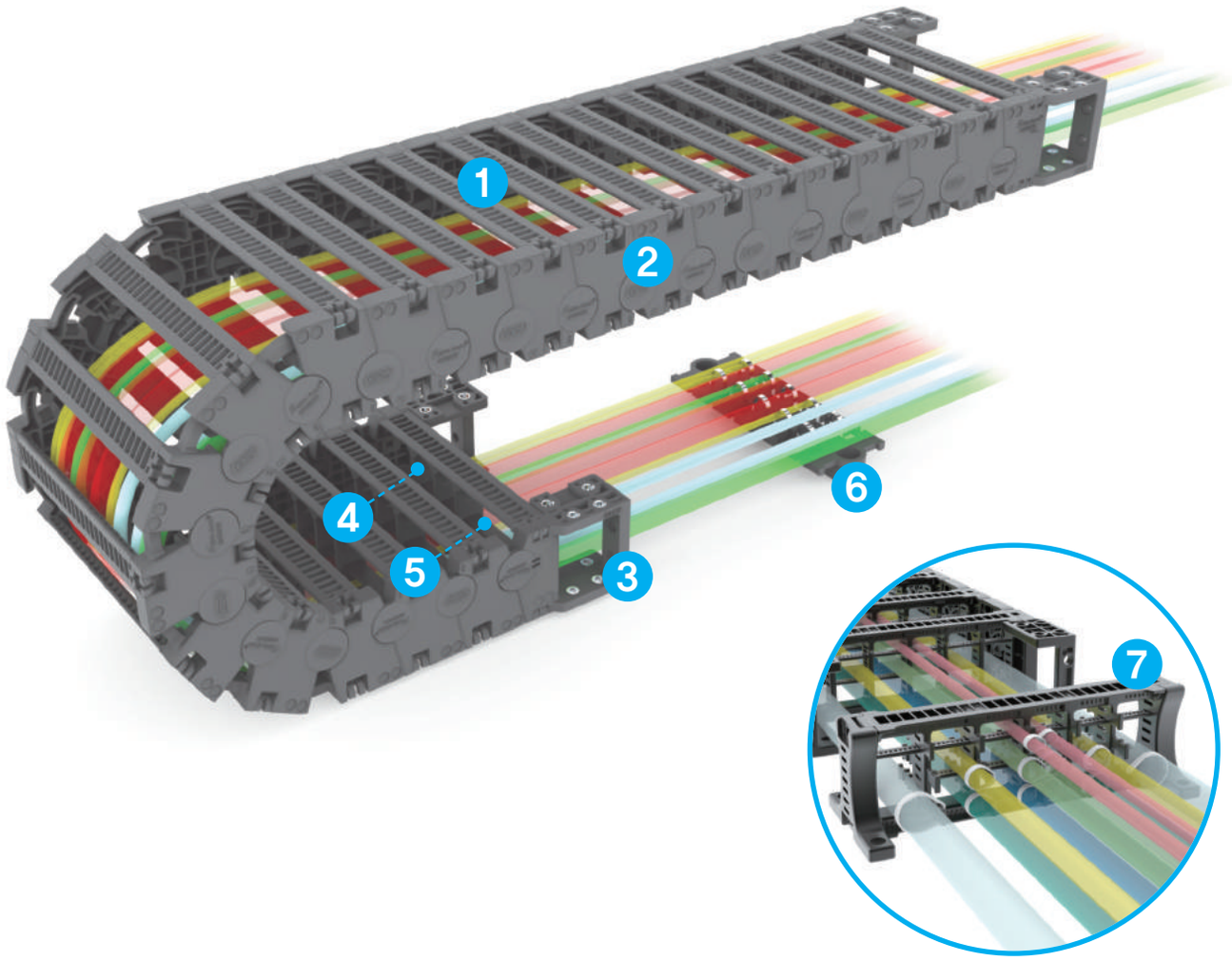
▶ Used M5 bolt with steel washers at FEB.
▶ All frame and other components of nsb CR is common for asb CR.

- CR.L type : Frames are assembled every second links.



asb Chain - Clean room type

>> Part of asb Chain Clean Room type



❶ Frame (Hinged Type) (FR)
Hinged-type frame, open one side, supports connection of both side of side band and have tongue and groove system plate to secure the position of the divider on the frame.

❷ Side Band (SB)
It's part of cable chain that each side band's connected by holding band.

❸ Free End Bracket (FEB)
A unit that connects at last side band (left&right).
It can be fixed stronger using steel washers.

❹ Divider (DV-S, M, R, T)
A unit that divides inserted cables horizontally.

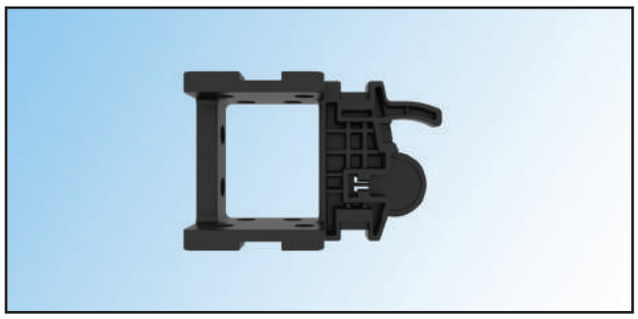
❺ Separator (SP)
A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❻ Tie Wrap (TW)
A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.

❼ System Tie Wrap (STW)
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisted and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

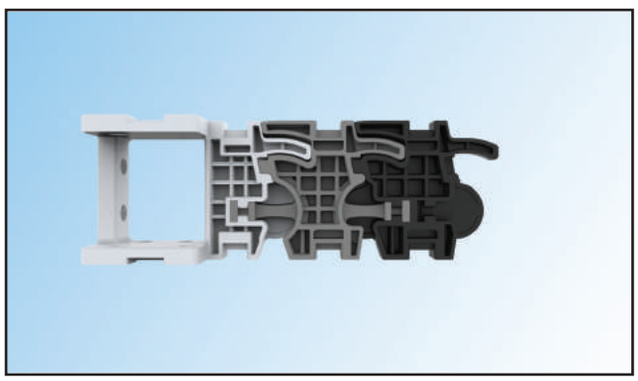
≫ Assembly procedure of asb Chain Clean room Type

The assembling process of CR-Type of asb Chain is like below and users must use rubber hammer with careful combination of Divider and Separator.



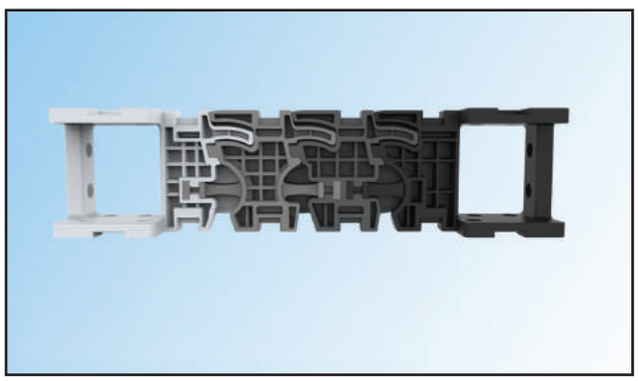
1

Always start assembling from Fixing bracket.



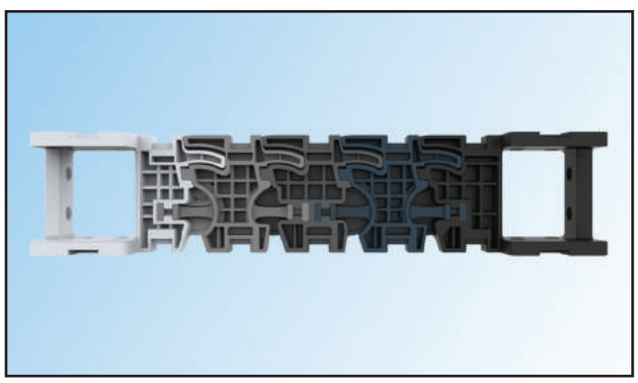
2

Assemble (+)side band and (-)side band in consecutive order.



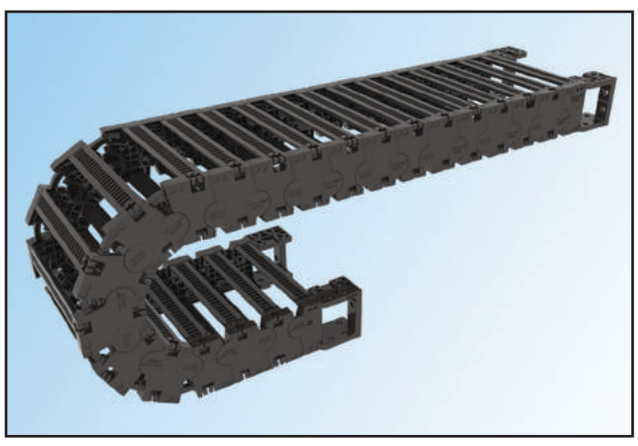
3

Even number of assembled side band :
In case of even number of links, Moving bracket must be (+)bracket.



3-1

Odd number of assembled side band :
In case of odd number of links, Moving bracket must be (-)bracket.



4

Complete to assemble asb Chain CR-Type, Sabin Chain.

- CR.L type : Frames are assembled every second link.

asb Chain - Clean room type

≫ Part list of asb Chain Clean Room type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.
- CR.L means that you assemble frame every second link instead of every link.

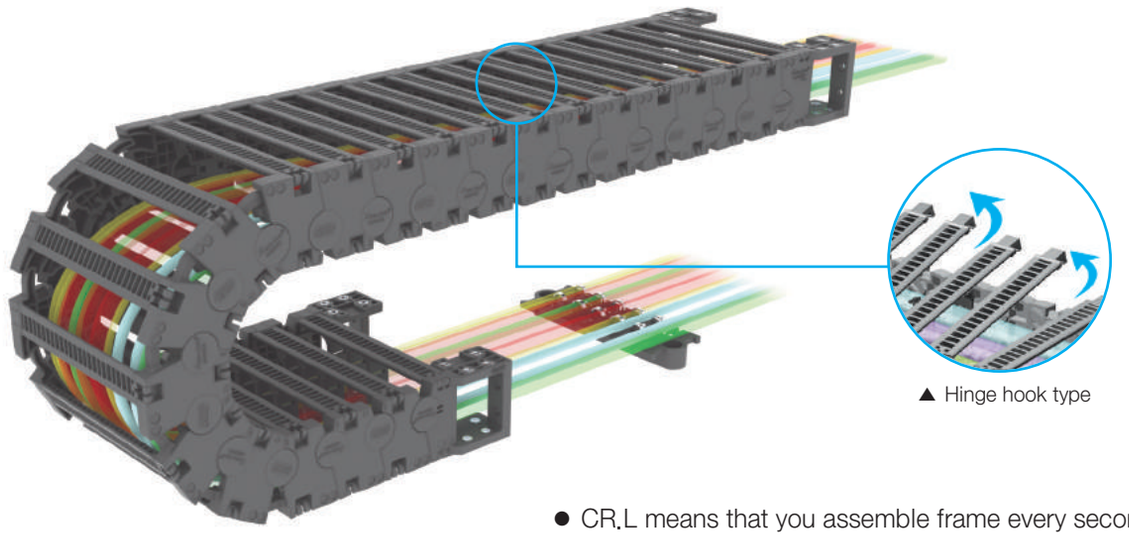
※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
asb028CR	SIDE BAND	asb-SB028CR.R*(LH) asb-SB028CR.R*(RH)	Left side band of asb028CR Right side band of asb028CR
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	asb-FEB028CR	End bracket of asb028CR
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.55 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 55mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
asb035CR	SIDE BAND	asb-SB035CR.R*(LH) asb-SB035CR.R*(RH)	Left side band of asb035CR Right side band of asb035CR
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	asb-FEB035CR	End bracket of asb035CR
	DIVIDER	sb-DV035/M sb-DV035/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.55 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 55mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW050/035N.50 S-TW050/035N.75 S-TW050/035N.100 S-TW050/035N.125 S-TW050/035N.150 S-TW050/035N.175 S-TW050/035N.200	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm Tie wrap for end bracket to fix cables, 175mm Tie wrap for end bracket to fix cables, 200mm
	SYSTEM TIE WRAP	sb-DV035/W S-TW.EB035	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

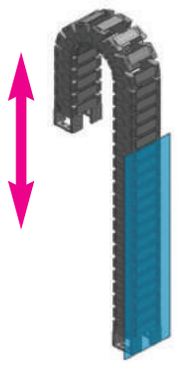
Model	Classification	Part number	Description
asb045CR	SIDE BAND	asb-SB045CR.R*(LH) asb-SB045CR.R*(RH)	Left side band of asb045CR Right side band of asb045CR
	FRAME	sb-FR/M.50 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.140 sb-FR/M.150 sb-FR/M.165 sb-FR/M.175 sb-FR/M.190 sb-FR/M.200 sb-FR/M.240 sb-FR/M.250 sb-FR/M.300	Frame, 50mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 140mm Frame, 150mm Frame, 165mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 300mm
	FREE END BRACKET	asb-FEB045CR sb-FEB/WH045	End bracket of asb045CR Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S sb-DV045/R sb-DV045/T	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

asb 028CR/asb 028CR.L

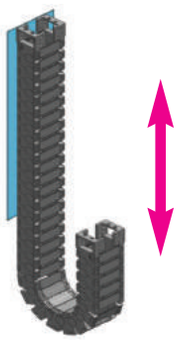


▲ Hinge hook type

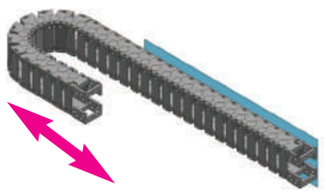
- CR.L means that you assemble frame every second link instead of every link.



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

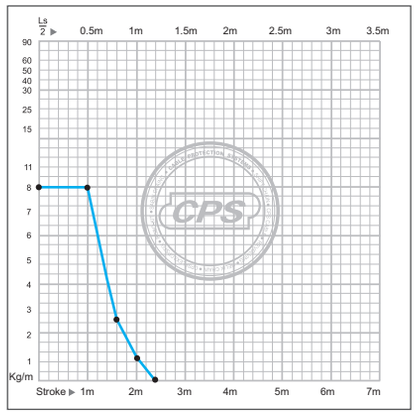
≫ Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

≫ Other installation length

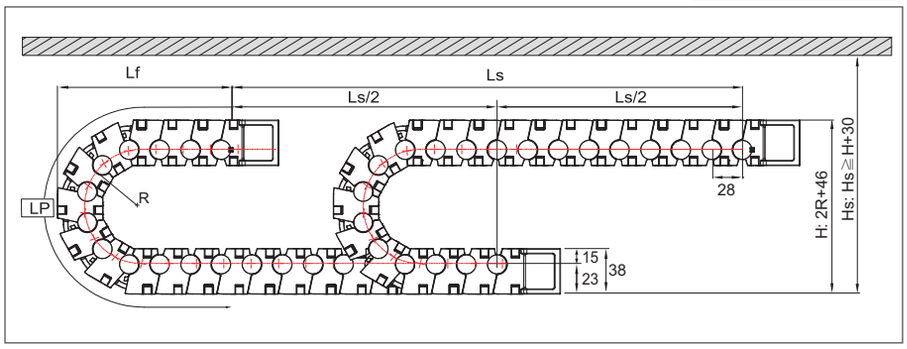
Vertical curve above = max 2.0m
Vertical curve below = max 40m
Side Mounted, Unsupported = max 1.0m

≫ Load diagrams self-supporting length



≫ Layout of the chain

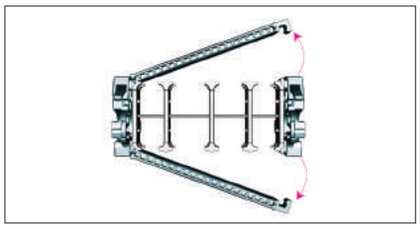
Ls: Stroke Hs: Safe Space

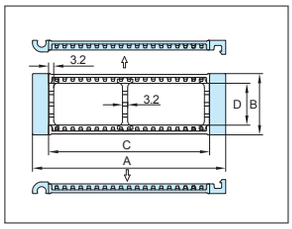


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
50	311	149	146
70	367	135	186
90	422	182	226
120	533	221	286
150	589	232	346

(Dimensions in mm)

Chain cross section



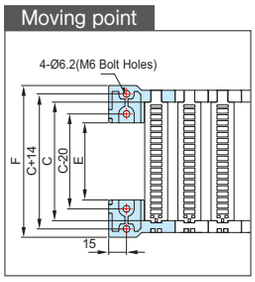


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
asb 028CR asb 028CR.L	55	38	35	26	0.90
	70		50		0.98
	75		55		1.02
	95		75		1.12
	120		100		1.27
	145		125		1.41
	170		150		1.59
	195		175		1.74
	220		200		1.84

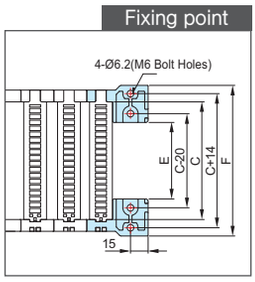
(Dimensions in mm)

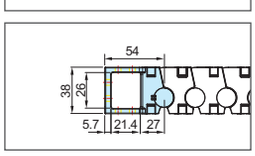
Free end bracket

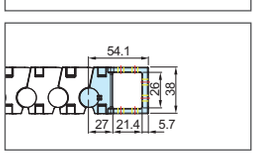
Moving point



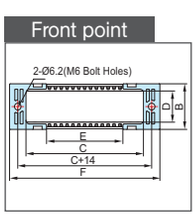
Fixing point







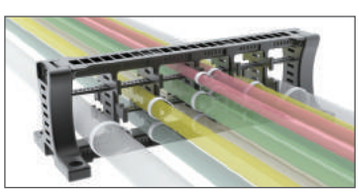
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
asb 028CR asb 028CR.L	63	38	35	26	0	M6 Bolt Holes
	78		50		15	
	83		55		20	
	103		75		40	
	128		100		65	
	153		125		90	
	178		150		115	
	203		175		140	
	228		200		165	

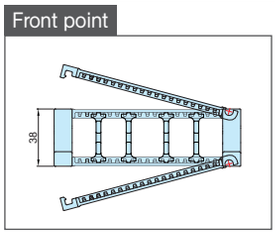
(Dimensions in mm)

System tie wrap (STW)

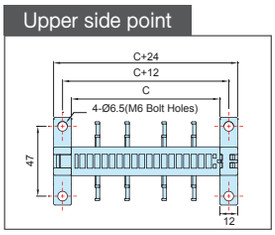


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

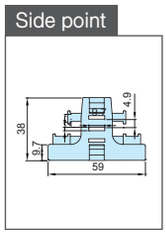
Front point



Upper side point

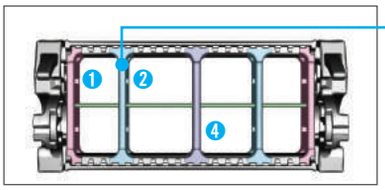


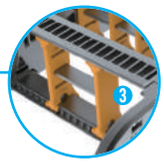
Side point

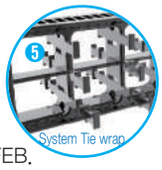


Chain Type	Ordering No.	C Frame	Hole Type
asb 028CR asb 028CR.L	S-TW.EB028.35	35	M6 Bolt Holes
	S-TW.EB028.50	50	
	S-TW.EB028.55	55	
	S-TW.EB028.75	75	
	S-TW.EB028.100	100	
	S-TW.EB028.125	125	
	S-TW.EB028.150	150	
	S-TW.EB028.175	175	
	S-TW.EB028.200	200	

Dividers(DV)

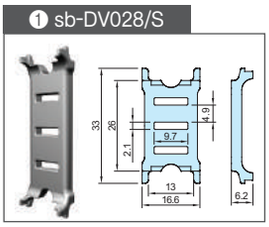




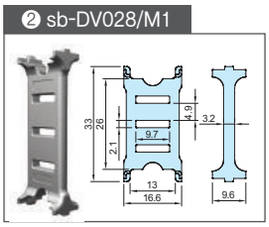


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

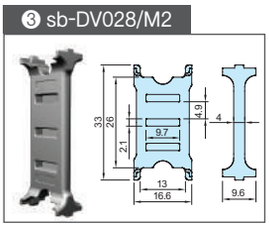
❶ sb-DV028/S



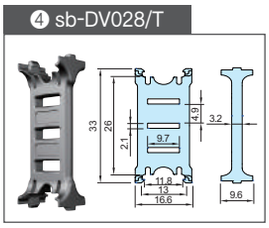
❷ sb-DV028/M1



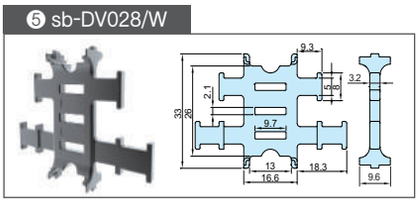
❸ sb-DV028/M2



❹ sb-DV028/T

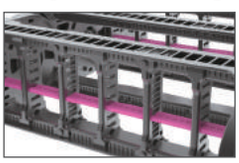


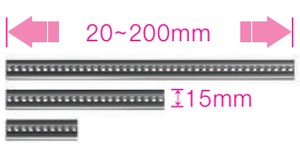
❺ sb-DV028/W



(Dimensions in mm)

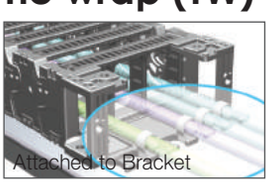
Separators(SP)

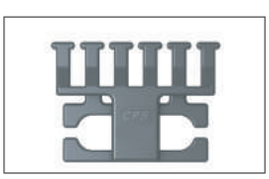


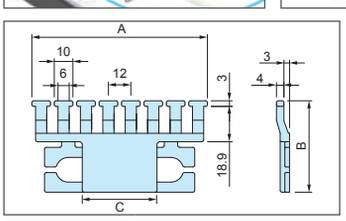


Chain Type	Ordering NO.	Frame
asb 028CR asb 028CR.L	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

Tie wrap (TW)

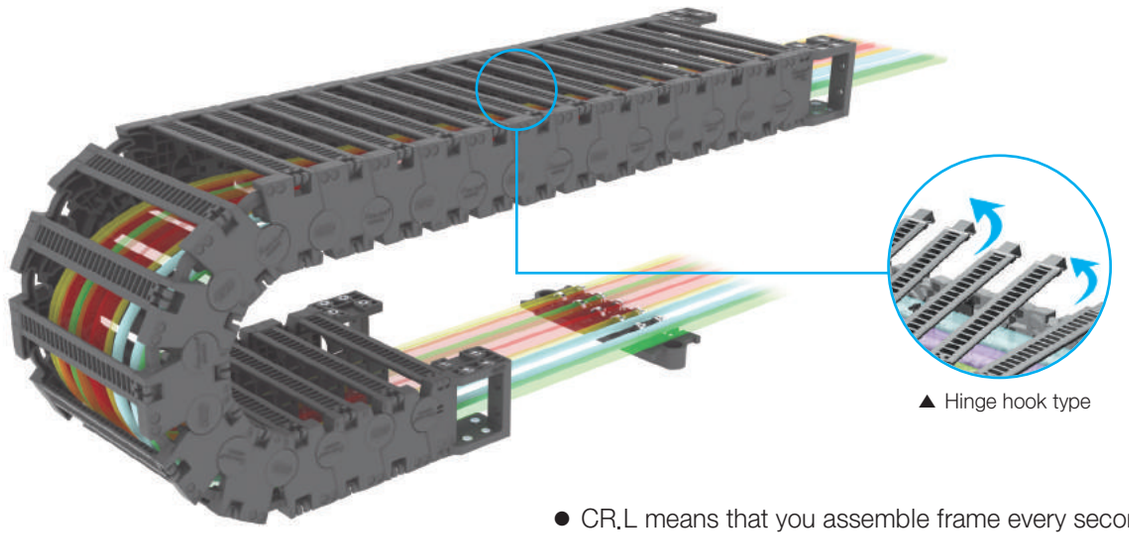






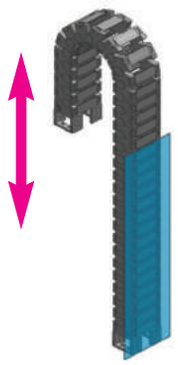
Chain Type	Ordering No.	A	B	C
asb 028CR asb 028CR.L	S-TW036/025CR.35	46	35.4	-
	S-TW036/025CR.50	69	48.9	15
	S-TW036/025CR.55	70	48.9	20
	S-TW036/025CR.75	94	48.9	40
	S-TW036/025CR.100	118	48.9	65
	S-TW036/025CR.125	142	48.9	90

asb 035CR/asb 035CR.L

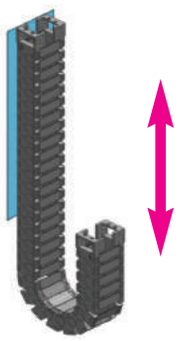


▲ Hinge hook type

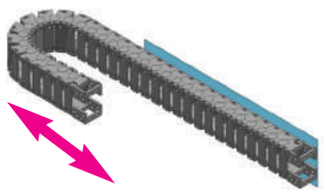
● CR.L means that you assemble frame every second link instead of every link.



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

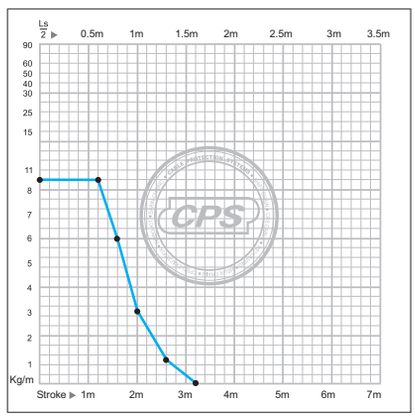
≫ Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

≫ Other installation length

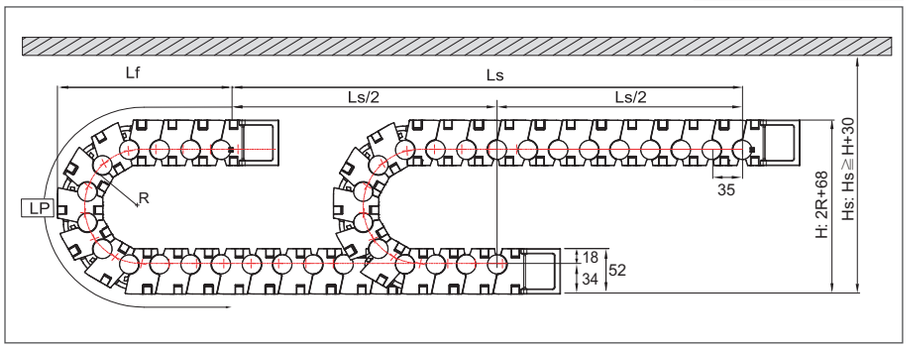
Vertical curve above = max 3.0m
Vertical curve below = max 50m
Side Mounted, Unsupported = max 1.0m

≫ Load diagrams self-supporting length



≫ Layout of the chain

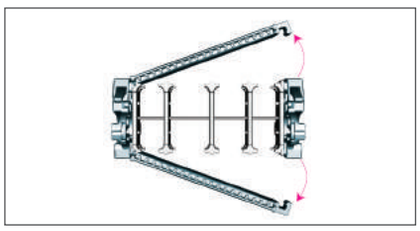
Ls: Stroke Hs: Safe Space

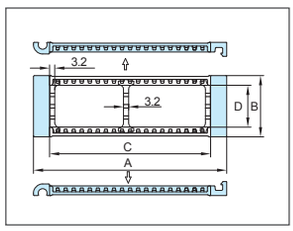


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
75	471	226	218
100	550	251	268
125	628	276	318
150	706	301	368
200	863	351	468

(Dimensions in mm)

Chain cross section



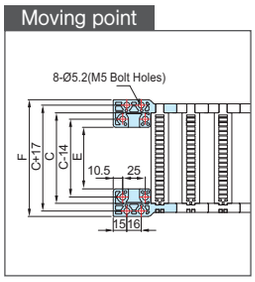


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
asb 035CR asb 035CR.L	55	52	35	40	1.00
	70		50		1.06
	75		55		1.09
	95		75		1.17
	120		100		1.29
	145		125		1.39
	170		150		1.53
	195		175		1.65
	220		200		1.73

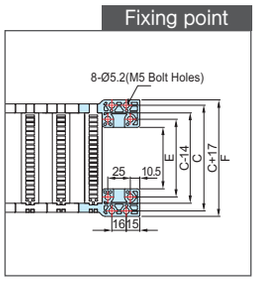
(Dimensions in mm)

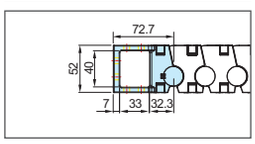
Free end bracket

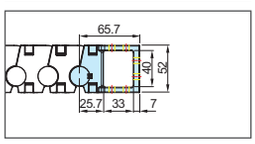
Moving point



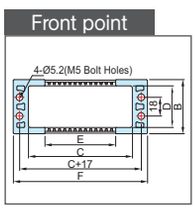
Fixing point







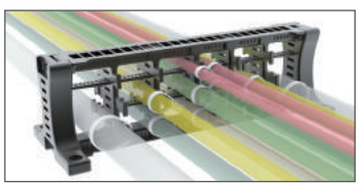
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
asb 035CR asb 035CR.L	64	52	35	40	3	M5 Bolt Holes
	79		50		18	
	84		55		23	
	104		75		43	
	129		100		68	
	154		125		93	
	179		150		118	
	204		175		143	
	229		200		168	

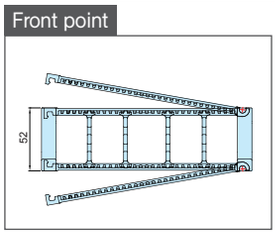
(Dimensions in mm)

System tie wrap (STW)

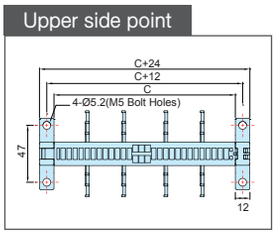


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

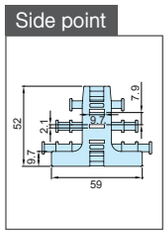
Front point



Upper side point

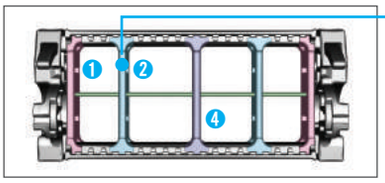


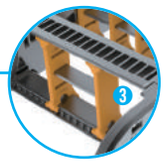
Side point



Chain Type	Ordering No.	C Frame	Hole Type
asb 035CR asb 035CR.L	S-TW.EB028.35	35	M5 Bolt Holes
	S-TW.EB028.50	50	
	S-TW.EB028.55	55	
	S-TW.EB028.75	75	
	S-TW.EB028.100	100	
	S-TW.EB028.125	125	
	S-TW.EB028.150	150	
	S-TW.EB028.175	175	
	S-TW.EB028.200	200	

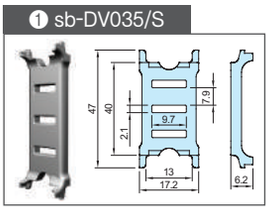
Dividers(DV)



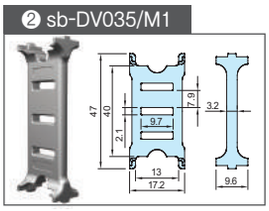


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

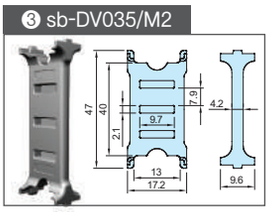
❶ sb-DV035/S



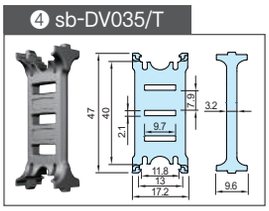
❷ sb-DV035/M1



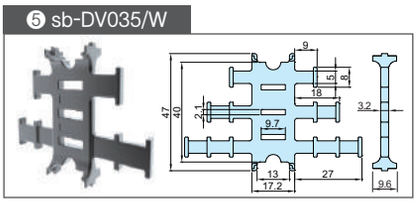
❸ sb-DV035/M2



❹ sb-DV035/T

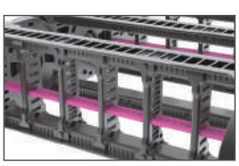


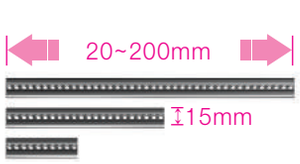
❺ sb-DV035/W



(Dimensions in mm)

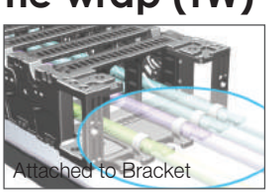
Separators(SP)

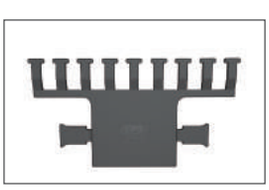


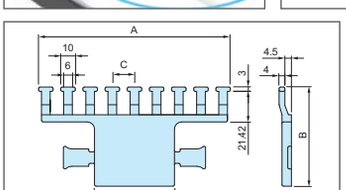


Chain Type	Ordering NO.	Frame
asb 035CR asb 035CR.L	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

Tie wrap (TW)

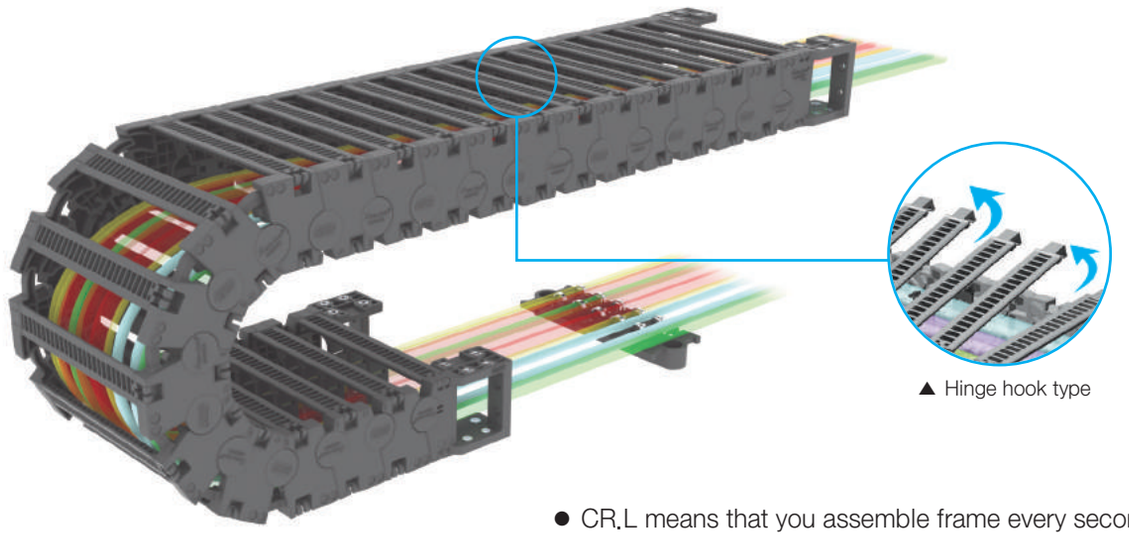






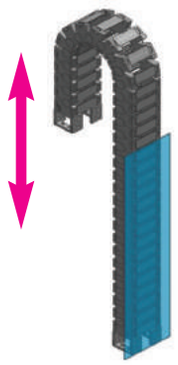
Chain Type	Ordering No.	A	B	C	D
asb 035CR asb 035CR.L	S-TW050/035N.50	82	64.5	12.00	5
	S-TW050/035N.55	82		12.00	10
	S-TW050/035N.75	107		12.13	30
	S-TW050/035N.100	132		15.25	55
	S-TW050/035N.125	157		14.70	80
	S-TW050/035N.150	182		14.35	105
	S-TW050/035N.175	203		12.31	130
	S-TW050/035N.200	232		13.88	155

asb 045CR/asb 045CR.L

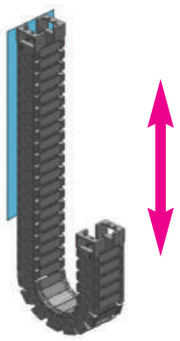


▲ Hinge hook type

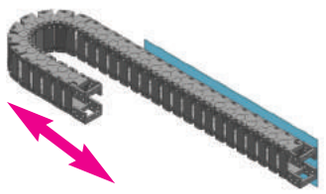
- CR.L means that you assemble frame every second link instead of every link.



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

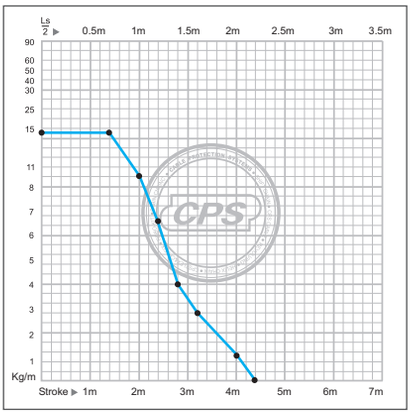
≫ Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

≫ Other installation length

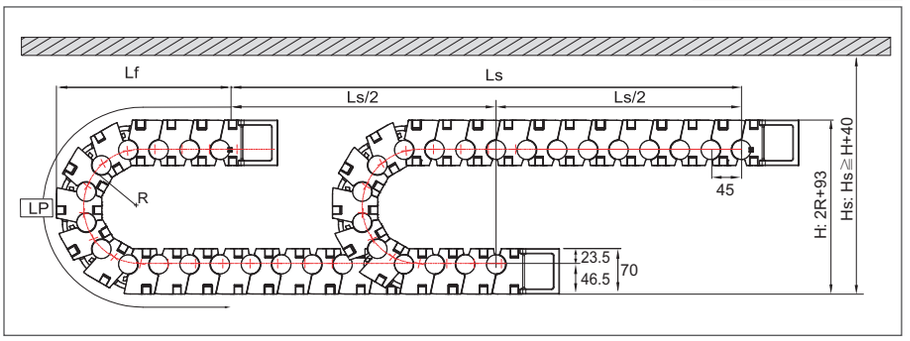
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 2.5m

≫ Load diagrams self-supporting length



≫ Layout of the chain

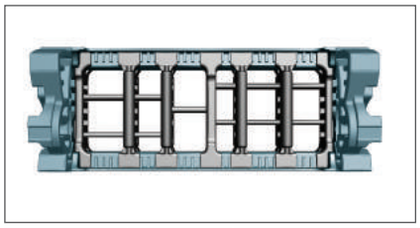
Ls: Stroke Hs: Safe Space

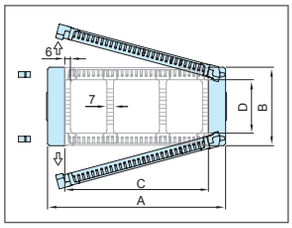


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
75	587	279	243
100	665	304	293
120	728	324	333
140	791	344	373
200	979	404	493
250	1,136	454	593
300	1,293	504	693

(Dimensions in mm)

Chain cross section



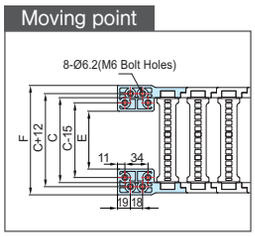


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
asb 045CR asb 045CR.L	80 105 130 155 170 180 195 205 220 230 270 280 330	70	50 75 100 125 140 150 165 175 190 200 240 250 300	49	2.59 2.74 2.90 3.11 3.23 3.31 3.41 3.48 3.90 4.18 4.64 4.76 5.32

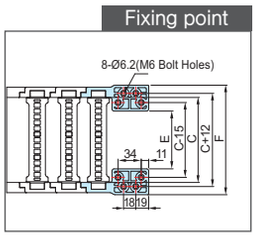
(Dimensions in mm)

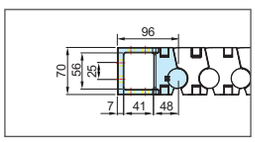
Free end bracket

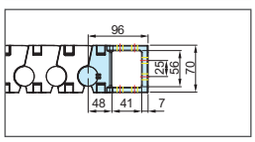
Moving point



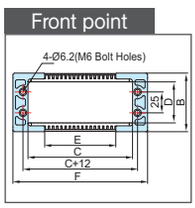
Fixing point







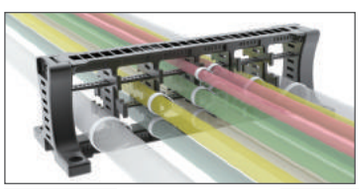
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
asb 045CR asb 045CR.L	86 111 136 161 176 186 201 211 226 236 276 286 336	70	50 75 100 125 140 150 165 175 190 200 240 250 300	49	10 35 60 85 100 110 125 135 150 160 200 210 260	M6 Bolt Holes

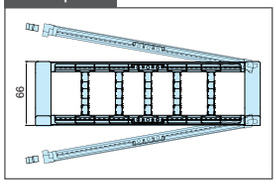
(Dimensions in mm)

System tie wrap (STW)

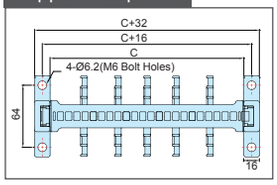


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

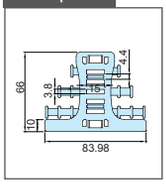
Front point



Upper side point

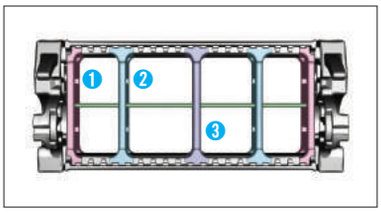


Side point



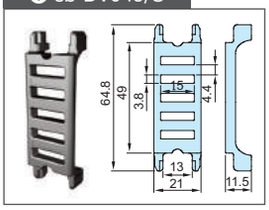
Chain Type	Ordering No.	C Frame	Hole Type
asb 045CR asb 045CR.L	S-TW.EB045.50 S-TW.EB045.75 S-TW.EB045.100 S-TW.EB045.125 S-TW.EB045.140 S-TW.EB045.150 S-TW.EB045.165 S-TW.EB045.175 S-TW.EB045.190 S-TW.EB045.200 S-TW.EB045.240 S-TW.EB045.250 S-TW.EB045.300	50 75 100 125 140 150 165 175 190 200 240 250 300	M6 Bolt Holes

Dividers(DV)

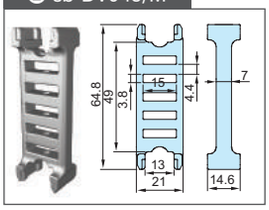


Assemble divider every second frame.
DV.T : Applied to Frame 200~300.
DV.M : Normal Divider.

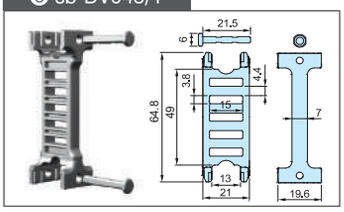
❶ sb-DV045/S



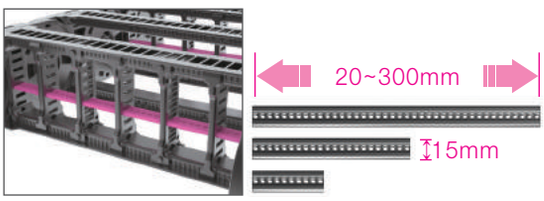
❷ sb-DV045/M



❸ sb-DV045/T

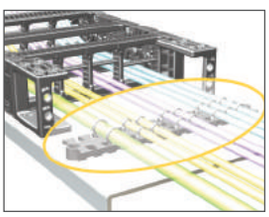


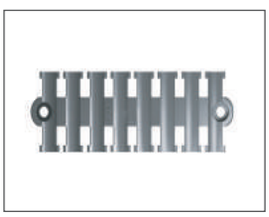
Separators(SP)

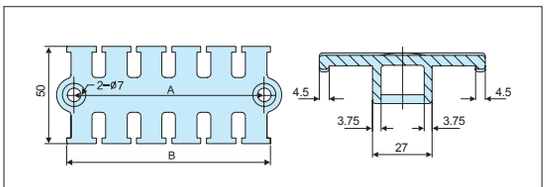


Chain Type	Ordering NO.
asb 045CR asb 045CR.L	sb-SP/400.400

Tie wrap (TW)







Chain Type	Ordering No.	A	B
asb 045CR asb 045CR.L	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

(Dimensions in mm)

nsb Chain - Clean room type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Noise level	30dB(DIN EN 61672-1)
Speed	5m/s
Acceleration	15m/s²
Temperature	-30℃ ~+130℃
Special production	ESD, UV, Customized color
Certificate	CE, IPA, ATEX(Ex), TUV

Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

nsb Chain **CR Type**	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Size A	Size B	Size C	Size D	Frame style	Section - composition
nsb 020CR	20	28,38,48	0.32 0.35	5	-30 ~ +130	34 54	22	20 40	15		
nsb 022CR	22	35, 45, 75, 100, 120	0.43 0.47 0.51 0.55 0.67 0.69	5	-30 ~ +130	30 41 51 61 81 91	29	16 27 37 47 67 77	22		
nsb 028CR	28	50, 70, 90, 120, 150	0.90 0.98 1.02 1.12 1.27 1.41 1.59 1.74 1.84	5	-30 ~ +130	55 70 75 95 120 145 170 195 220	38	35 50 55 75 100 125 150 175 200	26		
nsb 035CR	35	75, 100, 125, 150, 200	1.00 1.06 1.09 1.17 1.29 1.39 1.53 1.65 1.73	5	-30 ~ +130	55 70 75 95 120 145 170 195 220	52	35 50 55 75 100 125 150 175 200	40		
nsb 045CR	45	75, 100, 120, 140, 200, 250, 300	2.59 2.74 2.90 3.11 3.23 3.31 3.41 3.48 3.90 4.18 4.64 4.76 5.32	5	-30 ~ +130	80 105 130 155 170 180 195 205 220 230 270 280 330	70	50 75 100 125 140 150 165 175 190 200 240 250 300	49		
nsb 060CR	60	125, 140, 190, 220, 270, 390	3.56 3.66 3.97 4.16 4.33 4.52 4.64 4.98 5.06 5.48 6.09 6.66	5	-30 ~ +130	115 140 165 190 215 230 240 280 290 340 390 440	82	75 100 125 150 175 190 200 240 250 300 350 400	56		
nsb 075CR	75	180, 200, 250, 300, 350, 400, 500	5.37 5.57 5.72 5.82 6.01 6.26 6.68 7.11 7.22 7.80 7.94 8.67 9.43 10.01 10.41 11.88 12.17	5	-30 ~ +130	115 140 155 165 190 215 240 280 290 330 340 390 440 490 540 590 640	108	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78		

(Dimensions in mm)

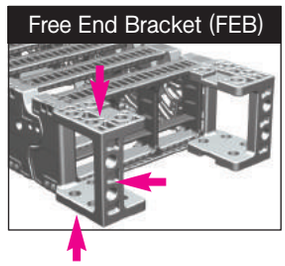
Ordering

nsb 020CR. 20. R48 / F - 600L : 10ST

- Sabin Chain
- Clean Room (CR)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

Bracket type

Free End Bracket (FEB)



▶ IPA Test result
- nsb 020CR.20.R48 : ISO Class1
- nsb 045CR.75.R75 : ISO Class1
- nsb 035CR.55.R75 : ISO Class2

≫ Characteristics of nsb Chain Cleanroom

- Low Noise due to innovative design of side band.

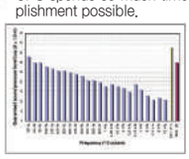
nsb CR type

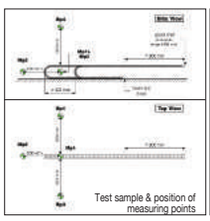
nsb N type

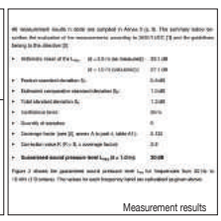
As it's designed differently compared to Normal type that has more friction space when assembled. It means that CR type has less friction space each other when assembled, thus, it makes low noise during operation.

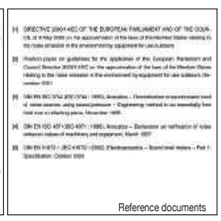
- The Quietest Cable Chain in the world

Unsatisfied with only just our own in-house testing, we sent our cable chain to the experts at the TUV testing facility in Germany and let them decide. The result was a mouse-like 30db noise level. The quietest ever recorded. It is the patented techniques CPS spends so much time perfecting this astounding accomplishment possible.

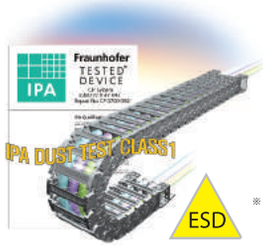






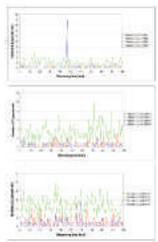


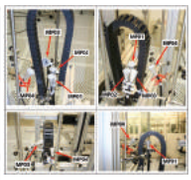
- Low Dust Cable Chain



Sabin Chain was given ISO CLASS1 clean room certification according to the Germany IPA Dust Collection Test (VDI 2083 CLASS 1 / DIN EN 14644-1 ISO CLASS 1) thereby surpassing the allowable standard of Class 1 and easily qualifying it for use in semiconductor production lines on automation machine tools and machines requiring quiet but quick applications.

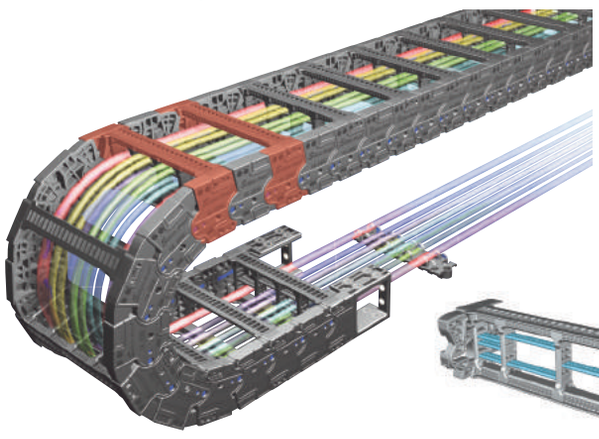
※ This test was done by the IPA TEST CENTER for the semiconductor manfacturer equipment and measurement processed with CLASS1 CLEAN ROOM(US Federal Standard 209E)



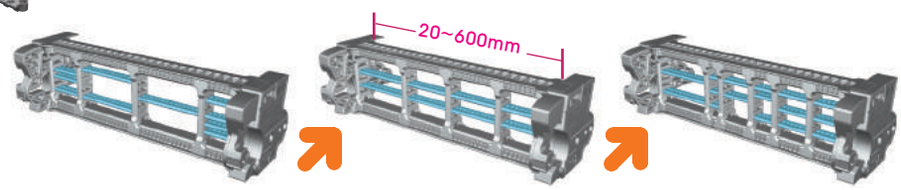


- Clean room environment
  Air speed(0.45 m/s)
  Temperature(+5°C)
  Humidity (45%)
- Test equipment
  Fraunhofer IPA Test machine
- Measurement Skill
  To checking the dust dimension of ＞0.2㎛, ＞0.3㎛, ＞0.5㎛, use LPSA210 TYPE machine made by PMS.
- Test operation and analysis
  Operated by the guideline of VDI 2083 Part8

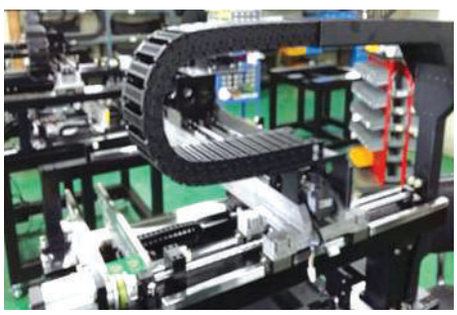
- Section composition method



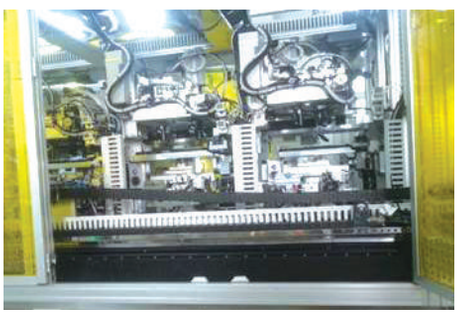
You should make section composition every second frames to make sure long lifetime of cables by preventing from twisting and lost of cables inside. (It's strongly recommended for customers who want to use for long time). It's basic issue and one of the most important factors showing long lifetime of cables.
You can make suitable section composition by using our diverse our dividers and separators that can be modified from 20mm ~ 600mm.



≫ Application of nsb Chain Clean Room type



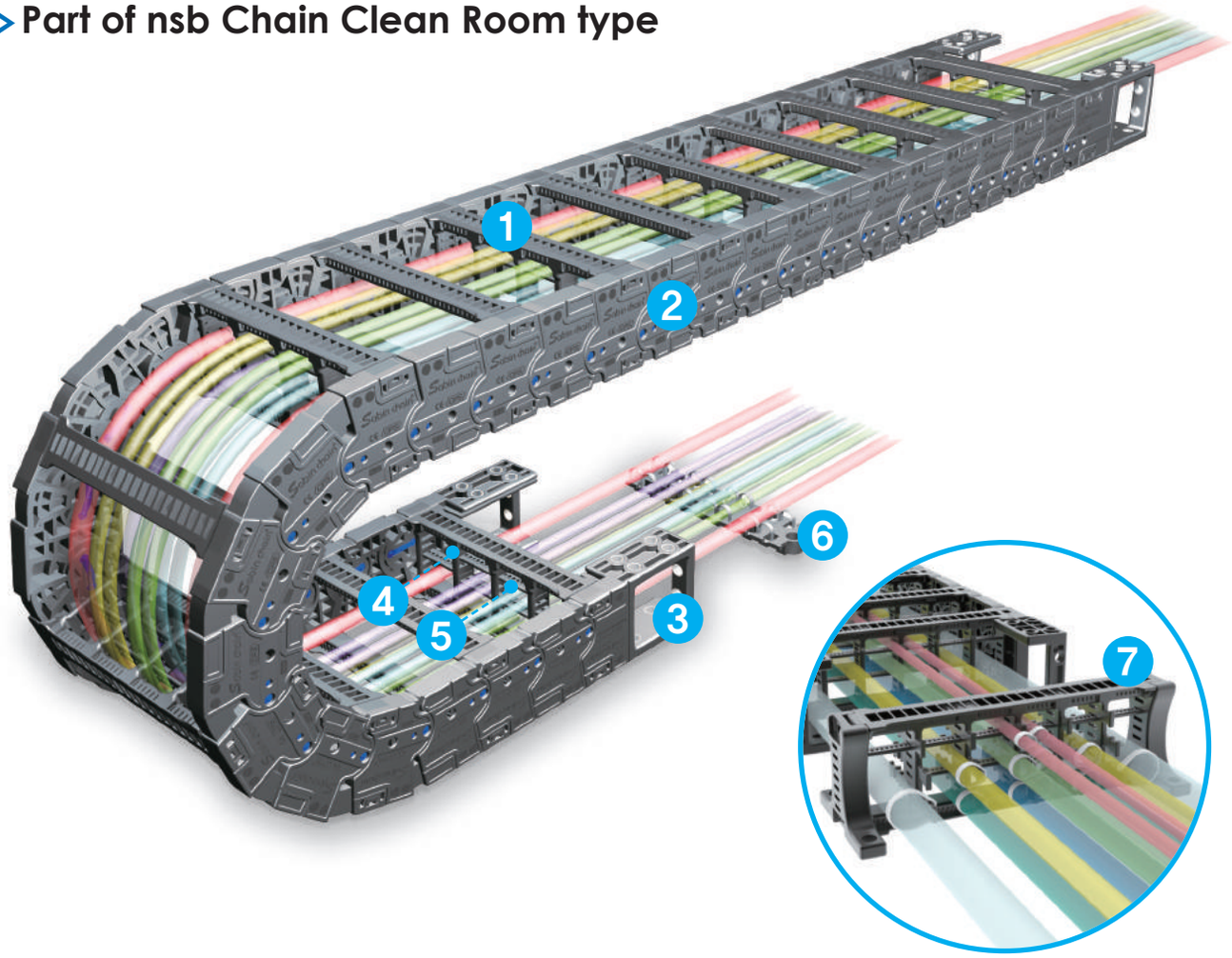
▶ NSB 022CR **Application:**
Testing machine for Lead application
Location:
Korea



▶ NSB 035CR
Application:
LCD Cleaner Line
Location:
Korea

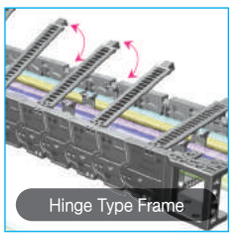
nsb Chain - Clean room type

≫ Part of nsb Chain Clean Room type



❶ Frame (FR)

Hinged-type frame, open one side, supports connection of both side of side band and have tongue and groove system plate to secure the position of the divider on the frame.

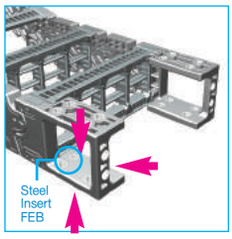


❷ Side Band (SB)

It's part of cable chain that each side band's connected by holding band.

❸ FREE END BRACKET (FEB)

A unit that connects at last side band (left&right). It can be fixed stronger using steel washers.



❹ Divider (DV-S, M, R, T)

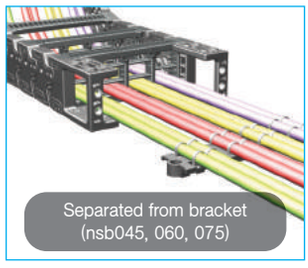
A unit that divides inserted cables horizontally.

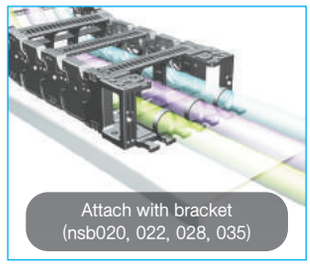
❺ Separators (SP)

A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❻ Tie wrap (TW)

A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.



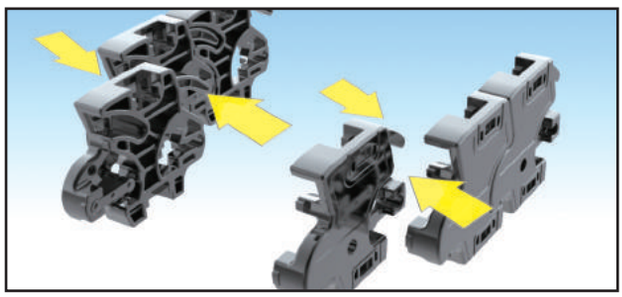


❼ System tie wrap (STW)

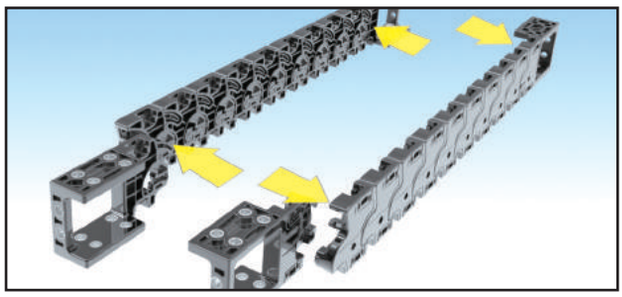
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisting and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

≫ Assembly procedure of nsb Chain Clean room Type

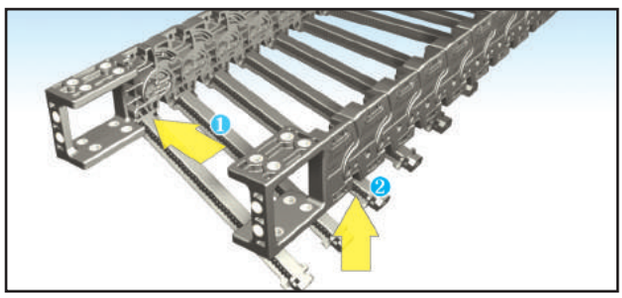
The assembling process of CR-Type of New Sabin Chain is like below and users must use rubber hammer with careful combination of Divider and Separator.



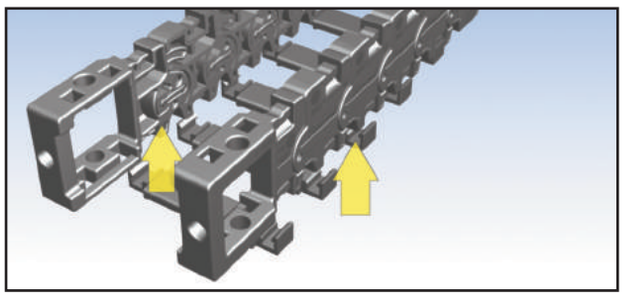
1 Connect each side band as many as you need.



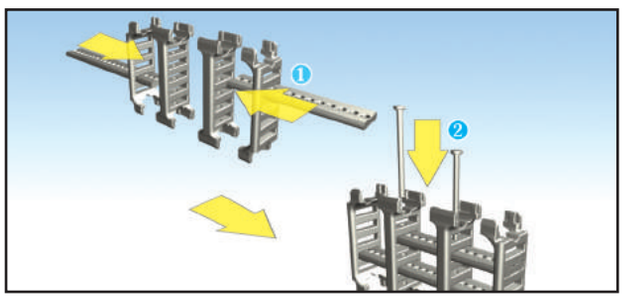
2 Assemble the end brackets on both ends.



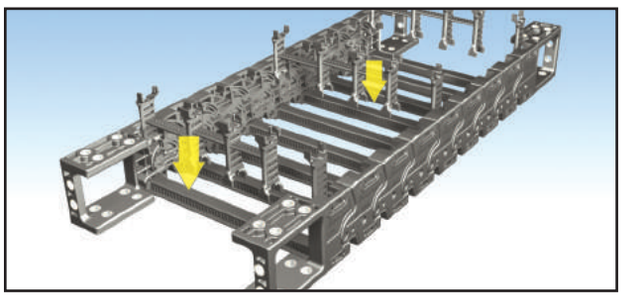
3 Attach frames to one side groove on the frames, then the other side.



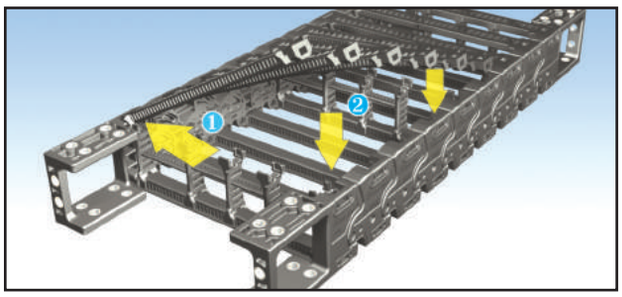
3-1 For nsb020CR and nsb022CR, they are not Hinge Type for method to connect frames, but Hook Type on both sides.



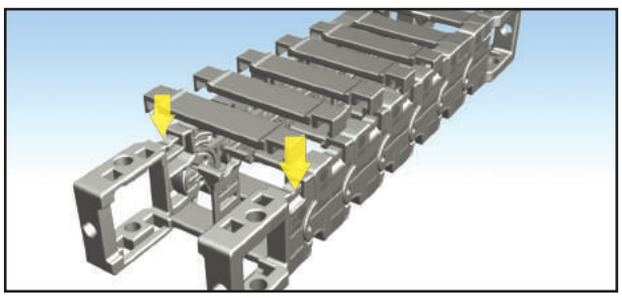
4 For nsb 045, 060, and 075, connect the pin of separator in hole of divider after inserting separator in hole of divider. For nsb028 and nsb035, separator fixing pins are not used.



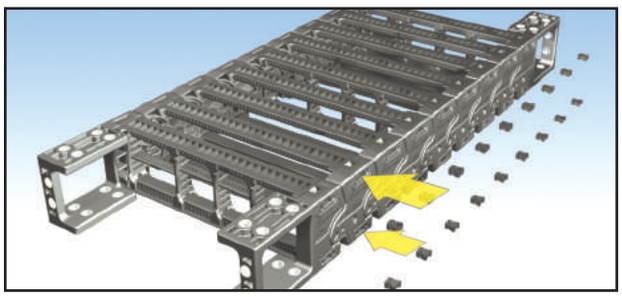
5 Fix the separator and divider patterns to the bottom-side frames as needed.



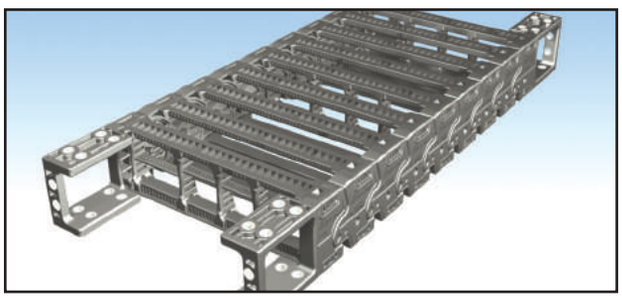
6 Attach frames to one side groove on the frames, then the other side.



6-1 For nsb020CR and nsb022CR, they are not Hinge Type for method to connect frames, but Hook Type on both sides.



7 Insert frame pins to secure the frames and complete carrier. (nsb045, 060, 075 are applied with frame pin, and nsb028, 035 are Hinge Type or Hook Type without frame pin.)



8 Complete to assemble New Sabin CR-Type, Sabin Chain.

nsb Chain - Clean room type

≫ Part list of nsb Chain Clean Room type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
nsb020CR	SIDE BAND	nsb-SB020CR.R*(LH) nsb-SB020CR.R*(RH)	Left side band of nsb020CR Right side band of nsb020CR
	FRAME	sb-FR018CR.20 sb-FR018CR.40	Frame, 20mm Frame, 40mm
	FREE END BRACKET	nsb-FEB020CR	End bracket of nsb020CR
	DIVIDER	sb-DV018CR	Normal divider, clean room type
	TIE WRAP	sb-TW018CR.20 sb-TW018CR.40	Tie wrap for end bracket to fix cables, 20mm Tie wrap for end bracket to fix cables, 40mm

Model	Classification	Part number	Description
nsb022CR	SIDE BAND	nsb-SB022CR.R*(LH) nsb-SB022CR.R*(RH)	Left side band of nsb022CR Right side band of nsb022CR
	FRAME	sb-FR020CR.16 S-FR033/020CR.27 S-FR033/020CR.37 S-FR033/020CR.47 S-FR033/020CR.67 S-FR033/020CR.77	Frame, 16mm Frame, 27mm Frame, 37mm Frame, 47mm Frame, 67mm Frame, 77mm
	FREE END BRACKET	nsb-FEB022CR	End bracket of nsb022CR
	DIVIDER	sb-DV020CR	Normal divider, cleanroom type
	TIE WRAP	sb-TW020CR.16 S-TW033/020CR.27 S-TW033/020CR.37 S-TW033/020CR.47 S-TW033/020CR.67 S-TW033/020CR.77	Tie wrap for end bracket to fix cables, 16mm Tie wrap for end bracket to fix cables, 27m Tie wrap for end bracket to fix cables, 37mm Tie wrap for end bracket to fix cables, 47mm Tie wrap for end bracket to fix cables, 67mm Tie wrap for end bracket to fix cables, 77mm

Model	Classification	Part number	Description
nsb028CR	SIDE BAND	nsb-SB028CR.R*(LH) nsb-SB028CR.R*(RH)	Left side band of nsb028CR Right side band of nsb028CR
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	nsb-FEB028CR	End bracket of nsb028CR
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

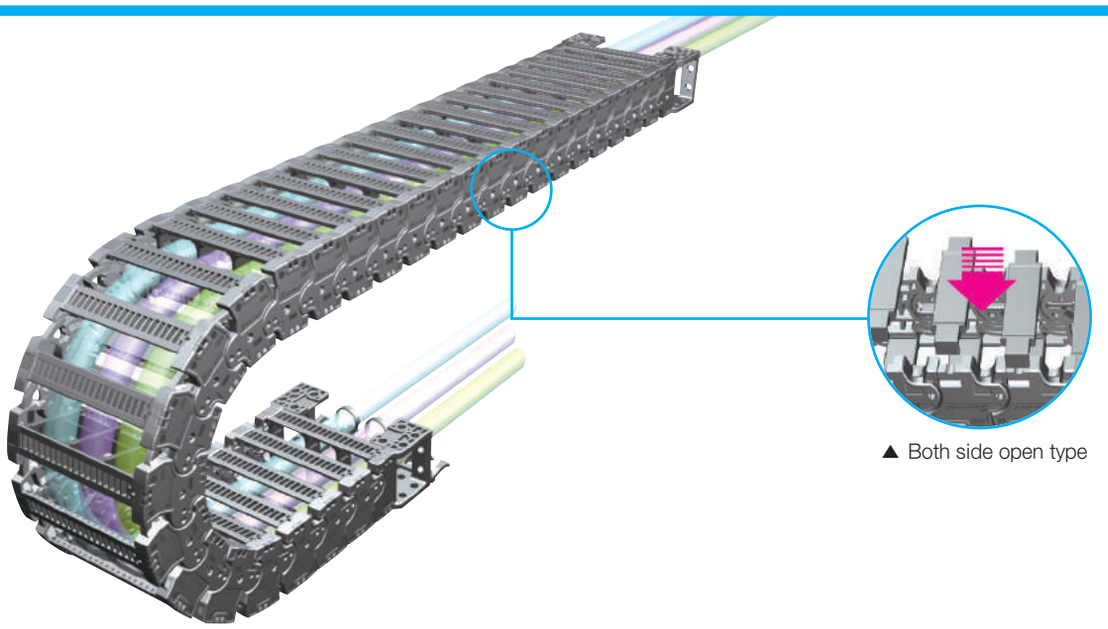
Model	Classification	Part number	Description
nsb035CR	SIDE BAND	nsb-SB035CR.R*(LH) nsb-SB035CR.R*(RH)	Left side band of nsb035CR Right side band of nsb035CR
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	nsb-FEB035CR	End bracket of nsb035CR
	DIVIDER	sb-DV035/M sb-DV035/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW036/025CR.50 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125 S-TW036/025CR.150 S-TW036/025CR.175 S-TW036/025CR.200	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm Tie wrap for end bracket to fix cables, 175mm Tie wrap for end bracket to fix cables, 200mm
	SYSTEM TIE WRAP	sb-DV035/W S-TW.EB035	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
nsb045CR	SIDE BAND	nsb-SB045CR,R*(LH) nsb-SB045CR,R*(RH)	Left side band of nsb045CR Right side band of nsb045CR
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR045,50 sb-FR045,75 sb-FR045,100 sb-FR045,125 sb-FR045,140 sb-FR045,150 sb-FR045,165 sb-FR045,175 sb-FR045,190 sb-FR045,200 sb-FR045,240 sb-FR045,250 sb-FR045,300	Frame, 50mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 140mm Frame, 150mm Frame, 165mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 300mm
	FREE END BRACKET	nsb-FEB045CR sb-FEB/WH045	End bracket of nsb045CR Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S sb-DV045/T sb-DV045/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400,400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW,EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

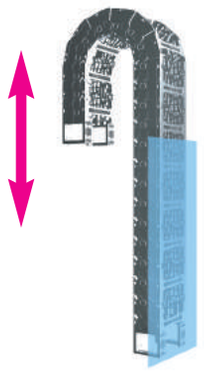
Model	Classification	Part number	Description
nsb060CR	SIDE BAND	nsb-SB060CR,R*(LH) nsb-SB060CR,R*(RH)	Left side band of nsb060CR Right side band of nsb060CR
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR060,75 sb-FR060,100 sb-FR060,125 sb-FR060,150 sb-FR060,175 sb-FR060,190 sb-FR060,200 sb-FR060,230 sb-FR060,250 sb-FR060,300 sb-FR060,350 sb-FR060,400	Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 230mm Frame, 250mm Frame, 300mm Frame, 350mm Frame, 400mm
	FREE END BRACKET	nsb-FEB060CR sb-FEB/WH060	End bracket of nsb060CR Steel washer for end bracket
	DIVIDER	sb-DV060/M sb-DV060/S sb-DV060/R sb-DV060/T sb-DV060/TP	Normal divider To fix separstors at the both side section Roller divider to reduce friction with cables, Clean room type T divider T divider pin
	SEPARATOR	sb-SP/400,400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW,EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
nsb075CR	SIDE BAND	nsb-SB075CR,R*(LH) nsb-SB075CR,R*(RH)	Left side band of nsb075CR Right side band of nsb075CR
	FRAME PIN	S-FP/S2	Frame pin
	FRAME	sb-FR075/100,75 sb-FR075/100,100 sb-FR075/100,115 sb-FR075/100,125 sb-FR075/100,150 sb-FR075/100,175 sb-FR075/100,200 sb-FR075/100,240 sb-FR075/100,250 sb-FR075/100,290 sb-FR075/100,300 sb-FR075/100,350 sb-FR075/100,400 sb-FR075/100,450 sb-FR075/100,500 sb-FR075/100,550 sb-FR075/100,600	Frame, 75mm Frame, 100mm Frame, 115mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 290mm Frame, 300mm Frame, 350mm Frame, 400mm Frame, 450mm Frame, 500mm Frame, 550mm Frame, 600mm
	FREE END BRACKET	nsb-FEB075CR sb-FEB/WH075	End bracket of nsb075CR Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S sb-DV075/R sb-DV075/T sb-DV075/TP	Normal divider To fix separstors at the both side section Roller divider to reduce friction with cables, Clean room type T divider T divider pin
	SEPARATOR	sb-SP/400,400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW,EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

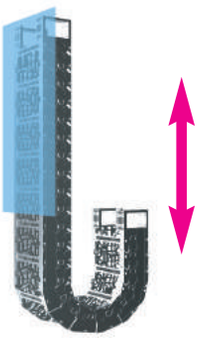
nsb 020CR



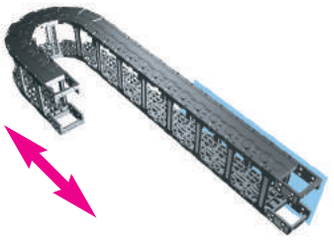
▲ Both side open type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

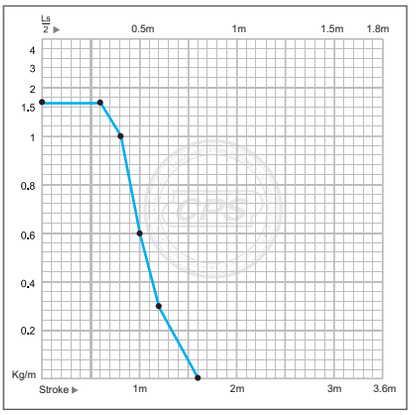
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

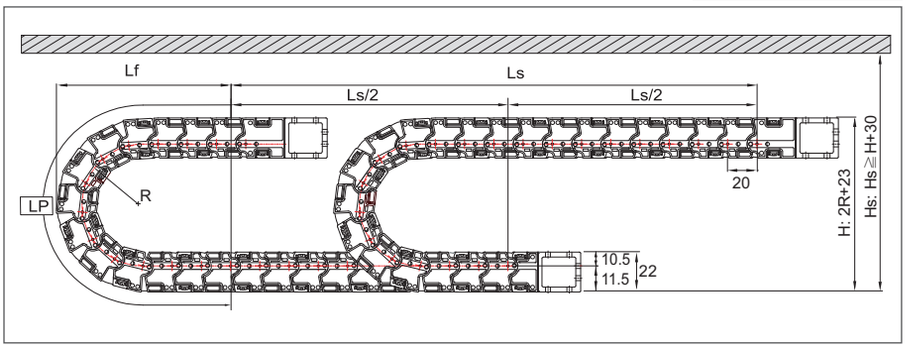
Vertical curve above = max 1.0m
Vertical curve below = max 5m
Side Mounted, Unsupported = max 0.5m

Load diagrams self-supporting length



Layout of the chain

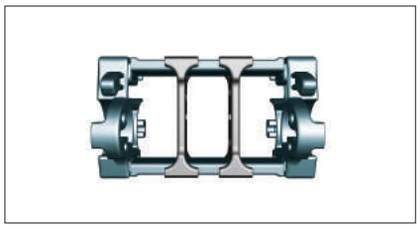
Ls: Stroke Hs: Safe Space

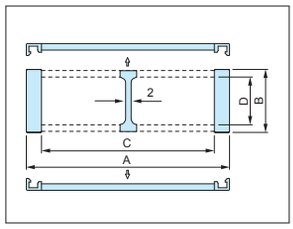


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
28	162	76	79
38	202	90	99
48	242	105	119

(Dimensions in mm)

Chain cross section

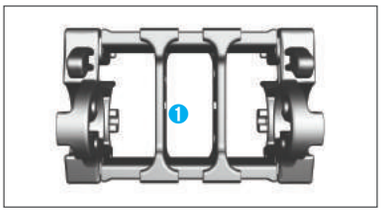




Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 020CR	34 54	22	20 40	15	0.32 0.35

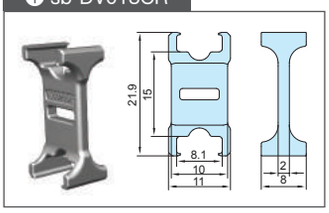
(Dimensions in mm)

Dividers(DV)



Assemble divider every third links.

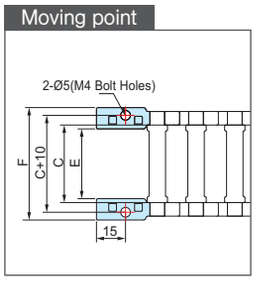
❶ sb-DV018CR



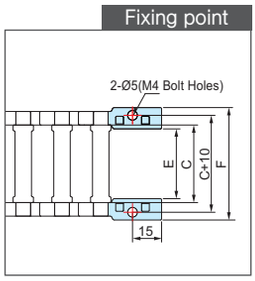
(Dimensions in mm)

Free end bracket

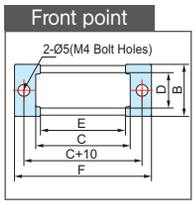
Moving point



Fixing point



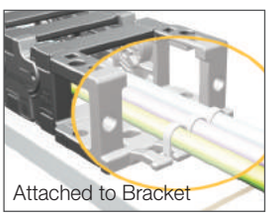
Front point



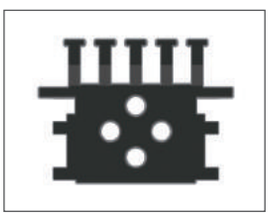
Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 020CR	38 58	22	20 40	15	16 36	M4 Bolt Holes

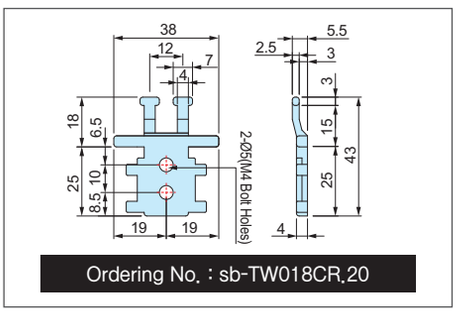
(Dimensions in mm)

Tie wrap (TW)

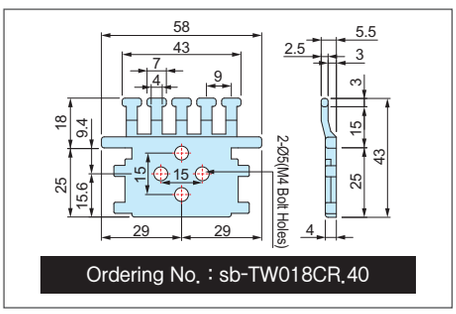


Attached to Bracket





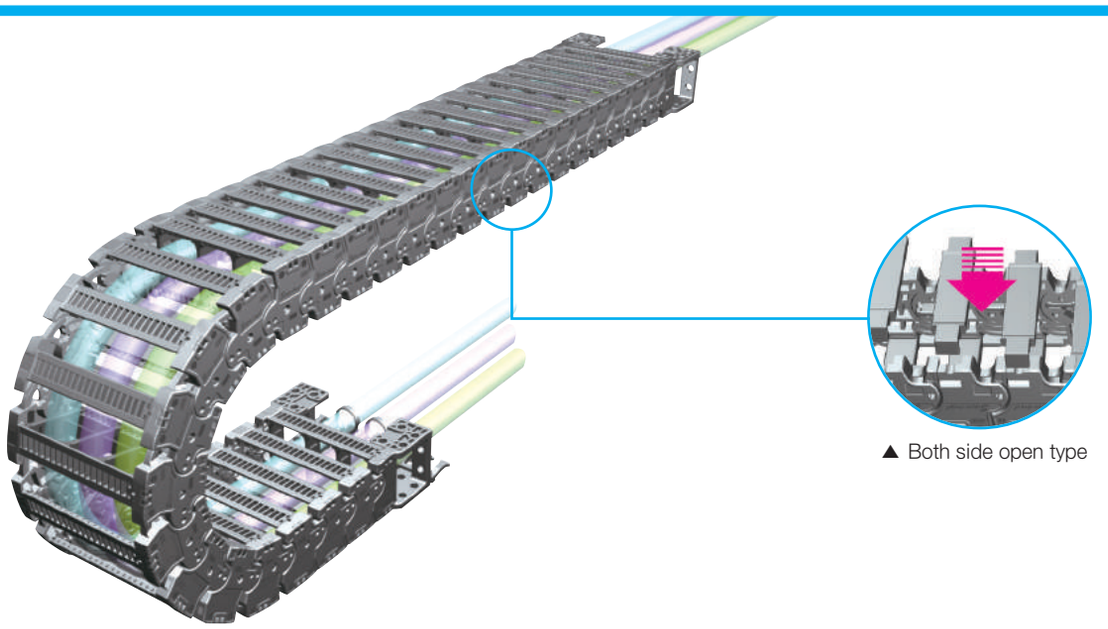
Ordering No. : sb-TW018CR.20



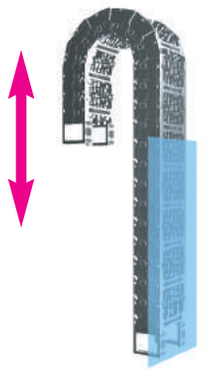
Ordering No. : sb-TW018CR.40

(Dimensions in mm)

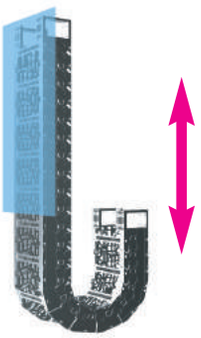
nsb 022CR



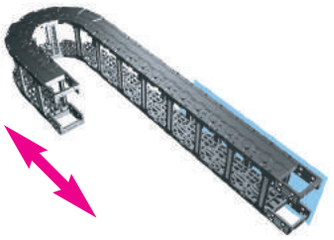
▲ Both side open type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

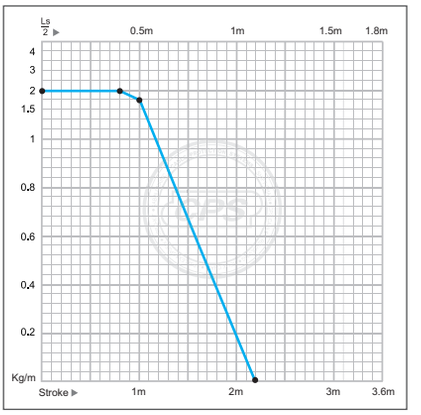
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

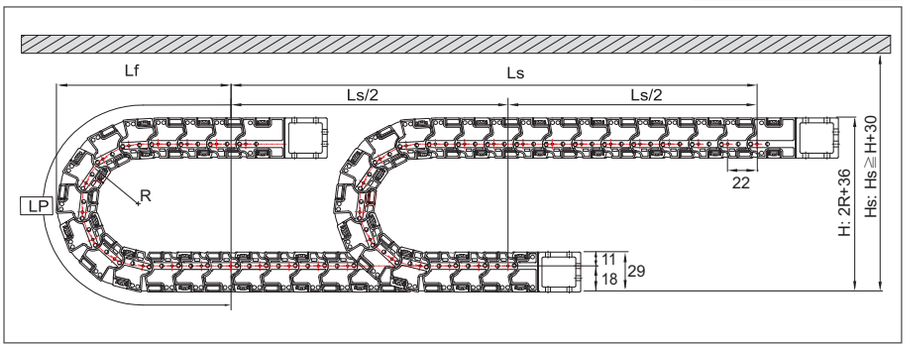
Vertical curve above = max 1.0m
Vertical curve below = max 5m
Side Mounted, Unsupported = max 0.5m

Load diagrams self-supporting length



Layout of the chain

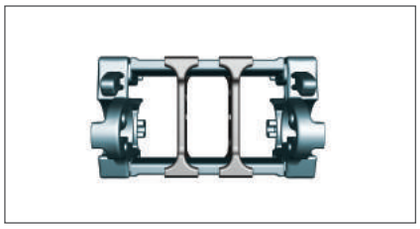
Ls: Stroke Hs: Safe Space

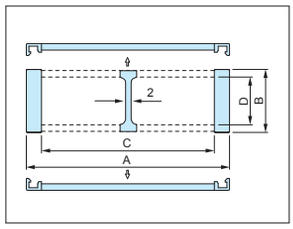


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
35	222	108	106
45	266	125	126
75	353	152	186
100	441	182	236
120	485	192	276

(Dimensions in mm)

Chain cross section

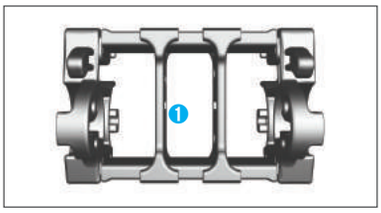




Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 022CR	30	29	16	22	0.43
	41		27		0.47
	51		37		0.51
	61		47		0.55
	81		67		0.67
	91		77		0.69
	114		100		0.81

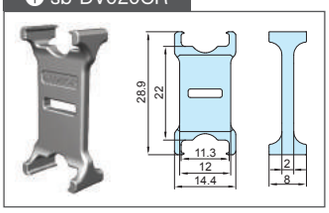
(Dimensions in mm)

Dividers(DV)



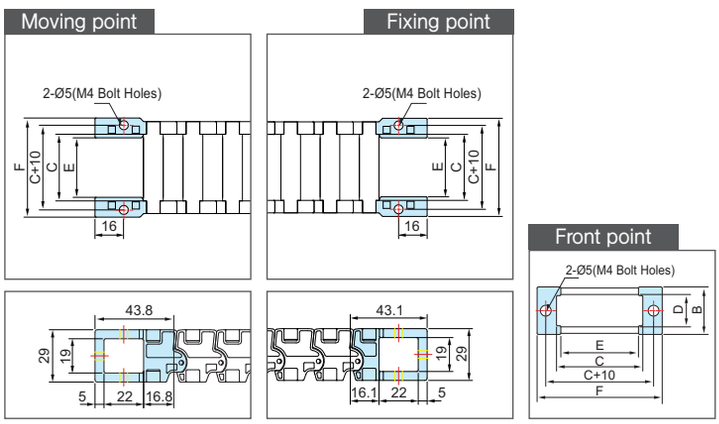
Assemble divider every third links.

1 sb-DV020CR



(Dimensions in mm)

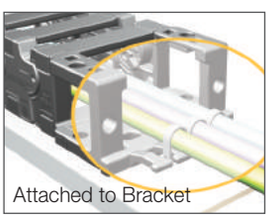
Free end bracket

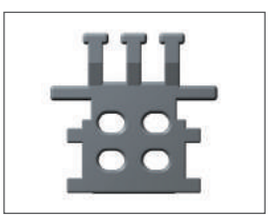


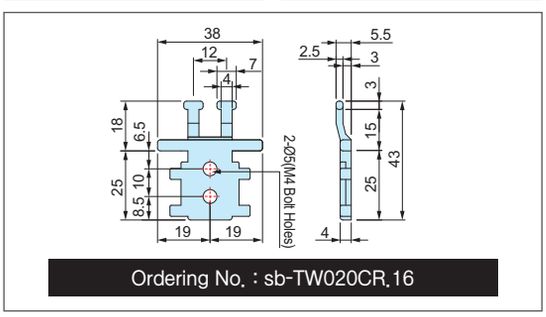
Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 022CR	34	29	16	22	12	M4 Bolt Holes
	45		27		23	
	55		37		33	
	65		47		43	
	85		67		63	
	95		77		73	
	118		100		96	

(Dimensions in mm)

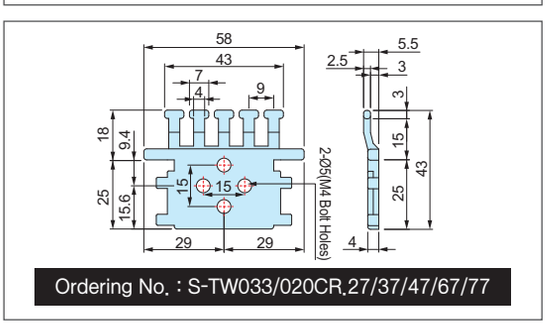
Tie wrap (TW)







Ordering No. : sb-TW020CR.16

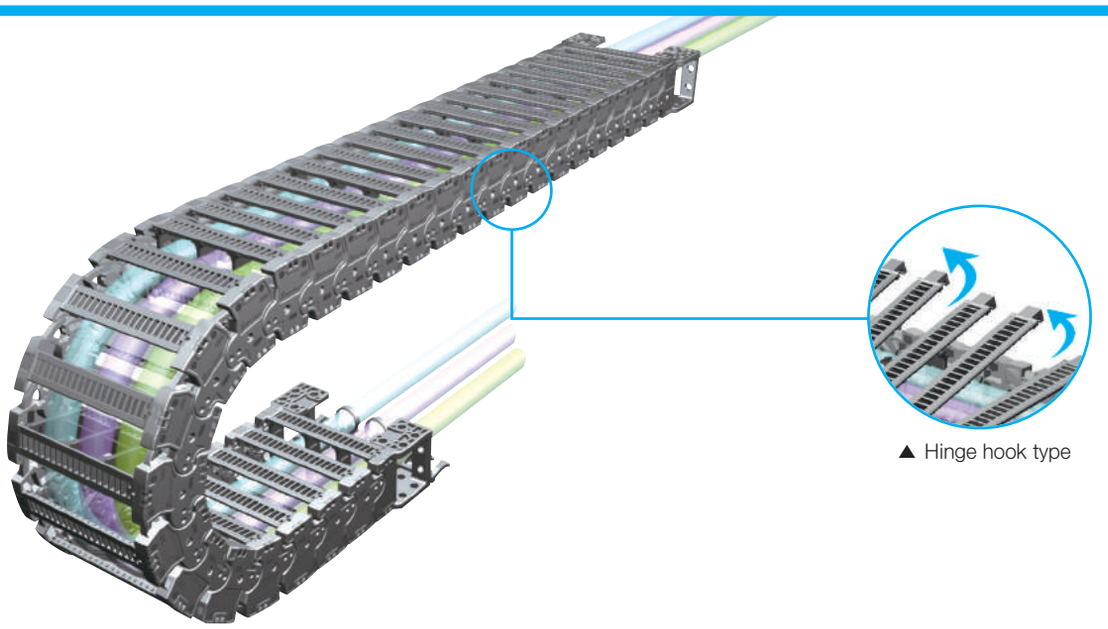


Ordering No. : S-TW033/020CR.27/37/47/67/77

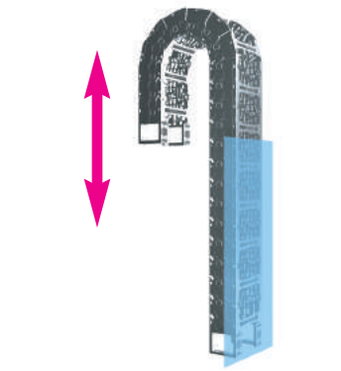
Chain Type	Ordering No.	A	B	C	D
nsb 022CR	sb-TW020CR.16	34	-	10.00	-
	S-TW033/020CR.27	45	27.5	10.20	12
	S-TW033/020CR.37	55	41.0	8.50	22
	S-TW033/020CR.47	65	48.0	10.40	32
	S-TW033/020CR.67	85	68.0	10.00	52
	S-TW033/020CR.77	95	78.0	8.87	62

(Dimensions in mm)

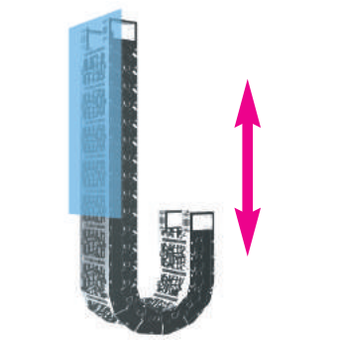
nsb 028CR



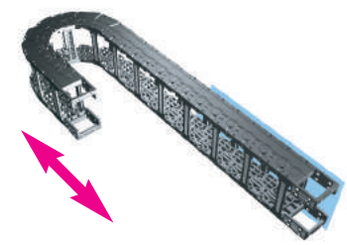
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

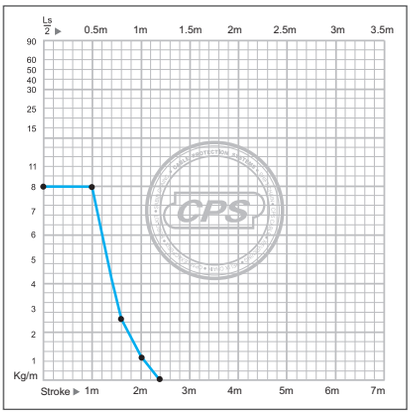
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

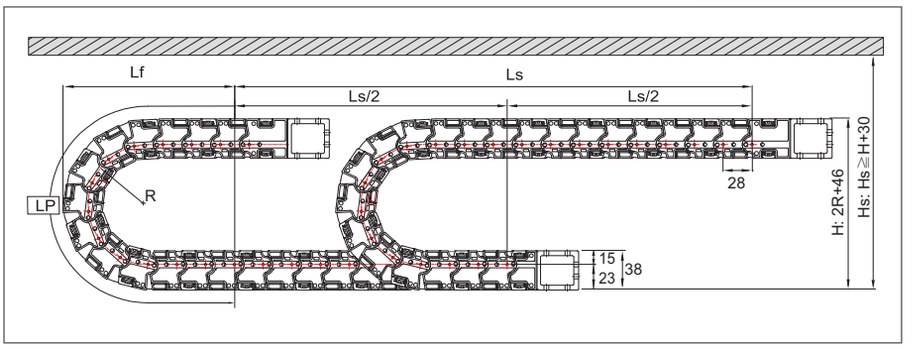
Vertical curve above = max 2.0m
Vertical curve below = max 40m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

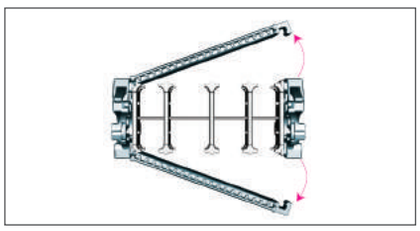
Ls: Stroke Hs: Safe Space

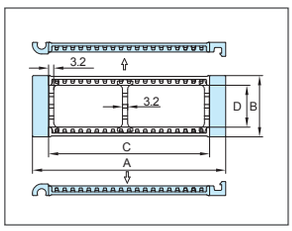


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
50	311	149	146
70	367	135	186
90	422	182	226
120	533	221	286
150	589	232	346

(Dimensions in mm)

Chain cross section



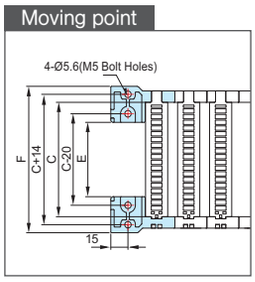


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 028CR	55	38	35	26	0.90
	70		50		0.98
	75		55		1.02
	95		75		1.12
	120		100		1.27
	145		125		1.41
	170		150		1.59
	195		175		1.74
	220		200		1.84

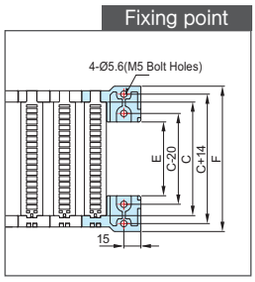
(Dimensions in mm)

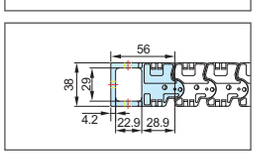
Free end bracket

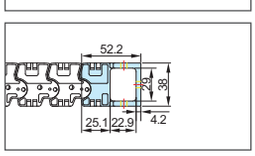
Moving point



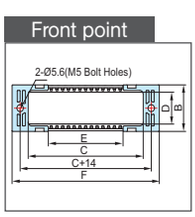
Fixing point







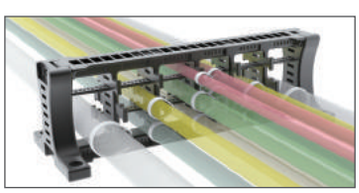
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 028CR	63	38	35	26	0	M5 Bolt Holes
	78		50		15	
	83		55		20	
	103		75		40	
	128		100		65	
	153		125		90	
	178		150		115	
	203		175		140	
	228		200		165	

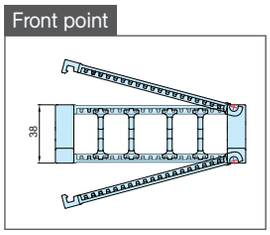
(Dimensions in mm)

System tie wrap (STW)

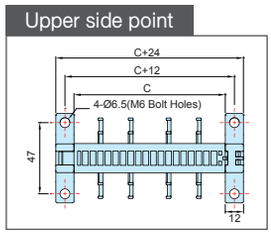


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

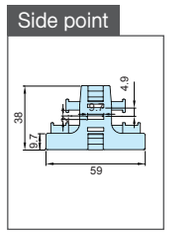
Front point



Upper side point

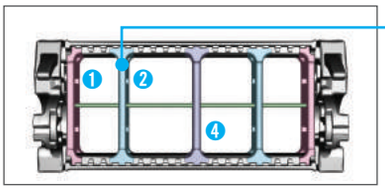


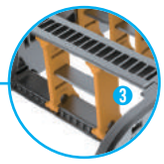
Side point



Chain Type	Ordering No.	C Frame	Hole Type
nsb 028CR	S-TW.EB028.35	35	M6 Bolt Holes
	S-TW.EB028.50	50	
	S-TW.EB028.55	55	
	S-TW.EB028.75	75	
	S-TW.EB028.100	100	
	S-TW.EB028.125	125	
	S-TW.EB028.150	150	
	S-TW.EB028.175	175	
	S-TW.EB028.200	200	

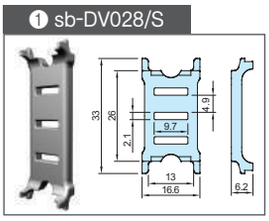
Dividers(DV)



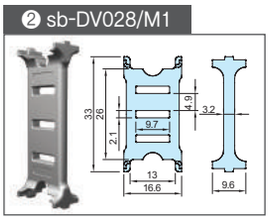


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

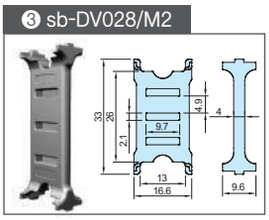
❶ sb-DV028/S



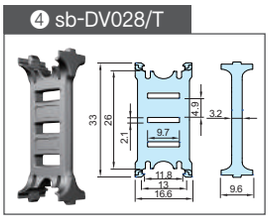
❷ sb-DV028/M1



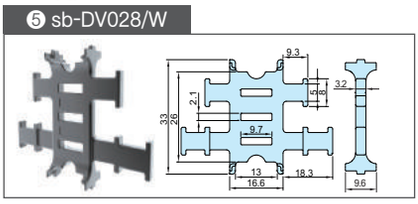
❸ sb-DV028/M2



❹ sb-DV028/T

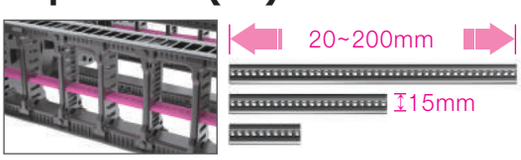


❺ sb-DV028/W



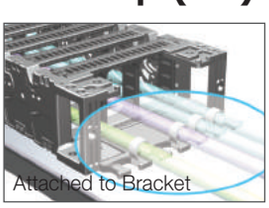
(Dimensions in mm)

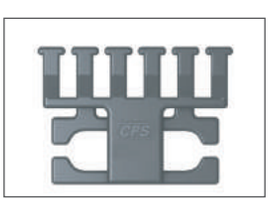
Separators(SP)

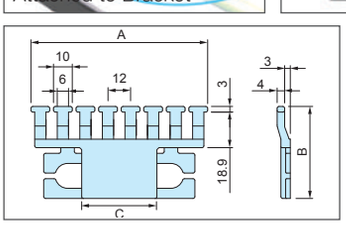


Chain Type	Ordering NO.	Frame
nsb 028CR	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

Tie wrap (TW)

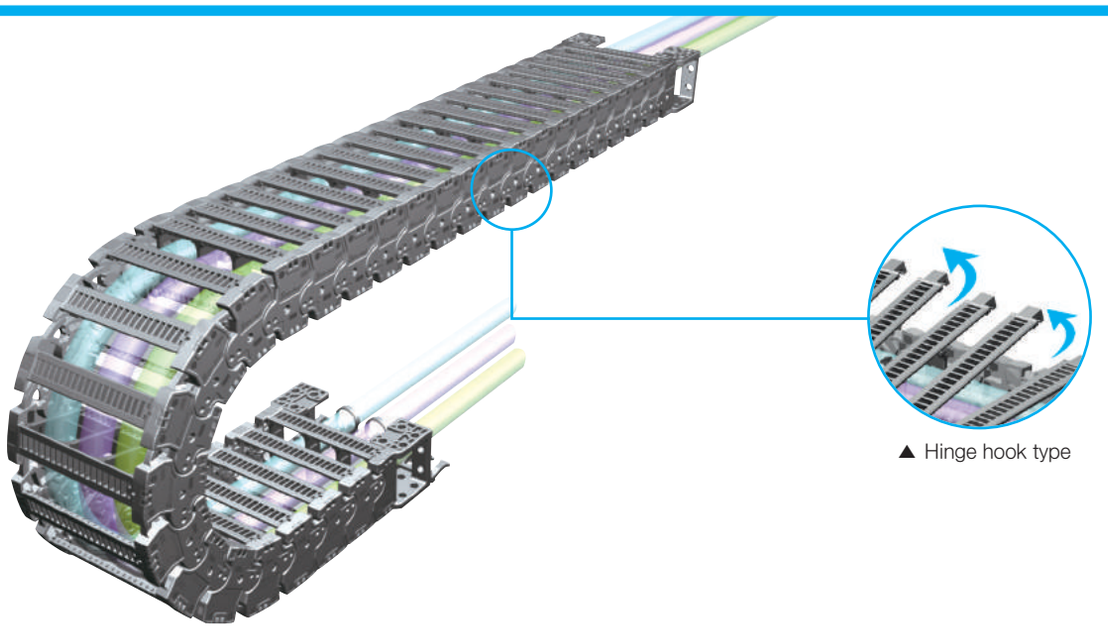




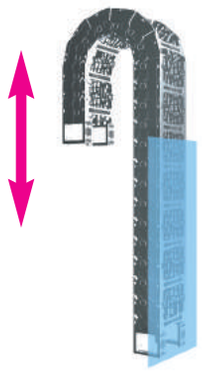


Chain Type	Ordering No.	A	B	C
nsb 028CR	S-TW036/025CR.35	46	35.4	-
	S-TW036/025CR.50	69	48.9	15
	S-TW036/025CR.55	70	48.9	20
	S-TW036/025CR.75	94	48.9	40
	S-TW036/025CR.100	118	48.9	65
	S-TW036/025CR.125	142	48.9	90

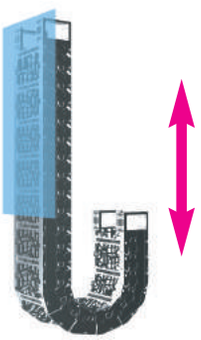
nsb 035CR



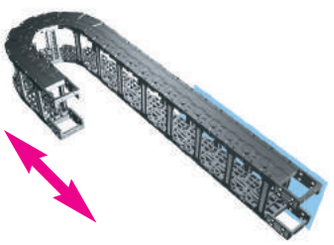
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

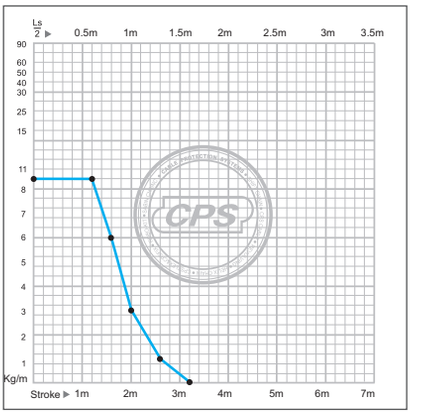
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

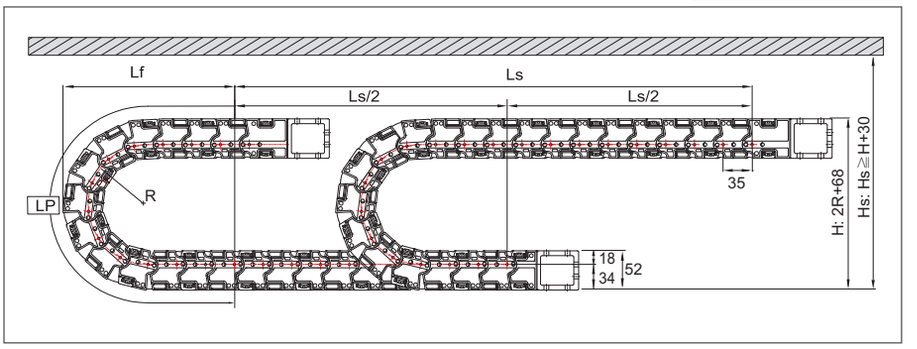
Vertical curve above = max 3.0m
Vertical curve below = max 50m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

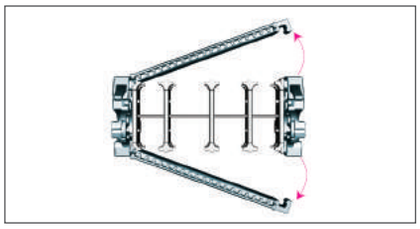
Ls: Stroke Hs: Safe Space

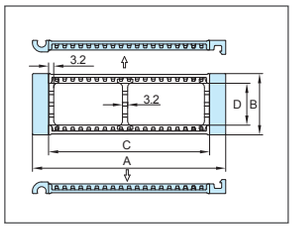


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
75	471	226	218
100	550	251	268
125	628	276	318
150	706	301	368
200	863	351	468

(Dimensions in mm)

Chain cross section



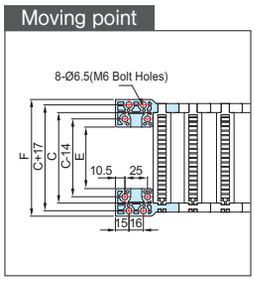


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 035CR	55	52	35	40	1.00
	70		50		1.06
	75		55		1.09
	95		75		1.17
	120		100		1.29
	145		125		1.39
	170		150		1.53
	195		175		1.65
	220		200		1.73

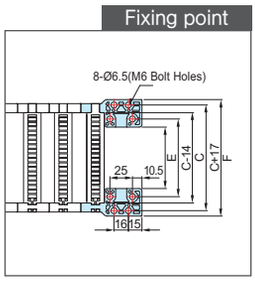
(Dimensions in mm)

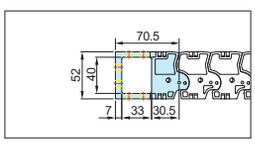
Free end bracket

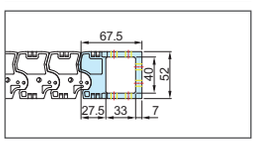
Moving point



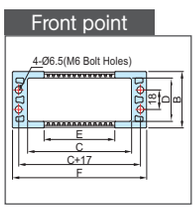
Fixing point







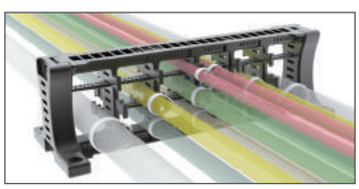
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 035CR	64	52	35	40	3	M6 Bolt Holes
	79		50		18	
	84		55		23	
	104		75		43	
	129		100		68	
	154		125		93	
	179		150		118	
	204		175		143	
	229		200		168	

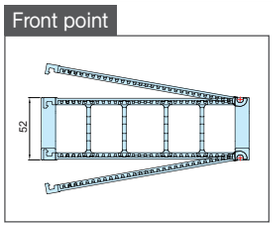
(Dimensions in mm)

System tie wrap (STW)

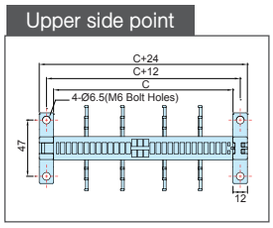


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

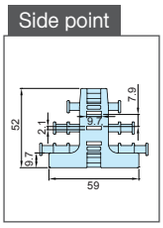
Front point



Upper side point

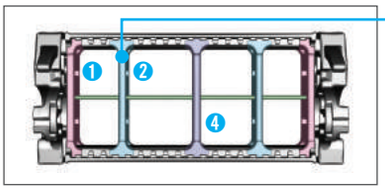


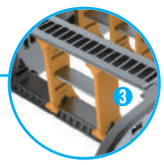
Side point

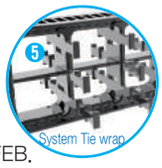


Chain Type	Ordering No.	C Frame	Hole Type
nsb 035CR	S-TW.EB035.35	35	M6 Bolt Holes
	S-TW.EB035.50	50	
	S-TW.EB035.55	55	
	S-TW.EB035.75	75	
	S-TW.EB035.100	100	
	S-TW.EB035.125	125	
	S-TW.EB035.150	150	
	S-TW.EB035.175	175	
	S-TW.EB035.200	200	

Dividers(DV)

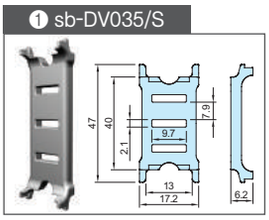




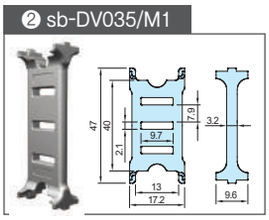


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

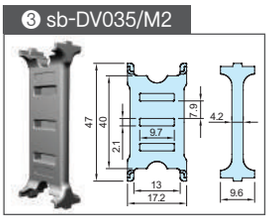
❶ sb-DV035/S



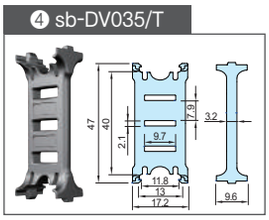
❷ sb-DV035/M1



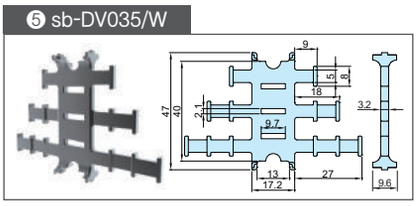
❸ sb-DV035/M2



❹ sb-DV035/T

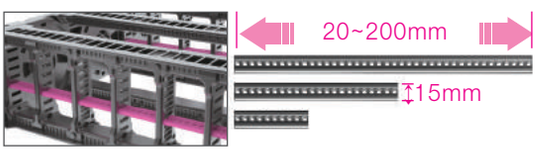


❺ sb-DV035/W



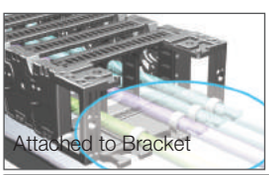
(Dimensions in mm)

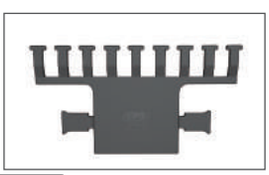
Separators(SP)

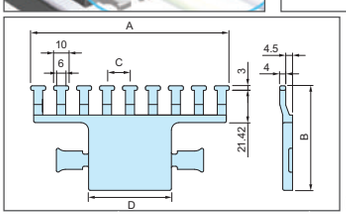


Chain Type	Ordering NO.	Frame
nsb 035CR	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

Tie wrap (TW)



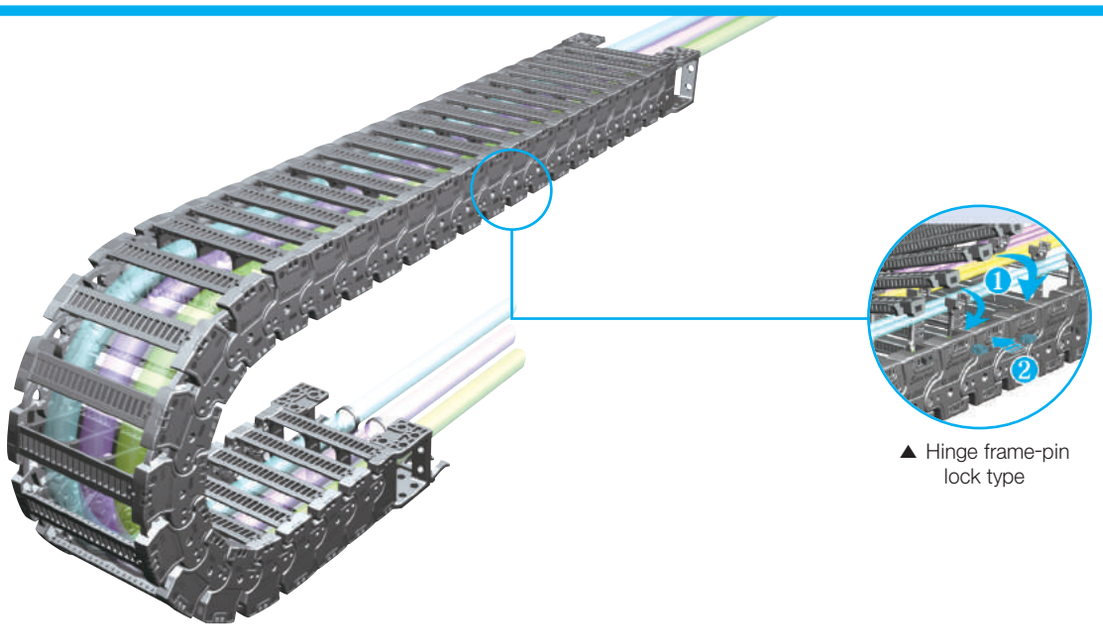




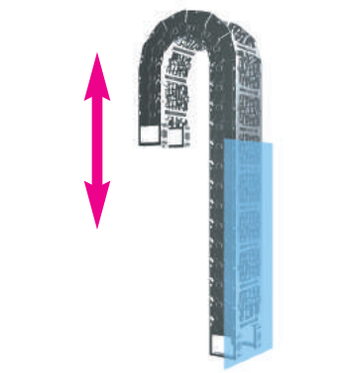
(Dimensions in mm)

Chain Type	Ordering No.	A	B	C	D
nsb 035CR	S-TW050/035N.50	82	64.5	12.00	5
	S-TW050/035N.55	82		12.00	10
	S-TW050/035N.75	107		12.13	30
	S-TW050/035N.100	132		15.25	55
	S-TW050/035N.125	157		14.70	80
	S-TW050/035N.150	182		14.35	105
	S-TW050/035N.175	203		12.31	130
	S-TW050/035N.200	232		13.88	155

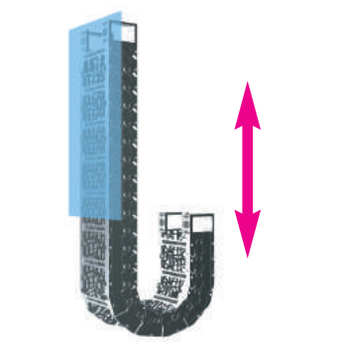
nsb 045CR



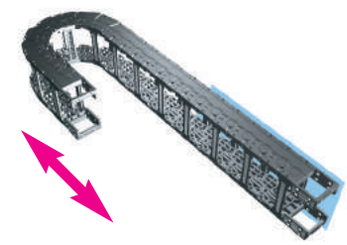
▲ Hinge frame-pin lock type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

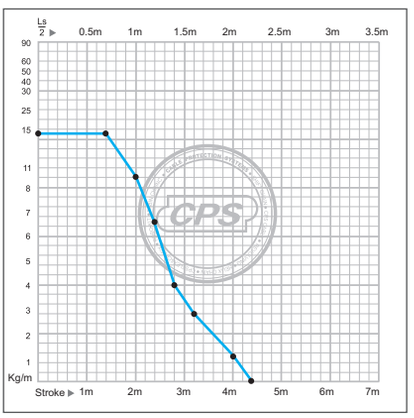
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

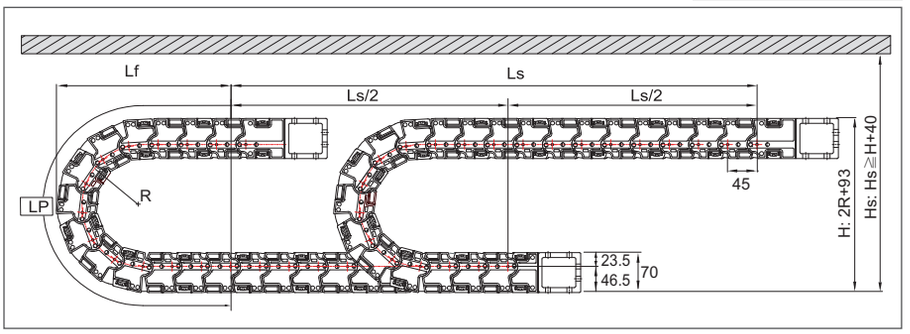
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 2.5m

Load diagrams self-supporting length



Layout of the chain

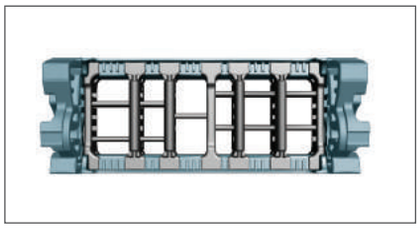
Ls: Stroke Hs: Safe Space

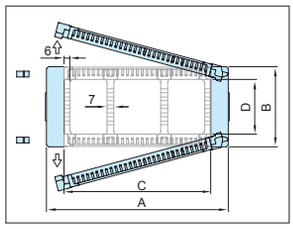


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
75	587	279	243
100	665	304	293
120	728	324	333
140	791	344	373
200	979	404	493
250	1,136	454	593
300	1,293	504	693

(Dimensions in mm)

Chain cross section



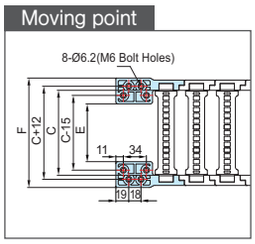


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 045CR	80 105 130 155 170 180 195 205 220 230 270 280 330	70	50 75 100 125 140 150 165 175 190 200 240 250 300	49	2.59 2.74 2.90 3.11 3.23 3.31 3.41 3.48 3.90 4.18 4.64 4.76 5.32

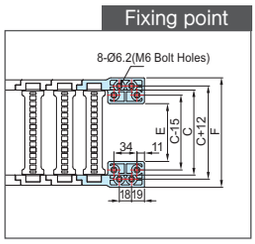
(Dimensions in mm)

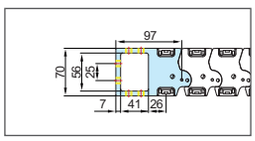
Free end bracket

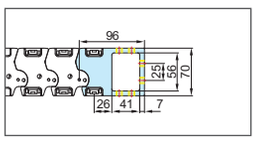
Moving point



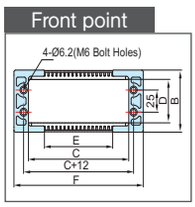
Fixing point







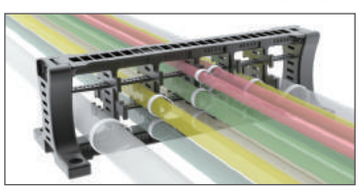
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 045CR	86 111 136 161 176 186 201 211 226 236 276 286 336	70	50 75 100 125 140 150 165 175 190 200 240 250 300	49	10 35 60 85 100 110 125 135 150 160 200 210 260	M6 Bolt Holes

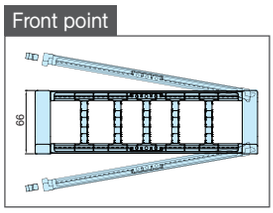
(Dimensions in mm)

System tie wrap (STW)

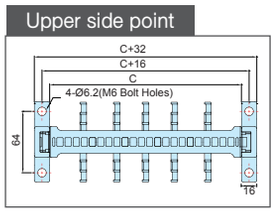


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

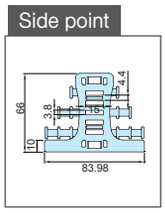
Front point



Upper side point

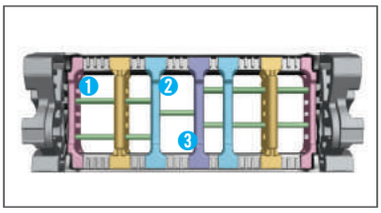


Side point



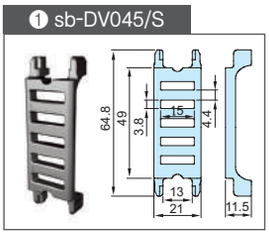
Chain Type	Ordering No.	C Frame	Hole Type
nsb 045CR	S-TW.EB045.50 S-TW.EB045.75 S-TW.EB045.100 S-TW.EB045.125 S-TW.EB045.140 S-TW.EB045.150 S-TW.EB045.165 S-TW.EB045.175 S-TW.EB045.190 S-TW.EB045.200 S-TW.EB045.240 S-TW.EB045.250 S-TW.EB045.300	50 75 100 125 140 150 165 175 190 200 240 250 300	M6 Bolt Holes

Dividers(DV)

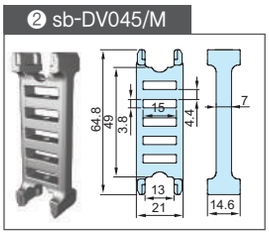


Assemble divider every second frame.
DV.T : Applied to Frame 200~300.
DV.M : Normal Divider.

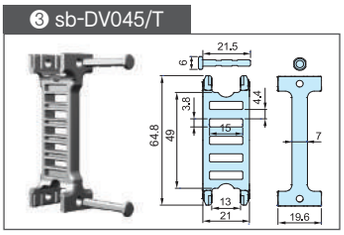
❶ sb-DV045/S



❷ sb-DV045/M

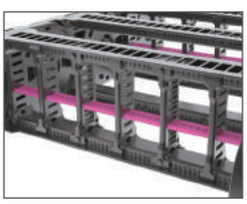


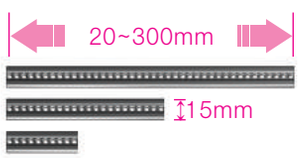
❸ sb-DV045/T



(Dimensions in mm)

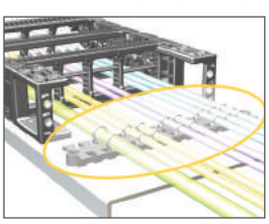
Separators(SP)

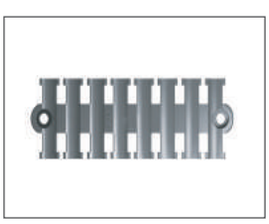


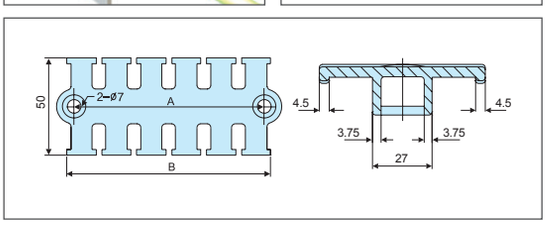


Chain Type	Ordering NO.
nsb 045CR	sb-SP/400.400

Tie wrap (TW)



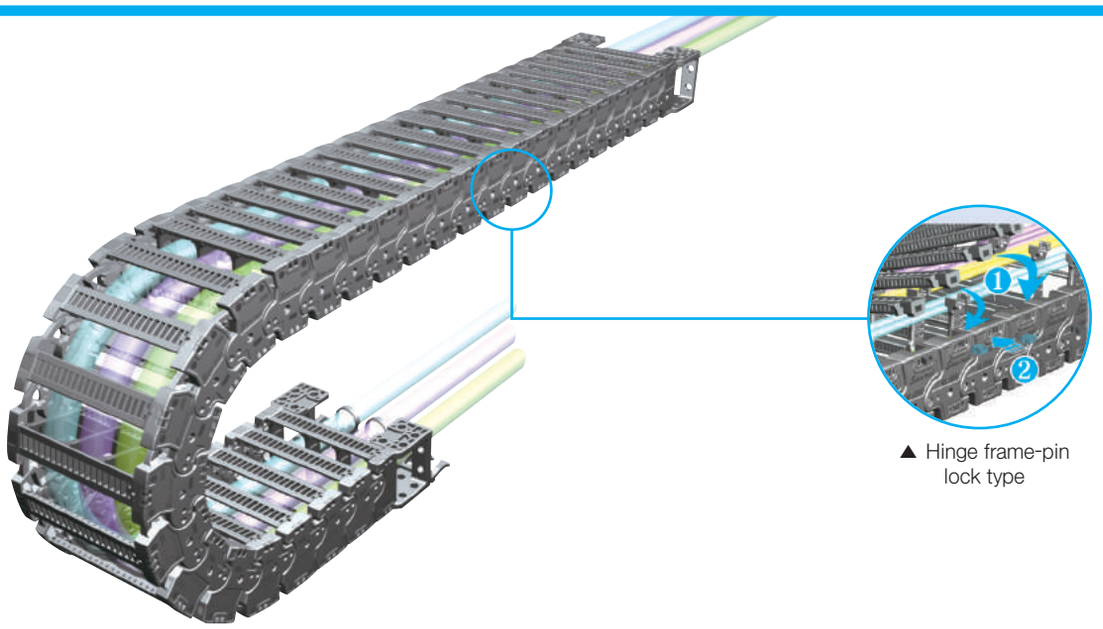




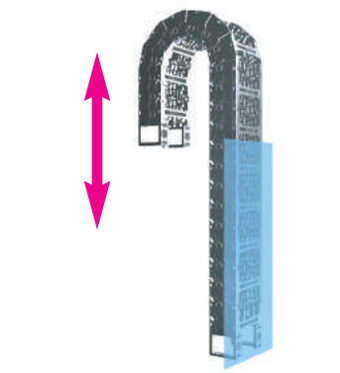
Chain Type	Ordering No.	A	B
nsb 045CR	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

(Dimensions in mm)

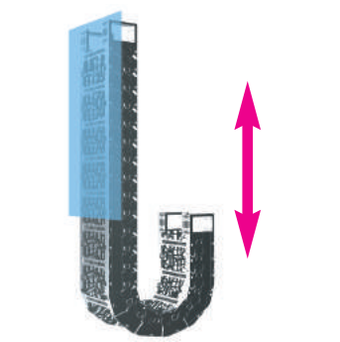
nsb 060CR



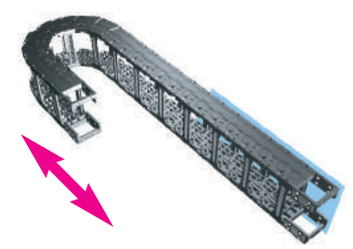
▲ Hinge frame-pin lock type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

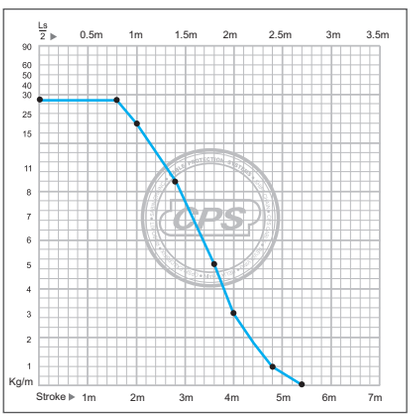
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

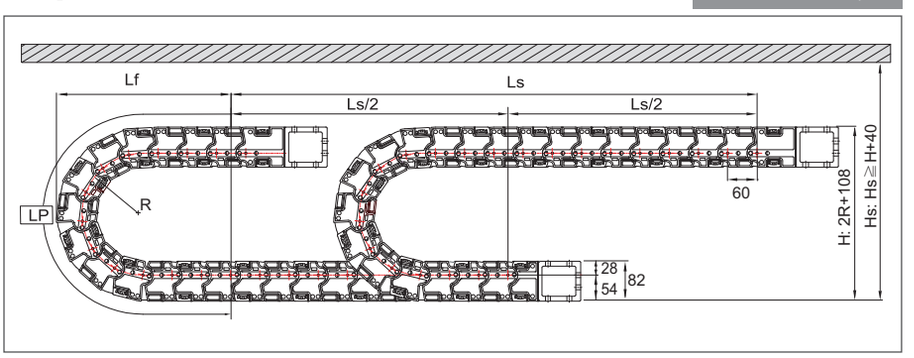
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

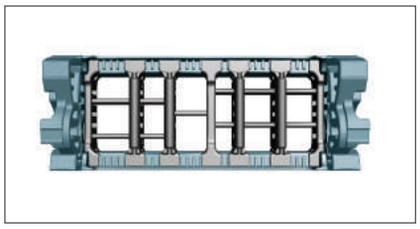
Ls: Stroke Hs: Safe Space

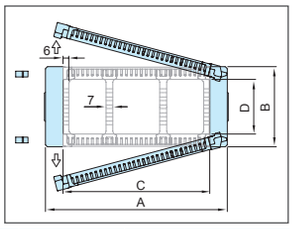


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
125	854	389	358
140	901	404	388
190	1,058	454	488
220	1,152	484	548
270	1,309	574	648
390	1,686	654	888

(Dimensions in mm)

Chain cross section



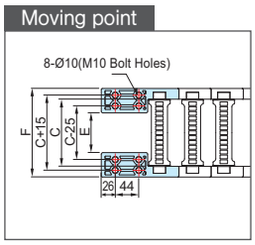


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 060CR	115 140 165 190 215 230 240 270 280 290 340 390 440	82	75 100 125 150 175 190 200 230 240 250 300 350 400	55	3.56 3.66 3.97 4.16 4.33 4.52 4.64 4.90 4.98 5.06 5.48 6.09 6.66

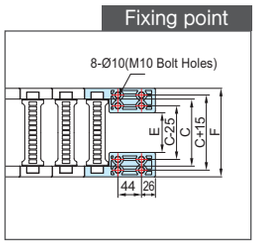
(Dimensions in mm)

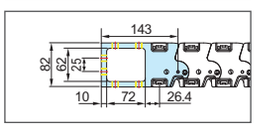
Free end bracket

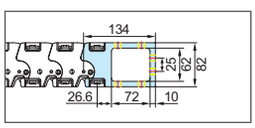
Moving point



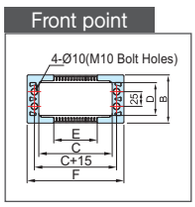
Fixing point







Front point



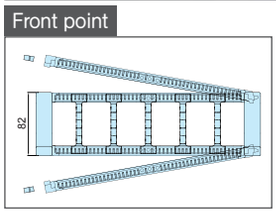
Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 060CR	115 140 165 190 215 230 240 270 280 290 340 390 440	82	75 100 125 150 175 190 200 230 240 250 300 350 400	55	24 49 74 99 124 139 149 179 189 199 249 299 349	M10 Bolt Holes

(Dimensions in mm)

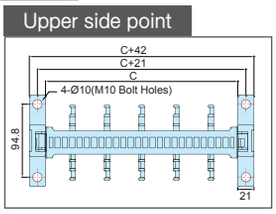
System tie wrap (STW)

It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

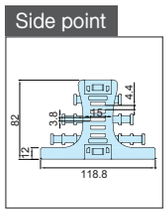
Front point



Upper side point



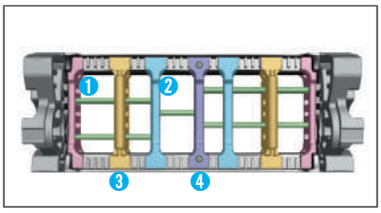
Side point

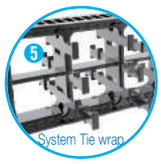


Chain Type	Ordering No.	C Frame	Hole Type
nsb 060CR	S-TW.EB060.75 S-TW.EB060.100 S-TW.EB060.125 S-TW.EB060.150 S-TW.EB060.175 S-TW.EB060.190 S-TW.EB060.200 S-TW.EB060.230 S-TW.EB060.240 S-TW.EB060.250 S-TW.EB060.300 S-TW.EB060.350 S-TW.EB060.400	75 100 125 150 175 190 200 230 240 250 300 350 400	M10 Bolt Holes

(Dimensions in mm)

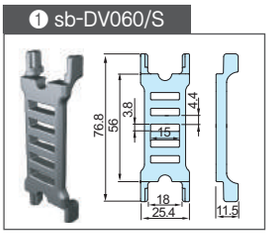
Dividers(DV)



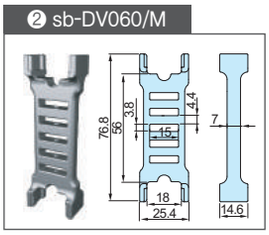


Assemble divider every second frame.
DV.T : Applied to Frame 250~400.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

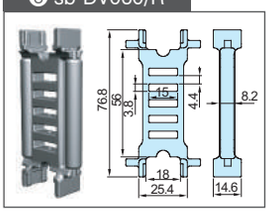
❶ sb-DV060/S



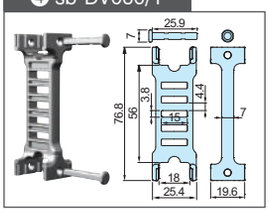
❷ sb-DV060/M



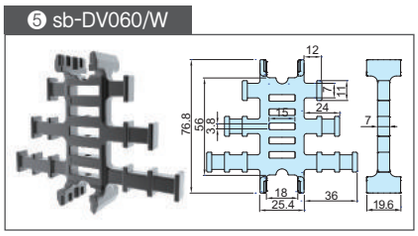
❸ sb-DV060/R



❹ sb-DV060/T

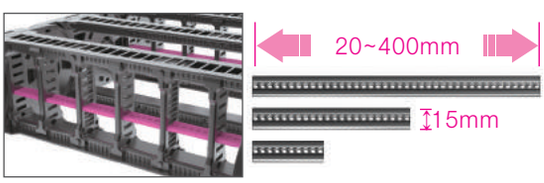


❺ sb-DV060/W



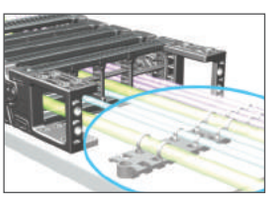
(Dimensions in mm)

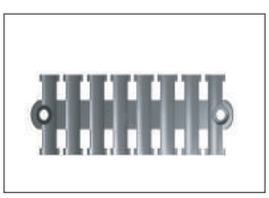
Separators(SP)

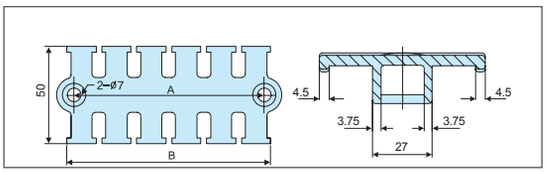


Chain Type	Ordering NO.
nsb 060CR	sb-SP/400.400

Tie wrap (TW)



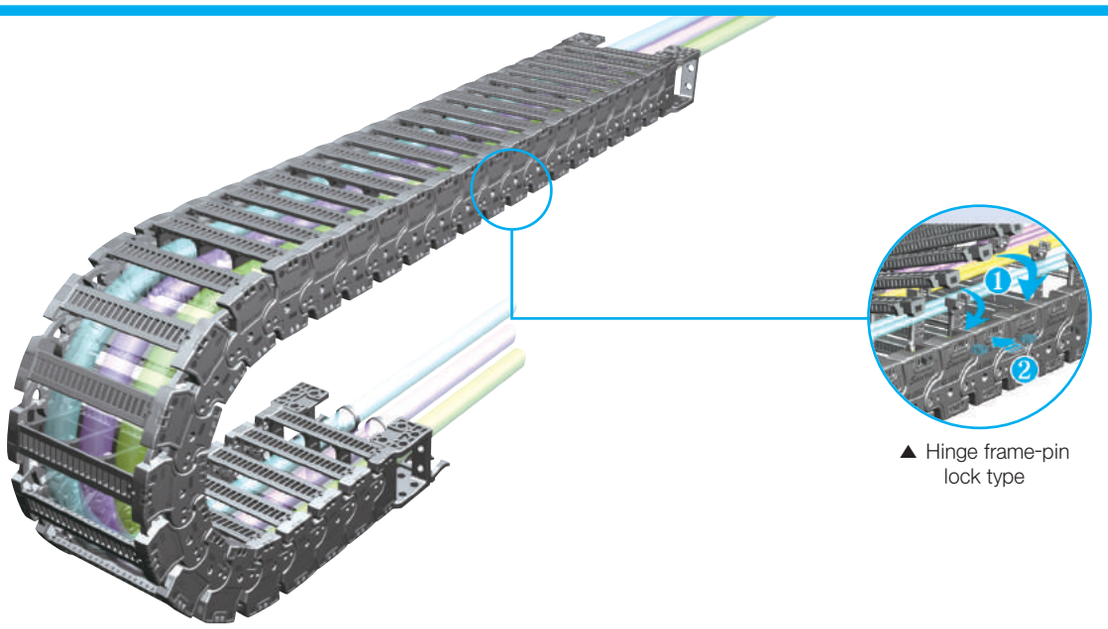




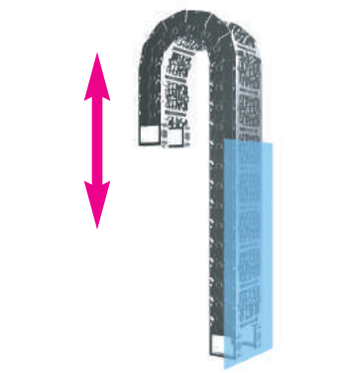
Chain Type	Ordering No.	A	B
nsb 060CR	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

(Dimensions in mm)

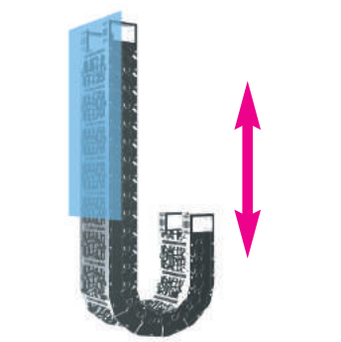
nsb 075CR



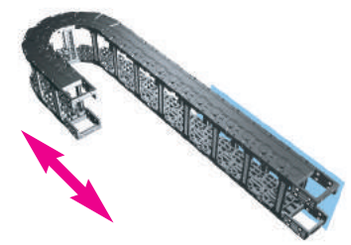
▲ Hinge frame-pin lock type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

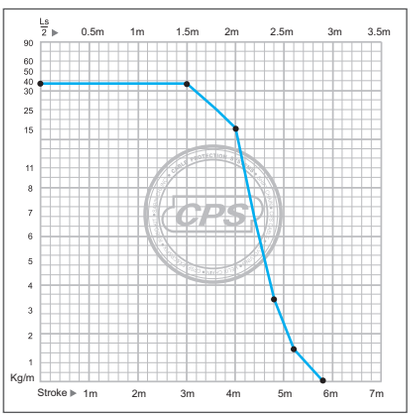
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

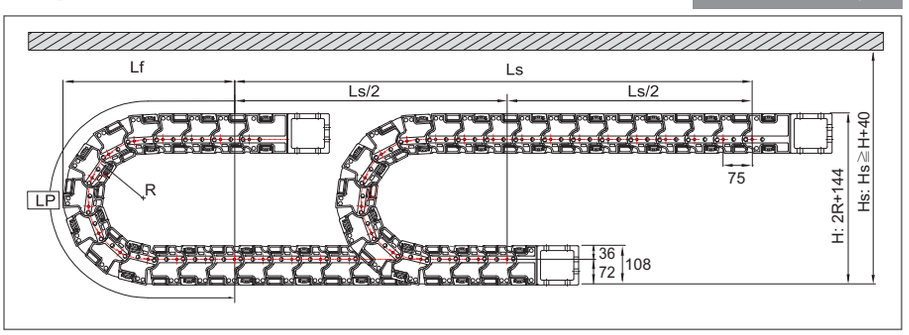
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

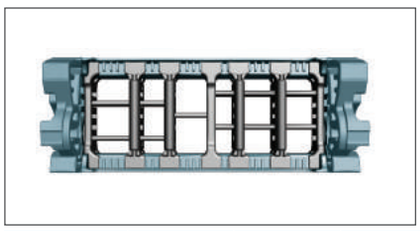
Ls: Stroke Hs: Safe Space

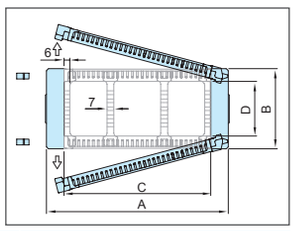


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
180	1,147	515	504
200	1,210	535	544
250	1,367	585	644
300	1,524	635	744
350	1,681	685	844
400	1,838	735	944
500	2,152	835	1,144

(Dimensions in mm)

Chain cross section



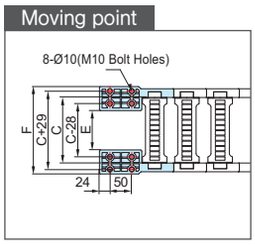


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 075CR	115	108	75	78	5.37
	140		100		5.57
	155		115		5.72
	165		125		5.82
	190		150		6.01
	215		175		6.26
	240		200		6.68
	280		240		7.11
	290		250		7.22
	330		290		7.80
	340		300		7.94
	390		350		8.67
	440		400		9.43
	490		450		10.01
	540		500		10.41
	590		550		11.88
	640		600		12.17

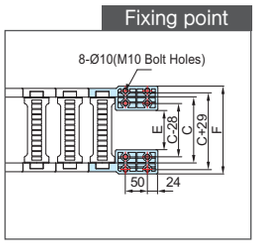
(Dimensions in mm)

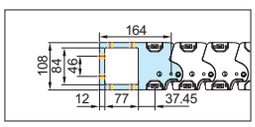
Free end bracket

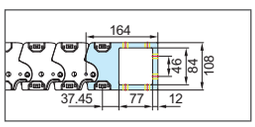
Moving point



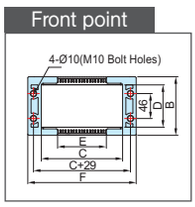
Fixing point







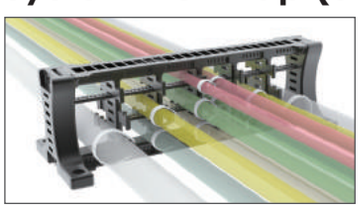
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 075CR	125	108	75	78	15	M10 Bolt Holes
	150		100		40	
	165		115		55	
	175		125		65	
	200		150		90	
	225		175		115	
	250		200		140	
	290		240		180	
	300		250		190	
	340		290		230	
	350		300		240	
	400		350		290	
	450		400		340	
	500		450		390	
	550		500		440	
	600		550		490	
	650		600		540	

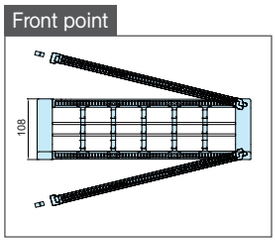
(Dimensions in mm)

System tie wrap (STW)

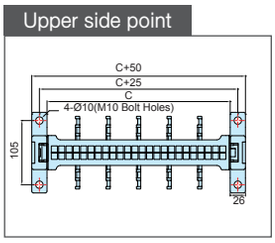


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

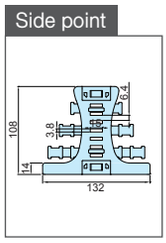
Front point



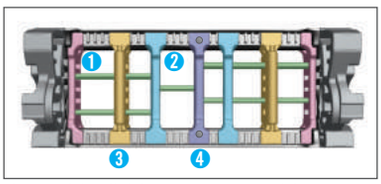
Upper side point



Side point

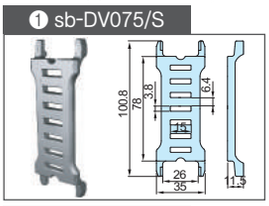


Dividers(DV)

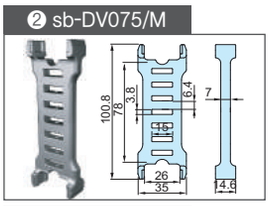


Assemble divider every second frame.
DV.T : Applied to Frame 300~600.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

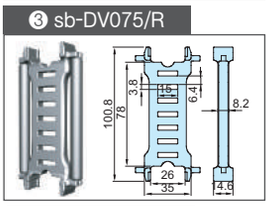
❶ sb-DV075/S



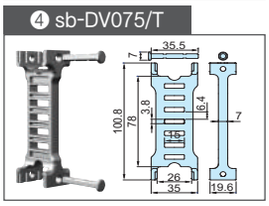
❷ sb-DV075/M



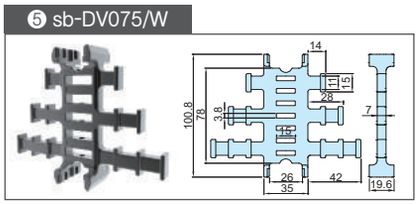
❸ sb-DV075/R



❹ sb-DV075/T

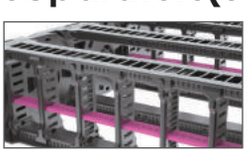


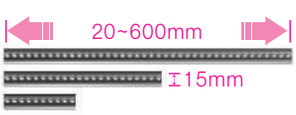
❺ sb-DV075/W



(Dimensions in mm)

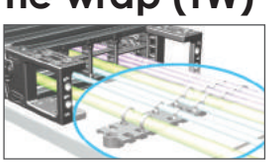
Separators(SP)

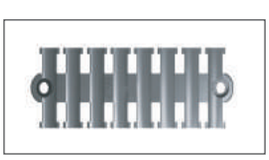


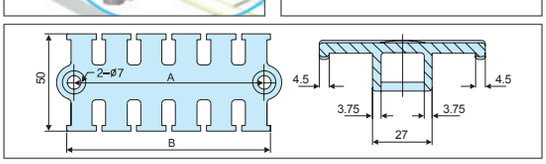


Chain Type	Ordering NO.
nsb 075CR	sb-SP/600.600

Tie wrap (TW)







Chain Type	Ordering No.	A	B
nsb 075CR	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

Chain Type	Ordering No.	C Frame	Hole Type
nsb 075CR	S-TW.EB075.75	75	M10 Bolt Holes
	S-TW.EB075.100	100	
	S-TW.EB075.115	115	
	S-TW.EB075.125	125	
	S-TW.EB075.150	150	
	S-TW.EB075.175	175	
	S-TW.EB075.200	200	
	S-TW.EB075.240	240	
	S-TW.EB075.250	250	
	S-TW.EB075.290	290	
	S-TW.EB075.300	300	
	S-TW.EB075.350	350	
	S-TW.EB075.400	400	
	S-TW.EB075.450	450	
	S-TW.EB075.500	500	
	S-TW.EB075.550	550	
	S-TW.EB075.600	600	

nsb Chain - Normal type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	5m/s
Acceleration	15m/s²
Temperature	-30℃ ~+130℃
Special production	ESD, UV, Customized color
Certificate	CE, ATEX(Ex)

Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

nsb Chain N Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Size A	Size B	Size C	Size D	Frame style	Section - composition
nsb 028N	28	46, 66, 86, 116, 146	0.79 0.82 0.85 0.90 0.98 1.08 1.18 1.45 1.59	5	-30 ~ +130	55 70 75 95 120 145 170 195 220	38	35 50 55 75 100 125 150 175 200	26		
nsb 035N	35	55, 65, 90, 115, 140, 190	1.10 1.13 1.15 1.18 1.25 1.32 1.41 1.62 1.72	5	-30 ~ +130	55 70 75 95 120 145 170 195 220	52	35 50 55 75 100 125 150 175 200	40		
nsb 045N	45	90, 110, 135, 165, 185, 235, 285	2.06 2.14 2.22 2.32 2.38 2.42 2.47 2.51 2.72 2.86 3.09 3.15 3.43	5	-30 ~ +130	80 105 130 155 170 180 195 205 220 230 270 280 330	66	50 75 100 125 140 150 165 175 190 200 240 250 300	45		
nsb 060N	60	125, 135, 150, 180 230, 270, 340	3.30 3.35 3.51 3.60 3.69 3.78 3.84 4.01 4.05 4.26 4.57 4.85	5	-30 ~ +130	115 140 165 190 215 230 240 280 290 340 390 440	82	75 100 125 150 175 190 200 240 250 300 350 400	56		
nsb 075N	75	160, 180, 230, 280, 330, 380, 480	4.80 4.90 4.97 5.02 5.12 5.25 5.46 5.67 5.72 6.02 6.09 6.45 6.83 7.12 7.32 8.06 8.20	5	-30 ~ +130	115 140 155 165 190 215 240 280 290 330 340 390 440 490 540 590 640	108	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78		

(Dimensions in mm)

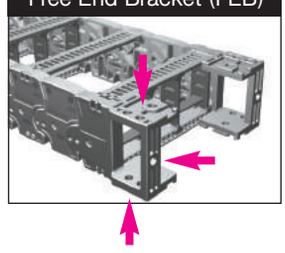
Ordering

nsb 028N. 50. R66 / F - 1000L : 10ST

- Sabin Chain
- Normal (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

Bracket type

Free End Bracket (FEB)

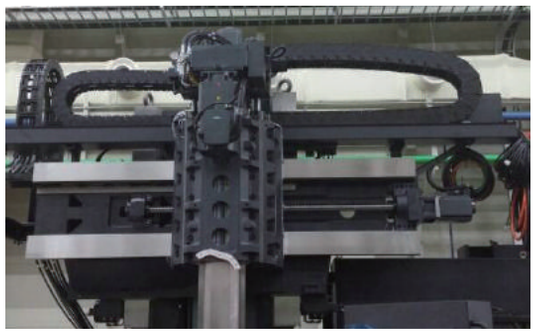


≫ Application of nsb Chain Normal type

- nsb Chain can be applied to all kinds of machine tools and factory lines.

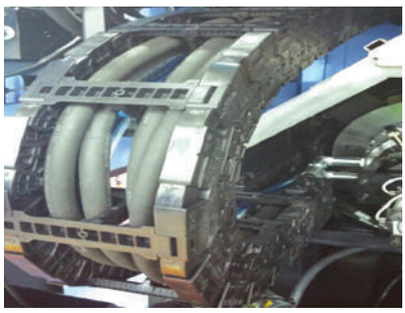
▶ NSB 045N & 035N

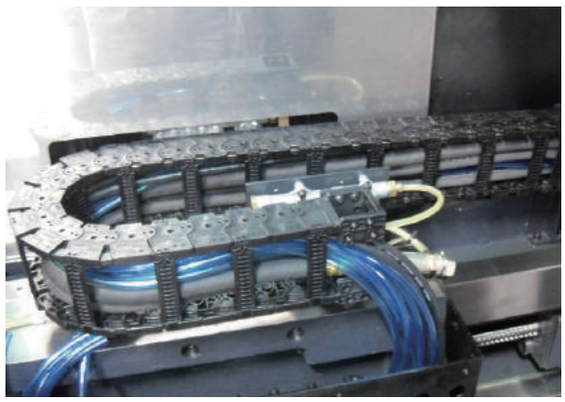
Application
Machine tools
Location
Korea
Remark
Stroke : 2 meters



▶ NSB 060N

Application
Machine tools
Location
Korea
Remark
Stroke : 2 meters





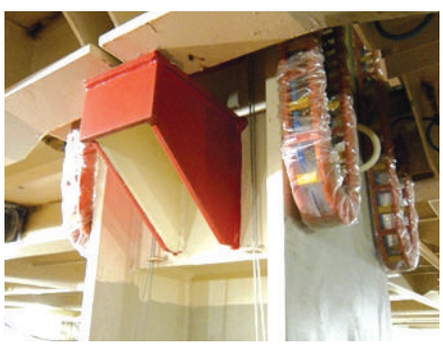
▶ NSB 045N

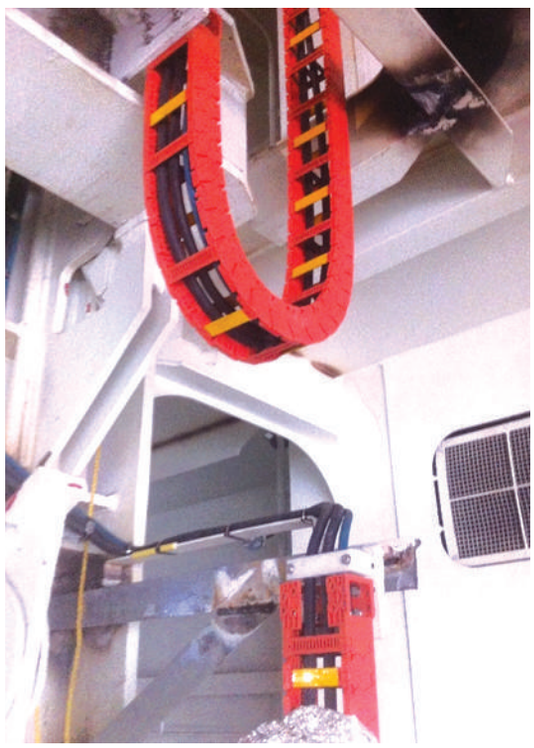
Application
Factory production line
Location
Korea

- CPS can produce customized product for customers for ESD and special color.

▶ NSB 035N

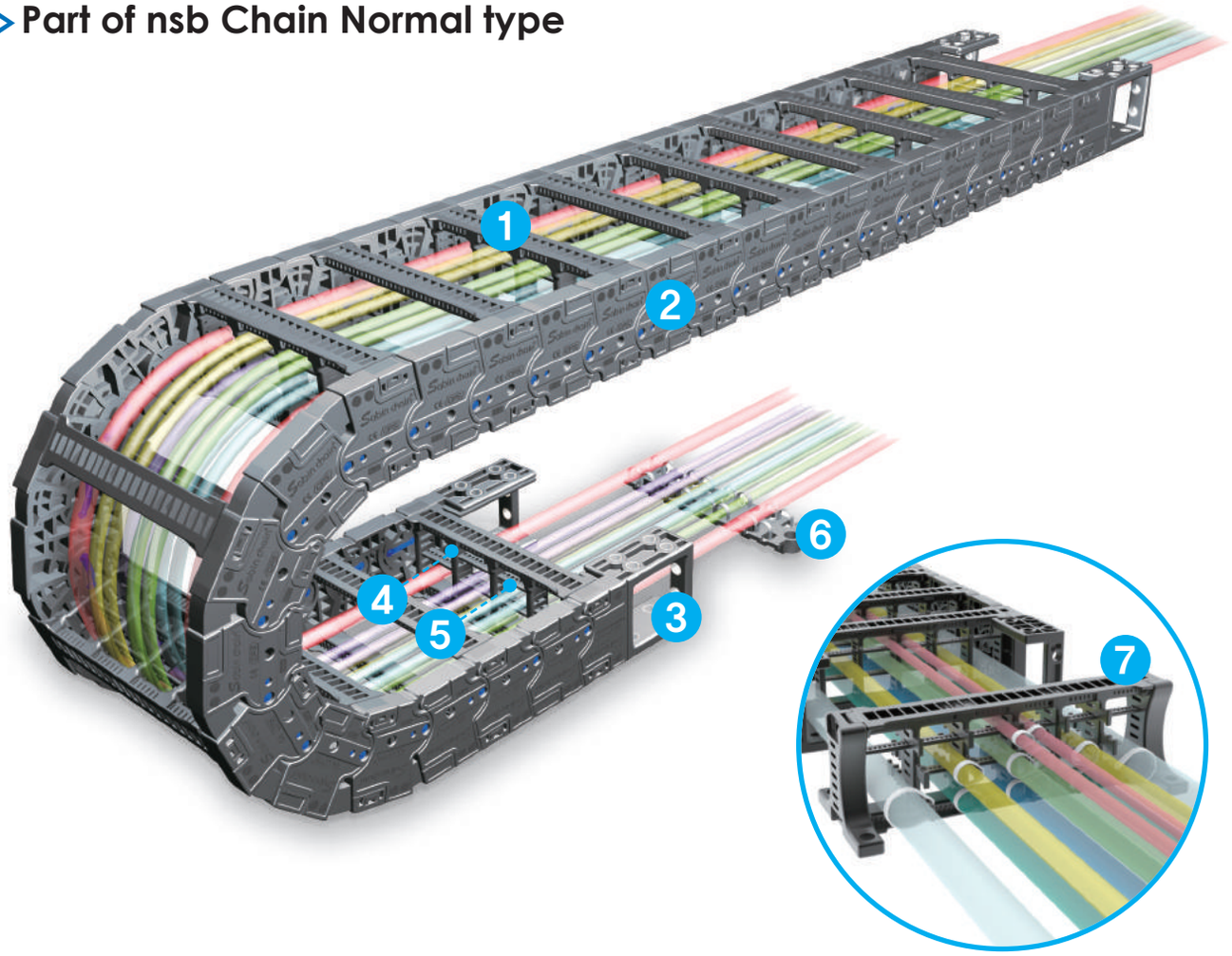
Application
PCTC Ship
Location
Korea (H-heavy industry)
Remark
ESD, Orange color





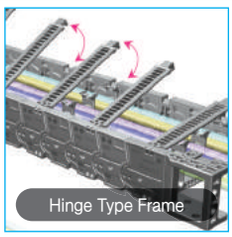
nsb Chain - Normal type

≫ Part of nsb Chain Normal type



❶ Frame (FR)

Hinged-type frame, open one side, supports connection of both side of side band and have tongue and groove system plate to secure the position of the divider on the frame.

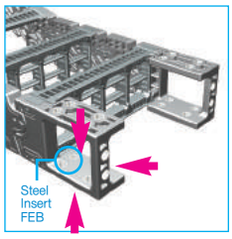


❷ Side Band (SB)

It's part of cable chain that each side band's connected by holding band.

❸ FREE END BRACKET (FEB)

A unit that connects at last side band (left&right). It can be fixed stronger using steel washers.



❹ Dividers (DV)

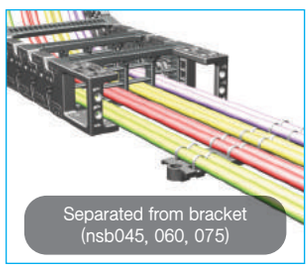
Divider sets the inside of chain vertically to prevent cable from twisting and sheath damage caused by friction. There are S, M, R and T type.

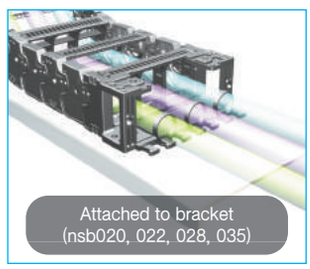
❺ Separators (SP)

A unit that divides inserted cables vertically to prevent twisting and breaking problem.

❻ Tie wrap (TW)

A unit that ties cables to maintain straightness of them.
It can be assembled to bracket directly or installed separately from bracket.



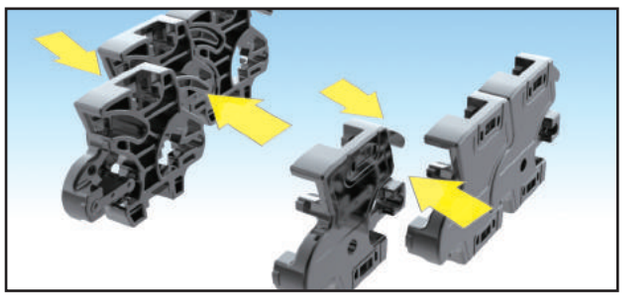


❼ System tie wrap (STW)

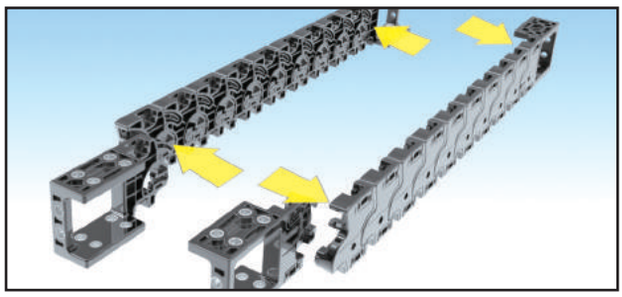
System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled wthout any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisting and it can also be assemble without any tools or bolt. This tie wrap has two types, one is to assemble inside bracket the other one is outside.

≫ Assembly procedure of nsb Chain Normal Type

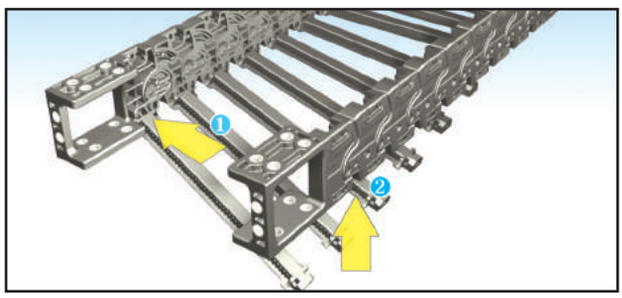
The assembling process of CR-Type of New Sabin Chain is like below and user must use rubber hammer with careful combination of Divider and Separator.



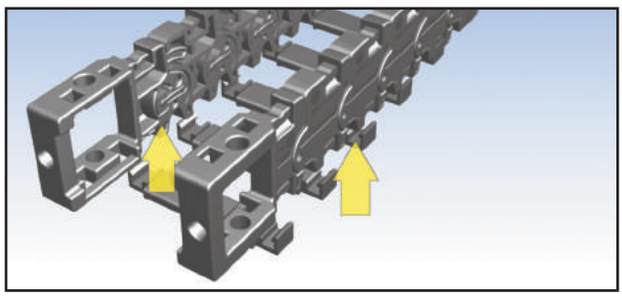
1 Connect each side band as many as you need.



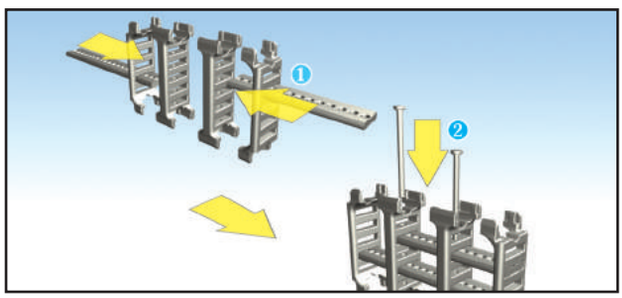
2 Assemble the end brackets on both ends.



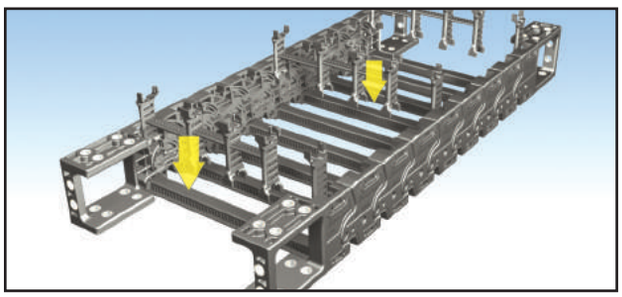
3 Attach frames to one side groove on the frames, then the other side.



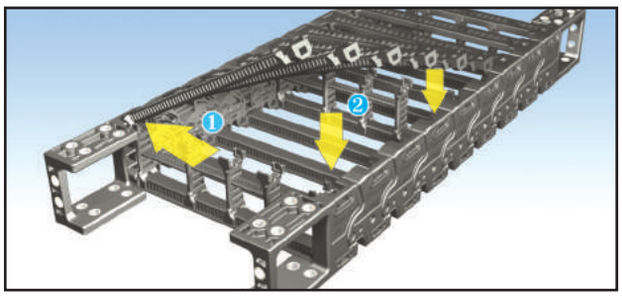
3-1 For nsb020CR and nsb022CR, they are not Hinge Type for method to connect frames, but Hook Type on both sides.



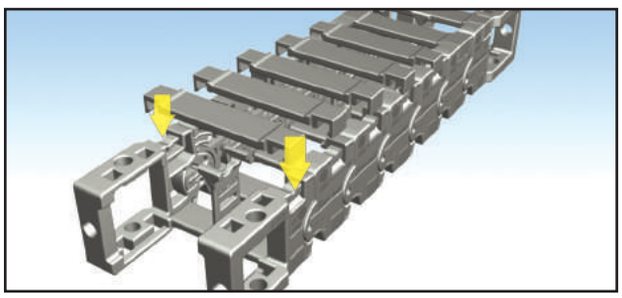
4 For nsb 045, 060, and 075, connect the pin of separator in hole of divider after inserting separator in hole of divider. For nsb028 and nsb035, separator fixing pins are not used.



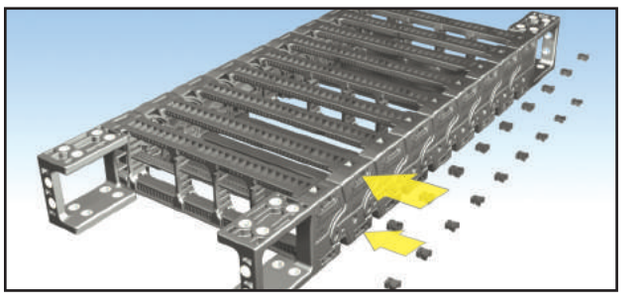
5 Fix the separator and divider patterns to the bottom-side frames as needed.



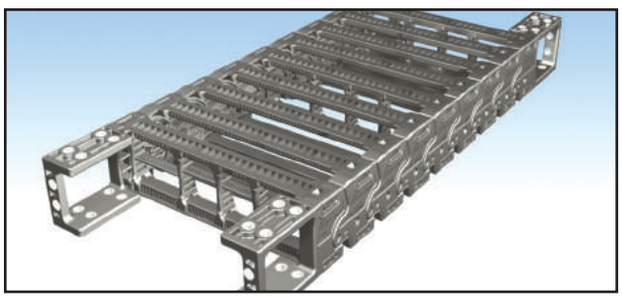
6 Attach frames to one side groove on the frames, then the other side.



6-1 For nsb020CR and nsb022CR, they are not Hinge Type for method to connect frames, but Hook Type on both sides.



7 Insert frame pins to secure the frames and complete carrier. (nsb045, 060, 075 are applied with frame pin, and nsb028, 035 are Hinge Type or Hook Type without frame pin.)



8 Complete to assemble New Sabin CR-Type, Sabin Chain.

nsb Chain - Normal type

≫ Part list of nsb Chain Normal type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
nsb028N	SIDE BAND	nsb-SB028N.R*(RH) nsb-SB028N.R*(LH)	Left side band of nsb028N Right side band of nsb028N
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	nsb-FEB028N	End bracket of nsb028N
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100 S-TW036/025CR.125	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

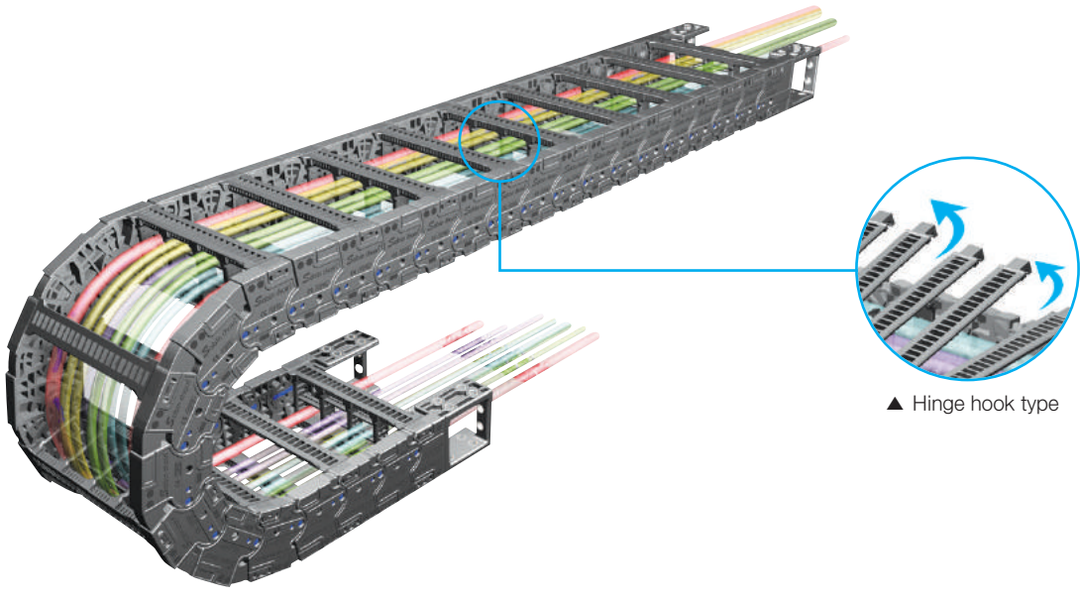
Model	Classification	Part number	Description
nsb035N	SIDE BAND	nsb-SB035N.R*(LH) nsb-SB035N.R*(RH)	Left side band of nsb035N Right side band of nsb035N
	FRAME	sb-FR/M.35 sb-FR/M.50 sb-FR/M.55 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.200	Frame, 35mm Frame, 50mm Frame, 55mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm
	FREE END BRACKET	nsb-FEB035N	End bracket of nsb035N
	DIVIDER	sb-DV035/M sb-DV035/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150 S-SP/M.175 S-SP/M.200	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm Separator, 175mm Separator, 200mm
	TIE WRAP	S-TW050/035N.50 S-TW050/035N.75 S-TW050/035N.100 S-TW050/035N.125 S-TW050/035N.150 S-TW050/035N.175 S-TW050/035N.200	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm Tie wrap for end bracket to fix cables, 175mm Tie wrap for end bracket to fix cables, 200mm
	SYSTEM TIE WRAP	sb-DV035/W S-TW.EB035	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
nsb045N	SIDE BAND	nsb-SB045N.R*(LH) nsb-SB045N.R*(RH)	Left side band of nsb045N Right side band of nsb045N
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR/M.50 sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.140 sb-FR/M.150 sb-FR/M.165 sb-FR/M.175 sb-FR/M.190 sb-FR/M.200 sb-FR/M.240 sb-FR/M.250 sb-FR/M.300	Frame, 50mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 140mm Frame, 150mm Frame, 165mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 300mm
	FREE END BRACKET	nsb-FEB045N sb-FEB/WH045	End bracket of nsb045N Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S sb-DV045/T	Normal divider To fix separstors at the both side section T divider
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

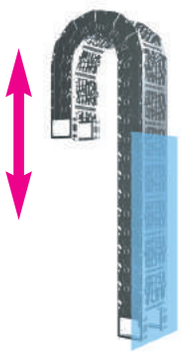
Model	Classification	Part number	Description
nsb060N	SIDE BAND	nsb-SB060N.R*(LH) nsb-SB060N.R*(RH)	Left side band of nsb060N Right side band of nsb060N
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR/M.75 sb-FR/M.100 sb-FR/M.125 sb-FR/M.150 sb-FR/M.175 sb-FR/M.190 sb-FR/M.200 sb-FR/M.230 sb-FR/M.250 sb-FR/M.300 sb-FR/M.350 sb-FR/M.400	Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 230mm Frame, 250mm Frame, 300mm Frame, 350mm Frame, 400mm
	FREE END BRACKET	nsb-FEB060N sb-FEB/WH060	End bracket of nsb060N Steel washer for end bracket
	DIVIDER	sb-DV060/M sb-DV060/S sb-DV060/R sb-DV060/T sb-DV060/TP	Normal divider To fix separstors at the both side section Roller divider to reduce friction with cables, Clean room type T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW.EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
nsb075N	SIDE BAND	nsb-SB075N.R*(LH) nsb-SB075N.R*(RH)	Left side band of nsb075N Right side band of nsb075N
	FRAME PIN	S-FP/S2	Frame pin
	FRAME	sb-FR075/100.75 sb-FR075/100.100 sb-FR075/100.115 sb-FR075/100.125 sb-FR075/100.150 sb-FR075/100.175 sb-FR075/100.200 sb-FR075/100.240 sb-FR075/100.250 sb-FR075/100.290 sb-FR075/100.300 sb-FR075/100.350 sb-FR075/100.400 sb-FR075/100.450 sb-FR075/100.500 sb-FR075/100.550 sb-FR075/100.600	Frame, 75mm Frame, 100mm Frame, 115mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 290mm Frame, 300mm Frame, 350mm Frame, 400mm Frame, 450mm Frame, 500mm Frame, 550mm Frame, 600mm
	FREE END BRACKET	nsb-FEB075N sb-FEB/WH075	End bracket of nsb075N Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S sb-DV075/R sb-DV075/T sb-DV075/TP	Normal divider To fix separstors at the both side section Roller divider to reduce friction with cables, Clean room type T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW.EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

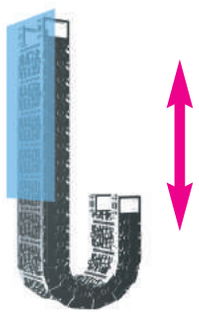
nsb 028N



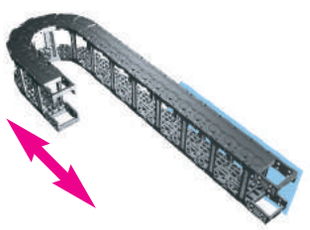
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

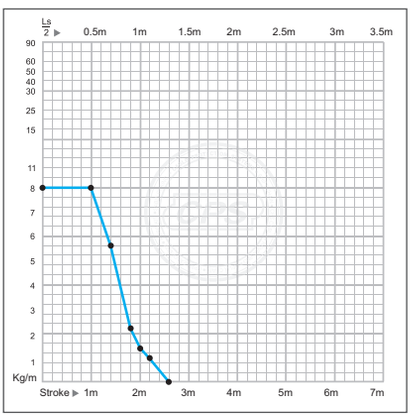
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

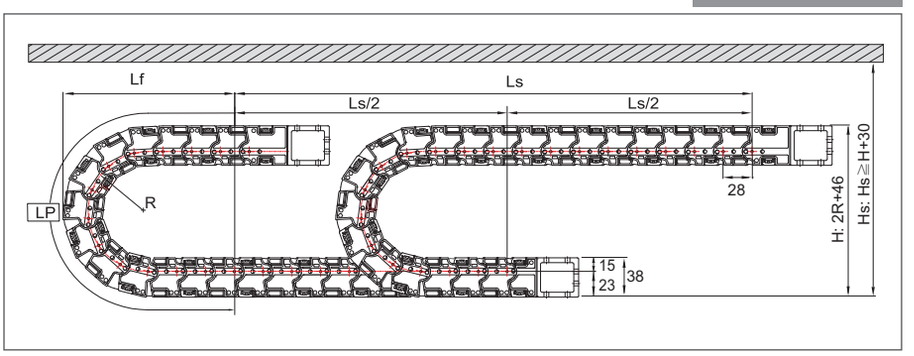
Vertical curve above = max 2.0m
Vertical curve below = max 40m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

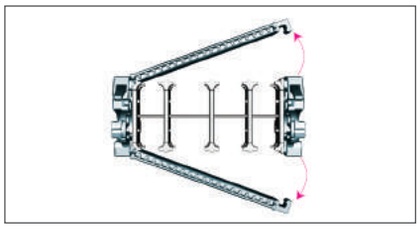
Ls: Stroke Hs: Safe Space

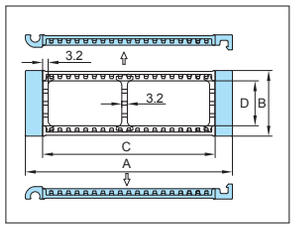


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
46	313	153	138
66	376	173	178
86	439	193	218
116	533	223	278
146	627	253	338

(Dimensions in mm)

Chain cross section



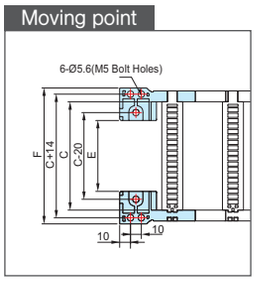


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 028N	55	38	35	26	0.79
	70		50		0.82
	75		55		0.85
	95		75		0.90
	120		100		0.98
	145		125		1.08
	170		150		1.18
	195		175		1.45
	220		200		1.59

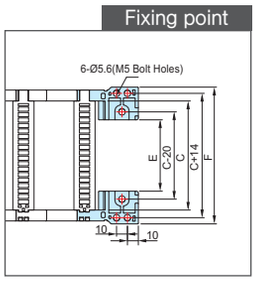
(Dimensions in mm)

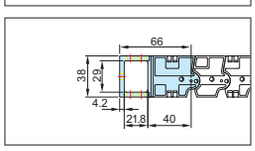
Free end bracket

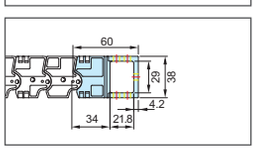
Moving point



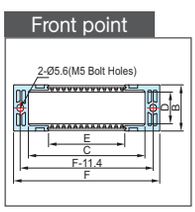
Fixing point







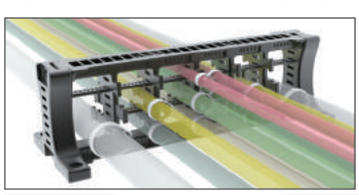
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 028N	60.4	38	35	26	0.4	M5 Bolt Holes
	75.4		50		15.4	
	80.4		55		20.4	
	100.4		75		40.4	
	125.4		100		65.4	
	150.4		125		90.4	
	175.4		150		115.4	
	200.4		175		140.4	
	225.4		200		165.4	

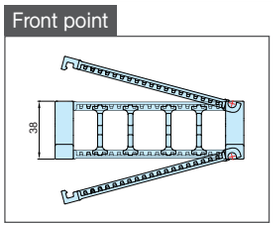
(Dimensions in mm)

System tie wrap (STW)

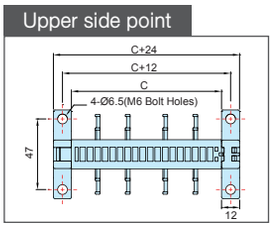


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

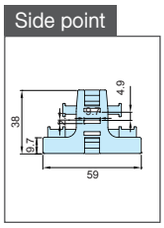
Front point



Upper side point



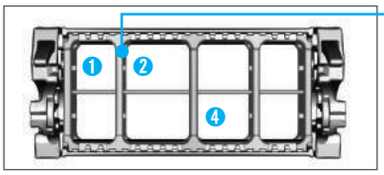
Side point

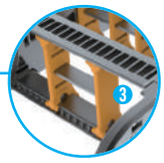


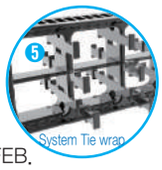
Chain Type	Ordering No.	C Frame	Hole Type
nsb 028N	S-TW.EB028.35	35	M6 Bolt Holes
	S-TW.EB028.50	50	
	S-TW.EB028.55	55	
	S-TW.EB028.75	75	
	S-TW.EB028.100	100	
	S-TW.EB028.125	125	
	S-TW.EB028.150	150	
	S-TW.EB028.175	175	
	S-TW.EB028.200	200	

(Dimensions in mm)

Dividers(DV)

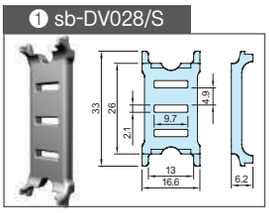




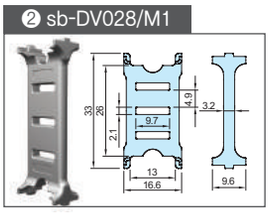


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

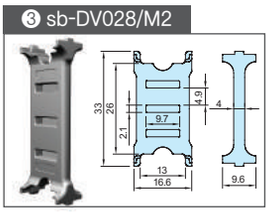
❶ sb-DV028/S



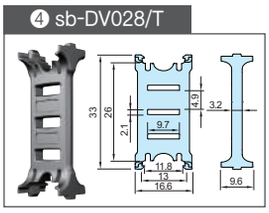
❷ sb-DV028/M1



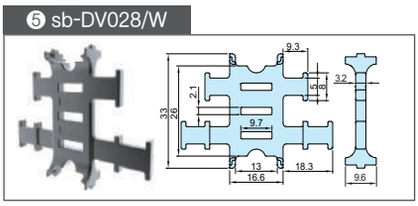
❸ sb-DV028/M2



❹ sb-DV028/T

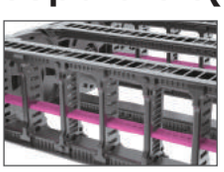


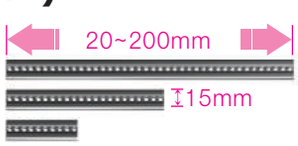
❺ sb-DV028/W



(Dimensions in mm)

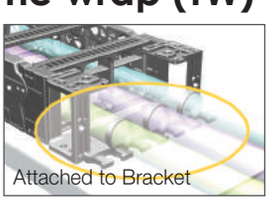
Separators(SP)

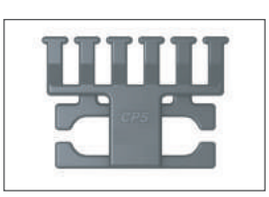


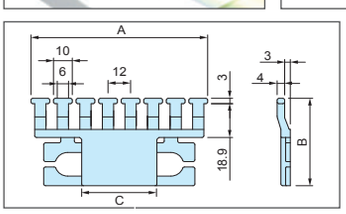


Chain Type	Ordering NO.	Frame
nsb 028N	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

Tie wrap (TW)

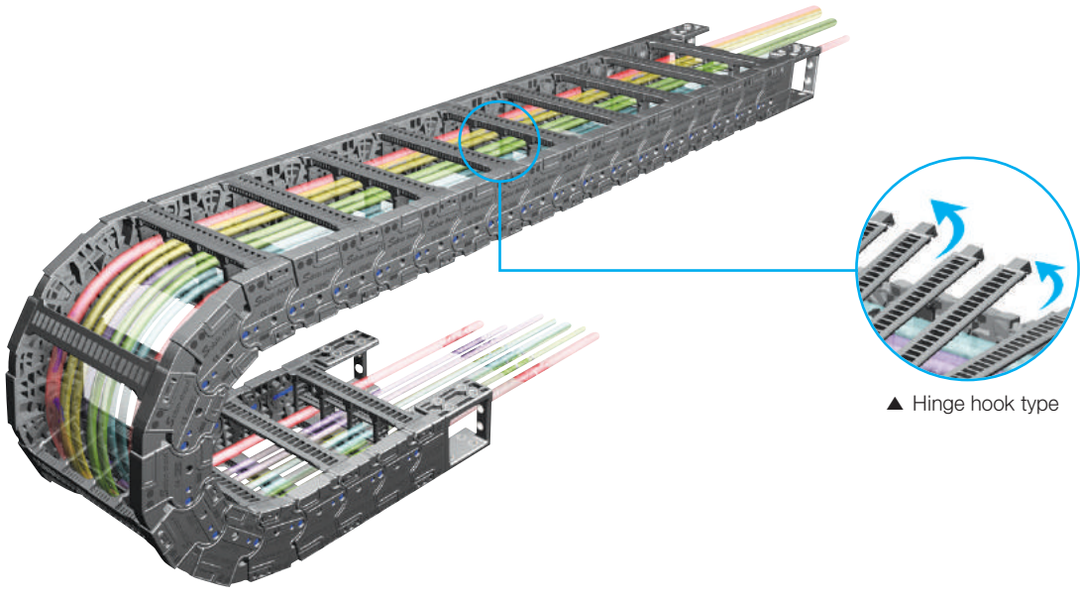




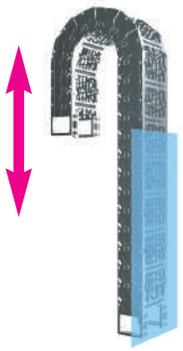


Chain Type	Ordering No.	A	B	C
nsb 028N	S-TW036/025CR.35	46	35.4	-
	S-TW036/025CR.50	69	48.9	15
	S-TW036/025CR.55	70	48.9	20
	S-TW036/025CR.75	94	48.9	40
	S-TW036/025CR.100	118	48.9	65
	S-TW036/025CR.125	142	48.9	90

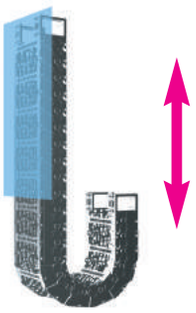
nsb 035N



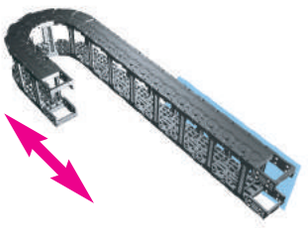
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

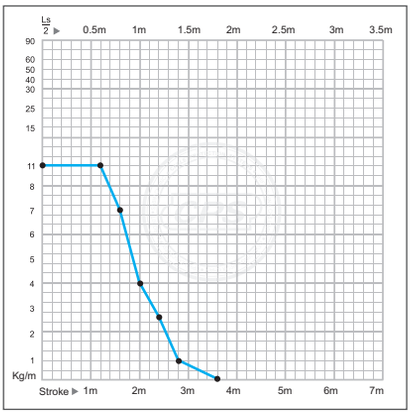
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

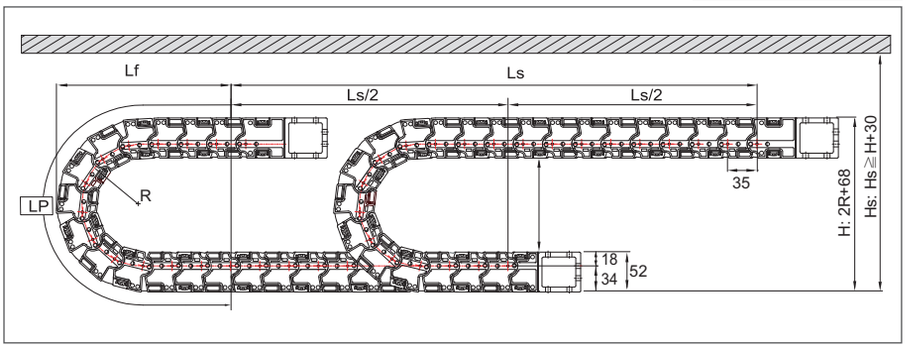
Vertical curve above = max 2.0m
Vertical curve below = max 40m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

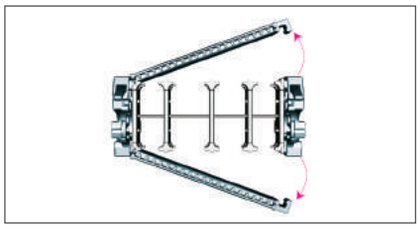
Ls: Stroke Hs: Safe Space

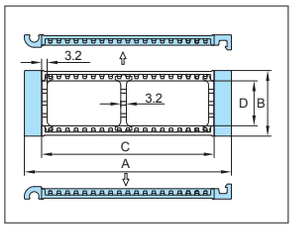


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
55	383	194	178
65	414	204	198
90	493	229	248
115	572	254	298
140	650	279	348
190	807	329	448

(Dimensions in mm)

Chain cross section



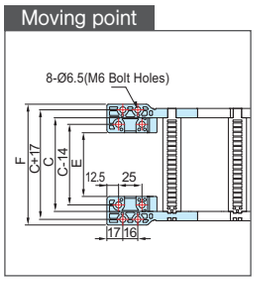


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 035N	55	52	35	40	1.10
	70		50		1.13
	75		55		1.15
	95		75		1.18
	120		100		1.25
	145		125		1.32
	170		150		1.41
	195		175		1.62
	220		200		1.72

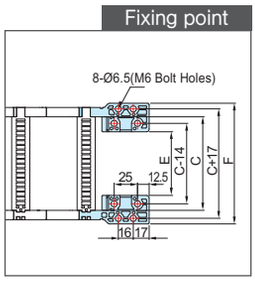
(Dimensions in mm)

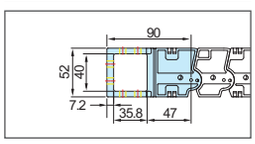
Free end bracket

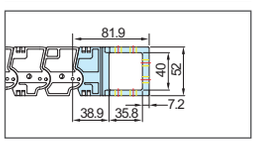
Moving point



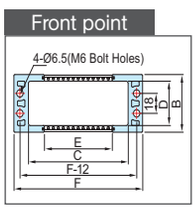
Fixing point







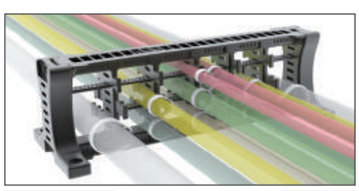
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 035N	64	52	35	40	3	M6 Bolt Holes
	79		50		18	
	84		55		23	
	104		75		43	
	129		100		68	
	154		125		93	
	179		150		118	
	204		175		143	
	229		200		168	

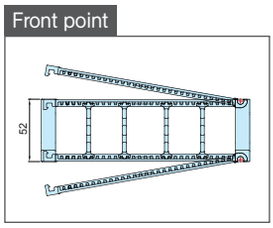
(Dimensions in mm)

System tie wrap (STW)

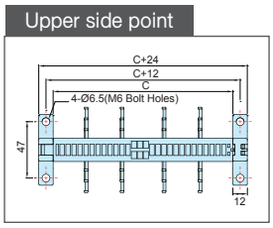


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

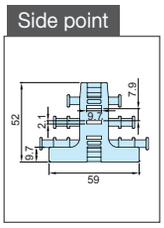
Front point



Upper side point



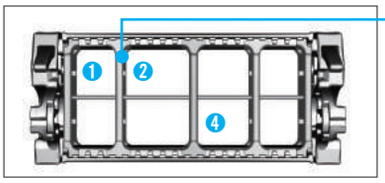
Side point

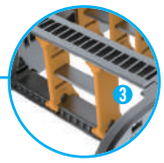


Chain Type	Ordering No.	C Frame	Hole Type
nsb 035N	S-TW.EB028.35	35	M6 Bolt Holes
	S-TW.EB028.50	50	
	S-TW.EB028.55	55	
	S-TW.EB028.75	75	
	S-TW.EB028.100	100	
	S-TW.EB028.125	125	
	S-TW.EB028.150	150	
	S-TW.EB028.175	175	
	S-TW.EB028.200	200	

(Dimensions in mm)

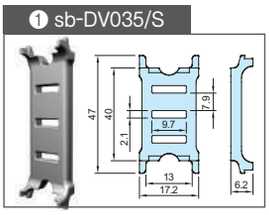
Dividers(DV)



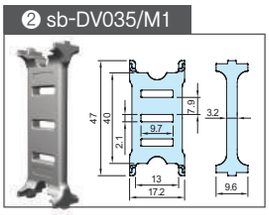


Assemble divider every second frame.
DV.T : Applied to Frame 125~200.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

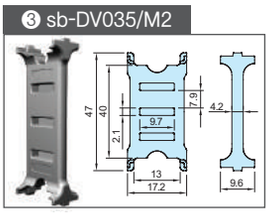
❶ sb-DV035/S



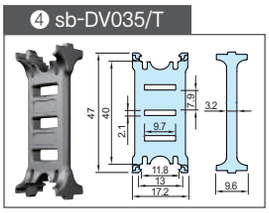
❷ sb-DV035/M1



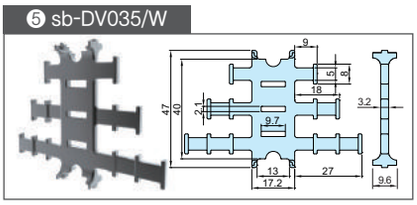
❸ sb-DV035/M2



❹ sb-DV035/T

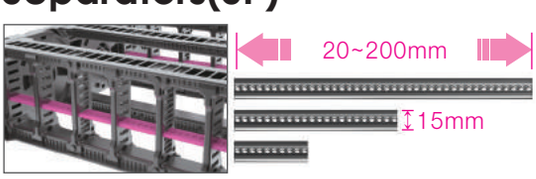


❺ sb-DV035/W



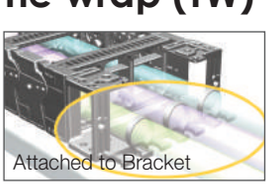
(Dimensions in mm)

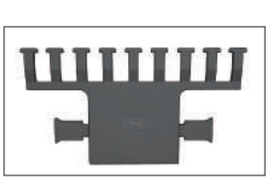
Separators(SP)

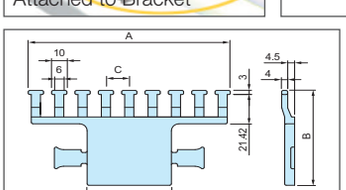


Chain Type	Ordering NO.	Frame
nsb 035N	S-SP/M.35	35
	S-SP/M.50	50
	S-SP/M.55	55
	S-SP/M.75	75
	S-SP/M.100	100
	S-SP/M.125	125
	S-SP/M.150	150
	S-SP/M.175	175
	S-SP/M.200	200

Tie wrap (TW)

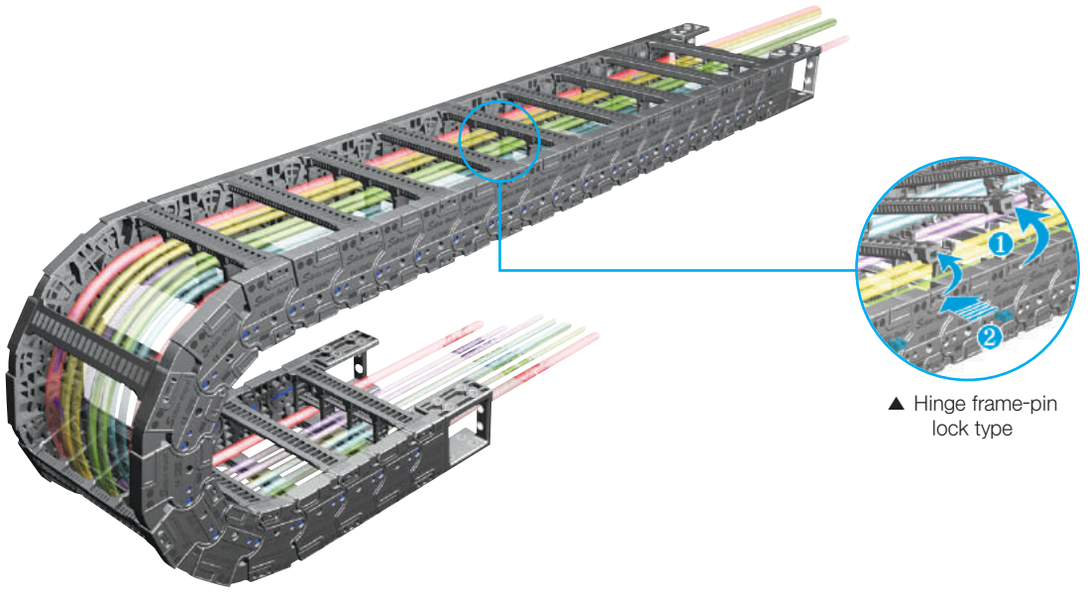




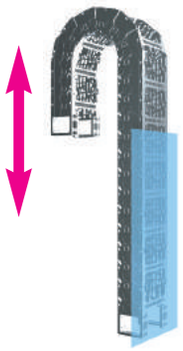


Chain Type	Ordering No.	A	B	C	D
nsb 035N	S-TW050/035N.50	82	64.5	12.00	5
	S-TW050/035N.55	82		12.00	10
	S-TW050/035N.75	107		12.13	30
	S-TW050/035N.100	132		15.25	55
	S-TW050/035N.125	157		14.70	80
	S-TW050/035N.150	182		14.35	105
	S-TW050/035N.175	203		12.31	130
	S-TW050/035N.200	232		13.88	155

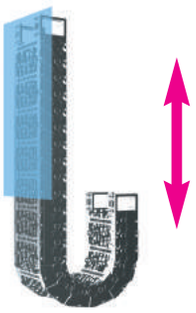
nsb 045N



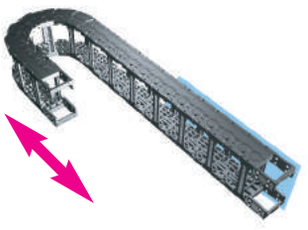
▲ Hinge frame-pin lock type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

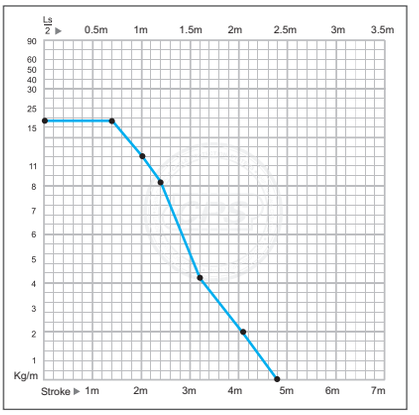
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

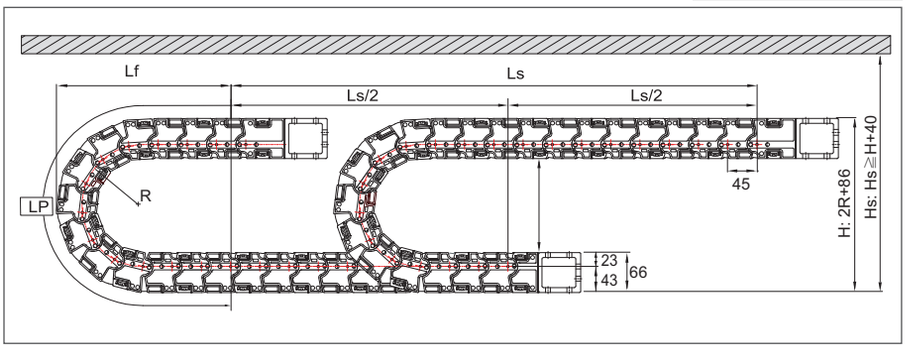
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 2.5m

Load diagrams self-supporting length



Layout of the chain

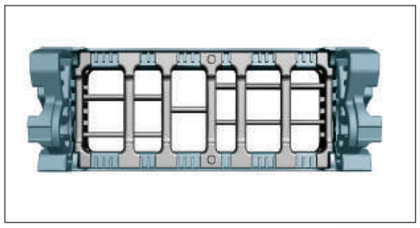
Ls: Stroke Hs: Safe Space

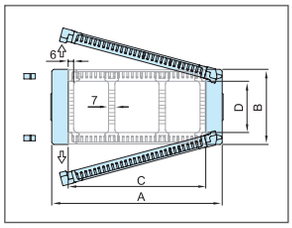


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
90	633	291	266
110	695	311	306
135	774	336	356
165	868	366	416
185	931	386	456
235	1,088	436	556
285	1,245	486	656

(Dimensions in mm)

Chain cross section



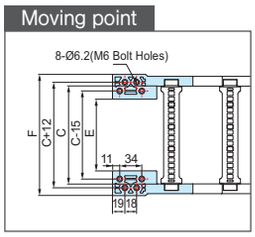


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 045N	80 105 130 155 170 180 195 205 220 230 270 280 330	66	50 75 100 125 140 150 165 175 190 200 240 250 300	45	2.06 2.14 2.22 2.32 2.38 2.42 2.47 2.51 2.72 2.86 3.09 3.15 3.43

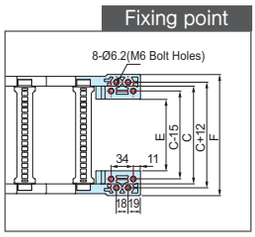
(Dimensions in mm)

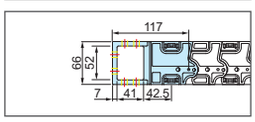
Free end bracket

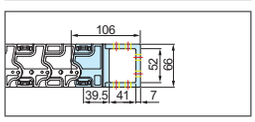
Moving point



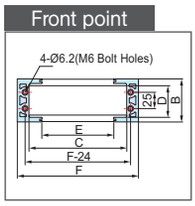
Fixing point







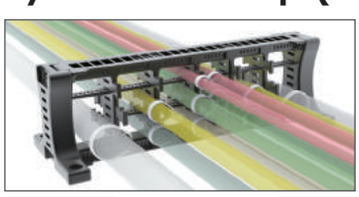
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 045N	86 111 136 161 176 186 201 211 226 236 276 286 336	66	50 75 100 125 140 150 165 175 190 200 240 250 300	45	10 35 60 85 100 110 125 135 150 160 200 210 260	M6 Bolt Holes

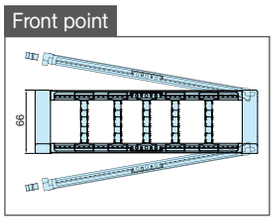
(Dimensions in mm)

System tie wrap (STW)

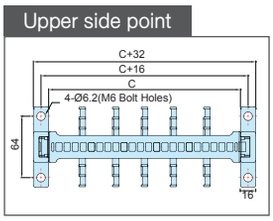


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

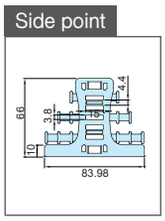
Front point



Upper side point

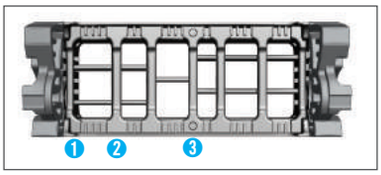


Side point



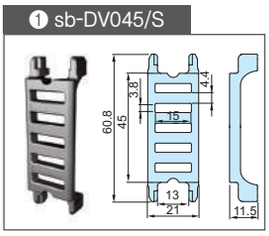
Chain Type	Ordering No.	C Frame	Hole Type
nsb 045N	S-TW,EB045.50 S-TW,EB045.75 S-TW,EB045.100 S-TW,EB045.125 S-TW,EB045.140 S-TW,EB045.150 S-TW,EB045.165 S-TW,EB045.175 S-TW,EB045.190 S-TW,EB045.200 S-TW,EB045.240 S-TW,EB045.250 S-TW,EB045.300	50 75 100 125 140 150 165 175 190 200 240 250 300	M6 Bolt Holes

Dividers(DV)

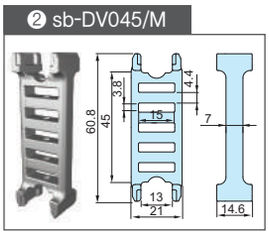


Assemble divider every second frame.
DV.T : Applied to Frame 200~300.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

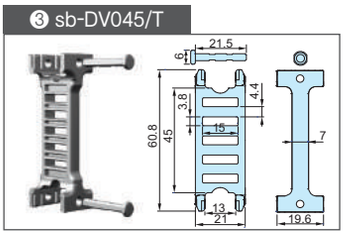
① sb-DV045/S



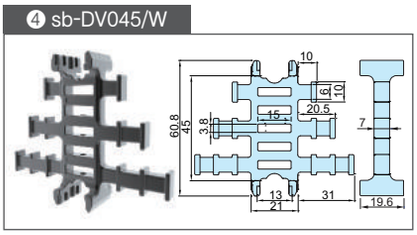
② sb-DV045/M



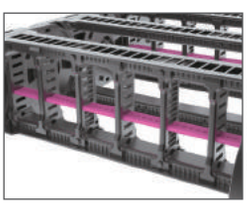
③ sb-DV045/T

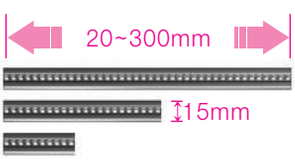


④ sb-DV045/W



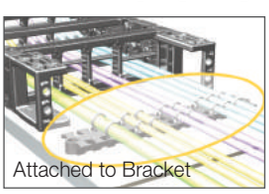
Separators(SP)

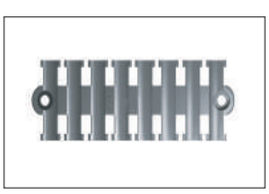


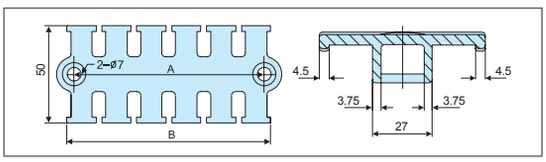


Chain Type	Ordering NO.
nsb 045N	sb-SP/400.400

Tie wrap (TW)

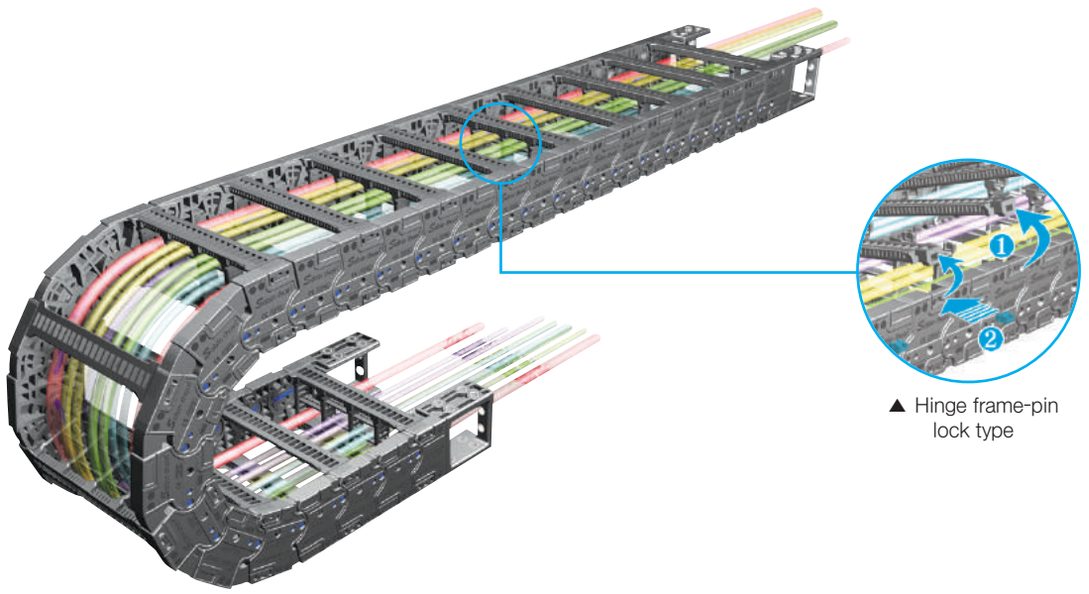




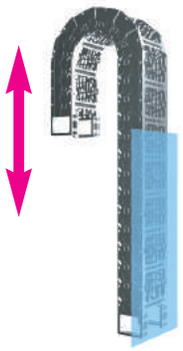


Chain Type	Ordering No.	A	B
nsb 045N	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

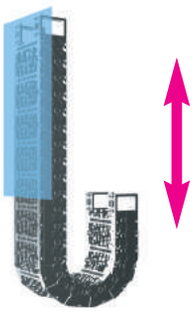
nsb 060N



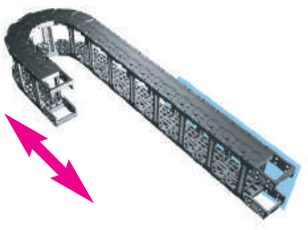
▲ Hinge frame-pin lock type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

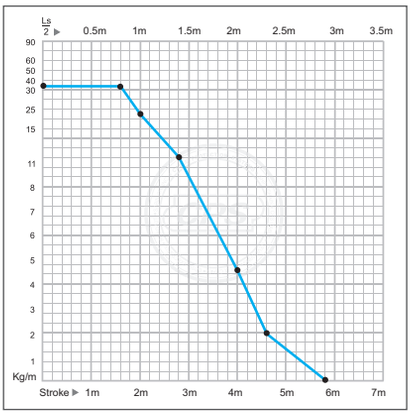
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

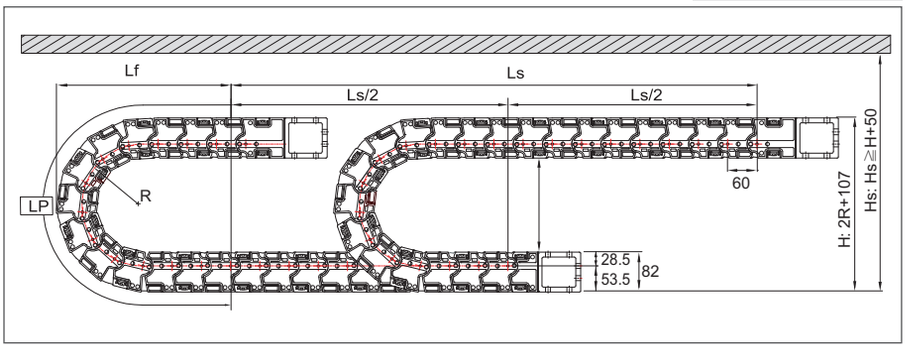
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

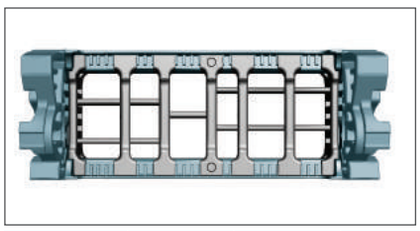
Ls: Stroke Hs: Safe Space

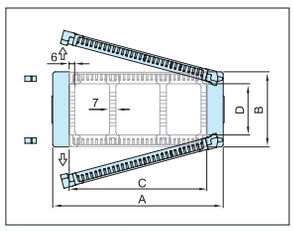


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
125	854	389	357
135	885	399	377
150	932	414	407
180	1,026	444	467
230	1,183	494	567
270	1,309	534	647
340	1,529	604	787

(Dimensions in mm)

Chain cross section



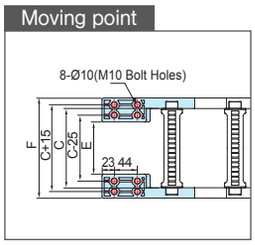


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 060N	115 140 165 190 215 230 240 270 280 290 340 390 440	82	75 100 125 150 175 190 200 230 240 250 300 350 400	55	3.30 3.35 3.51 3.60 3.69 3.78 3.84 3.97 4.01 4.05 4.26 4.57 4.86

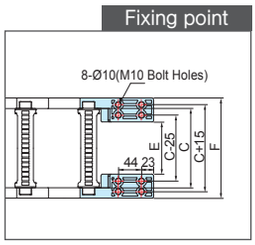
(Dimensions in mm)

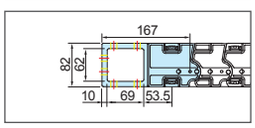
Free end bracket

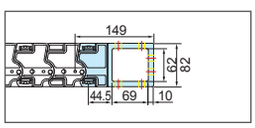
Moving point



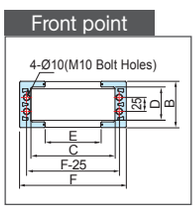
Fixing point







Front point



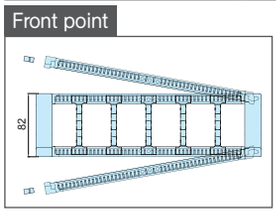
Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 060N	115 140 165 190 215 230 240 270 280 290 340 390 440	82	75 100 125 150 175 190 200 230 240 250 300 350 400	55	24 49 74 99 124 139 149 179 189 199 249 299 349	M10 Bolt Holes

(Dimensions in mm)

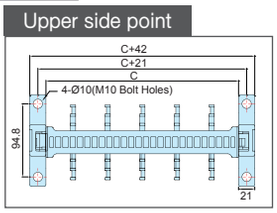
System tie wrap (STW)

It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

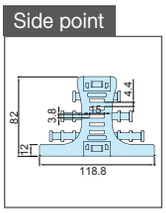
Front point



Upper side point

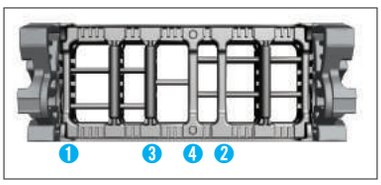


Side point



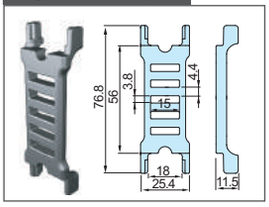
Chain Type	Ordering No.	C Frame	Hole Type
nsb 060N	S-TW.EB060.75 S-TW.EB060.100 S-TW.EB060.125 S-TW.EB060.150 S-TW.EB060.175 S-TW.EB060.190 S-TW.EB060.200 S-TW.EB060.230 S-TW.EB060.240 S-TW.EB060.250 S-TW.EB060.300 S-TW.EB060.350 S-TW.EB060.400	75 100 125 150 175 190 200 230 240 250 300 350 400	M10 Bolt Holes

Dividers(DV)

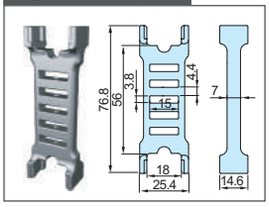


Assemble divider every second frame.
DV.T : Applied to Frame 250~400.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

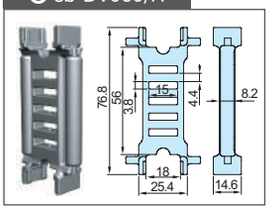
❶ sb-DV060/S



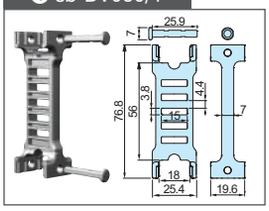
❷ sb-DV060/M



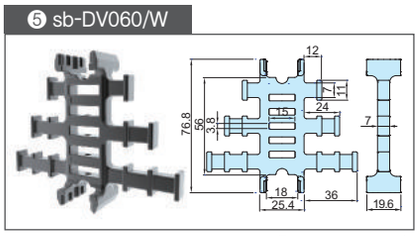
❸ sb-DV060/R



❹ sb-DV060/T

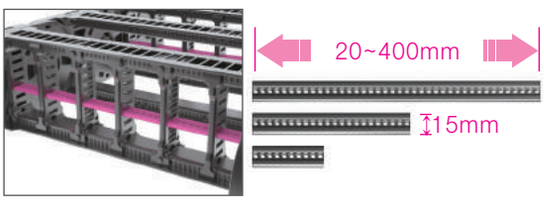


❺ sb-DV060/W



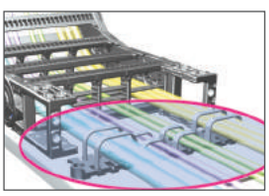
(Dimensions in mm)

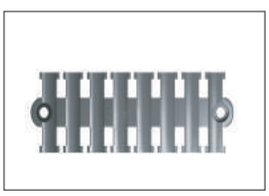
Separators(SP)

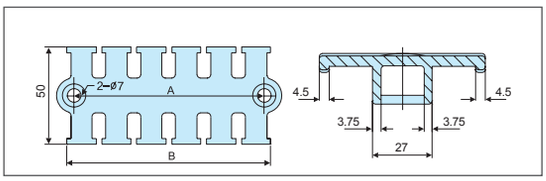


Chain Type	Ordering NO.
nsb 060N	sb-SP/400.400

Tie wrap (TW)

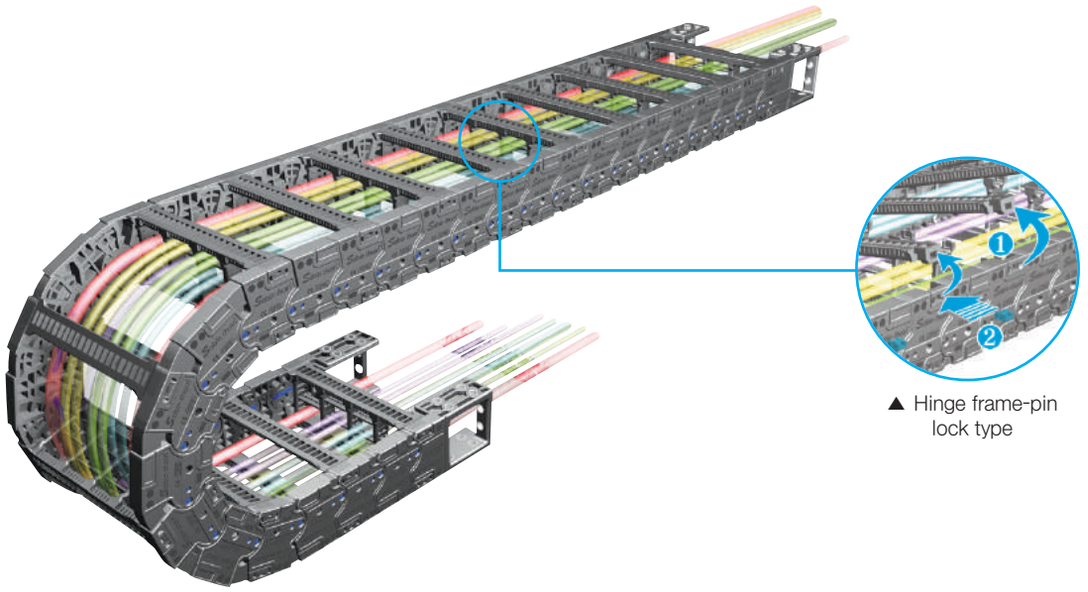




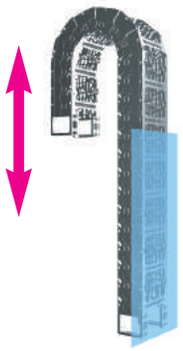


Chain Type	Ordering No.	A	B
nsb 060N	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

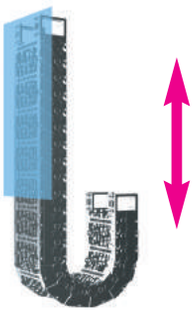
nsb 075N



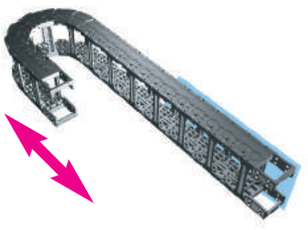
▲ Hinge frame-pin lock type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

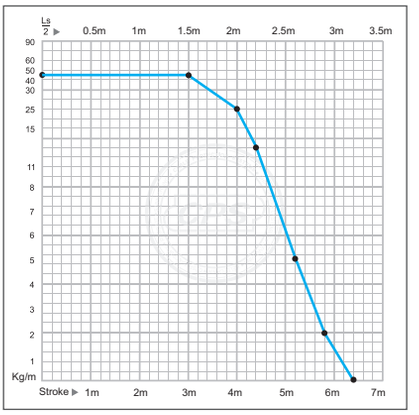
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

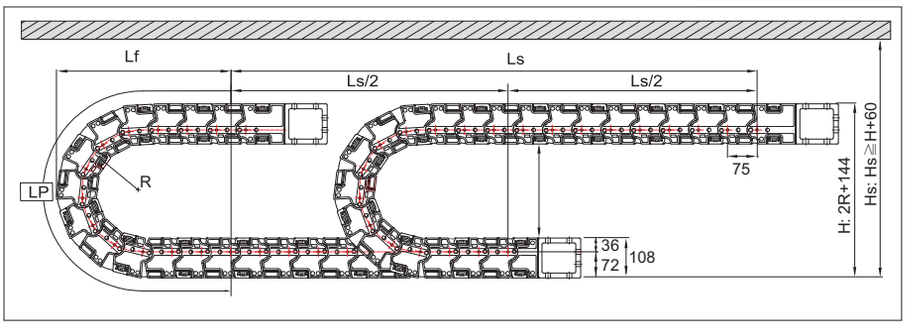
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

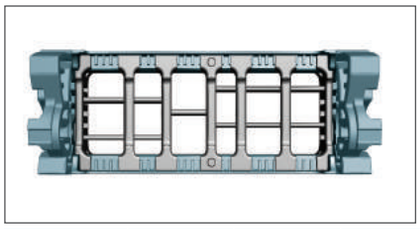
Ls: Stroke Hs: Safe Space

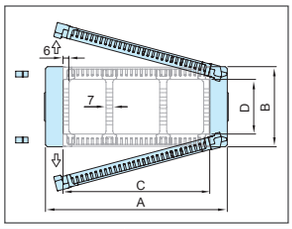


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
160	1,084	495	464
180	1,147	515	504
230	1,304	565	604
280	1,461	615	704
330	1,618	665	804
380	1,775	715	904
480	2,089	815	1,104

(Dimensions in mm)

Chain cross section



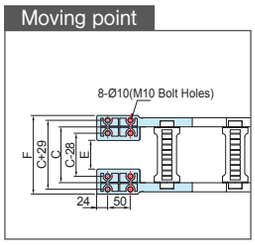


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 075N	115	108	75	78	4.80
	140		100		4.90
	155		115		4.97
	165		125		5.02
	190		150		5.12
	215		175		5.25
	240		200		5.46
	280		240		5.67
	290		250		5.72
	330		290		6.02
	340		300		6.09
	390		350		6.45
	440		400		6.83
	490		450		7.12
	540		500		7.32
	590		550		8.06
	640		600		8.20

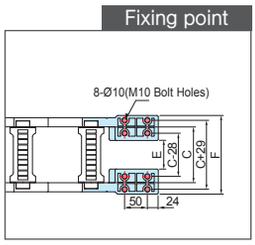
(Dimensions in mm)

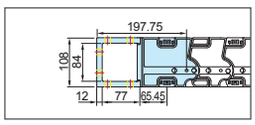
Free end bracket

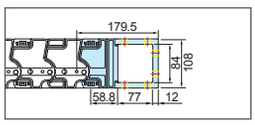
Moving point



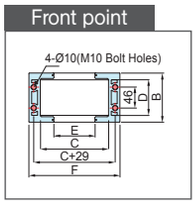
Fixing point







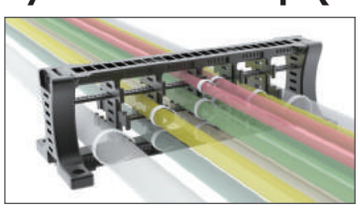
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 075N	125	108	75	78	15	M10 Bolt Holes
	150		100		40	
	165		115		55	
	175		125		65	
	200		150		90	
	225		175		115	
	250		200		140	
	290		240		180	
	300		250		190	
	340		290		230	
	350		300		240	
	400		350		290	
	450		400		340	
	500		450		390	
	550		500		440	
	600		550		490	
	650		600		540	

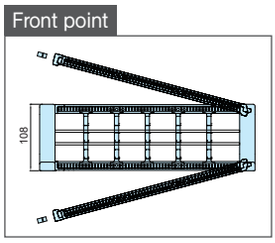
(Dimensions in mm)

System tie wrap (STW)

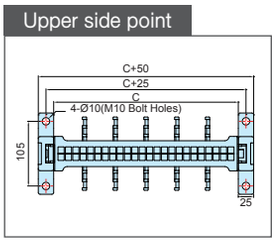


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

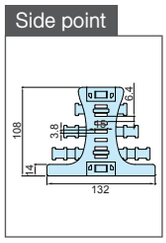
Front point



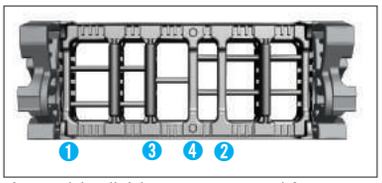
Upper side point



Side point

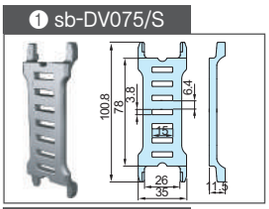


Dividers(DV)

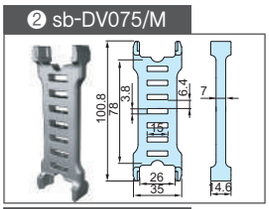


Assemble divider every second frame.
DV.T : Applied to Frame 300~600.
DV.M : Normal Divider.
DV.W : Applicable to System Tie Wrap or FEB.

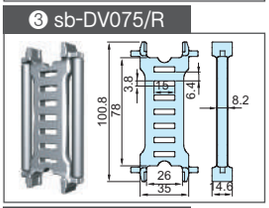
❶ sb-DV075/S



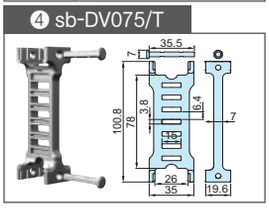
❷ sb-DV075/M



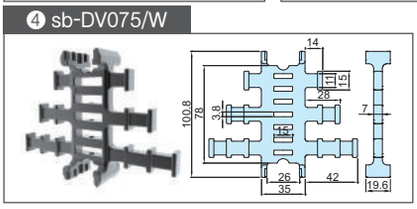
❸ sb-DV075/R



❹ sb-DV075/T

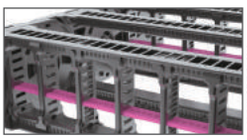


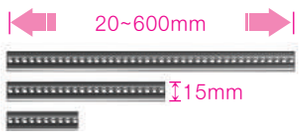
❹ sb-DV075/W



(Dimensions in mm)

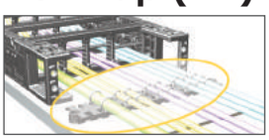
Separators(SP)

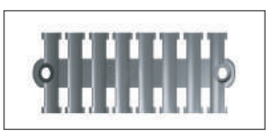


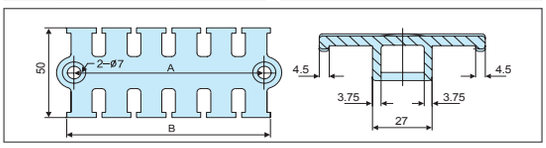


Chain Type	Ordering NO.
nsb 075N	sb-SP/600.600

Tie wrap (TW)







Chain Type	Ordering No.	A	B
nsb 075N	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

Chain Type	Ordering No.	C Frame	Hole Type
nsb 075N	S-TW.EB075.75	75	M10 Bolt Holes
	S-TW.EB075.100	100	
	S-TW.EB075.115	115	
	S-TW.EB075.125	125	
	S-TW.EB075.150	150	
	S-TW.EB075.175	175	
	S-TW.EB075.200	200	
	S-TW.EB075.240	240	
	S-TW.EB075.250	250	
	S-TW.EB075.290	290	
	S-TW.EB075.300	300	
	S-TW.EB075.350	350	
	S-TW.EB075.400	400	
	S-TW.EB075.450	450	
	S-TW.EB075.500	500	
	S-TW.EB075.550	550	
	S-TW.EB075.600	600	

nsb Chain - Enclosed type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	5m/s
Acceleration	15m/s²
Temperature	-30℃ ~+130℃
Special production	ESD, UV, Customized color
Certificate	CE, ATEX(Ex)

Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

nsb Chain E Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Size A	Size B	Size C	Size D	Frame style	Section - composition
nsb 028E	28	66, 86, 116, 146	1.00 1.13 1.30 1.50	5	-30 ~ +130	55 75 95 120	38	35 55 75 100	26		
nsb 035E	35	90, 115, 140, 190	1.45 1.64 1.83 2.06 2.28	5	-30 ~ +130	70 95 120 145 170	52	50 75 100 125 150	40		
nsb 045E	45	90, 110, 135, 165, 185, 235, 285	2.78 3.07 3.35 3.58	5	-30 ~ +130	105 130 155 180	66	75 100 125 150	45		
nsb 060E	60	125, 135, 150, 180, 230, 270, 340	4.32 4.86 5.41	5	-30 ~ +130	140 190 240	82	100 150 200	56		
nsb 075E	75	160, 180, 230, 280, 330, 380, 480	7.01 7.97 9.48	5	-30 ~ +130	190 240 340	108	150 200 300	78		

(Dimensions in mm)

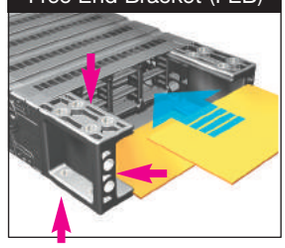
Ordering

nsb 028E. 50. R66 / F - 1000L : 10ST

- Sabin Chain
- Enclosed (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

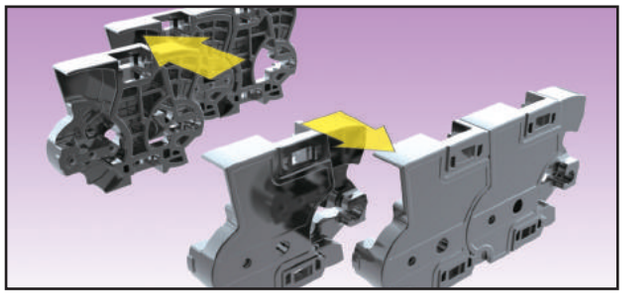
Bracket type

Free End Bracket (FEB)

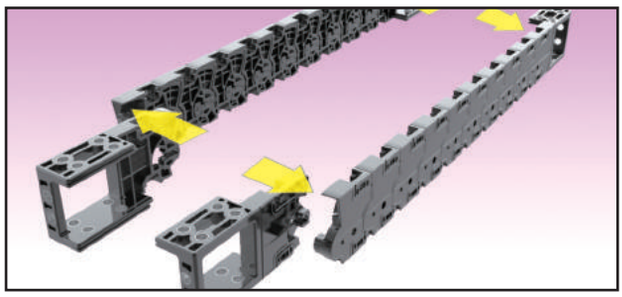


≫ Assembly procedure of nsb Chain Enclosed Type

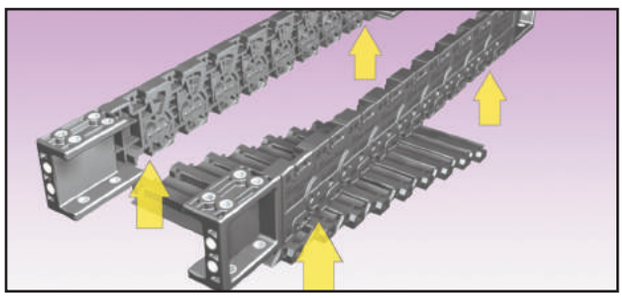
The assembling process of E-Type of New Sabin Chain is like below and user must use rubber hammer with careful combination of Divider and Separator.



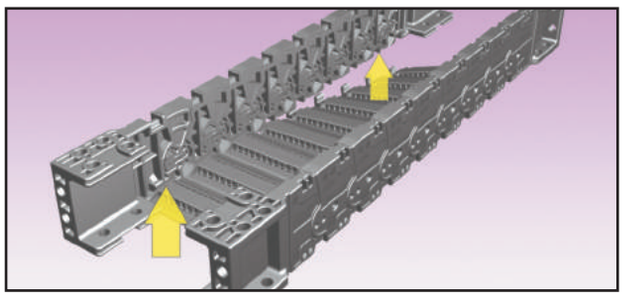
1 Connect each side band as many as you need.



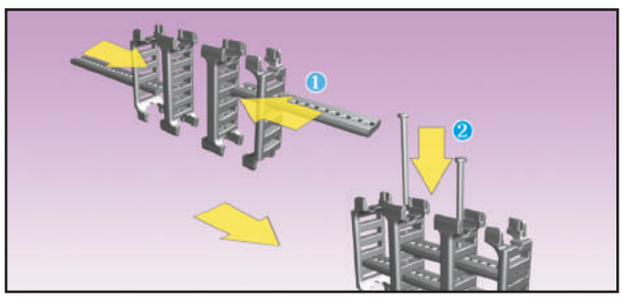
2 Assemble the end brackets on both ends.



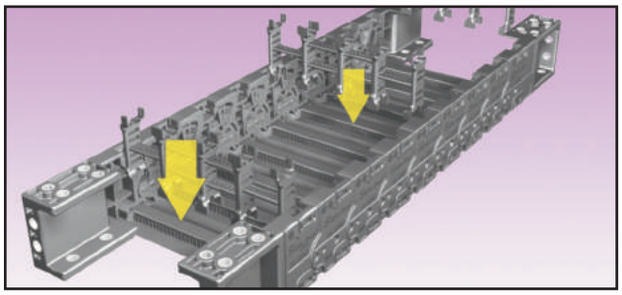
3 Attach frames starting with the bottom side of the carrier.



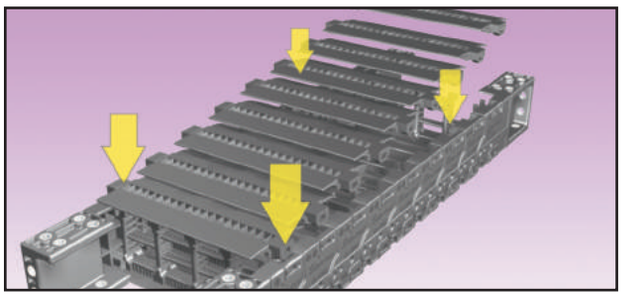
3-1 028E, 035E Type are Hinge Frame Type.



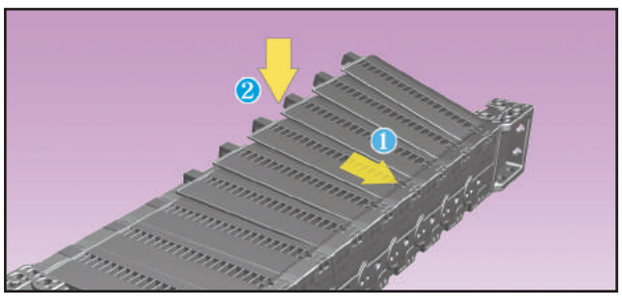
4 For nsb 045, 060, and 075, connect the pin of separator in hole of divider after inserting separator in hole of divider. For nsb028 and nsb035, separator fixing pins are not used.



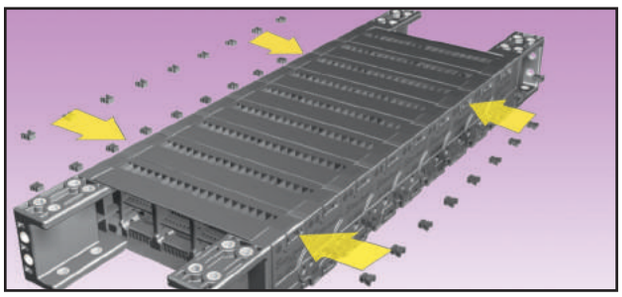
5 Fix the separator and divider patterns to the bottom-side frames as needed.



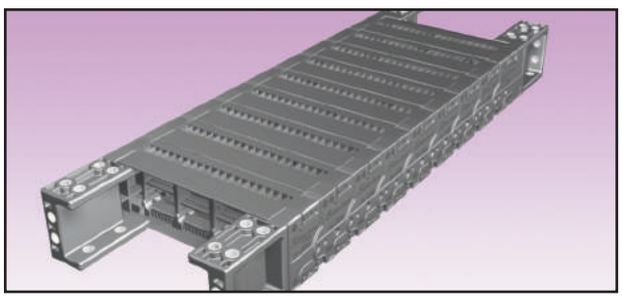
6 Fix the topside frames to the carrier.



6-1 028E, 035E Type are Hinge Frame Type.



7 Insert frame pins to secure the frames and complete carrier. (nsb045, 060, 075 are applied with frame pin, and nsb028, 035 are Hinge Type or Hook Type without frame pin.)



8 Complete to assemble New Sabin E-Type, Sabin Chain.

nsb Chain - Enclosed type

≫ Part list of nsb Chain Enclosed type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
nsb028E	SIDE BAND	nsb-SB028E.R*(LH) nsb-SB028E.R*(RH)	Left side band of nsb028E Right side band of nsb028E
	FRAME(DOWN) FRAME(UP)	ST-FRD028.35 ST-FRU028.35 ST-FRD028.55 ST-FRU028.55 ST-FRD028.75 ST-FRU028.75 ST-FRD028.100 ST-FRU028.100	Inside frame, 35mm Outside frame, 35mm Inside frame, 55mm Outside frame, 55mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm
	FREE END BRACKET	nsb-FEB028E	End bracket of nsb028E
	DIVIDER	sb-DV028/M sb-DV028/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.55 S-SP/M.75 S-SP/M.100	Separator, 35mm Separator, 55mm Separator, 75mm Separator, 100mm
	TIE WRAP	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100	Tie wrap for end bracket to fix cables, 35mm Tie wrap for end bracket to fix cables, 55mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm
	SYSTEM TIE WRAP	sb-DV028/W S-TW.EB028	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
nsb035E	SIDE BAND	nsb-SB035E.R*(LH) nsb-SB035E.R*(RH)	Left side band of nsb035E Right side band of nsb035E
	FRAME(DOWN) FRAME(UP)	ST-FRD035.50 ST-FRU035.50 ST-FRD035.75 ST-FRU035.75 ST-FRD035.100 ST-FRU035.100 ST-FRD035.125 ST-FRU035.125 ST-FRD035.150 ST-FRU035.150	Inside frame, 50mm Outside frame, 50mm Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm
	FREE END BRACKET	nsb-FEB035E	End bracket of nsb035E
	DIVIDER	sb-DV035/M sb-DV035/S	Normal divider To fix separstors at the both side section
	SEPARATOR	S-SP/M.35 S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150	Separator, 35mm Separator, 50mm Separator, 75mm Separator, 100mm Separator, 125mm Separator, 150mm
	TIE WRAP	S-TW050/035N.50 S-TW050/035N.75 S-TW050/035N.100 S-TW050/035N.125 S-TW050/035N.150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV035/W S-TW.EB035	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

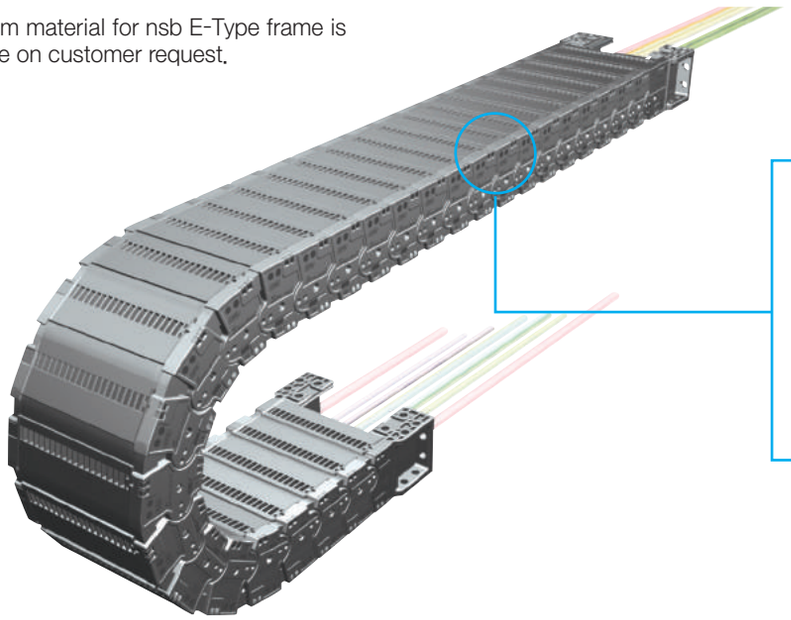
Model	Classification	Part number	Description
nsb045E	SIDE BAND	nsb-SB045E.R*(LH) nsb-SB045E.R*(RH)	Left side band of nsb045E Right side band of nsb045E
	FRAME PIN	S-FP/S1	Frame pin
	FRAME(DOWN) FRAME(UP)	ST-FRD045.75 ST-FRU045.75 ST-FRD045.100 ST-FRU045.100 ST-FRD045.125 ST-FRU045.125 ST-FRD045.150 ST-FRU045.150	Inside frame, 75mm Outside frame, 75mm Inside frame, 100mm Outside frame, 100mm Inside frame, 125mm Outside frame, 125mm Inside frame, 150mm Outside frame, 150mm
	FREE END BRACKET	nsb-FEB045E sb-FEB/WH045	End bracket of nsb045E Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S sb-DV045/T	Normal divider To fix separstors at the both side section T divider
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

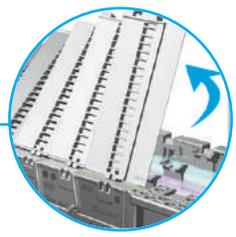
Model	Classification	Part number	Description
nsb060E	SIDE BAND	nsb-SB060E.R*(LH) nsb-SB060E.R*(RH)	Left side band of nsb060E Right side band of nsb060E
	FRAME PIN	S-FP/S1	Frame pin
	FRAME(DOWN) FRAME(UP)	sb-FRU060.100 sb-FRU060.100 sb-FRU060.150 sb-FRU060.150 sb-FRU060.200 sb-FRU060.200	Inside frame, 100mm Outside frame, 100mm Inside frame, 150mm Outside frame, 150mm Inside frame, 200mm Outside frame, 200mm
	FREE END BRACKET	nsb-FEB060E sb-FEB/WH060	End bracket of nsb060E Steel washer for end bracket
	DIVIDER	sb-DV060/M sb-DV060/S sb-DV060/R sb-DV060/T sb-DV060/TP	Normal divider To fix separstors at the both side section Roller divider to reduce friction with cables, Clean room type T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW.EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
nsb075E	SIDE BAND	nsb-SB075E.R*(LH) nsb-SB075E.R*(RH)	Left side band of nsb075E Right side band of nsb075E
	FRAME PIN	S-FP/S2	Frame pin
	FRAME(DOWN) FRAME(UP)	sb-FRU075.150 sb-FRU075.150 sb-FRU075.200 sb-FRU075.200 sb-FRU075.300 sb-FRU075.300	Inside frame, 150mm Outside frame, 150mm Inside frame, 200mm Outside frame, 200mm Inside frame, 300mm Outside frame, 300mm
	FREE END BRACKET	nsb-FEB075E sb-FEB/WH075	End bracket of nsb075E Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S sb-DV075/R sb-DV075/T sb-DV075/TP	Normal divider To fix separstors at the both side section Roller divider to reduce friction with cables, Clean room type T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW.EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

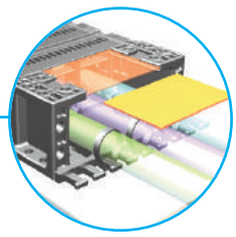
nsb 028E

• Alumnum material for nsb E-Type frame is available on customer request.

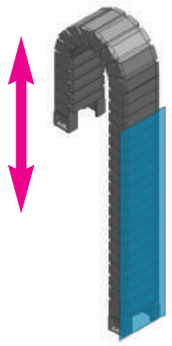




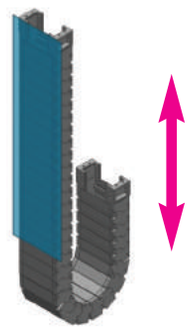
▲ Hinge hook type



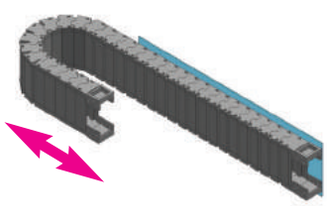
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

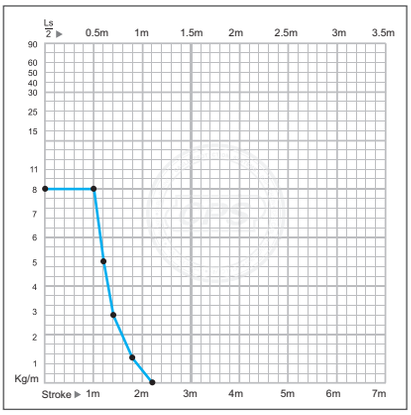
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

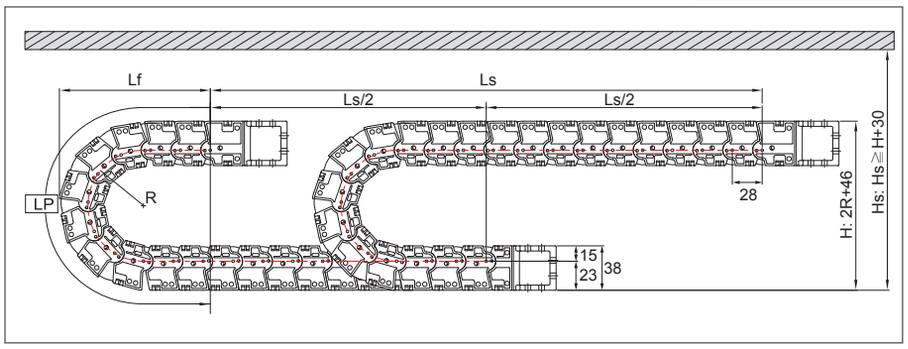
Vertical curve above = max 2.0m
Vertical curve below = max 40m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

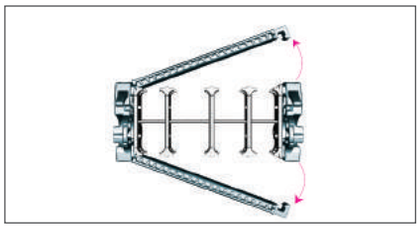
Ls: Stroke Hs: Safe Space

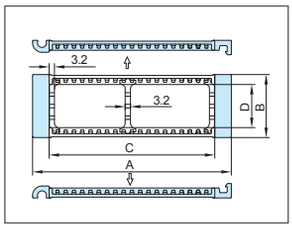


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
66	376	173	178
86	439	193	218
116	533	223	278
146	627	253	338

(Dimensions in mm)

Chain cross section

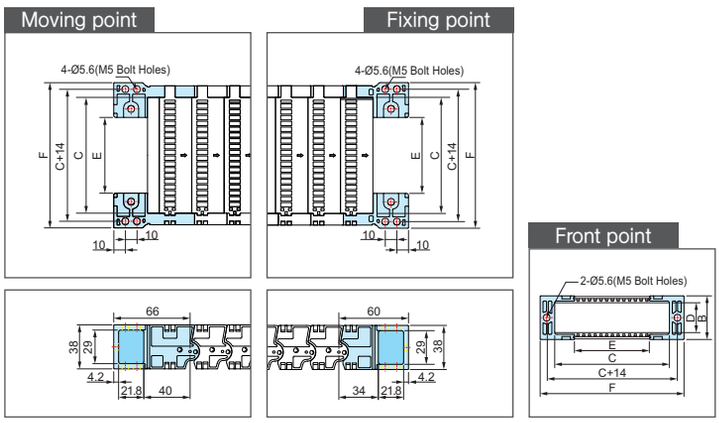




Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 028E	55 75 95 120	38	35 55 75 100	26	1.00 1.13 1.30 1.50

(Dimensions in mm)

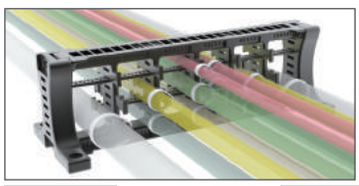
Free end bracket



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 028E	60.4 80.4 100.4 125.4	38	35 55 75 100	26	0.4 20.4 40.4 65.4	M5 Bolt Holes

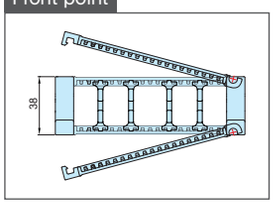
(Dimensions in mm)

System tie wrap (STW)

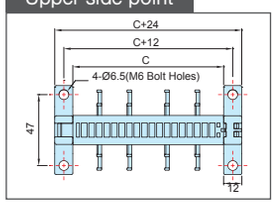


It is a unit to classify each cable for preventing entanglement of cables.
It can either be installed to free end bracket or installed separately according its application environment.

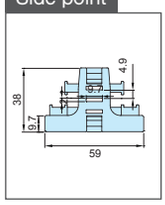
Front point



Upper side point



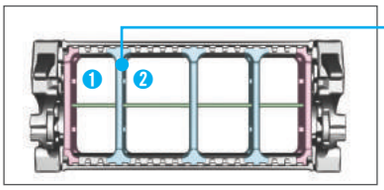
Side point

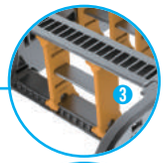


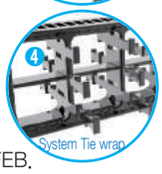
Chain Type	Ordering No.	C Frame	Hole Type
nsb 028E	S-TW.EB028.35 S-TW.EB028.55 S-TW.EB028.75 S-TW.EB028.100	35 55 75 100	M6 Bolt Holes

(Dimensions in mm)

Dividers(DV)

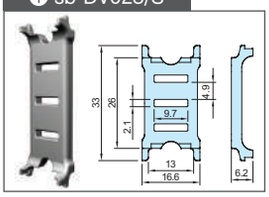




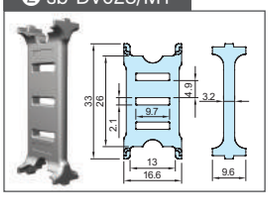


Assemble divider every second frame.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

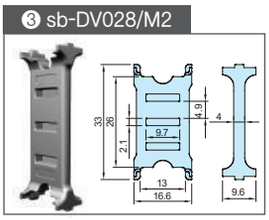
❶ sb-DV028/S



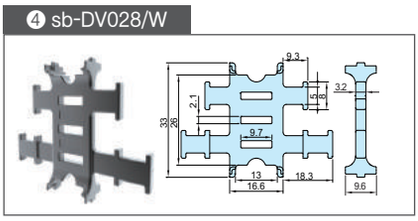
❷ sb-DV028/M1



❸ sb-DV028/M2

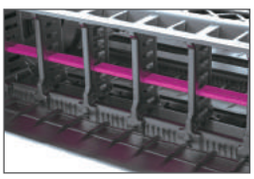


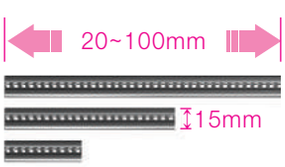
❹ sb-DV028/W



(Dimensions in mm)

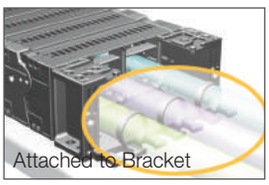
Separators(SP)

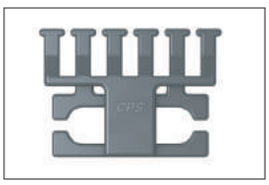


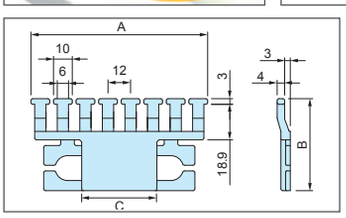


Chain Type	Ordering NO.	Frame
nsb 028E	S-SP/M.35 S-SP/M.55 S-SP/M.75 S-SP/M.100	35 55 75 100

Tie wrap (TW)





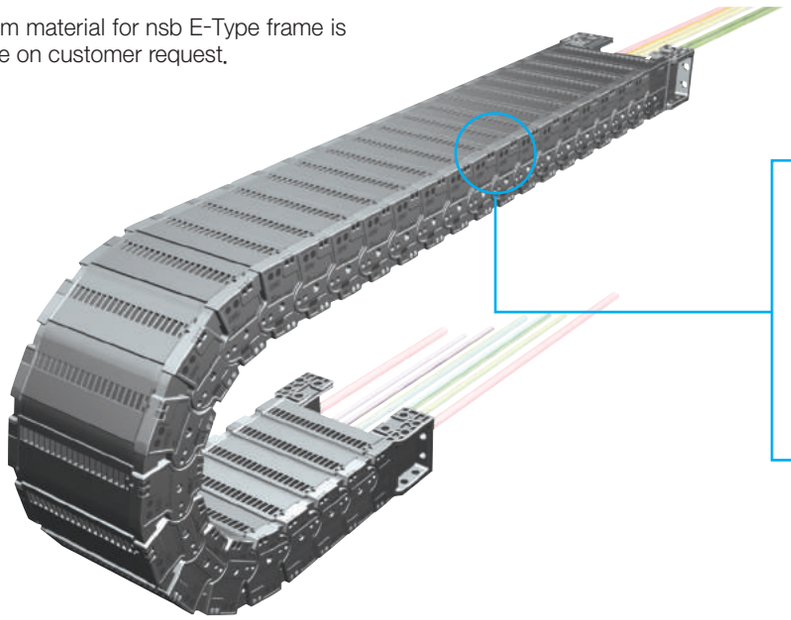


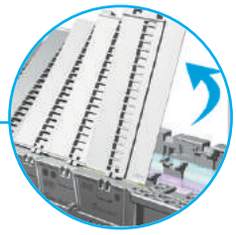
Chain Type	Ordering No.	A	B	C
nsb 028E	S-TW036/025CR.35 S-TW036/025CR.55 S-TW036/025CR.75 S-TW036/025CR.100	46 70 94 118	35.4 48.9 48.9 48.9	- 20 40 65

(Dimensions in mm)

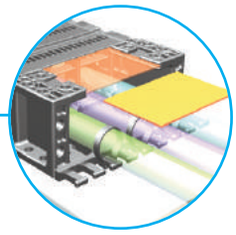
nsb 035E

• Alumnum material for nsb E-Type frame is available on customer request.

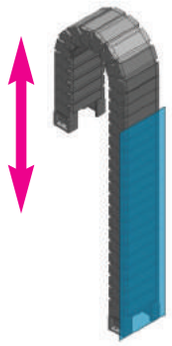




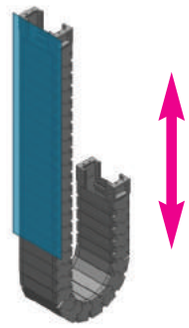
▲ Hinge hook type



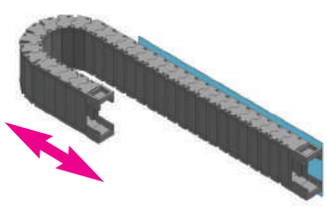
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

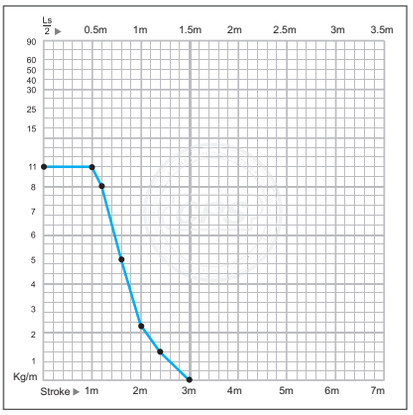
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

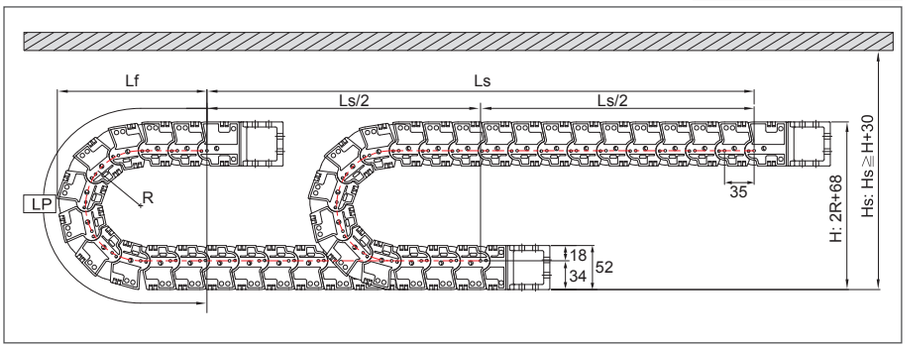
Vertical curve above = max 3.0m
Vertical curve below = max 50m
Side Mounted, Unsupported = max 1.0m

Load diagrams self-supporting length



Layout of the chain

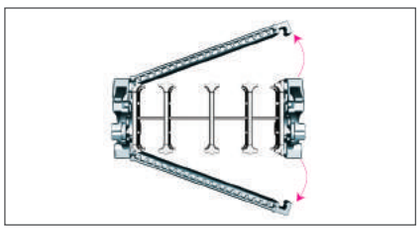
Ls: Stroke Hs: Safe Space

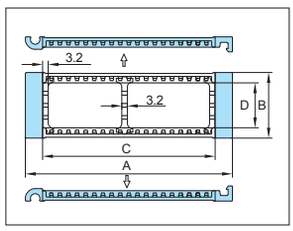


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
90	493	229	248
115	572	254	298
140	650	279	348
190	807	329	448

(Dimensions in mm)

Chain cross section



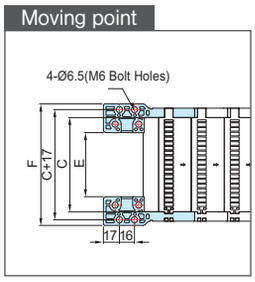


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 035E	70 95 120 145 170	52	50 75 100 125 150	40	1.45 1.64 1.83 2.06 2.28

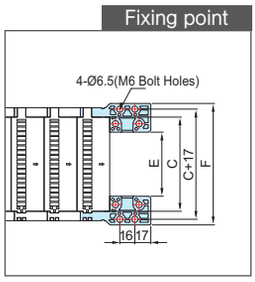
(Dimensions in mm)

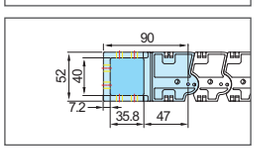
Free end bracket

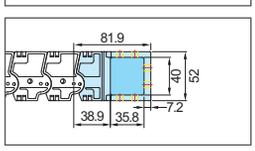
Moving point



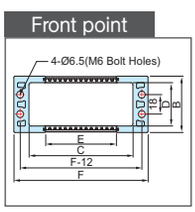
Fixing point







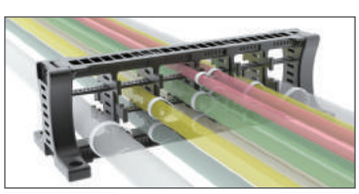
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 035E	79 104 129 154 179	52	50 75 100 125 150	40	18 43 68 93 118	M6 Bolt Holes

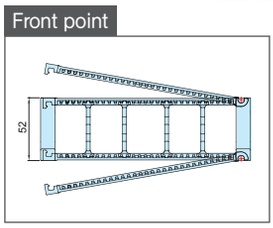
(Dimensions in mm)

System tie wrap (STW)

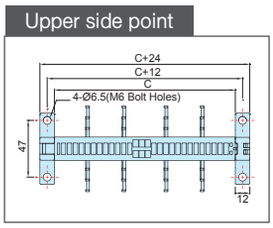


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

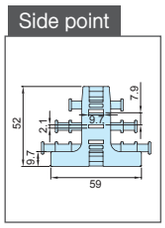
Front point



Upper side point

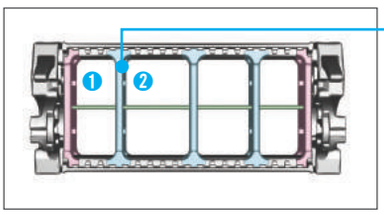


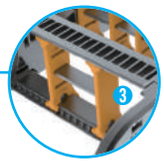
Side point

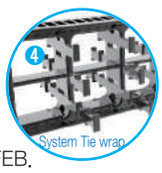


Chain Type	Ordering No.	C Frame	Hole Type
nsb 035E	S-TW.EB035.50 S-TW.EB035.75 S-TW.EB035.100 S-TW.EB035.125 S-TW.EB035.150	50 75 100 125 150	M6 Bolt Holes

Dividers(DV)

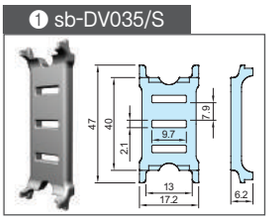




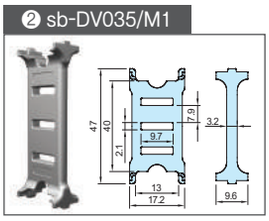


Assemble divider every second frame.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

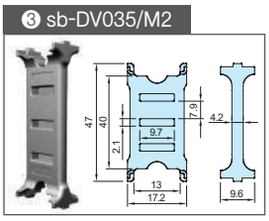
❶ sb-DV035/S



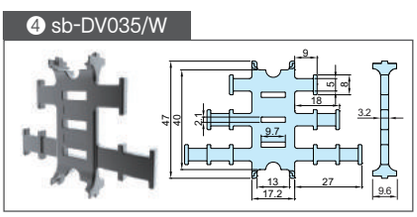
❷ sb-DV035/M1



❸ sb-DV035/M2

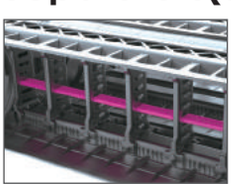


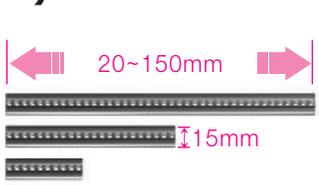
❹ sb-DV035/W



(Dimensions in mm)

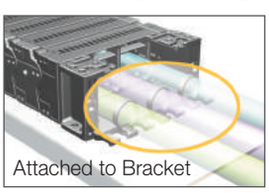
Separators(SP)

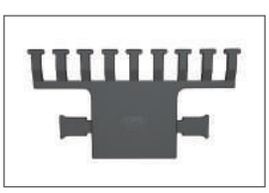


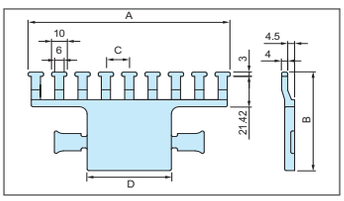


Chain Type	Ordering NO.	Frame
nsb 035E	S-SP/M.50 S-SP/M.75 S-SP/M.100 S-SP/M.125 S-SP/M.150	50 75 100 125 150

Tie wrap (TW)



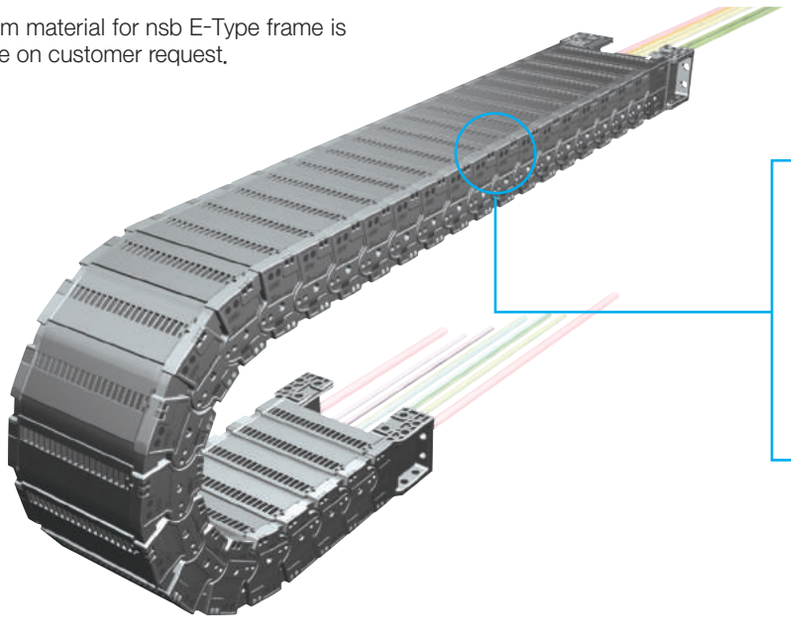


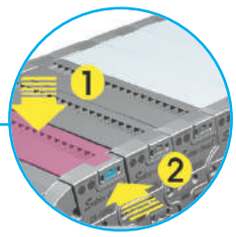


Chain Type	Ordering No.	A	B	C	
nsb 035E	S-TW050/035N.50 S-TW050/035N.75 S-TW050/035N.100 S-TW050/035N.125 S-TW050/035N.150	82 107 132 157 182	64.5	12.00 12.13 15.25 14.70 14.35	5 30 55 80 105

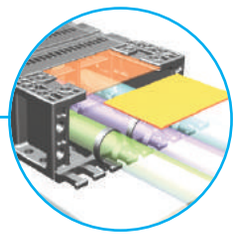
nsb 045E

• Alumnum material for nsb E-Type frame is available on customer request.

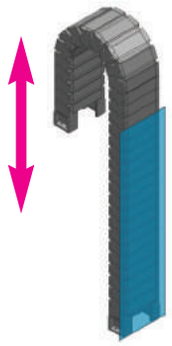




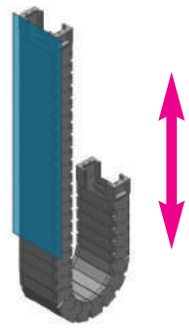
▲ Hinge frame-pin lock type



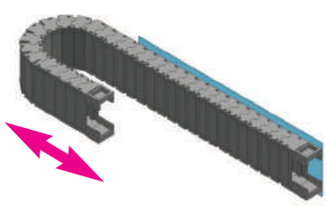
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

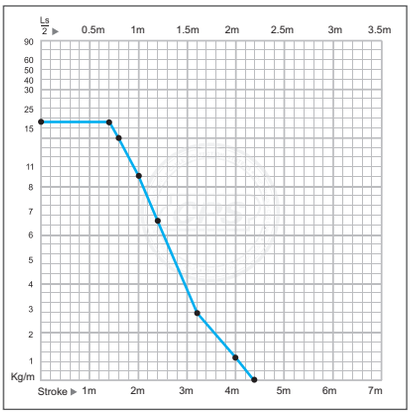
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

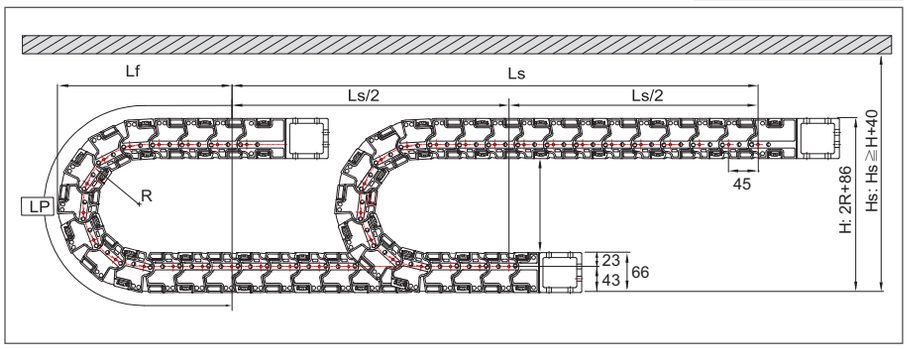
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 2.5m

Load diagrams self-supporting length



Layout of the chain

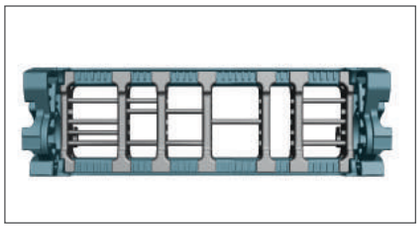
Ls: Stroke Hs: Safe Space

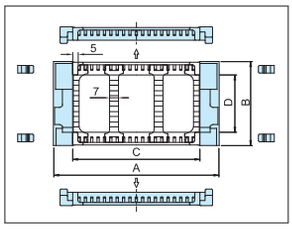


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
90	633	291	266
110	695	311	306
135	774	336	356
165	868	366	416
185	931	386	456
235	1,088	436	556
285	1,245	486	656

(Dimensions in mm)

Chain cross section



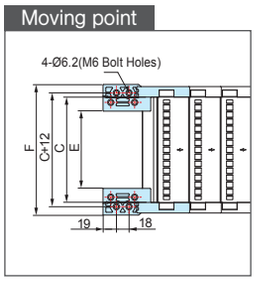


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 045E	105 130 155 180	66	75 100 125 150	45	2.78 3.07 3.35 3.58

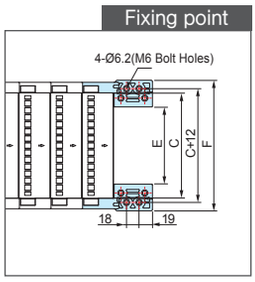
(Dimensions in mm)

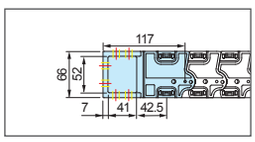
Free end bracket

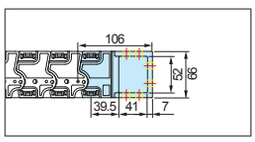
Moving point



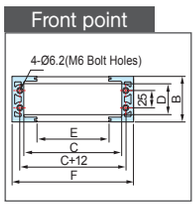
Fixing point







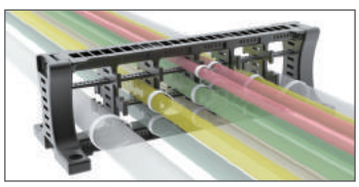
Front point



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 045E	111 136 161 186	66	75 100 125 150	45	35 60 85 110	M6 Bolt Holes

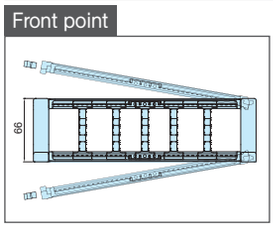
(Dimensions in mm)

System tie wrap (STW)

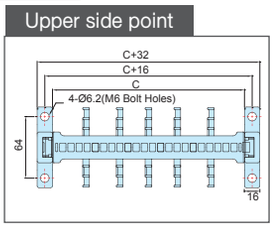


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

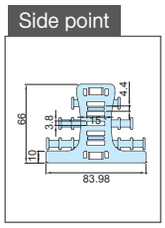
Front point



Upper side point



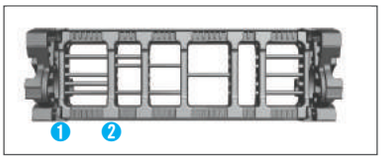
Side point



Chain Type	Ordering No.	C Frame	Hole Type
nsb 045E	S-TW.EB045.75 S-TW.EB045.100 S-TW.EB045.125 S-TW.EB045.150	75 100 125 150	M6 Bolt Holes

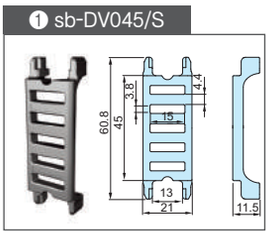
(Dimensions in mm)

Dividers(DV)

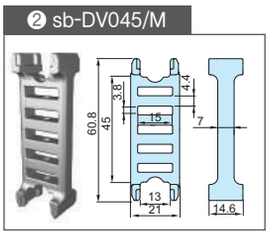


Assemble divider every second frame.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

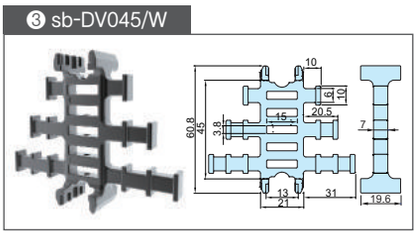
❶ sb-DV045/S



❷ sb-DV045/M

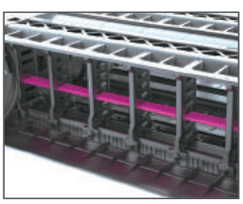


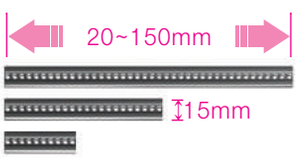
❸ sb-DV045/W



(Dimensions in mm)

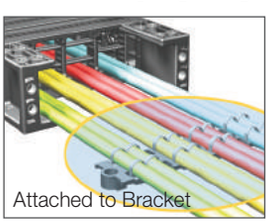
Separators(SP)

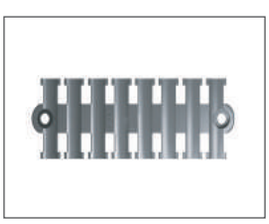


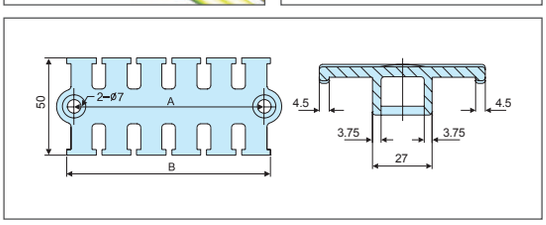


Chain Type	Ordering NO.
nsb 045E	sb-SP/400.400

Tie wrap (TW)





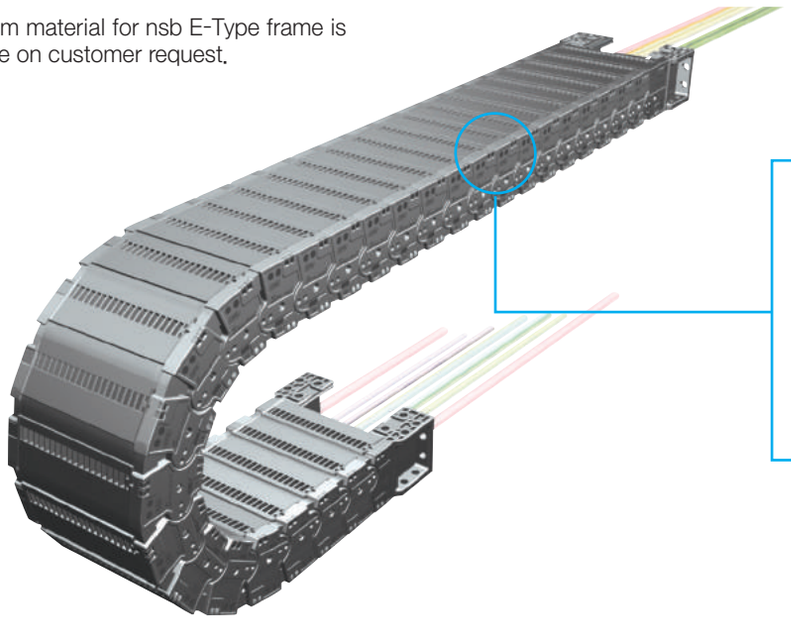


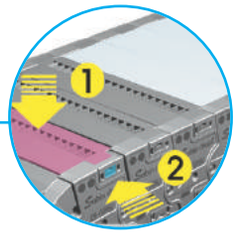
Chain Type	Ordering No.	A	B
nsb 045E	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

(Dimensions in mm)

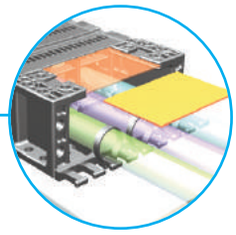
nsb 060E

• Alumnum material for nsb E-Type frame is available on customer request.

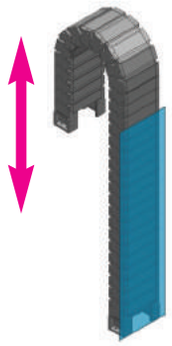




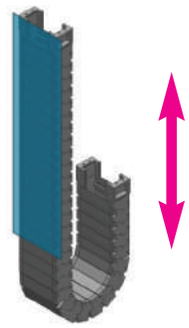
▲ Hinge frame-pin lock type



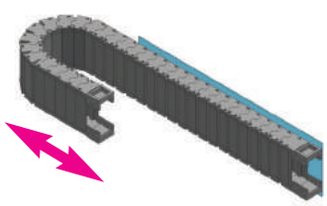
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

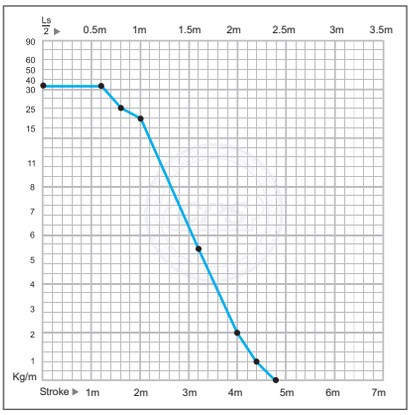
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

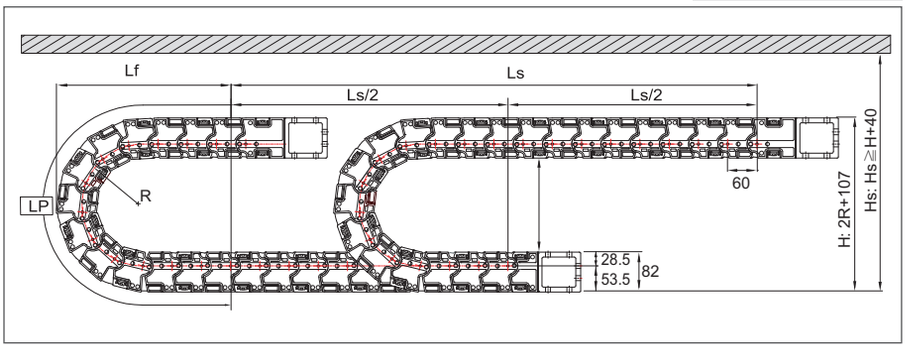
Vertical curve above = max 6.0m
Vertical curve below = max 100m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

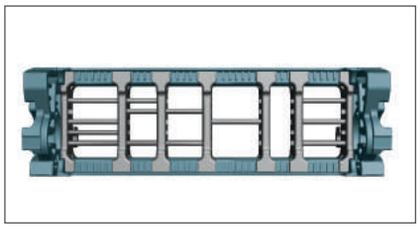
Ls: Stroke Hs: Safe Space

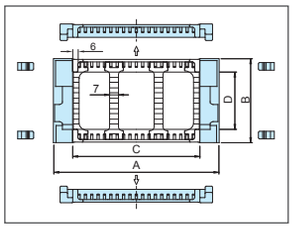


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
125	854	389	357
135	885	399	377
150	932	414	407
180	1,026	444	467
230	1,183	494	567
270	1,309	534	647
340	1,529	604	787

(Dimensions in mm)

Chain cross section

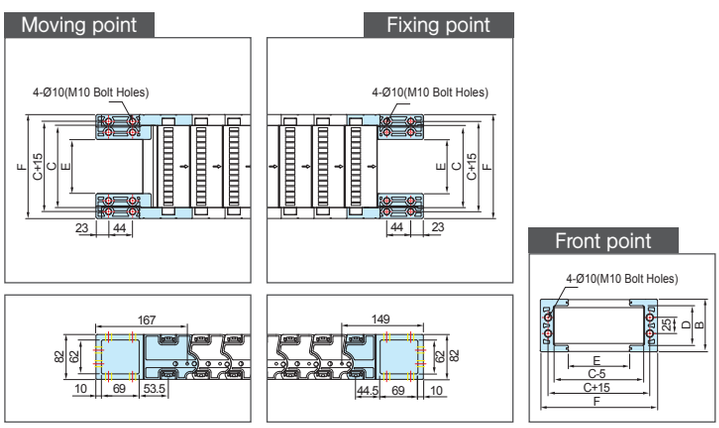




Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 060E	140 190 240	82	100 150 200	56	4.32 4.86 5.41

(Dimensions in mm)

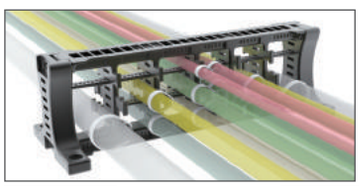
Free end bracket



Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	Hole Type
nsb 060E	140 190 240	82	100 150 200	56	49 99 149	M10 Bolt Holes

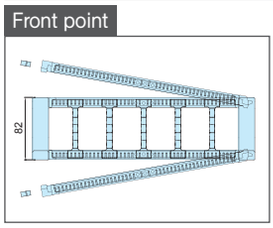
(Dimensions in mm)

System tie wrap (STW)

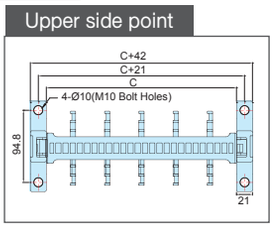


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

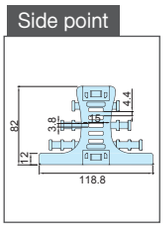
Front point



Upper side point



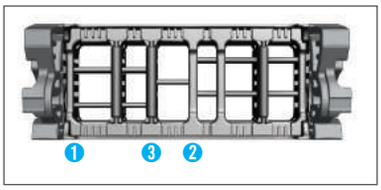
Side point



Chain Type	Ordering No.	C Frame	Hole Type
nsb 060E	S-TW.EB060.100 S-TW.EB060.150 S-TW.EB060.200	100 150 200	M10 Bolt Holes

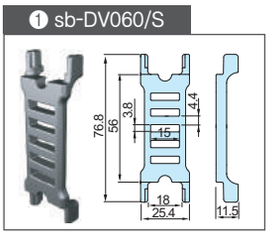
(Dimensions in mm)

Dividers(DV)

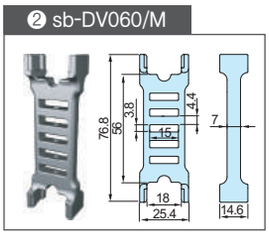


Assemble divider every second frame.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

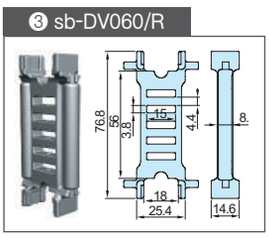
❶ sb-DV060/S



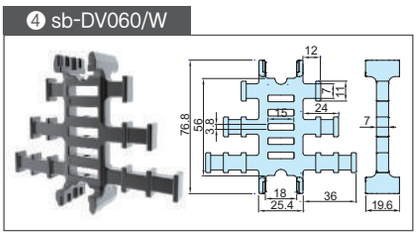
❷ sb-DV060/M



❸ sb-DV060/R

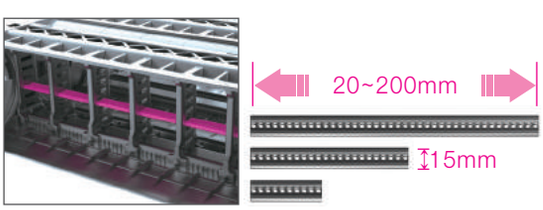


❹ sb-DV060/W



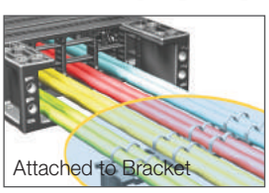
(Dimensions in mm)

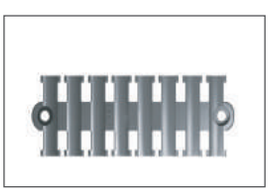
Separators(SP)

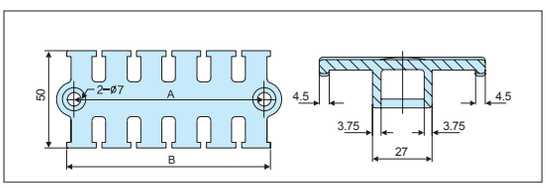


Chain Type	Ordering NO.
nsb 060E	sb-SP/400.400

Tie wrap (TW)



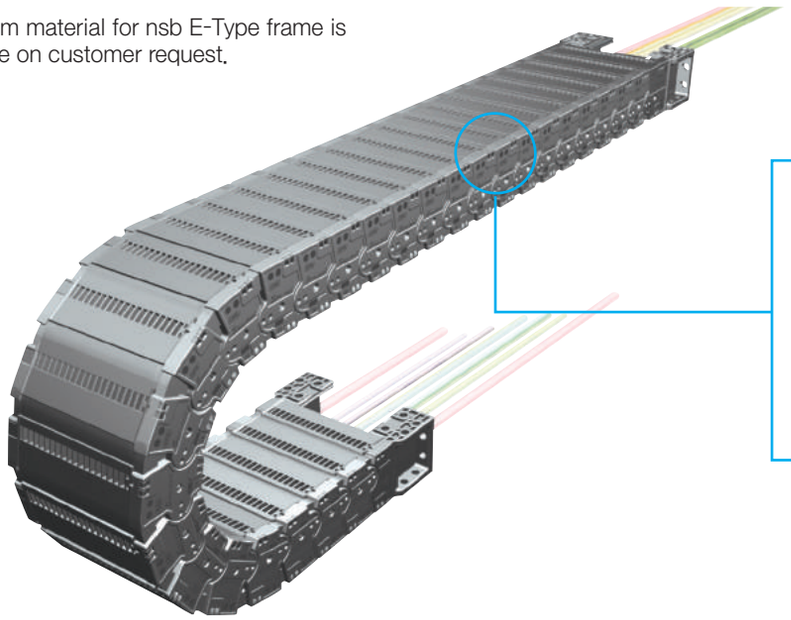


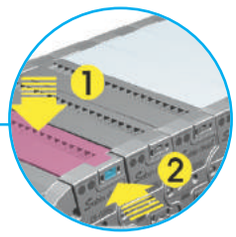


Chain Type	Ordering No.	A	B
nsb 060E	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

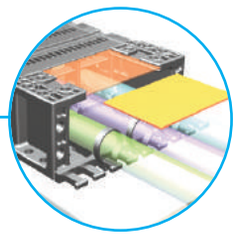
nsb 075E

• Alumnum material for nsb E-Type frame is available on customer request.

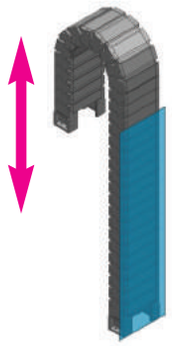




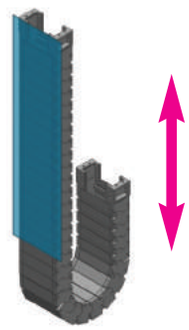
▲ Hinge frame-pin lock type



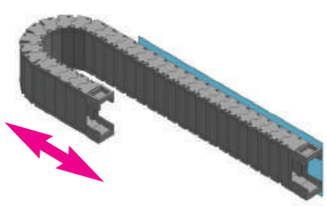
▲ Hinge hook type



Vertical with curve above



Vertical with curve below



Horizontal application mounted on its side

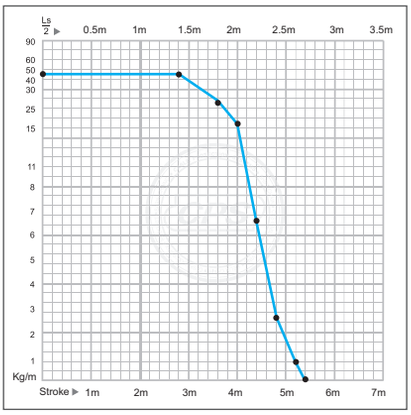
Calculation of the chain length

$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Other installation length

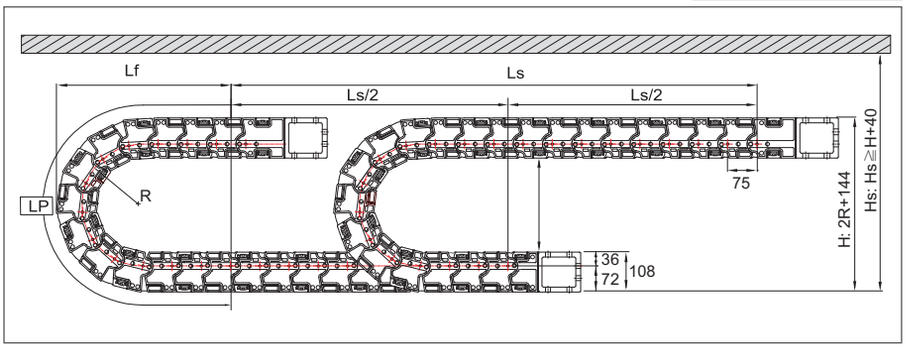
Vertical curve above = max 6.0m
Vertical curve below = max 120m
Side Mounted, Unsupported = max 3.0m

Load diagrams self-supporting length



Layout of the chain

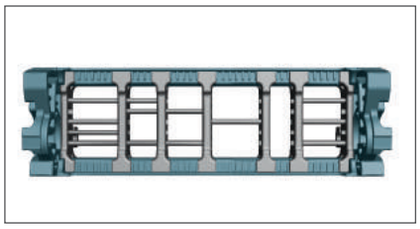
Ls: Stroke Hs: Safe Space

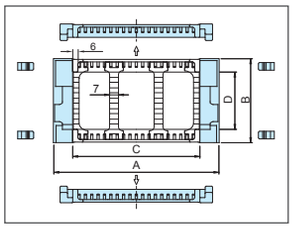


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
160	1,084	495	464
180	1,147	515	504
230	1,304	565	604
280	1,461	615	704
330	1,618	665	804
380	1,775	715	904
480	2,089	815	1,104

(Dimensions in mm)

Chain cross section

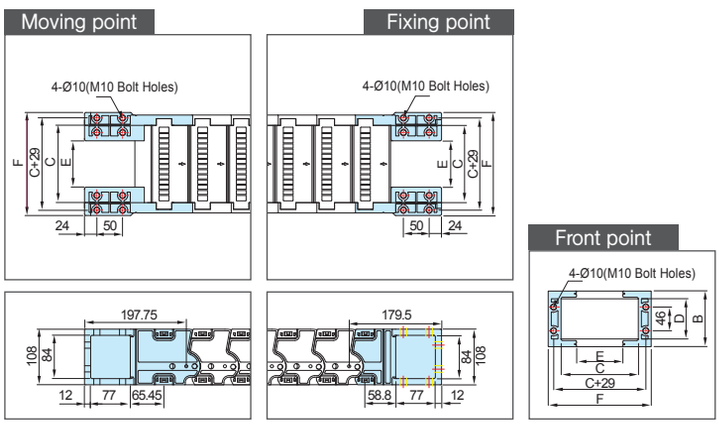




Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
nsb 075E	190 240 340	108	150 200 300	78	7.01 7.97 9.48

(Dimensions in mm)

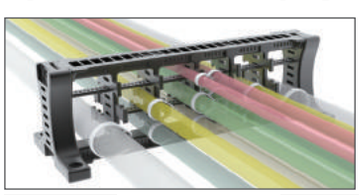
Free end bracket



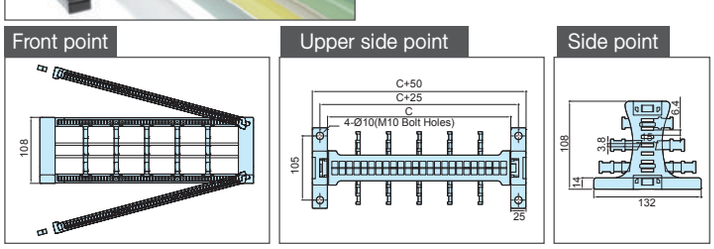
Chain Type	F Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M.EB Bolt hole width	Hole Type
nsb 075E	200 250 350	108	150 200 300	78	90 140 240	M10 Bolt Holes

(Dimensions in mm)

System tie wrap (STW)



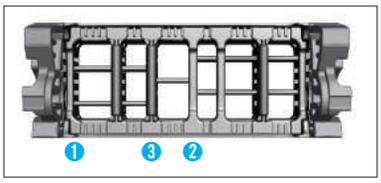
It is a unit to classify each cable for preventing entanglement of cables.
It can either be installed to free end bracket or installed separately according its application environment.



Chain Type	Ordering No.	C Frame	Hole Type
nsb 075E	S-TW.EB075.150 S-TW.EB075.200 S-TW.EB075.300	150 200 300	M10 Bolt Holes

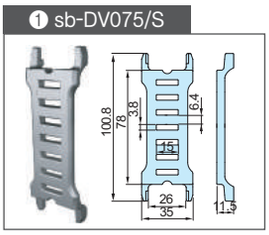
(Dimensions in mm)

Dividers(DV)

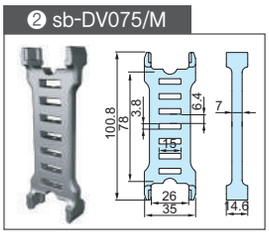


Assemble divider every second frame.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

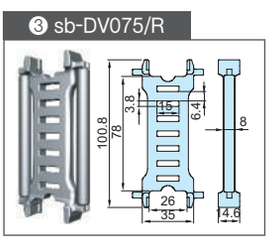
❶ sb-DV075/S



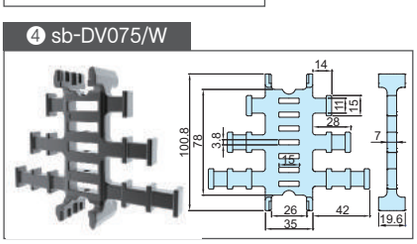
❷ sb-DV075/M



❸ sb-DV075/R

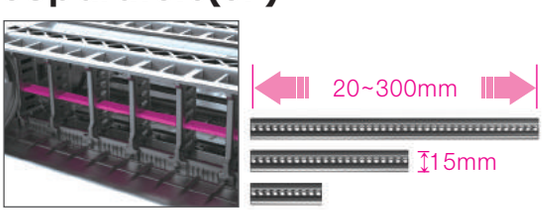


❹ sb-DV075/W



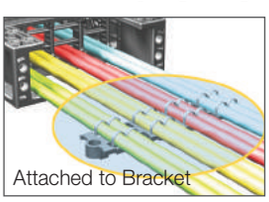
(Dimensions in mm)

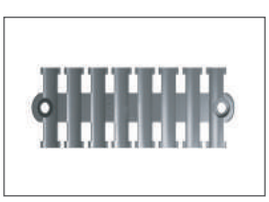
Separators(SP)

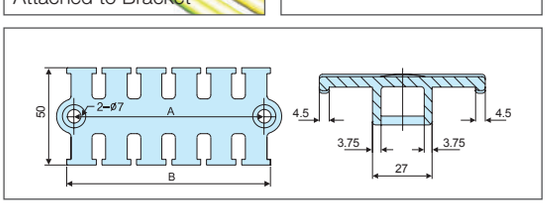


Chain Type	Ordering NO.
nsb 075E	sb-SP/400.400

Tie wrap (TW)







Chain Type	Ordering No.	A	B
nsb 075E	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	58 75 98 122 141	65 82 105 129 148

nsb Chain - Sliding type

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	3㎧
Acceleration	10㎧
Temperature	-30℃ ~+130℃
Certificate	CE, ATEX

Calculation table

Item	Value
Length of Cable Chain	L = ½ X LS + LP
Bending Radius	
The biggest Cable inserted	Multiply 8~10 and the biggest cable
The biggest Hydraulic Hose inserted	Multiply 15~20 and the biggest hose

Dimension table

nsb Chain S Type	Pitch	Bending Radius (R)	Weight kg/m	Speed m/s	Temperature ℃	Size A	Size B	Size C	Size D	Frame style	Section - composition
nsb 050S	50	110, 135, 165, 185, 235, 285	2.38 2.44 2.51 2.61 2.67 2.71 2.76 2.80 2.97 3.09 3.32 3.38 3.63	3	-30 ~ +130	104 129 154 179 194 204 219 229 244 254 294 304 354	71.5	50 75 100 125 140 150 165 175 190 200 240 250 300	45		
nsb 065S	65	140, 190, 220, 270, 390	3.29 3.34 3.49 3.58 3.68 3.76 3.82 3.99 4.03 4.24 4.53 4.85	3	-30 ~ +130	137 162 187 212 237 252 262 302 312 362 412 462	89	75 100 125 150 175 190 200 240 250 300 350 400	56		
nsb 080S	80	180, 200, 250, 300, 350, 400, 500	4.27 4.36 4.43 4.47 4.57 4.67 4.85 5.03 5.07 5.33 5.40 5.71 6.09 6.28 6.45 7.08 7.20	3	-30 ~ +130	143 168 183 193 218 243 268 308 318 358 368 418 468 518 568 618 668	115	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78		

(Dimensions in mm)

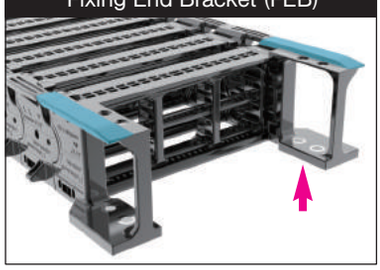
Ordering

nsb 050S. 175. R185 / B1 - 10000L : 10ST

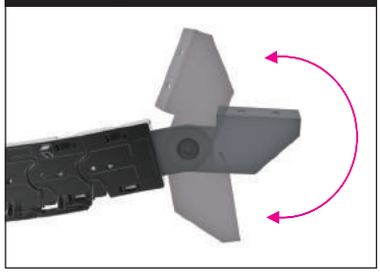
- Sabin Chain
- Sliding (S)
- Inside width
- Bending radius
- Bracket Type : B1,B2
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

Bracket type

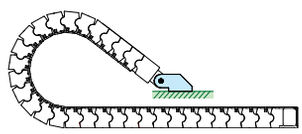
Fixing End Bracket (FEB)



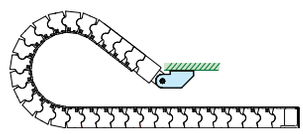
Moving End Bracket (M.EB)



The moving bracket is designed to move up and down according to movement of cable chain, or application requires. Fixing holes are formed widely for its convenience to be applied to other brand of cable chain. There are 2 tpye of bracket; B1,B2.



B1

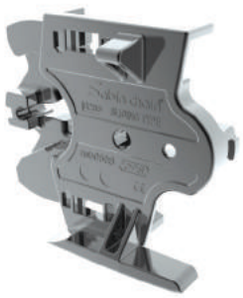


B2

nsb Chain - Sliding type

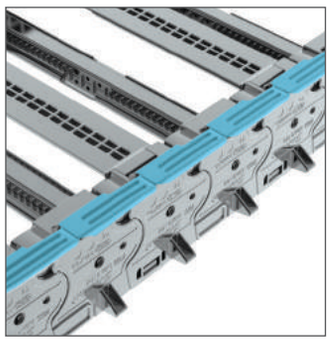
≫ Characteristics of nsb chain Sliding Type

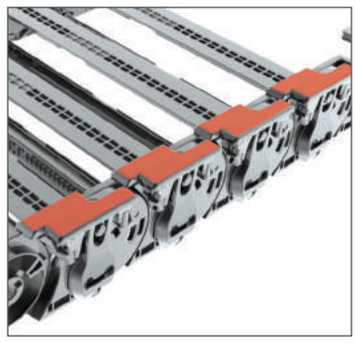
1 *Minimized noise level!*



▶ nsb sliding chain is also Holding band structure.

〈Feature-1〉



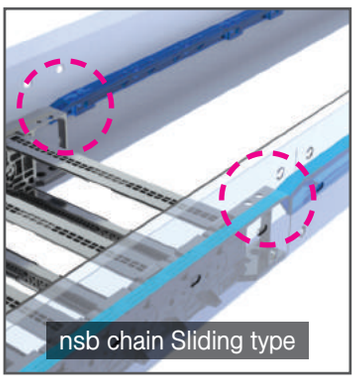


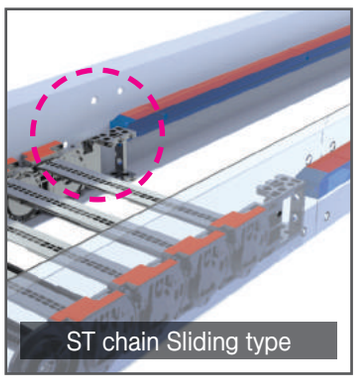
〈Feature-2〉

There are 3 factors for minimizing noise level of nsb sliding chain.

Firstly, it can minimize noise level than other sliding types including other brand due to Holding band inserted structure. You can refer "feature-1".

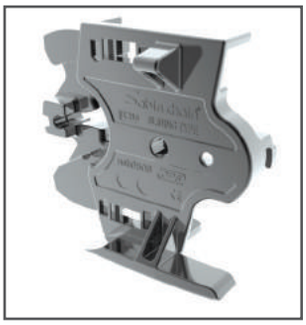
Secondly, by reducing interval between skid to skid of side band. If you refer "feature-2", you can find out that it's minimum gap between each side band which makes low noise when sliding part is moving on fixing part. If creates some interval, it makes noise.

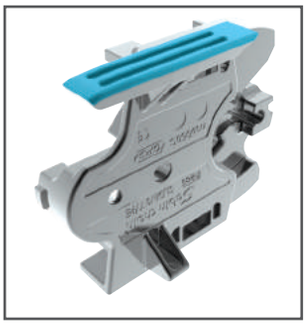




In third, by making it equal height between height of FEB and height of Nylon bar installed for chain movement.

2 *Easy to assemble and disassemble!*

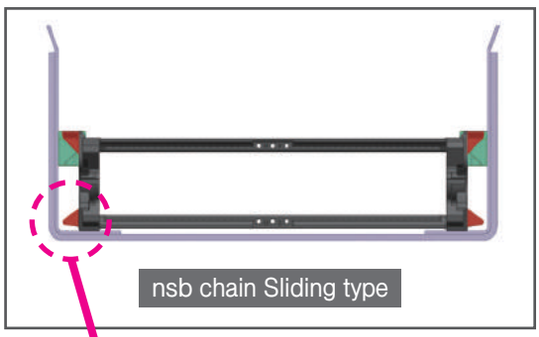


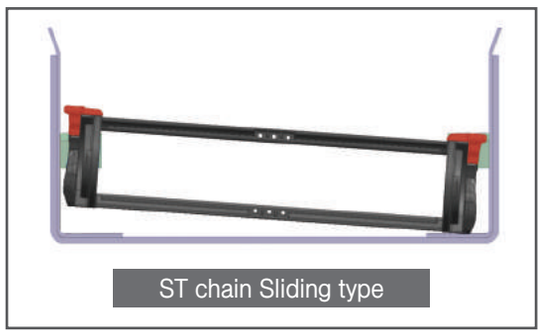


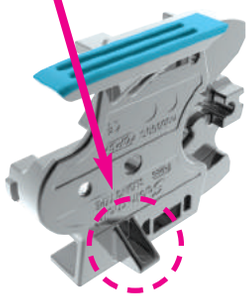
Easy to assemble and disassemble

By united skid and side band, it means that we designed it integral side band as sliding type, it is very easy to assemble and disassemble. Actually, on-site technicians and maintenance workers prefer nsb sliding type as it is easy to assemble and disassemble, they simply remove only frame-pin and frame without removing skid to get rid of frame-pin and frame. It makes them save time for assembling and disassembling work, which is the reason they prefer this model.

3 Stable operation and Suitable for high speed!



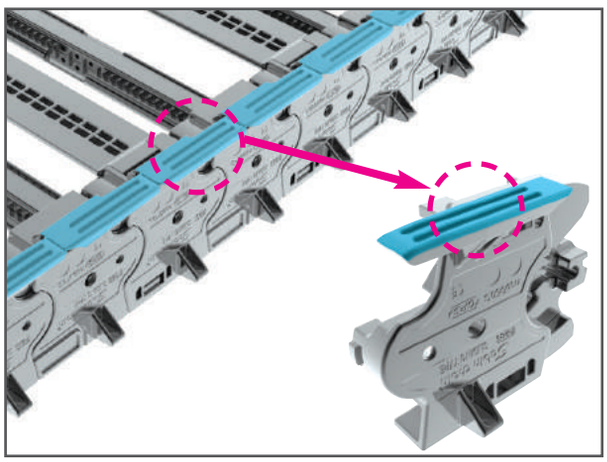




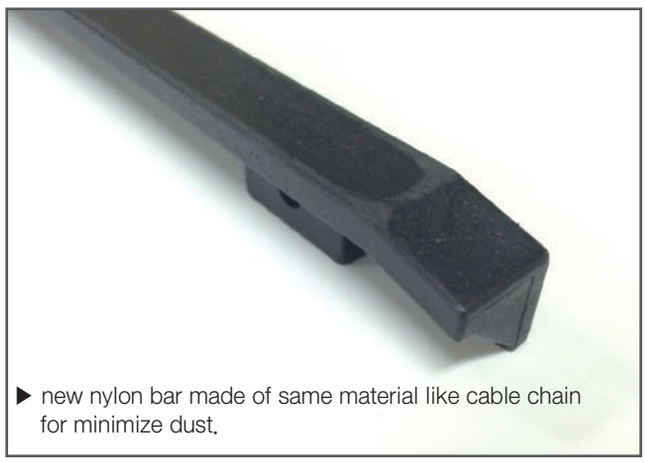
Stable operation and Suitable for high speed

Supporting fixture has been added to keep stable operation inside Guide channel.
This type is designed for gantry loader application which has fast movement with lower friction.
Moreover, our previous model, our Shift chain sliding type, have risk to be detached between side band and skid. Thus, detached skid would be inside guide channel or cable chain it means that it disturbs stable and smooth movement. But, nsb sliding type has been designed integral type sideband with skid, there's no risk for this issue.

4 Minimized Dust!



〈Feature-1〉



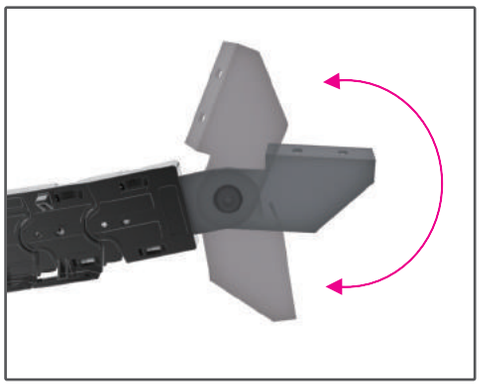
▶ new nylon bar made of same material like cable chain for minimize dust.

〈Feature-2〉

There are 2 factors for low dust of nsb sliding chain.

Firstly, by forming the groove on skid surface, it can minimize dust.
Secondly, by using nylon bar made of same material like cable chain, it minimizes dust.
(Cable chain reaches on nylon bar section after passing FEB section.)

5 Can be substituted for other Brand of Cable Chain!



Can be substituted for other Brand

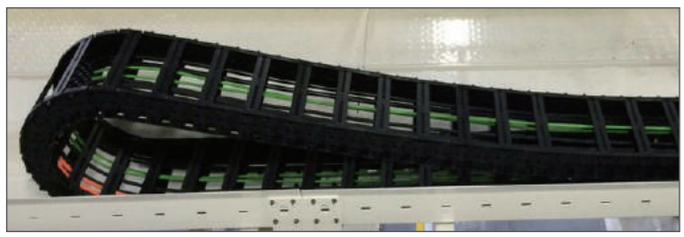
The moving bracket is designed to move up and down according to movement of cabel chain. Or application requires. Fixing holes are form widely for its convenience to be applied to other brand of cable chain. There are 2 tpye of bracket; B1, B2.

nsb Chain - Sliding type

>> Application of nsb Chain Sliding type

▶ nsb 050S

Application:
Gantry Loader
Location:
Korea, China, USA and India

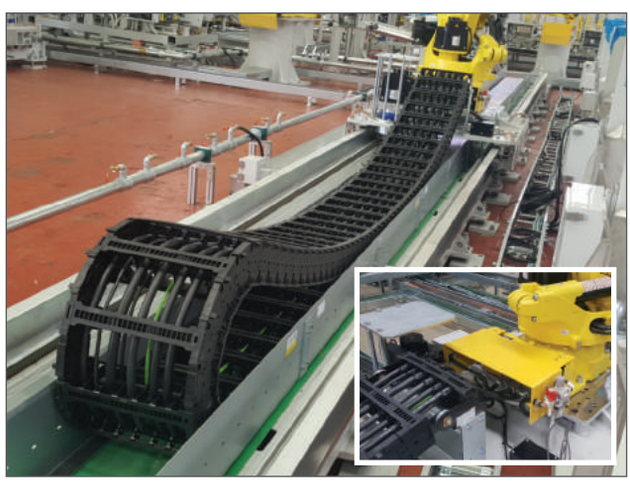


▶ nsb 065S

Application:
Crane(54m/Stroke)
Location:
Korea
Remark:
Section composition with dividers and sperators
System tie-wrap dividers(DV/W) at fixing end brackets

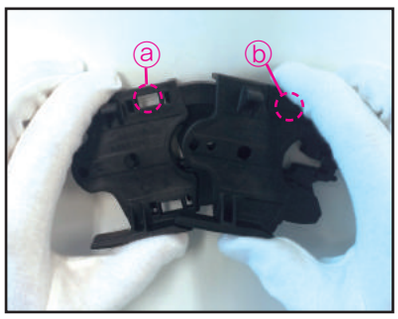
▶ nsb 080S

Application :
Robot carriage
Location :
Korea, China, Mexico, Brazil



≫ Assembly procedure of nsb Chain Sliding type

The assembling process of S-Type of New Sabin Chain is like below and user must use rubber hammer with careful combination of Divider and Separator.

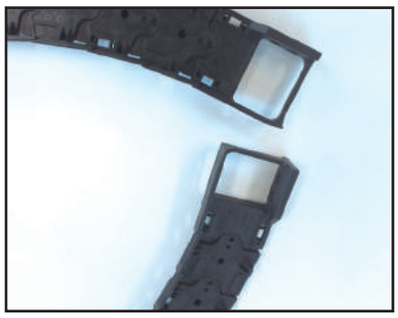


1

Classify LH and RH first, then assemble the Side band.
(Assemble from ⓐ to ⓑ according to priority)

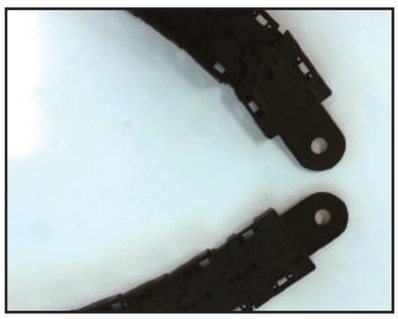
2

Connect the Side Band according to required length.



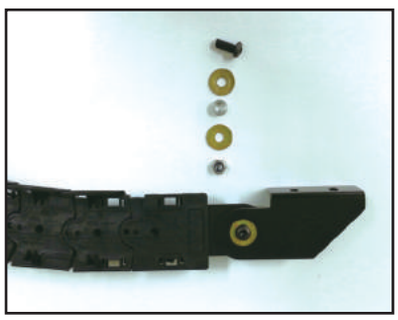
3

Install F.EB to the right and left direction.



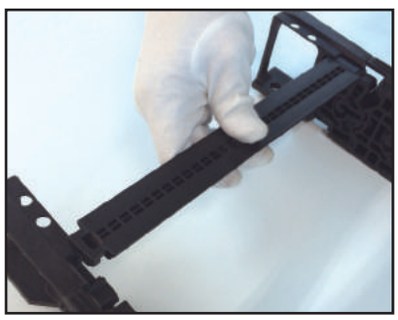
4

Install M.EB to the right and left direction.



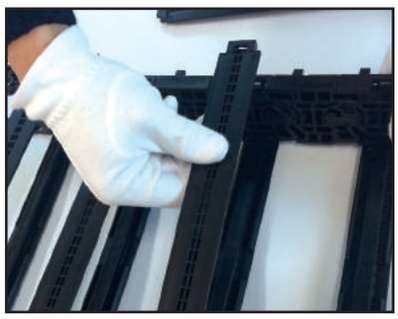
5

Assemble the Steel Bracket on the M.EB by tightening bolt and nut.
(Bolt → flat washer → insert steel → flat washer → Nut)



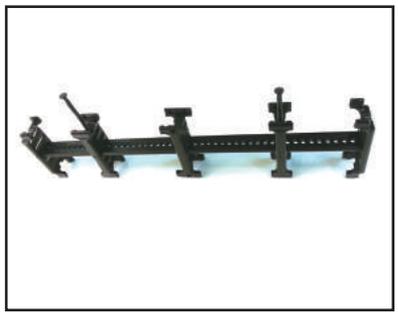
6

Assemble the left and right Side Band with specified frame.



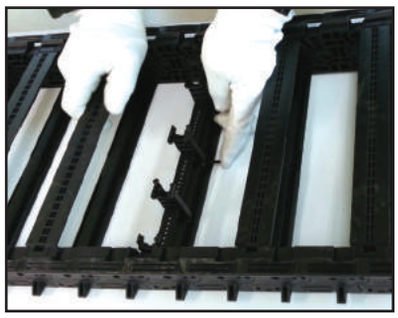
7

Frame of the opposite side also assemble in the same manner.



8

Assemble dividers and spearators considering inserted number of cables.



9

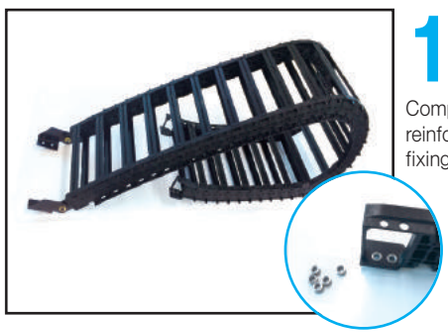
Fix the dividers on lower frame.
(Assemble divider every Four links)

10

Combine the upper frame exactly on the groove of sideband and divider.

11

Fix the frame with side band by using the frame pin.



12

Complete by inserting the reinforce washer to fit in fixing hole of F.EB.

nsb Chain - Sliding type

≫ Part list of nsb Chain Sliding type

- Composition of Cable chain(Standard)
  = Side band(RH) + Frame + Side band(LH) + Bending radius Unit + Free end bracket
- M divider(normal divider) should be applied every second frames to make a section composition.

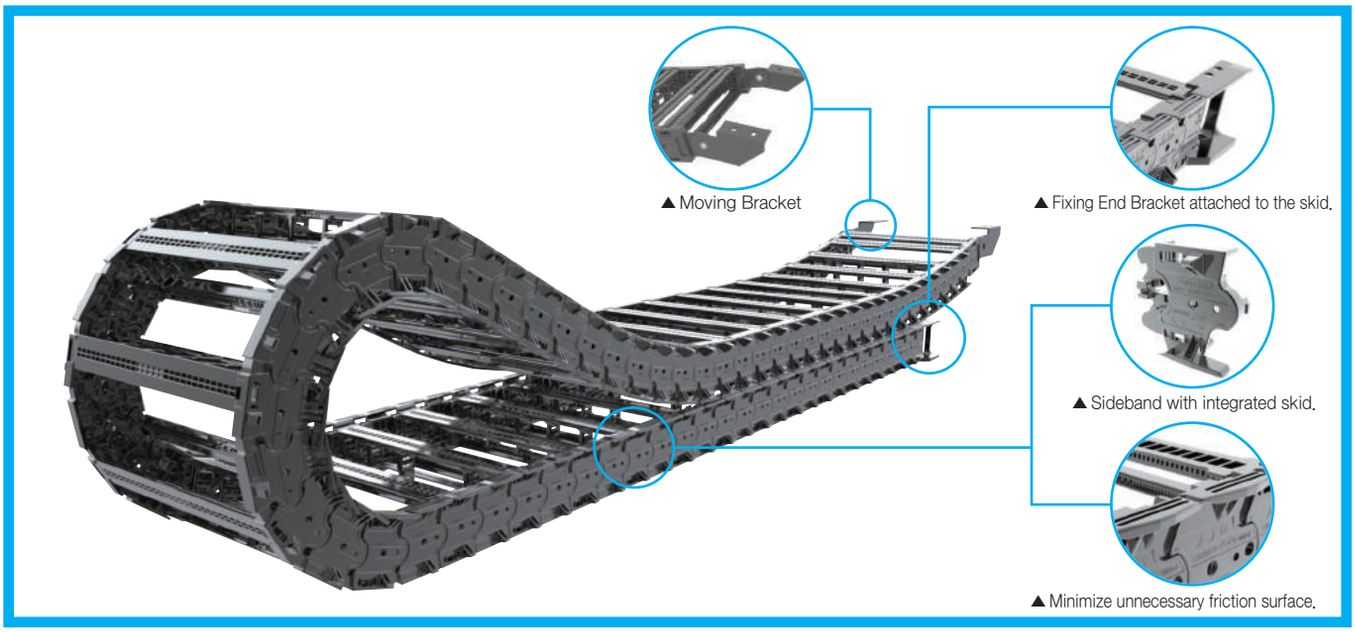
※ Please refer to below part list and description to understand composition of cable chain.

Model	Classification	Part number	Description
nsb050S	SIDE BAND	nsb-SB050S.R*(LH) nsb-SB050S.R*(RH)	Left side band of nsb050S Right side band of nsb050S
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR045.50 sb-FR045.75 sb-FR045.100 sb-FR045.125 sb-FR045.140 sb-FR045.150 sb-FR045.165 sb-FR045.175 sb-FR045.190 sb-FR045.200 sb-FR045.240 sb-FR045.250 sb-FR045.300	Frame, 50mm Frame, 75mm Frame, 100mm Frame, 125mm Frame, 140mm Frame, 150mm Frame, 165mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 300mm
	FREE END BRACKET	NSB-FEB050S /F NSB-FEB050S /M(SEB) nsb-FEB/WH050	Free end bracket of nsb050S, Fixing Steel end bracket of nsb050S, Moving Steel washer for end bracket
	DIVIDER	sb-DV045/M sb-DV045/S sb-DV045/T sb-DV045/TP	Normal divider To fix separstors at the both side section T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN045	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV045/W S-TW.EB045	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

Model	Classification	Part number	Description
nsb065S	SIDE BAND	nsb-SB065S.R*(LH) nsb-SB065S.R*(RH)	Left side band of nsb050S Right side band of nsb050S
	FRAME PIN	S-FP/S1	Frame pin
	FRAME	sb-FR060.75 sb-FR060.100 sb-FR060.125 sb-FR060.150 sb-FR060.175 sb-FR060.190 sb-FR060.200 sb-FR060.230 sb-FR060.250 sb-FR060.300 sb-FR060.350 sb-FR060.400	Frame, 75mm Frame, 100mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 190mm Frame, 200mm Frame, 230mm Frame, 250mm Frame, 300mm Frame, 350mm Frame, 400mm
	FREE END BRACKET	NSB-FEB050S /F NSB-FEB050S /M(SEB) nsb-FEB/WH050	Free end bracket of nsb050S, Fixing Steel end bracket of nsb050S, Moving Steel washer for end bracket
	DIVIDER	sb-DV060/M sb-DV060/S sb-DV060/R sb-DV060/T sb-DV060/TP	Normal divider To fix separstors at the both side section Roller divider to reduce friction with cables T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN060	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV060/W S-TW.EB060	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

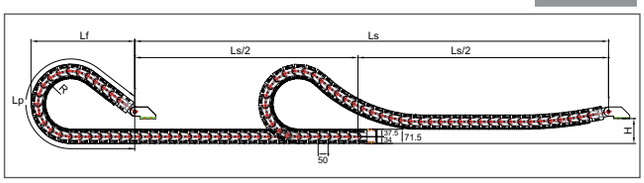
Model	Classification	Part number	Description
nsb080S	SIDE BAND	nsb-SB080S.R*(LH) nsb-SB080S.R*(RH)	Left side band of nsb080S Right side band of nsb080S
	FRAME PIN	S-FP/S2	Frame pin
	FRAME	sb-FR075/100.75 sb-FR075/100.100 sb-FR075/100.115 sb-FR075/100.125 sb-FR075/100.150 sb-FR075/100.175 sb-FR075/100.200 sb-FR075/100.240 sb-FR075/100.250 sb-FR075/100.290 sb-FR075/100.300 sb-FR075/100.350 sb-FR075/100.400 sb-FR075/100.450 sb-FR075/100.500 sb-FR075/100.550 sb-FR075/100.600	Frame, 75mm Frame, 100mm Frame, 115mm Frame, 125mm Frame, 150mm Frame, 175mm Frame, 200mm Frame, 240mm Frame, 250mm Frame, 290mm Frame, 300mm Frame, 350mm Frame, 400mm Frame, 450mm Frame, 500mm Frame, 550mm Frame, 600mm
	FREE END BRACKET	NSB-FEB080S /F NSB-FEB080S /M(SEB) nsb-FEB/WH080	Free end bracket of nsb080S, Fixing Steel end bracket of nsb080S, Moving Steel washer for end bracket
	DIVIDER	sb-DV075/M sb-DV075/S sb-DV075/R sb-DV075/T sb-DV075/TP	Normal divider To fix separstors at the both side section Roller divider to reduce friction with cables T divider T divider pin
	SEPARATOR	sb-SP/400.400 SP-PIN075	Separator, 400mm Separator pin to fix
	TIE WRAP	S-TW50 S-TW75 S-TW100 S-TW125 S-TW150	Tie wrap for end bracket to fix cables, 50mm Tie wrap for end bracket to fix cables, 75mm Tie wrap for end bracket to fix cables, 100mm Tie wrap for end bracket to fix cables, 125mm Tie wrap for end bracket to fix cables, 150mm
	SYSTEM TIE WRAP	sb-DV075/W S-TW.EB075	Divider for fixing cables at end bracket System tie wrap to arrange for cables right after moving bracket or fixing bracket

nsb 050S



» Layout of the chain

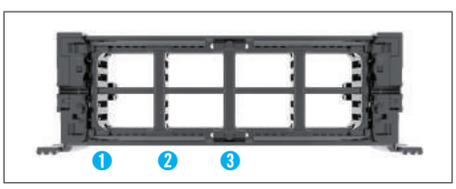
Ls: Stroke



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
110	916	380	180
135	1,068	430	
165	1,255	490	
185	1,382	530	
235	1,703	630	
285	2,029	730	

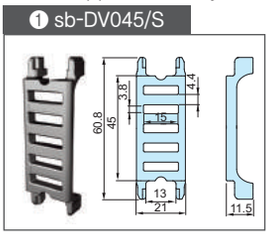
(Dimensions in mm)

» Dividers(DV)

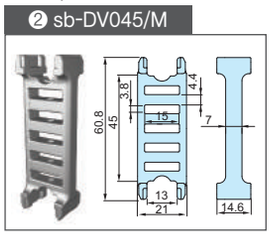


Assemble divider every second frame.
DV.T : Applied to Frame 200~300.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

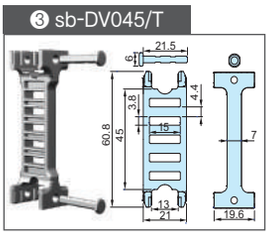
❶ sb-DV045/S



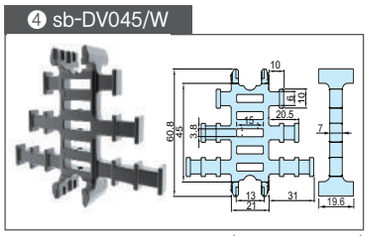
❷ sb-DV045/M



❸ sb-DV045/T

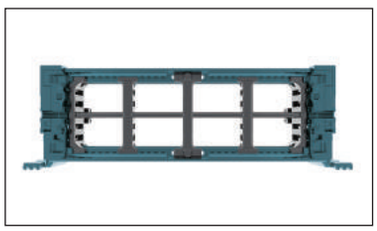


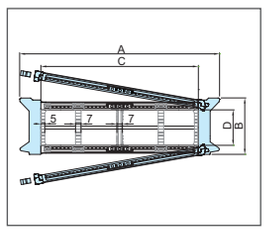
❹ sb-DV045/W



(Dimensions in mm)

» Chain cross section

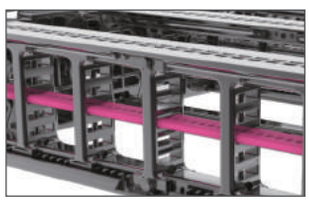


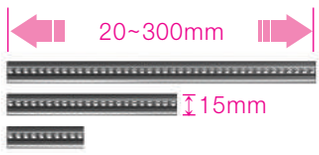


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
nsb 050S	104	71.5	50	45	2.38
	129		75		2.44
	154		100		2.51
	179		125		2.61
	194		140		2.67
	204		150		2.71
	219		165		2.76
	229		175		2.80
	244		190		2.97
	254		200		3.09
	294		240		3.32
	304		250		3.38
	354		300		3.63

(Dimensions in mm)

» Separators(SP)



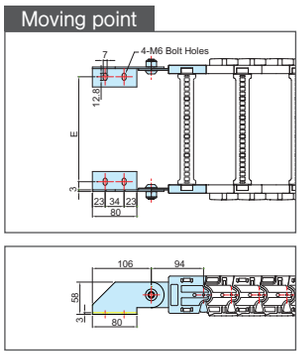


Chain Type	Ordering NO.
nsb 050S	sb-SP/400.400

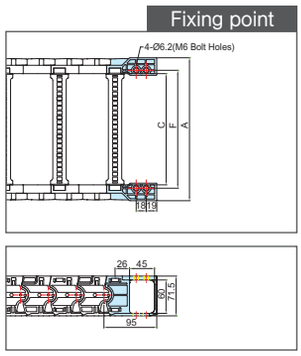
(Dimensions in mm)

Free end bracket

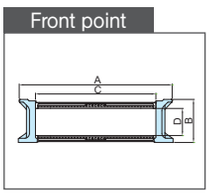
Moving point



Fixing point



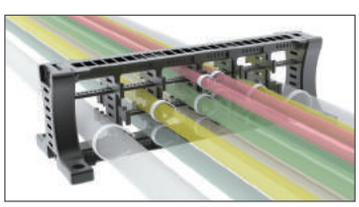
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M.EB Bolt hole width	F F.EB Bolt hole width
nsb 050S	104	71.5	50	45	38.7	62
	129		75		63.7	87
	154		100		88.7	112
	179		125		113.7	137
	194		140		128.7	152
	204		150		138.7	162
	219		165		153.7	177
	229		175		163.7	187
	244		190		178.7	202
	254		200		188.7	212
	294		240		228.7	252
	304		250		238.7	262
	354		300		288.7	312

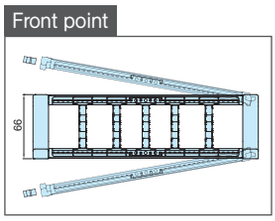
(Dimensions in mm)

System tie wrap (STW)

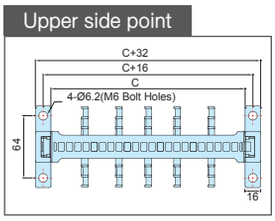


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

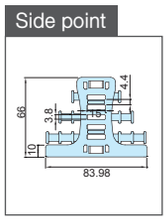
Front point



Upper side point



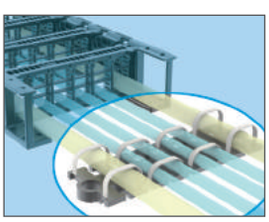
Side point

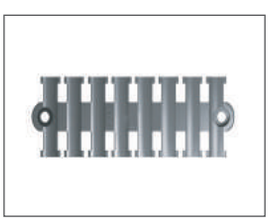


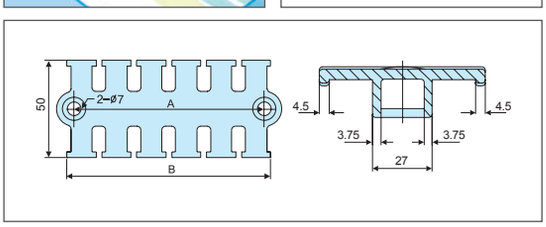
Chain Type	Ordering No.	C Frame	Hole Type
nsb 050S	S-TW.EB045.50	50	M6 Bolt Holes
	S-TW.EB045.75	75	
	S-TW.EB045.100	100	
	S-TW.EB045.125	125	
	S-TW.EB045.140	140	
	S-TW.EB045.150	150	
	S-TW.EB045.165	165	
	S-TW.EB045.175	175	
	S-TW.EB045.190	190	
	S-TW.EB045.200	200	
	S-TW.EB045.240	240	
	S-TW.EB045.250	250	
	S-TW.EB045.300	300	

(Dimensions in mm)

Tie wrap (TW)





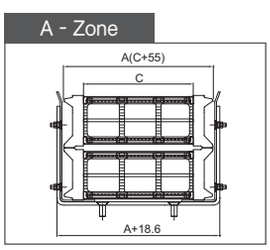


Chain Type	Ordering No.	A	B
nsb 050S	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

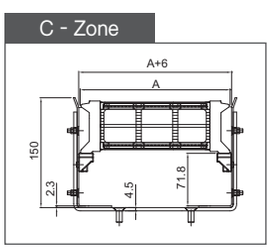
(Dimensions in mm)

Guide channel

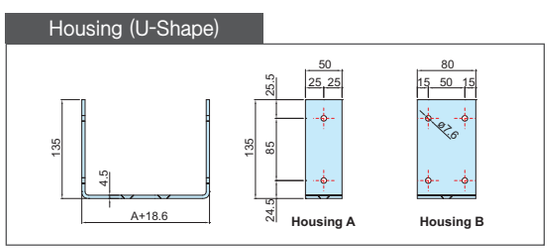
A - Zone



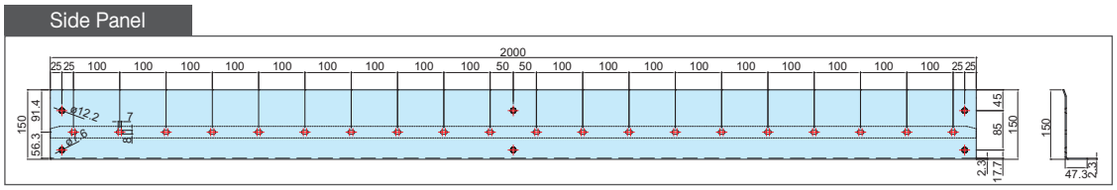
C - Zone



Housing (U-Shape)

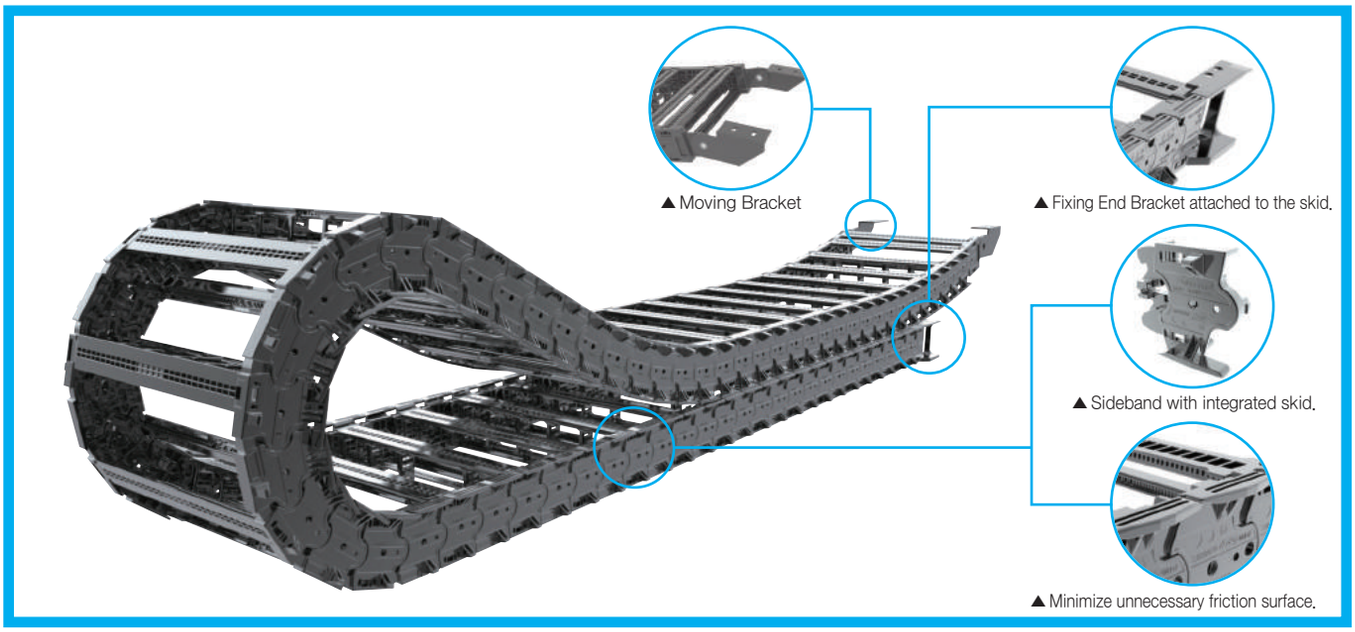


Side Panel



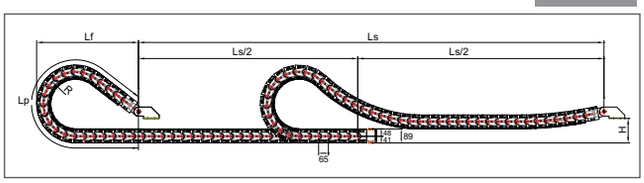
(Dimensions in mm)

nsb 065S



Layout of the chain

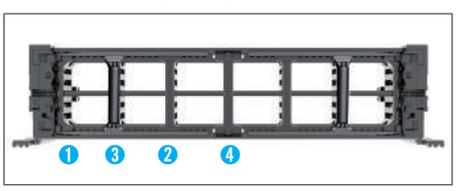
Ls: Stroke



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
140	1,225	615	210
190	1,543	715	
220	1,734	775	
270	2,052	875	
390	2,814	1,115	

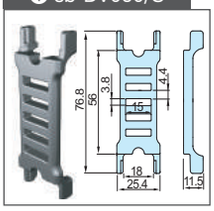
(Dimensions in mm)

Dividers(DV)

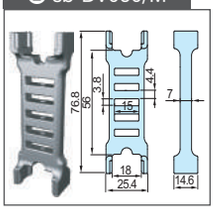


Assemble divider every second frame.
DV.T : Applied to Frame 250~400.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

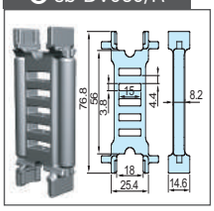
❶ sb-DV060/S



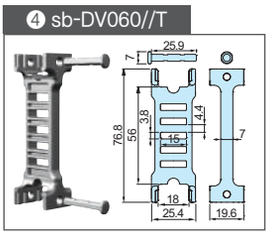
❷ sb-DV060/M



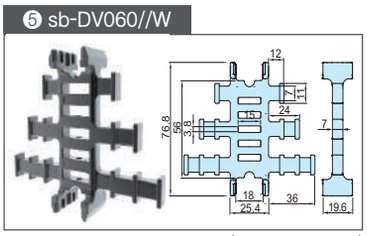
❸ sb-DV060/R



❹ sb-DV060//T

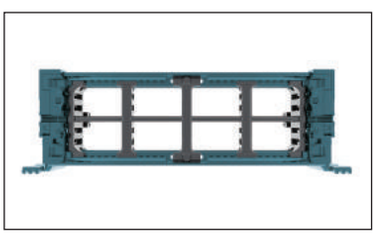


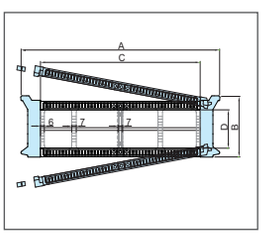
❺ sb-DV060//W



(Dimensions in mm)

Chain cross section

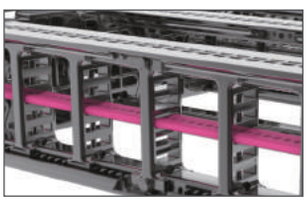


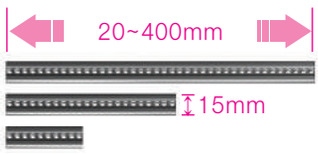


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
nsb 065S	137	89	75	56	3.29
	162		100		3.34
	187		125		3.49
	212		150		3.58
	237		175		3.68
	252		190		3.76
	262		200		3.82
	292		230		3.94
	302		240		3.99
	312		250		4.03
	362		300		4.24
	412		350		4.53
	462		400		4.85

(Dimensions in mm)

Separators(SP)



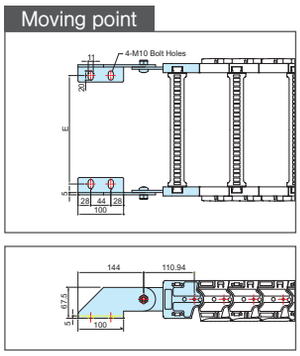


Chain Type	Ordering NO.
nsb 065S	sb-SP/400.400

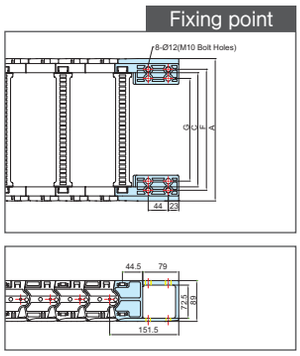
(Dimensions in mm)

Free end bracket

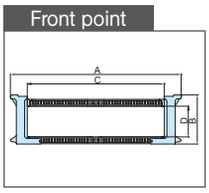
Moving point



Fixing point



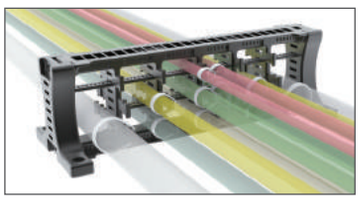
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M.EB Bolt hole width	F F.EB Bolt hole width	G F.EB Bolt width
nsb 065S	137	89	75	56	62.6	90	50
	162		100		87.6	115	75
	187		125		112.6	140	100
	212		150		137.6	165	125
	237		175		162.6	190	150
	252		190		177.6	205	165
	262		200		187.6	215	175
	292		230		217.6	245	205
	302		240		227.6	255	215
	312		250		237.6	265	225
	362		300		287.6	315	275
	412		350		337.6	365	325
	462		400		387.6	415	375

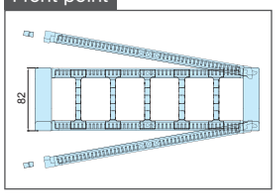
(Dimensions in mm)

System tie wrap (STW)

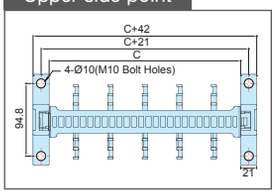


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

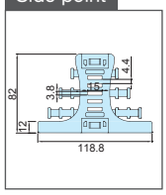
Front point



Upper side point



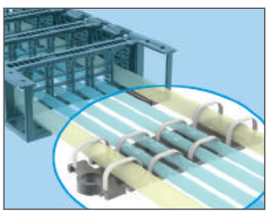
Side point

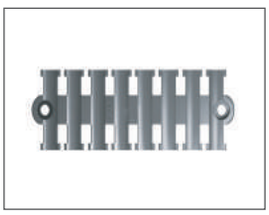


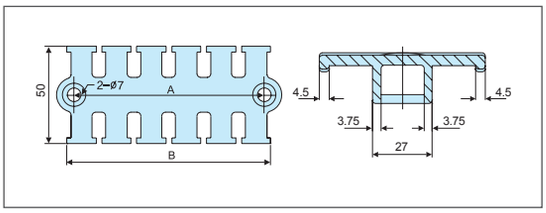
Chain Type	Ordering No.	C Frame	Hole Type
nsb 065S	S-TW.EB060.75	75	M10 Bolt Holes
	S-TW.EB060.100	100	
	S-TW.EB060.125	125	
	S-TW.EB060.150	150	
	S-TW.EB060.175	175	
	S-TW.EB060.190	190	
	S-TW.EB060.200	200	
	S-TW.EB060.230	230	
	S-TW.EB060.240	240	
	S-TW.EB060.250	250	
	S-TW.EB060.300	300	
	S-TW.EB060.350	350	
	S-TW.EB060.400	400	

(Dimensions in mm)

Tie wrap (TW)





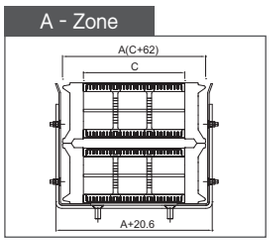


Chain Type	Ordering No.	A	B
nsb 065S	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

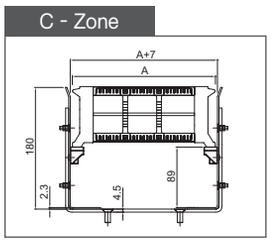
(Dimensions in mm)

Guide channel

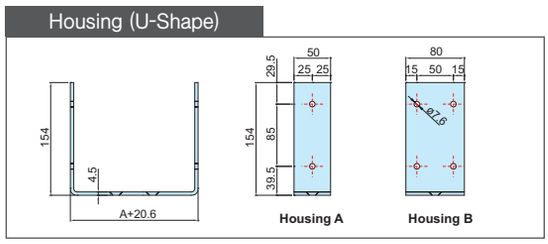
A - Zone



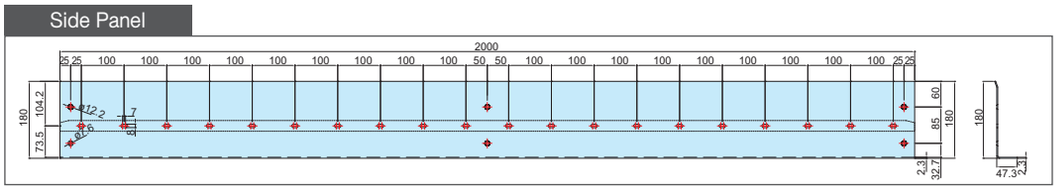
C - Zone



Housing (U-Shape)

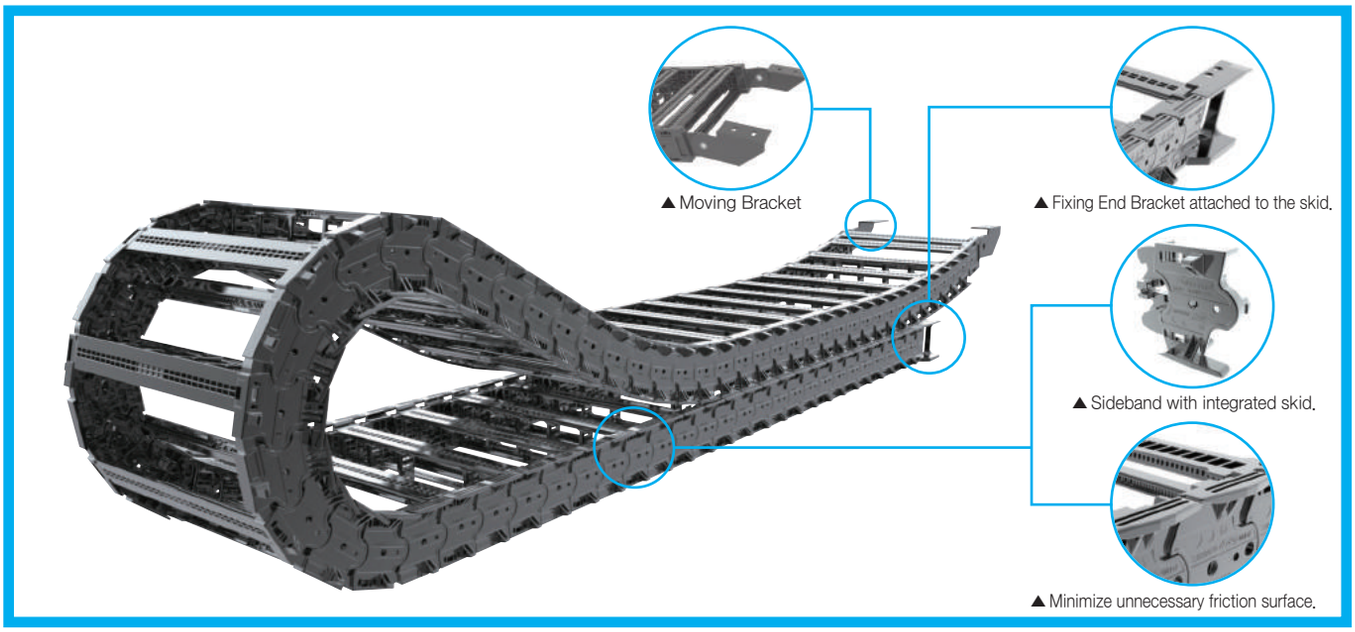


Side Panel



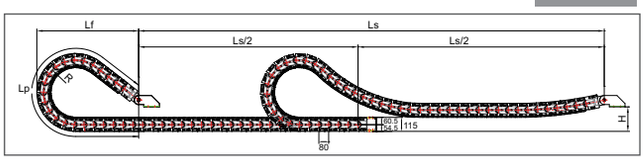
(Dimensions in mm)

nsb 080S



» Layout of the chain

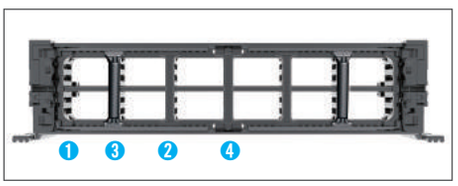
Ls: Stroke



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
180	1,490	690	260
200	1,617	730	
250	1,935	830	
300	2,253	930	
350	2,571	1,030	
400	2,889	1,130	
500	3,524	1,330	

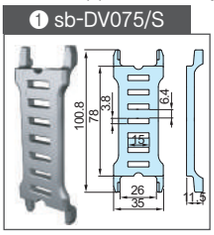
(Dimensions in mm)

» Dividers(DV)

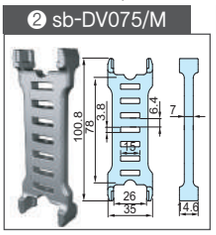


Assemble divider every second frame.
DV.T : Applied to Frame 300~600.
DV.M : Normal divider.
DV.W : Applicable to System Tie Wrap or FEB.

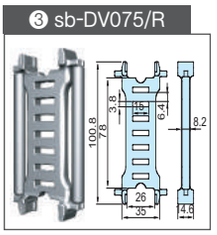
❶ sb-DV075/S



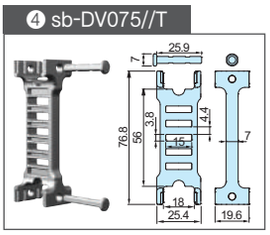
❷ sb-DV075/M



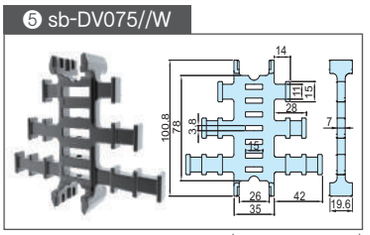
❸ sb-DV075/R



❹ sb-DV075//T

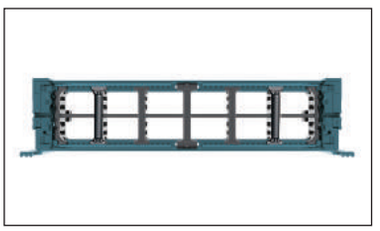


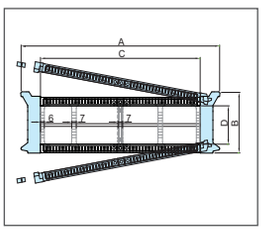
❺ sb-DV075//W



(Dimensions in mm)

» Chain cross section

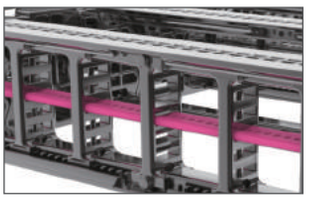


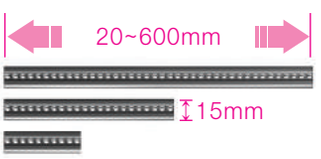


Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	Weight kg/m
nsb 080S	143	115	75	78	4.27
	168		100		4.36
	183		115		4.43
	193		125		4.47
	218		150		4.57
	243		175		4.67
	268		200		4.85
	308		240		5.03
	318		250		5.07
	358		290		5.33
	368		300		5.40
	418		350		5.71
	468		400		6.09
	518		450		6.28
	568		500		6.45
	618		550		7.08
	668		600		7.20

(Dimensions in mm)

» Separators(SP)



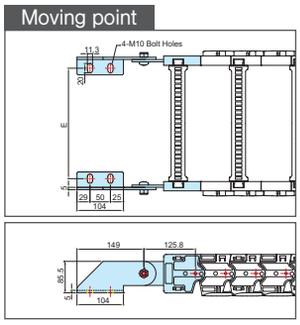


Chain Type	Ordering NO.
nsb 080S	sb-SP/600.600

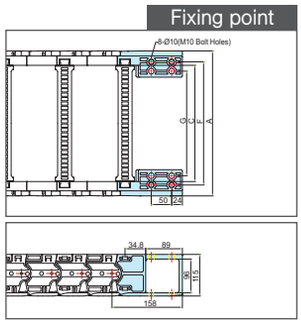
(Dimensions in mm)

Free end bracket

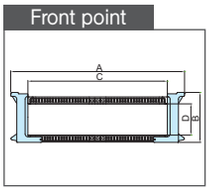
Moving point



Fixing point



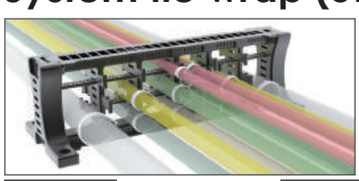
Front point



Chain Type	A Width(Outer)	B Height(Outer)	C Frame	D Height(Inner)	E M,EB Bolt hole width	F F,EB Bolt hole width	G F,EB Bolt width
nsb 080S	143 168 183 193 218 243 268 308 318 358 368 418 468 518 568 618 668	115	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	78	63 88 103 113 138 163 188 228 238 278 288 338 388 438 488 538 588	104 129 144 154 179 204 229 269 279 319 329 379 429 479 529 579 629	47 72 87 97 122 147 172 212 222 262 272 322 372 422 472 522 572

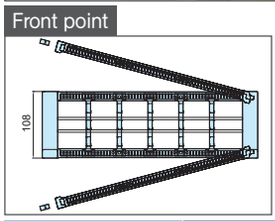
(Dimensions in mm)

System tie wrap (STW)

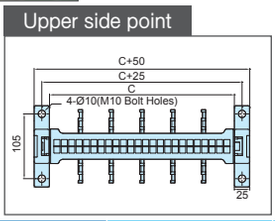


It is a unit to classify each cable for preventing entanglement of cables. It can either be installed to free end bracket or installed separately according its application environment.

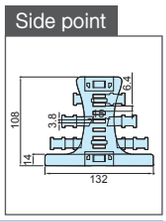
Front point



Upper side point



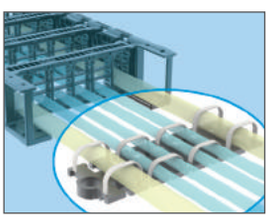
Side point

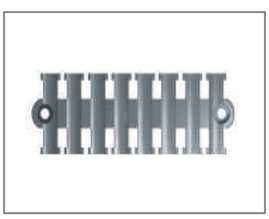


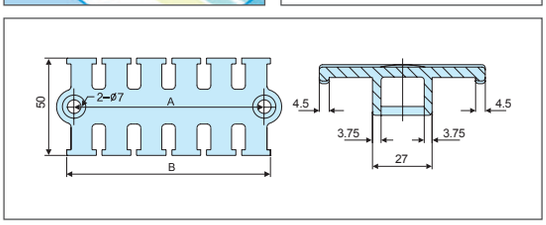
Chain Type	Ordering No.	C Frame	Hole Type
nsb 080S	S-TW,EB075,75 S-TW,EB075,100 S-TW,EB075,115 S-TW,EB075,125 S-TW,EB075,150 S-TW,EB075,175 S-TW,EB075,200 S-TW,EB075,240 S-TW,EB075,250 S-TW,EB075,290 S-TW,EB075,300 S-TW,EB075,350 S-TW,EB075,400 S-TW,EB075,450 S-TW,EB075,500 S-TW,EB075,550 S-TW,EB075,600	75 100 115 125 150 175 200 240 250 290 300 350 400 450 500 550 600	M10 Bolt Holes

(Dimensions in mm)

Tie wrap (TW)





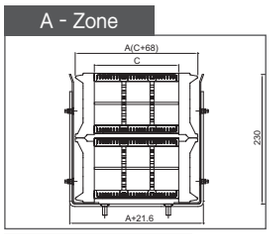


Chain Type	Ordering No.	A	B
nsb 080S	S-TW50	58	65
	S-TW75	75	82
	S-TW100	98	105
	S-TW125	122	129
	S-TW150	141	148

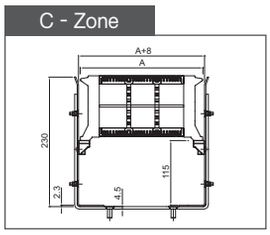
(Dimensions in mm)

Guide channel

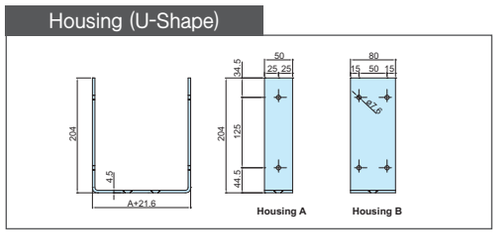
A - Zone



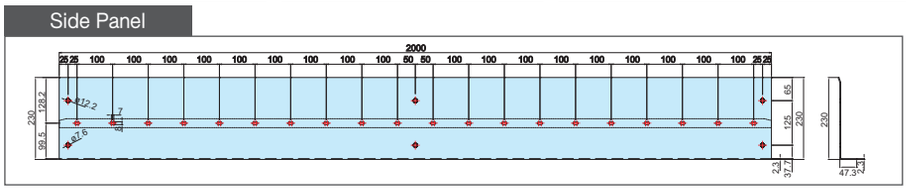
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Unity Systems

General information

Item	Value
Material	CPS-Amid(PA6+GF), RoHs
Speed	3~5㎧
Acceleration	10~15㎧
Temperature	-30℃ ~+130℃
Color of Unity Systems	Yellow, Black
Certificate	CE, ATEX(Ex)

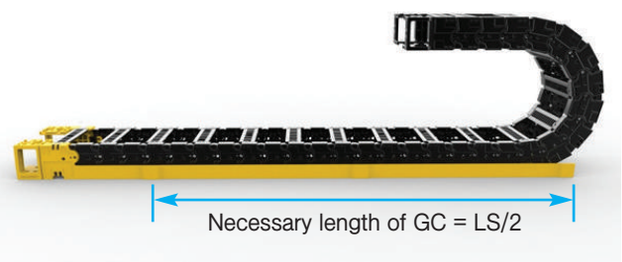
Available Product list with Unity systems

Product Model	Value
Shift Chain Normal	ST044N, ST055N, ST072N, ST095N, ST120N
Shift Chain Enclosed	ST044E, ST055E, ST072E, ST095E, ST120E
nsb Chain Clean room	nsb020CR, nsb022CR, nsb028CR, nsb035CR, nsb045CR, nsb060CR, nsb075CR
nsb Chain Normal	nsb028N, nsb035N, nsb045N, nsb060N, nsb075N
nsb Chain Enclosde	nsb028E, nsb035E, nsb045E, nsb060E, nsb075E

Unity system Application method

Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

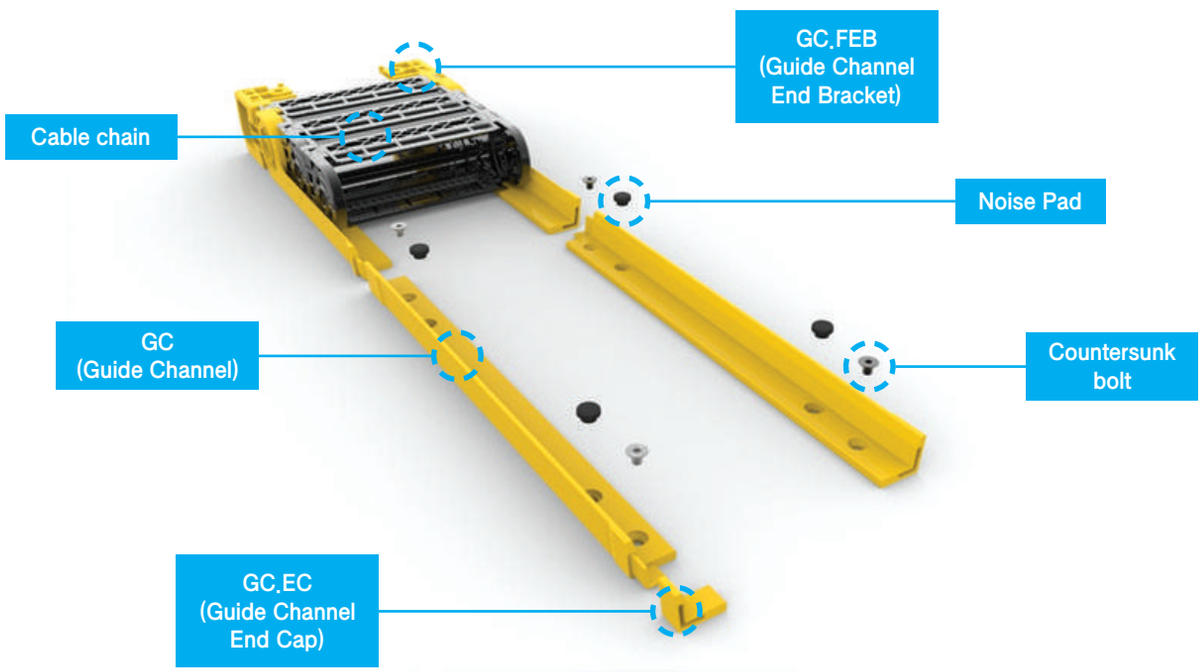
- Horizontal type example



Cable Chain Calculation table

Item	Value
Length of Cable Chain	L = ½*LS + LP
Bending Radius	
- The biggest Cable inserted	Multiply 8 ~ 10 and the biggest cable
- The biggest Hydraulic Hose inserted	Multiply 15 ~ 20 and the biggest hose

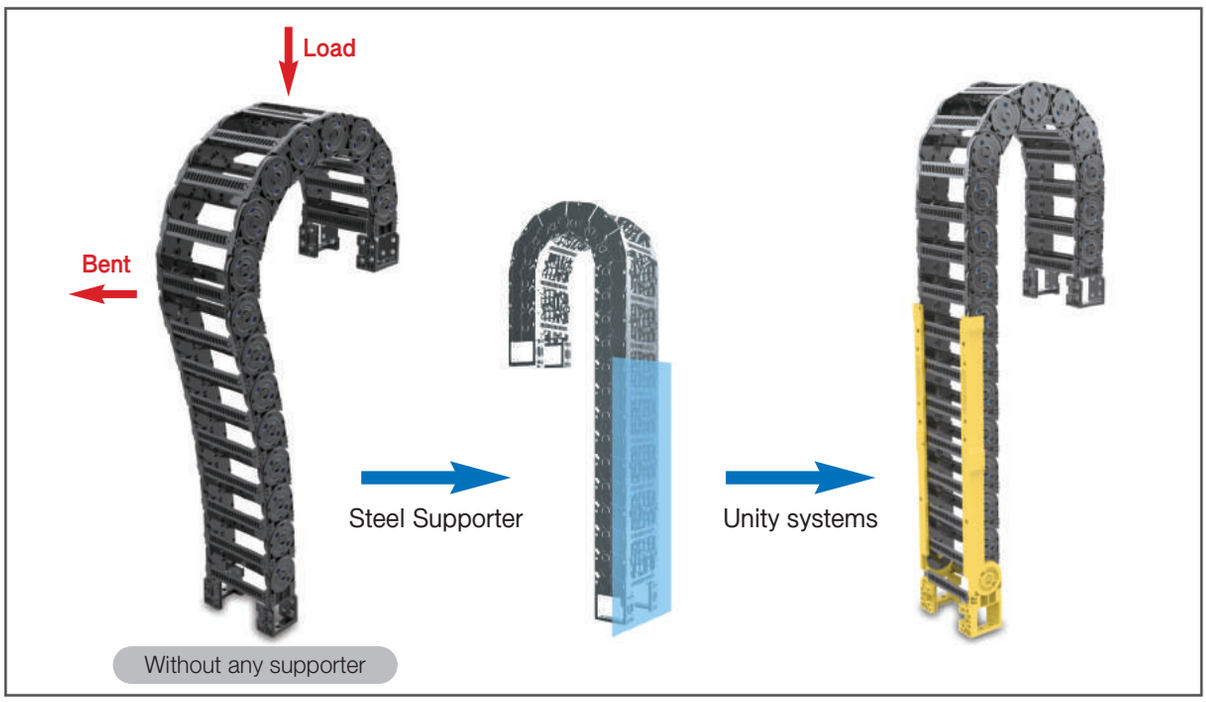
Part list of Unity systems



Unity Systems

Characteristics of Unity systems

1 *To protect cable at vertical application!*

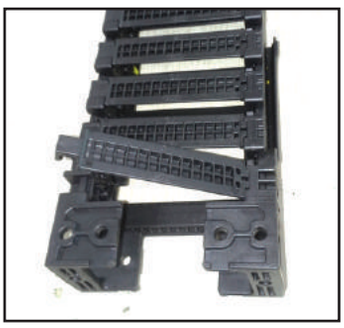


2 *Cost saved as it's made by high quality PA6 to replace steel supporter or steel guide channel!*

- Cost-saving effect by using the plastic material, compared to previous expensive material such as stainless steel & aluminium.
- Time-saving effect of installation by all-in-one composition.
- No need to spend extra cost when connecting it with cable chain.
- Can shorten delivery because the extra designing process is unnecessary.
- Installation with only the parts is feasible.

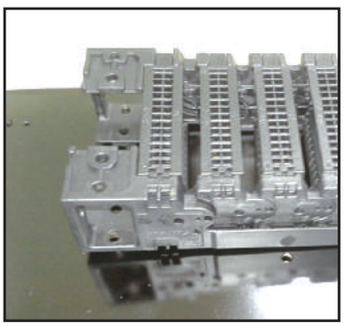
Assembly procedure of Unity systems

The assembling procedure of Unity Systems Chain is like below and you must use rubber hammer with careful combination of Divider and Separator.



1

Prepare cable chain that guide channel attached end bracket is assembled to.
It is a same assembling method between existing cable chain and FEB.



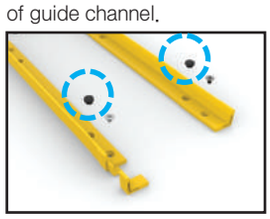
2

Connect cable chain that guide channel attached end bracket is assembled to extended form of guide channel and equipment where end cap is assembled. And connect them with bolts.

3

Completed figure of cable chain.

Can attach rubber pad for noise protection to the surface of guide channel.



ST044N - Unity Systems

Unity system Application method

Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

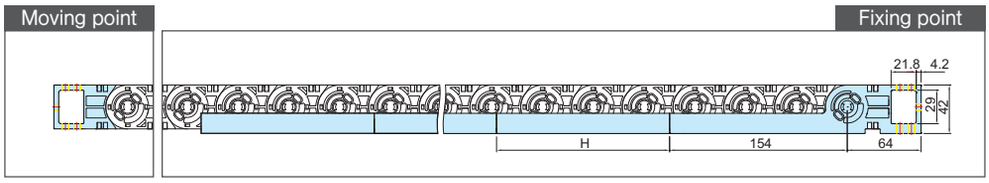
Vertical type

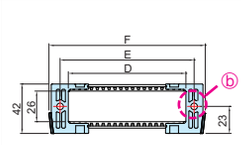
Horizontal type

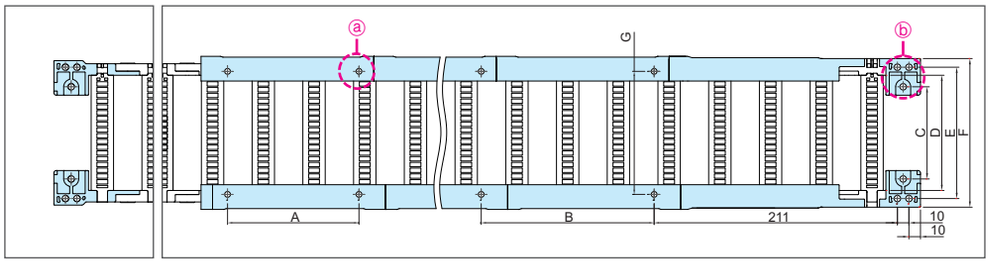
Moving point

Fixing point

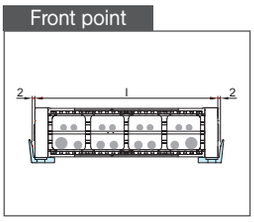
Front point



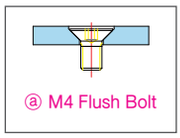


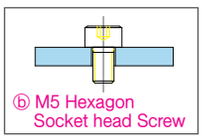


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 044N	15	35	49	68	41.8	56
	30	50	64	83	56.8	71
	35	55	69	88	61.8	76
	55	75	89	108	81.8	96
	80	100	114	133	106.8	121
	105	125	139	158	131.8	146
	130	150	164	183	156.8	171
	155	175	189	208	181.8	196
	180	200	214	233	206.8	221


ⓐ M4 Flush Bolt


ⓑ M5 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC150	150	151	114
GC250	250	251	214

(Dimensions in mm)

Ordering

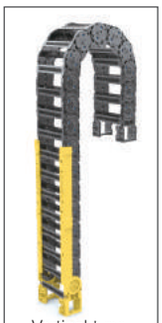
ST 044N. 100. R120 / F - 1500L : 10ST

- Shift Chain
- Normal type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

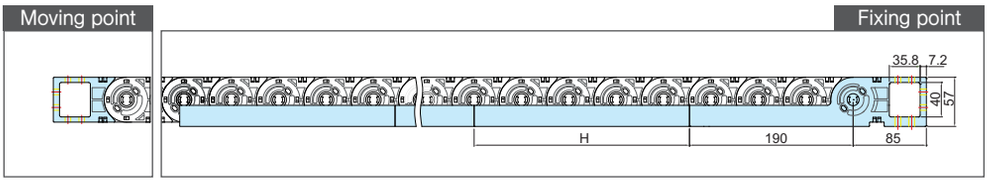
ST055N - Unity Systems

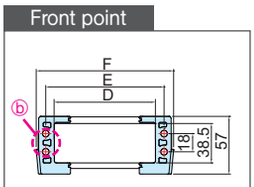
Unity system Application method

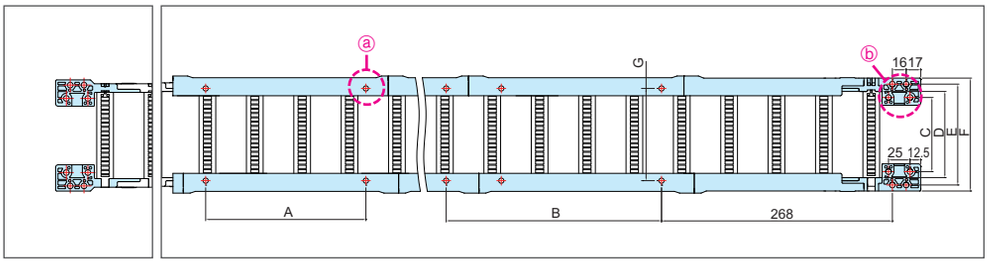
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

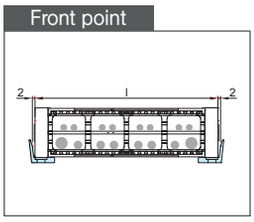

Vertical type

Horizontal type

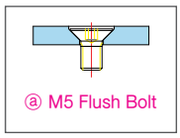


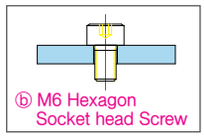






Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 055N	21	35	52	71	42	56
	36	50	67	86	57	71
	41	55	72	91	62	76
	61	75	92	111	82	96
	86	100	117	136	107	121
	111	125	142	161	132	146
	136	150	167	186	157	171
	161	175	192	211	182	196
	186	200	217	236	207	221


ⓐ M5 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC250	250	251	186
GC400	400	401	336

(Dimensions in mm)

Ordering

ST 055N. 150. R150 / F - 1800L : 10ST

- Shift Chain
- Normal type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

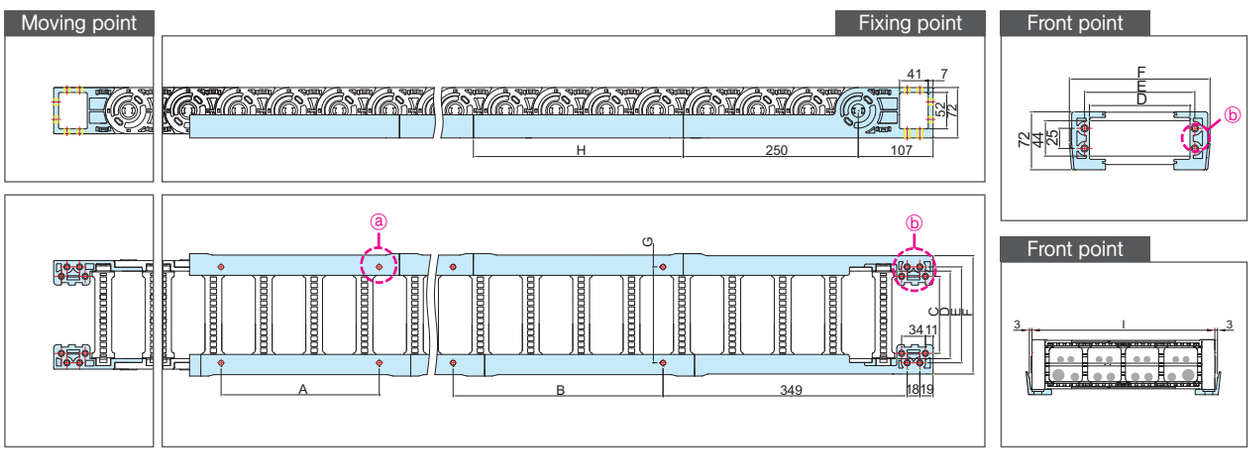
ST072N - Unity Systems

Unity system Application method

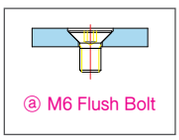
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

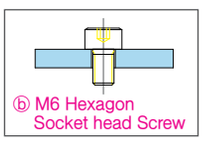
Vertical type

Horizontal type



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 072N	35	50	62	100	62	82
	60	75	87	125	87	107
	85	100	112	150	112	132
	110	125	137	175	137	157
	125	140	152	190	152	172
	135	150	162	200	162	182
	150	165	177	215	177	197
	160	175	187	225	187	207
	175	190	202	240	202	222
	185	200	212	250	212	232
	225	240	252	290	252	272
	235	250	262	300	262	282
	285	300	312	350	312	332


ⓐ M6 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC300	300	301	226
GC500	300	501	426

(Dimensions in mm)

Ordering

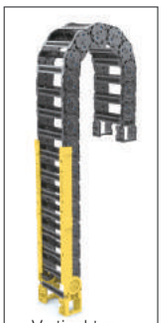
ST 072N. 175. R200 / F - 2000L : 10ST

- Shift Chain
- Normal type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

ST095N - Unity Systems

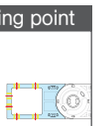
Unity system Application method

Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

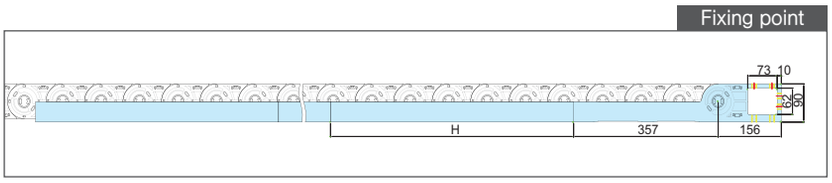

Vertical type

Horizontal type

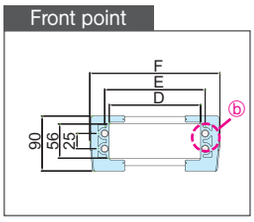
Moving point

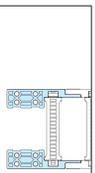


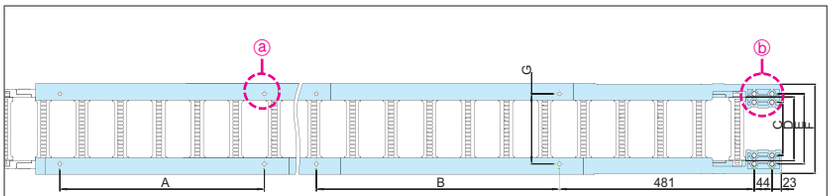
Fixing point



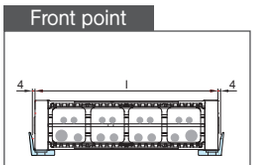
Front point



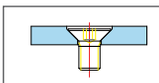


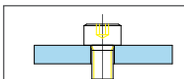


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 095N	50	75	90	135	90	113
	75	100	115	160	115	138
	100	125	140	185	140	163
	125	150	165	210	165	188
	150	175	190	235	190	213
	165	190	205	250	205	228
	175	200	215	260	215	238
	200	230	245	280	245	268
	215	240	255	290	255	278
	225	250	265	310	265	288
	275	300	315	360	315	338
	325	350	365	410	365	388
	375	400	415	460	415	438


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

ST 095N. 200. R230 / F - 2500L : 10ST

- Shift Chain
- Normal type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

ST120N - Unity Systems

Unity system Application method

Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

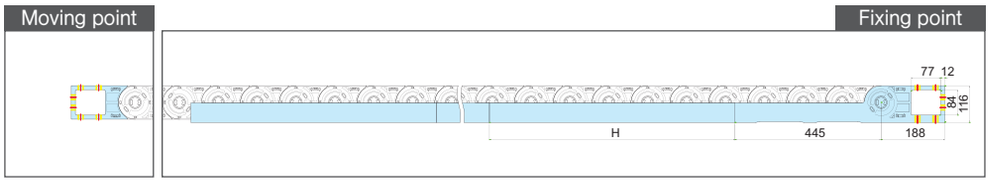
Vertical type

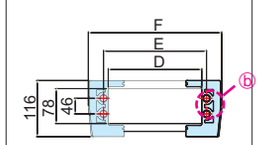
Horizontal type

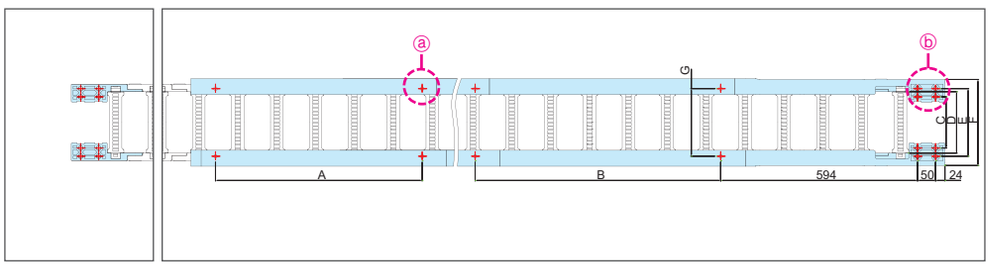
Moving point

Fixing point

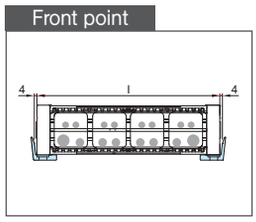
Front point



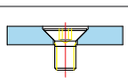


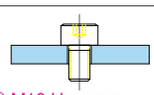


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 120N	47	75	104	139	94	117
	72	100	129	164	119	142
	87	115	144	179	134	157
	97	125	154	189	144	167
	122	150	179	214	169	192
	147	175	204	239	194	217
	172	200	229	264	219	242
	212	240	269	304	259	282
	222	250	279	314	269	292
	262	290	319	354	309	332
	272	300	329	364	319	342
	322	350	379	414	369	392
	372	400	429	464	419	442
	422	450	479	514	469	492
	472	500	529	564	519	542
	522	550	579	614	569	592
	572	600	629	664	619	642


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

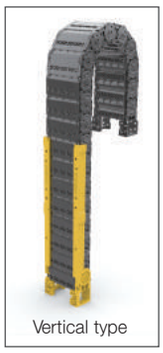
ST 120N. 400. R300 / F - 3000L : 10ST

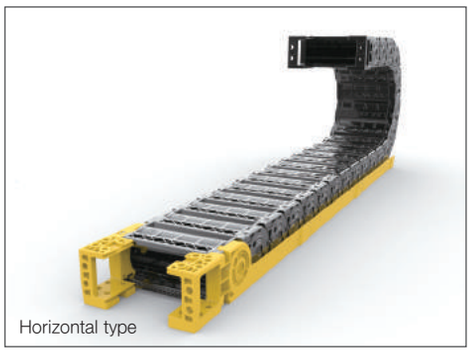
- Shift Chain
- Normal type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

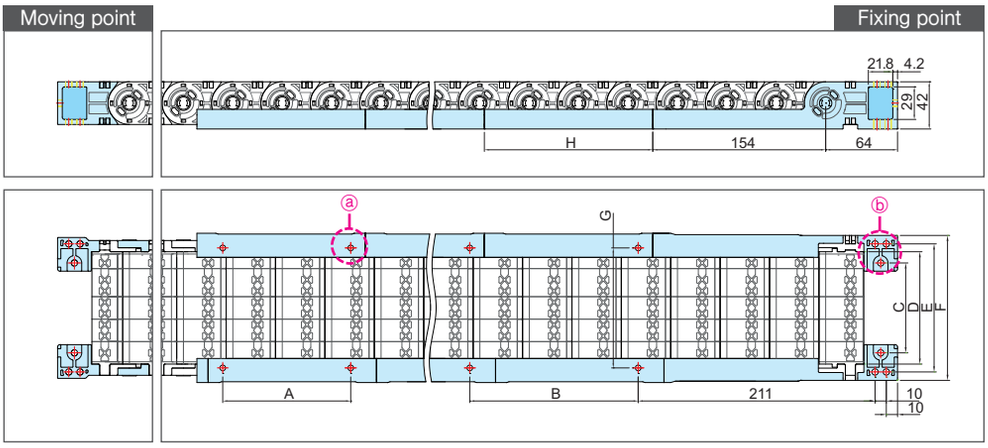
ST044E- Unity Systems

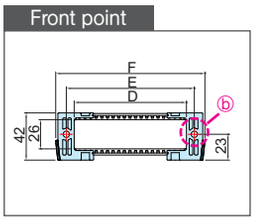
Unity system Application method

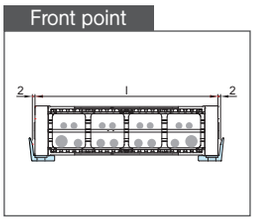
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)


Vertical type

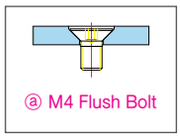

Horizontal type

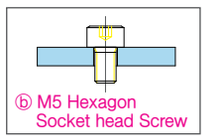






Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 044E	15	35	49	68	41.8	56
	35	55	69	88	61.8	76
	55	75	89	108	81.8	96
	80	100	114	133	106.8	121


ⓐ M4 Flush Bolt


ⓑ M5 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC150	150	151	114
GC250	250	251	214

(Dimensions in mm)

Ordering

ST 044E. 100. R120 / F - 1500L : 10ST

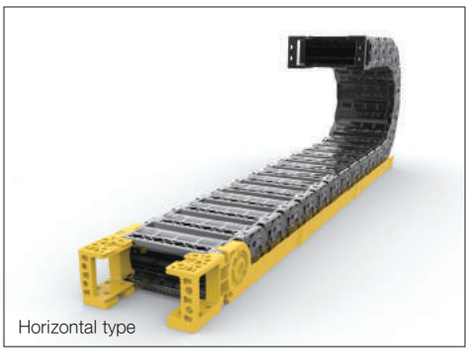
- Shift Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

ST055E- Unity Systems

Unity system Application method

Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

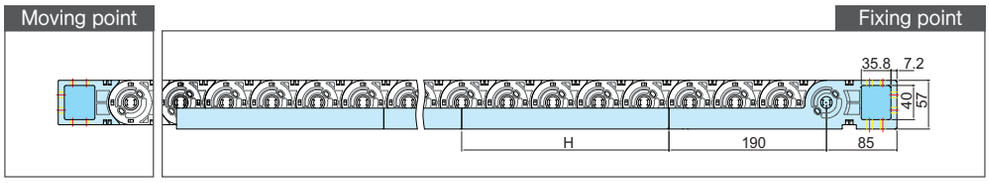
Vertical type

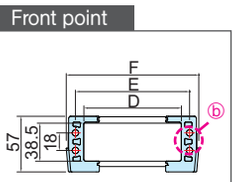

Horizontal type

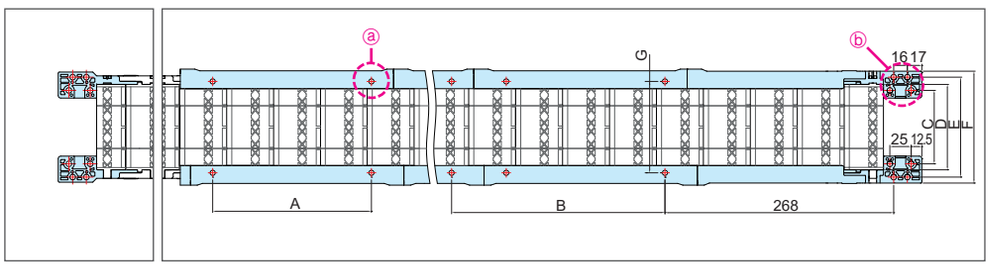
Moving point

Fixing point

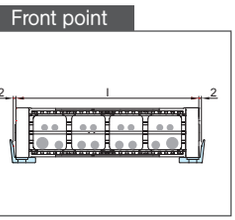
Front point



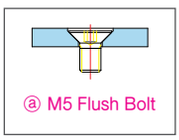


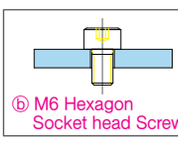


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 055E	36	50	67	67	57	71
	61	75	92	92	82	96
	86	100	117	117	107	121
	111	125	142	142	132	146
	136	150	167	167	157	171


ⓐ M5 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC250	250	251	186
GC400	400	401	336

(Dimensions in mm)

Ordering

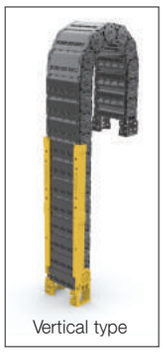
ST 055E. 150. R150 / F - 1800L : 10ST

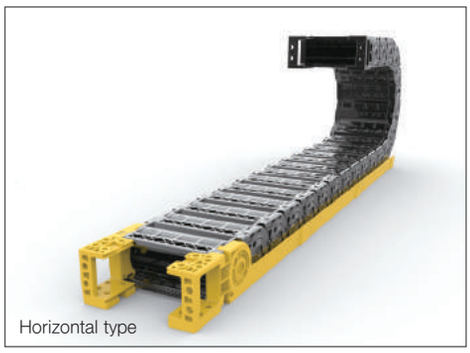
- Shift Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

ST072E- Unity Systems

Unity system Application method

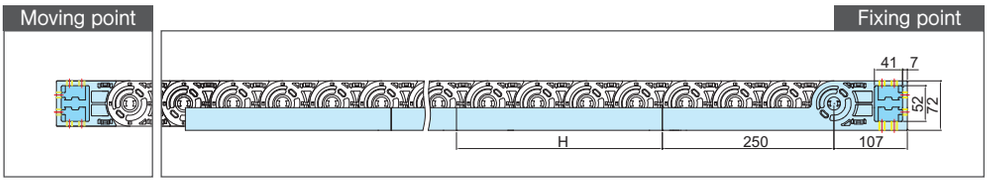
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

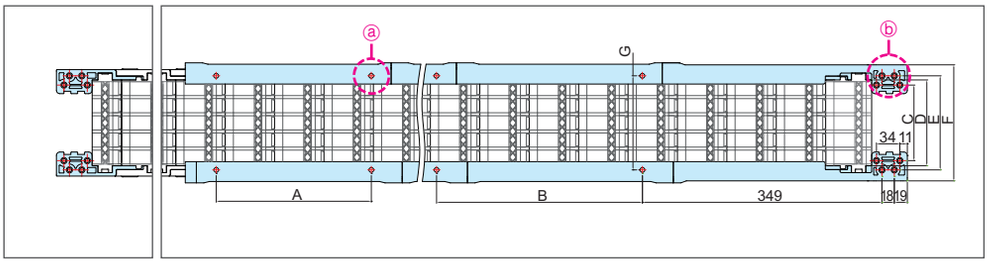

Vertical type


Horizontal type

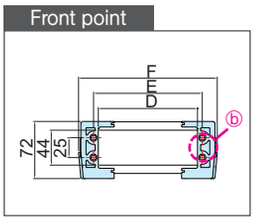
Moving point

Fixing point

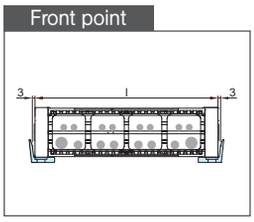




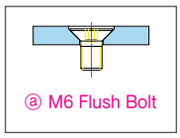
Front point

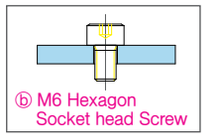


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 072E	35	50	62	100	62	82
	60	75	87	125	87	107
	85	100	112	150	112	132
	110	125	137	175	137	157
	135	150	162	200	162	182


ⓐ M6 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC300	300	301	226
GC500	500	501	426

(Dimensions in mm)

Ordering

ST 072E. 150. R200 / F - 3000L : 10ST

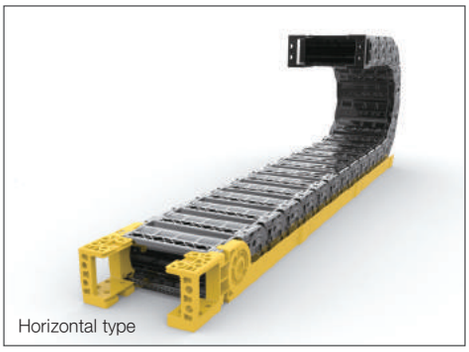
- Shift Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

ST095E- Unity Systems

Unity system Application method

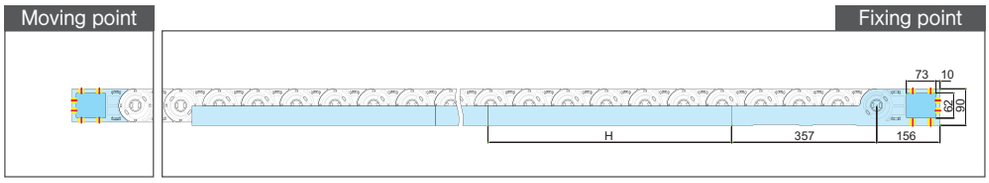
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

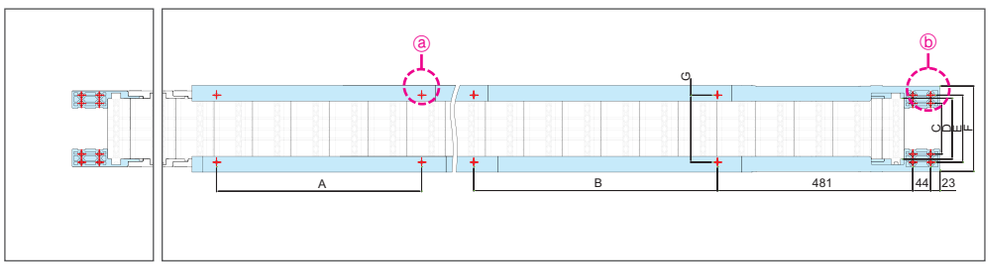
Vertical type


Horizontal type

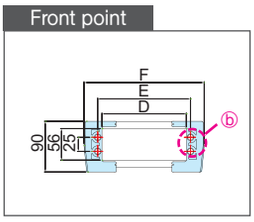
Moving point

Fixing point

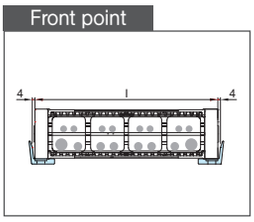




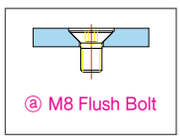
Front point

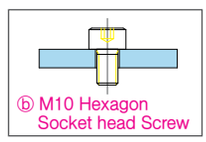


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 095E	75	100	115	160	115	138
	100	125	140	185	140	163
	125	150	165	210	165	188
	150	175	190	235	190	213
	175	200	215	260	215	238


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

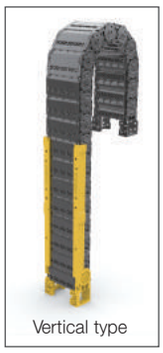
ST 095E. 200. R200 / F - 3000L : 10ST

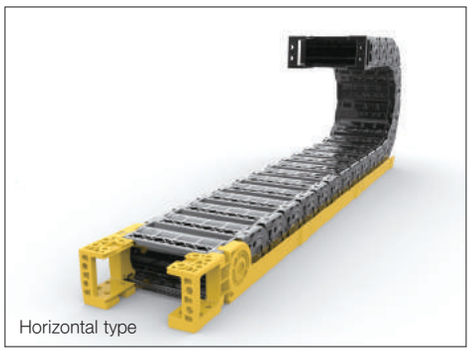
- Shift Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

ST120E- Unity Systems

Unity system Application method

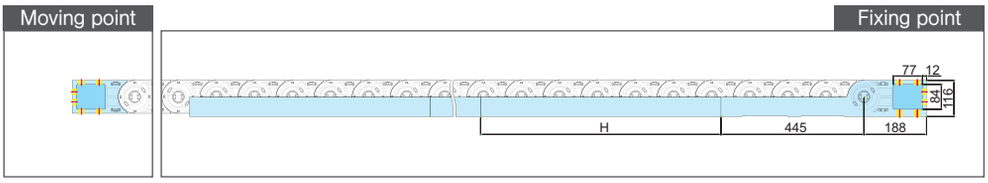
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)


Vertical type

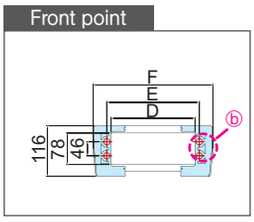

Horizontal type

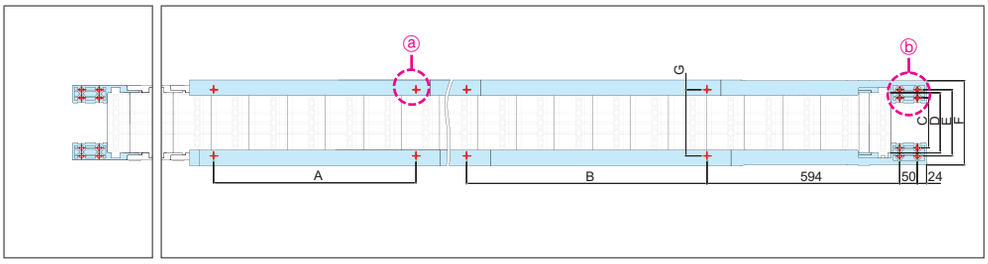
Moving point

Fixing point

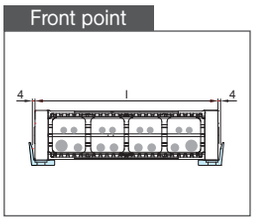


Front point

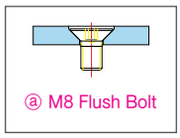


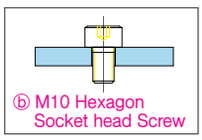


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
ST 120E	122	150	179	214	169	192
	172	200	229	264	219	242
	222	250	279	314	269	292
	272	300	329	364	319	342


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

ST 120E. 200. R200 / F - 3000L : 10ST

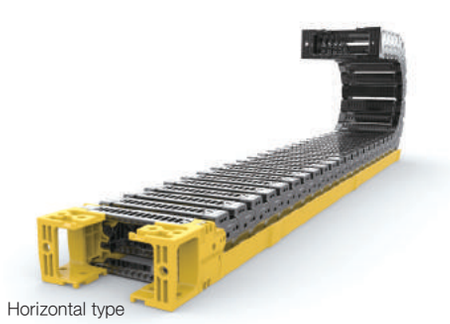
- Shift Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

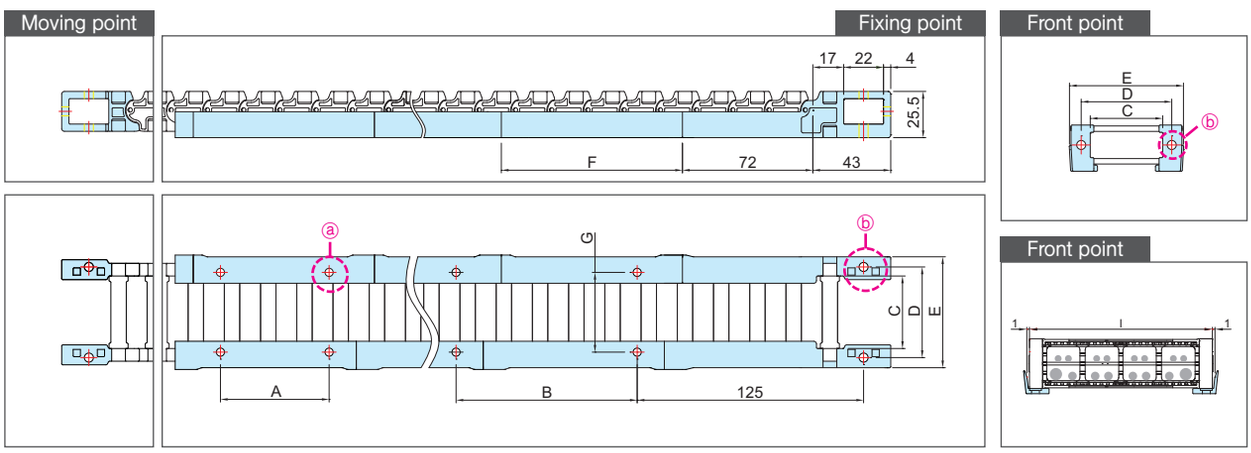
nsb020CR- Unity Systems

Unity system Application method

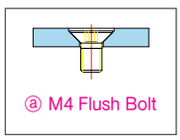
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

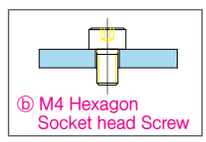
Vertical type


Horizontal type



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	G GC hole width	I FEB width
nsb 020CR	20	30	44	24	34
	40	50	64	44	54


ⓐ M4 Flush Bolt


ⓑ M4 Hexagon Socket head Screw

GC Type	F FEB width	B GC fixing hole	A GC hole
GC100	100	101	60
GC200	200	201	160

(Dimensions in mm)

Ordering

nsb 020CR. 20. R48 / F - 600L : 10ST

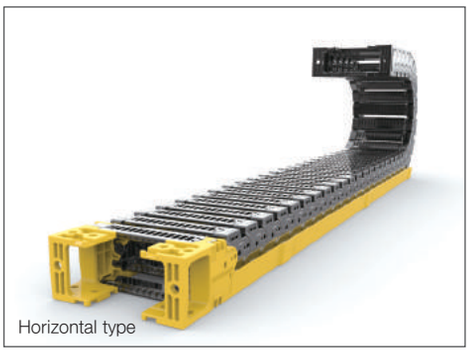
- Sabin Chain
- Clean Room type (CR)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G: Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
- Length(mm)
- Q'ty(set)

nsb022CR- Unity Systems

Unity system Application method

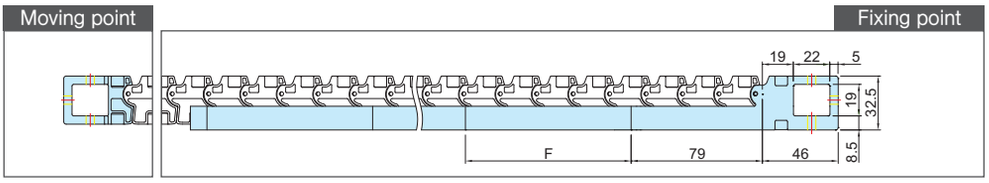
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

Vertical type

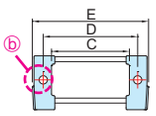

Horizontal type

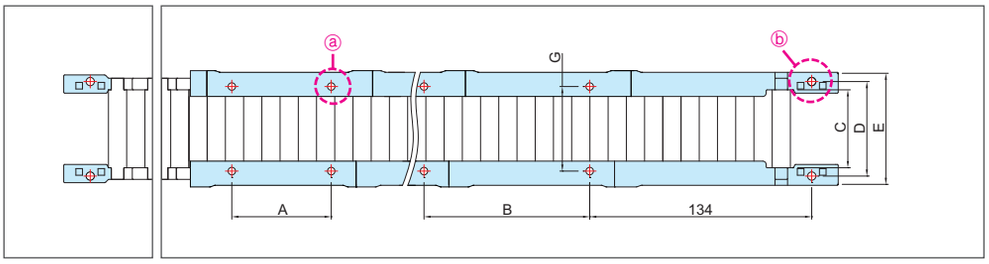
Moving point

Fixing point

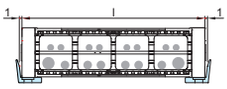


Front point

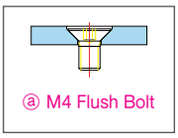


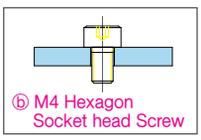


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	G GC hole width	I FEB width
nsb 022CR	16	26	40	20	30
	27	37	51	31	41
	37	47	61	41	51
	47	57	71	51	61
	67	77	91	71	81
	77	87	101	81	91


ⓐ M4 Flush Bolt


ⓑ M4 Hexagon Socket head Screw

GC Type	F FEB width	B GC fixing hole	A GC hole
GC100	100	101	60
GC200	200	201	160

(Dimensions in mm)

Ordering

nsb 022CR. 47. R45 / F - 846L : 10ST

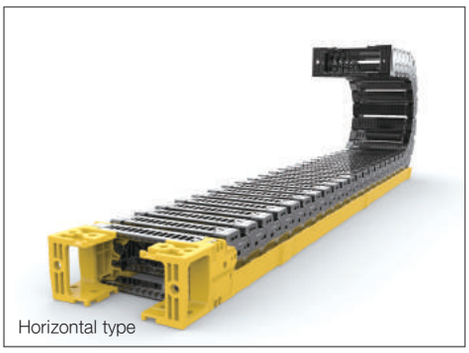
- Sabin Chain
- Clean Room type (CR)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
- Length(mm)
- Q'ty(set)

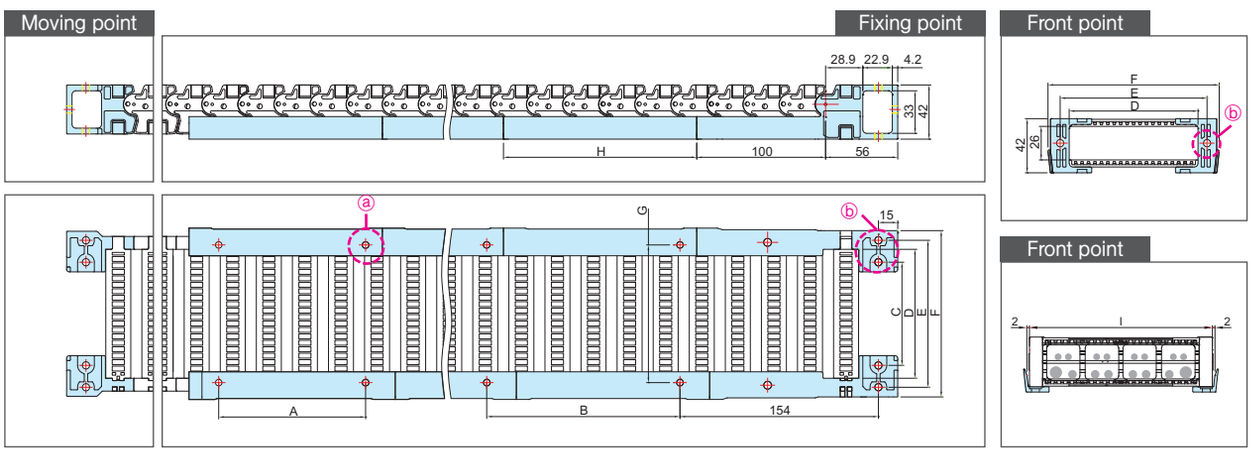
nsb028CR- Unity Systems

Unity system Application method

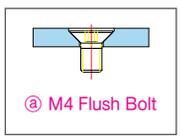
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

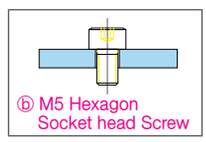
Vertical type


Horizontal type



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 028CR	15	35	49	68	41.8	55
	30	50	64	83	56.8	70
	35	55	69	88	61.8	75
	55	75	89	108	81.8	95
	80	100	114	133	106.8	120
	105	125	139	158	131.8	145
	130	150	164	183	156.8	170
	155	175	189	208	181.8	195
	180	200	214	233	206.8	220


ⓐ M4 Flush Bolt


ⓑ M5 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC150	150	151	114
GC250	250	251	214

(Dimensions in mm)

Ordering

nsb 028CR. 75. R70 / F - 1000L : 10ST

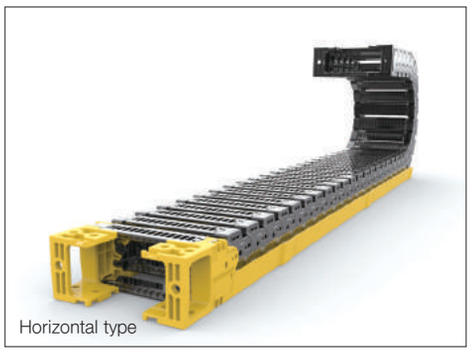
- Sabin Chain
- Clean Room type (CR)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G: Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

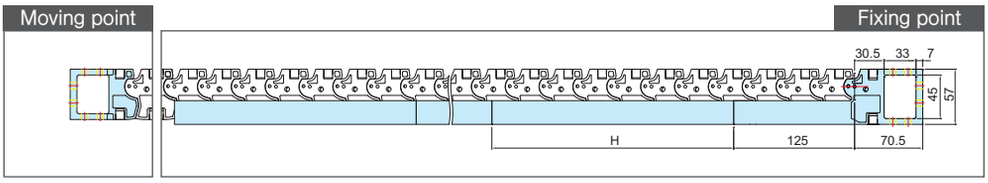
nsb035CR- Unity Systems

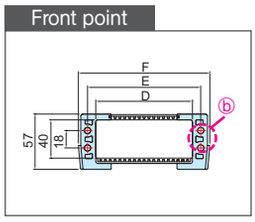
Unity system Application method

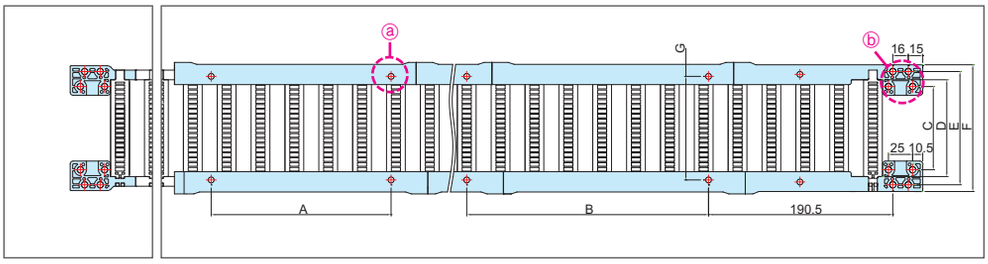
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

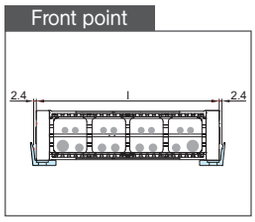
Vertical type


Horizontal type

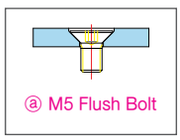


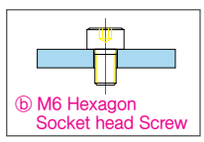






Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 035CR	21	35	52	71	42	55
	36	50	67	86	57	70
	41	55	72	91	62	75
	61	75	92	111	82	95
	86	100	117	136	107	120
	111	125	142	161	132	145
	136	150	167	186	157	170
	161	175	192	211	182	195
	186	200	217	236	207	220


ⓐ M5 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC250	250	251	186
GC400	400	401	336

(Dimensions in mm)

Ordering

nsb 035CR. 100. R75 / F - 1200L : 10ST

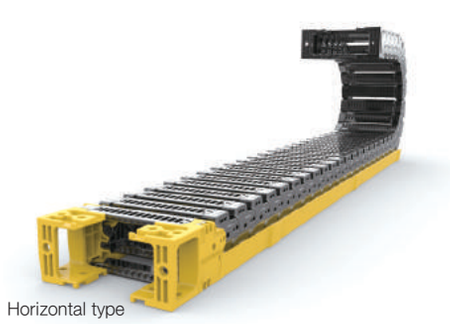
- Sabin Chain
- Clean Room type (CR)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

nsb045CR- Unity Systems

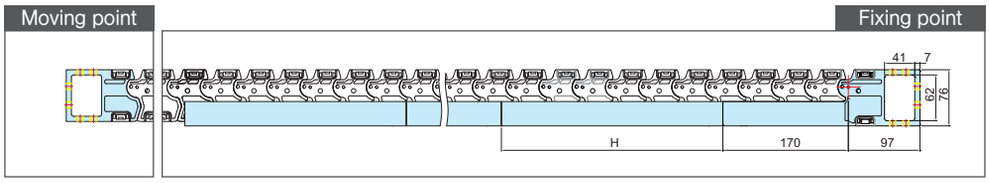
Unity system Application method

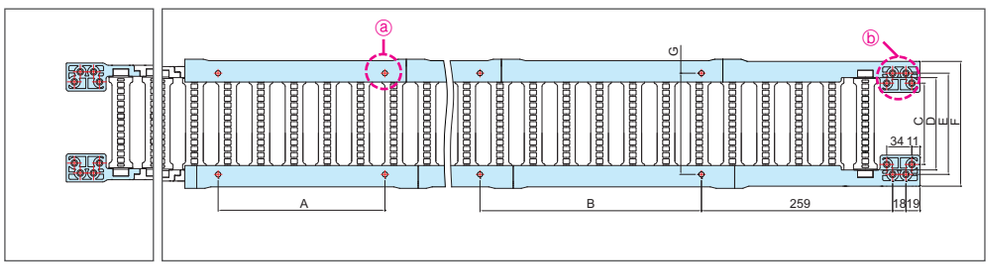
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

Vertical type


Horizontal type

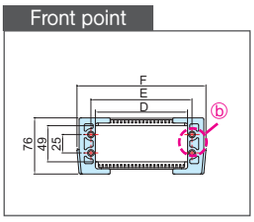
Moving point



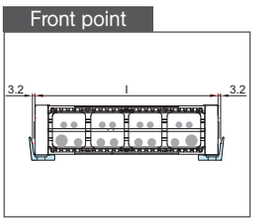


Fixing point

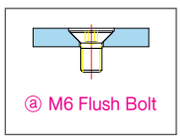
Front point

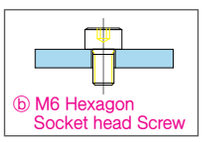


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 045CR	35	50	62	100	62	80
	60	75	87	125	87	105
	85	100	112	150	112	130
	110	125	137	175	137	155
	125	140	152	190	152	170
	135	150	162	200	162	180
	150	165	177	215	177	195
	160	175	187	225	187	205
	175	190	202	240	202	220
	185	200	212	250	212	230
	225	240	252	290	252	270
	235	250	262	300	262	280
	285	300	312	350	312	330


ⓐ M6 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC300	300	301	226
GC500	500	501	426

(Dimensions in mm)

Ordering

nsb 045CR. 100. R75 / F - 2000L : 10ST

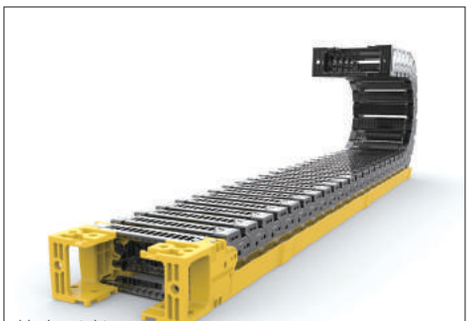
- Sabin Chain
- Clean Room type (CR)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

nsb060CR- Unity Systems

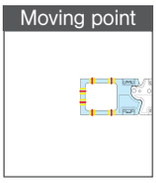
Unity system Application method

Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

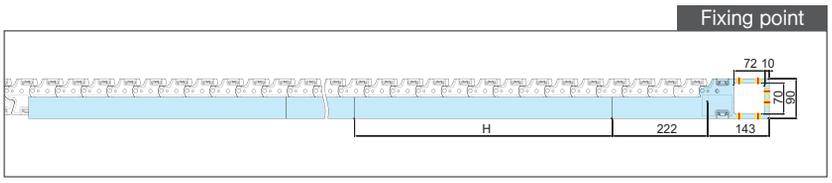
Vertical type


Horizontal type

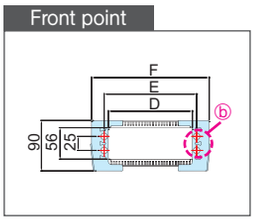
Moving point

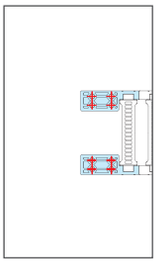


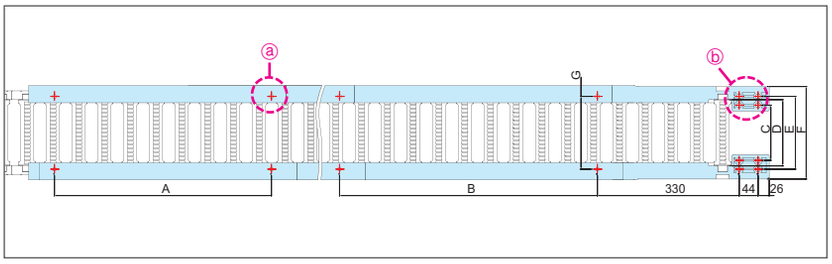
Fixing point



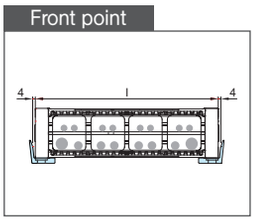
Front point



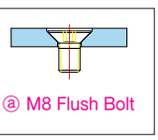


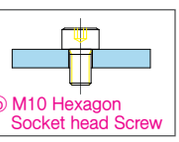


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 060CR	50	75	90	139	94	115
	75	100	115	164	119	140
	100	125	140	189	144	165
	125	150	165	214	169	190
	150	175	190	239	194	215
	165	190	205	254	209	230
	175	200	215	264	219	240
	205	230	245	294	249	270
	215	240	255	304	259	280
	225	250	265	314	269	290
	275	300	315	364	319	340
	325	350	365	414	369	390
	375	400	415	464	419	440


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

nsb 060CR. 150. R140 / F - 2500L : 10ST

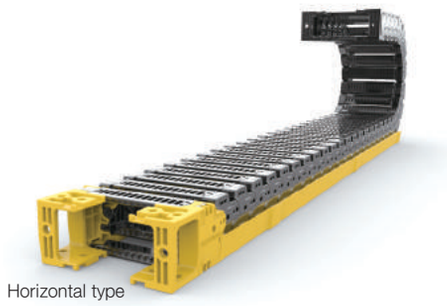
- Sabin Chain
- Clean Room type (CR)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

nsb075CR- Unity Systems

Unity system Application method

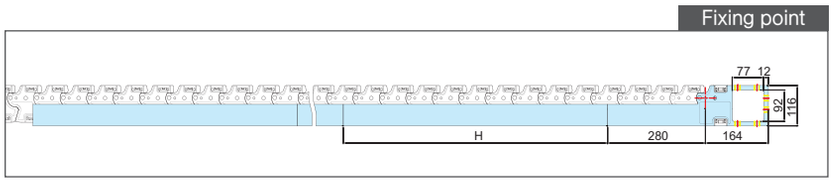
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

Vertical type

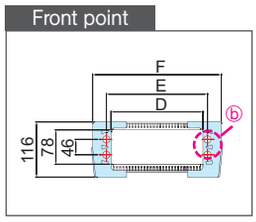

Horizontal type

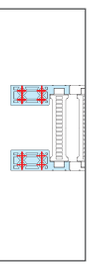
Moving point

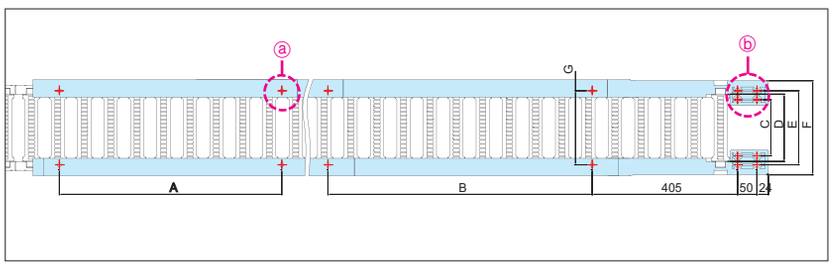
Fixing point



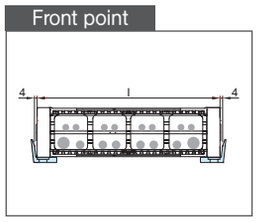
Front point



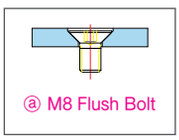


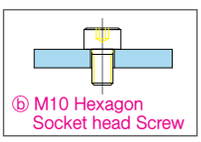


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 075CR	47	75	104	139	94	115
	72	100	129	164	119	140
	87	115	144	179	134	155
	97	125	154	189	144	165
	122	150	179	214	169	190
	147	175	204	239	194	215
	172	200	229	264	219	240
	212	240	269	304	259	280
	222	250	279	314	269	290
	262	290	319	354	309	330
	272	300	329	364	319	340
	322	350	379	414	369	390
	372	400	429	464	419	440
	422	450	479	514	469	490
	472	500	529	564	519	540
	522	550	579	614	569	590
	572	600	629	664	619	640


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

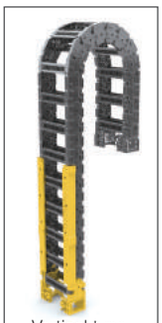
nsb 075CR. 300. R200 / F - 3000L : 10ST

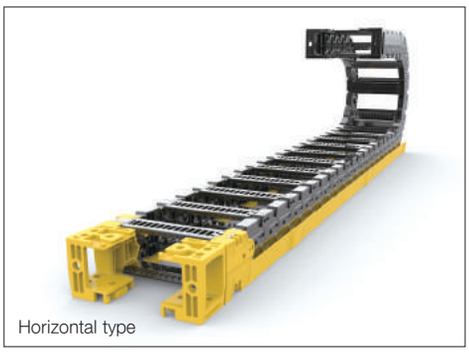
- Sabin Chain
- Clean Room type (CR)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

nsb028N- Unity Systems

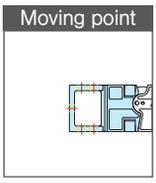
Unity system Application method

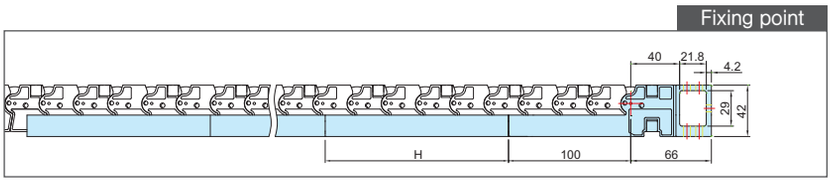
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)


Vertical type


Horizontal type

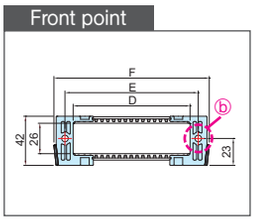
Moving point

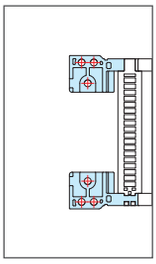


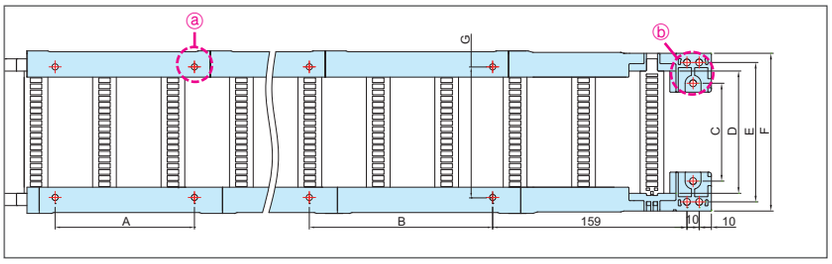


Fixing point

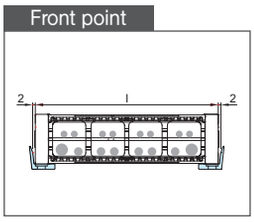
Front point



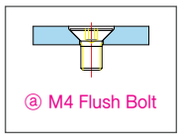


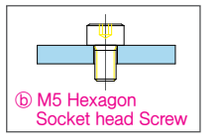


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 028N	15	35	49	68	41.8	55
	30	50	64	83	56.8	70
	35	55	69	88	61.8	75
	55	75	89	108	81.8	95
	80	100	114	133	106.8	120
	105	125	139	158	131.8	145
	130	150	164	183	156.8	170
	155	175	189	208	181.8	195
	180	200	214	233	206.8	220


ⓐ M4 Flush Bolt


ⓑ M5 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC150	150	151	114
GC250	250	251	214

(Dimensions in mm)

Ordering

nsb 028N. 50. R66 / F - 1000L : 10ST

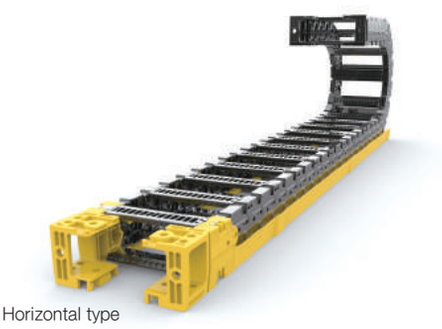
- Sabin Chain
- Normal Type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

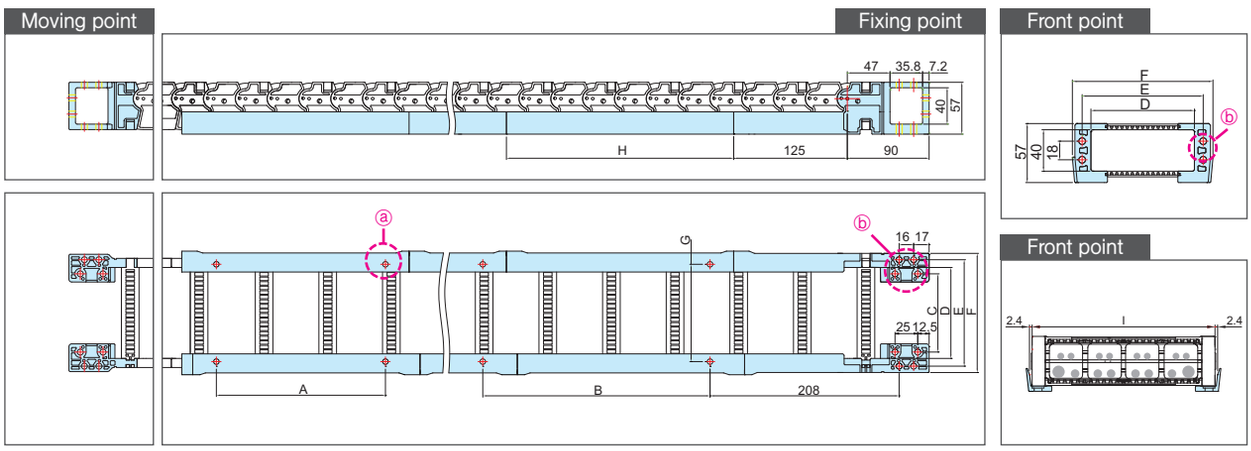
nsb035N- Unity Systems

Unity system Application method

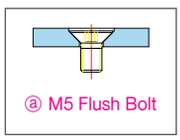
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

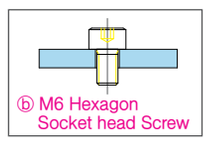
Vertical type


Horizontal type



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 035N	21	35	52	71	42	55
	36	50	67	86	57	70
	41	55	72	91	62	75
	61	75	92	111	82	95
	86	100	117	136	107	120
	111	125	142	161	132	145
	136	150	167	186	157	170
	161	175	192	211	182	195
	186	200	217	236	207	220


ⓐ M5 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC250	250	251	186
GC400	400	401	336

(Dimensions in mm)

Ordering

nsb 035N. 75. R90 / F - 1000L : 10ST

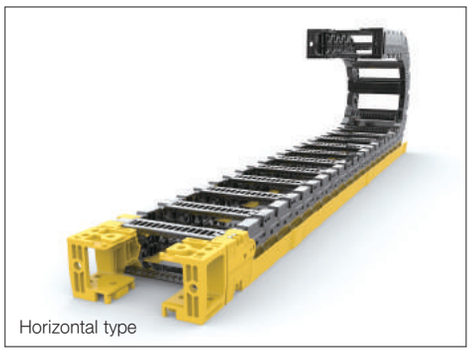
- Sabin Chain
- Normal Type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

nsb045N- Unity Systems

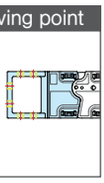
Unity system Application method

Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

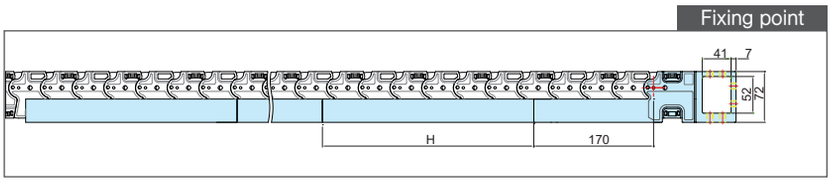
Vertical type


Horizontal type

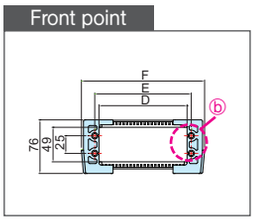
Moving point

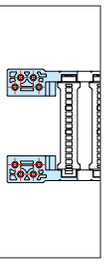


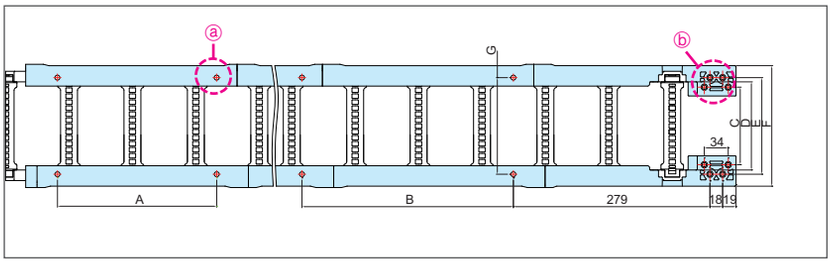
Fixing point



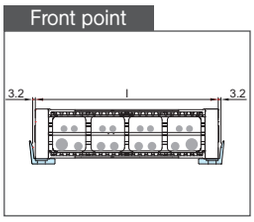
Front point



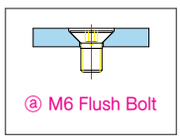


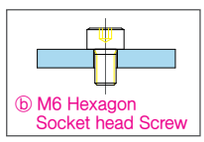


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 045N	35	50	62	100	62	80
	60	75	87	125	87	105
	85	100	112	150	112	130
	110	125	137	175	137	155
	125	140	152	190	152	170
	135	150	162	200	162	180
	150	165	177	215	177	195
	160	175	187	225	187	205
	175	190	202	240	202	220
	185	200	212	250	212	230
	225	240	252	290	252	270
	235	250	262	300	262	280
	285	300	312	350	312	330


ⓐ M6 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC250	250	251	186
GC400	400	401	336

(Dimensions in mm)

Ordering

nsb 045N. 125. R165 / F - 2000L : 10ST

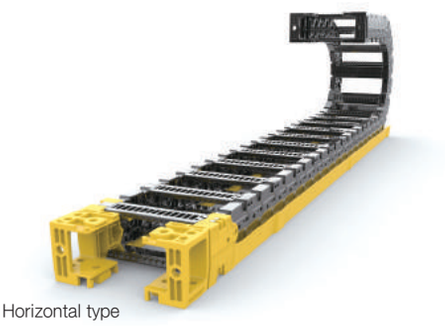
- Sabin Chain
- Normal Type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

nsb060N- Unity Systems

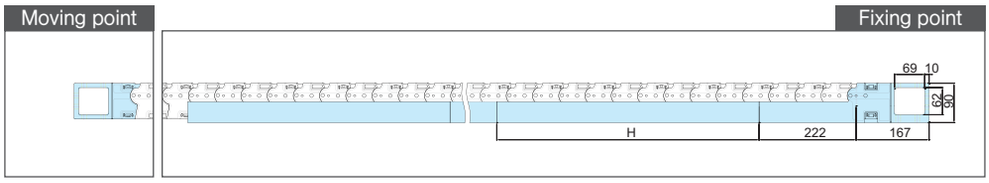
Unity system Application method

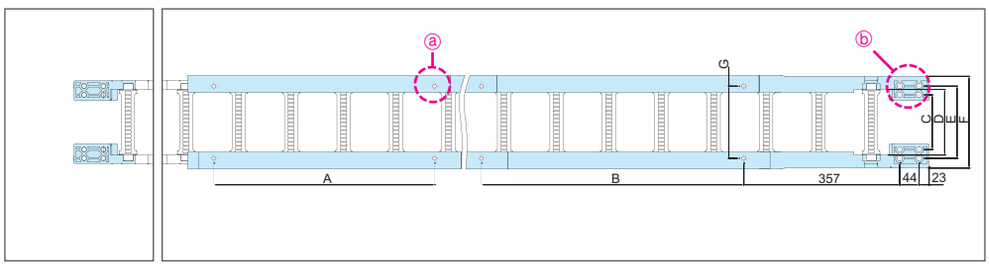
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

Vertical type


Horizontal type

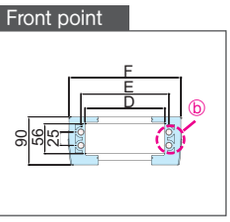
Moving point



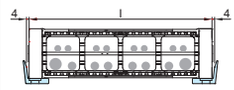


Fixing point

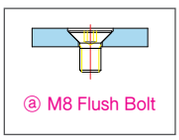
Front point

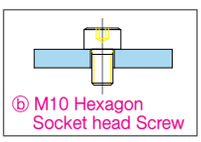


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 060N	50	75	90	139	94	115
	75	100	115	164	119	140
	100	125	140	189	144	165
	125	150	165	214	169	190
	150	175	190	239	194	215
	165	190	205	254	209	230
	175	200	215	264	219	240
	205	230	245	294	249	270
	215	240	255	304	259	280
	225	250	265	314	269	290
	275	300	315	364	319	340
	325	350	365	414	369	390
	375	400	415	464	419	440


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

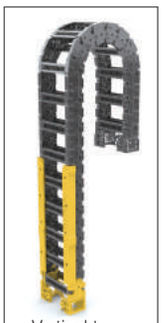
nsb 060N. 150. R180 / F - 2500L : 10ST

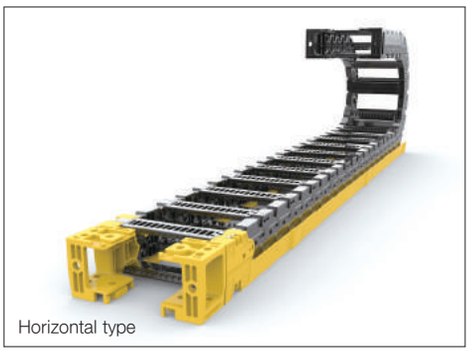
- Sabin Chain
- Normal Type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

nsb075N- Unity Systems

Unity system Application method

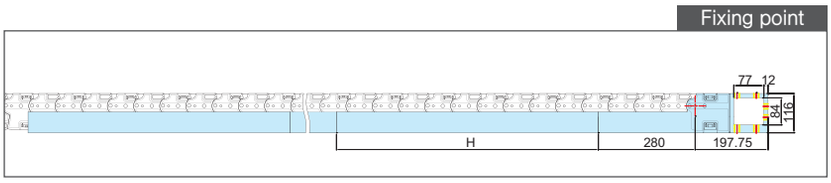
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)


Vertical type

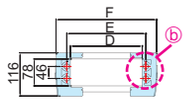

Horizontal type

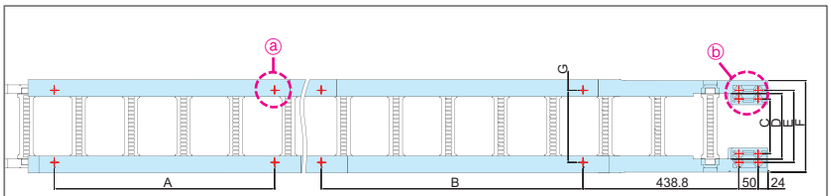
Moving point

Fixing point

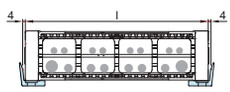


Front point

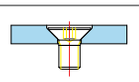


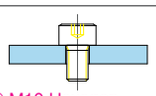


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 075N	47	75	104	139	94	115
	72	100	129	164	119	140
	87	115	144	179	134	155
	97	125	154	189	144	165
	122	150	179	214	169	190
	147	175	204	239	194	215
	172	200	229	264	219	240
	212	240	269	304	259	280
	222	250	279	314	269	290
	262	290	319	354	309	330
	272	300	329	364	319	340
	322	350	379	414	369	390
	372	400	429	464	419	440
	422	450	479	514	469	490
	472	500	529	564	519	540
	522	550	579	614	569	590
	572	600	629	664	619	640


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

nsb 075N. 125. R165 / F - 2000L : 10ST

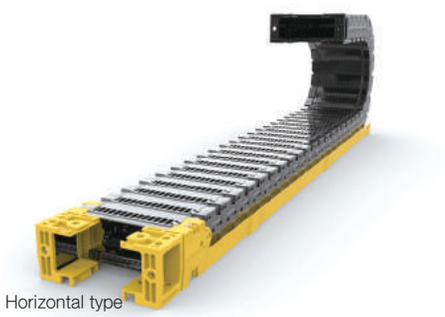
- Sabin Chain
- Normal Type (N)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

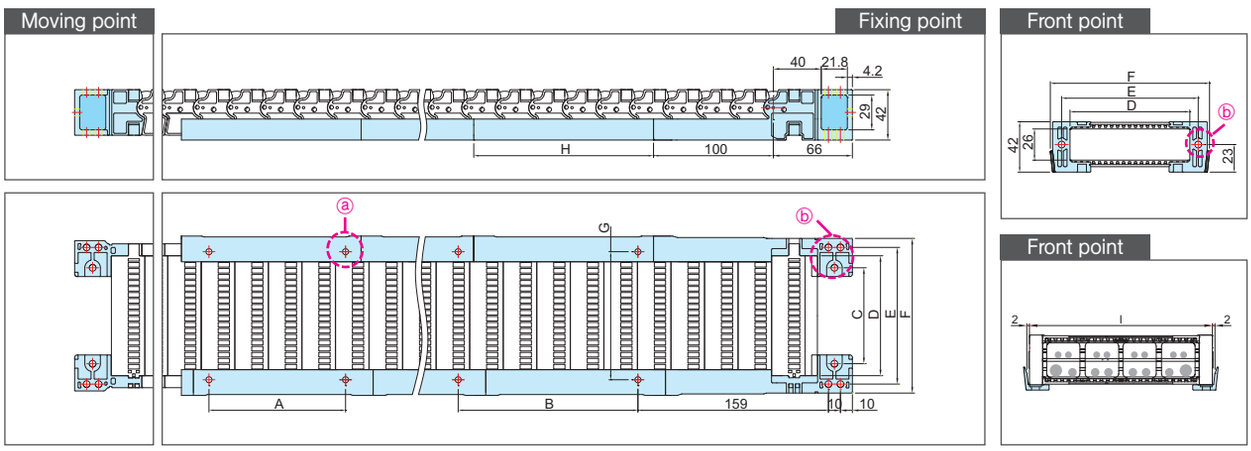
nsb028E- Unity Systems

Unity system Application method

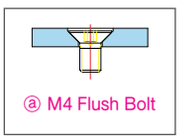
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

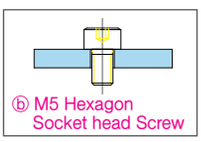
Vertical type


Horizontal type



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 028E	15	35	49	68	41.8	55
	35	55	69	88	61.8	75
	55	75	89	108	81.8	95
	80	100	114	133	106.8	120


ⓐ M4 Flush Bolt


ⓑ M5 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC150	150	151	114
GC250	250	251	214

(Dimensions in mm)

Ordering

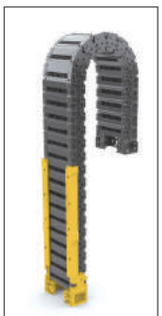
nsb 028E. 50. R66 / F - 1000L : 10ST

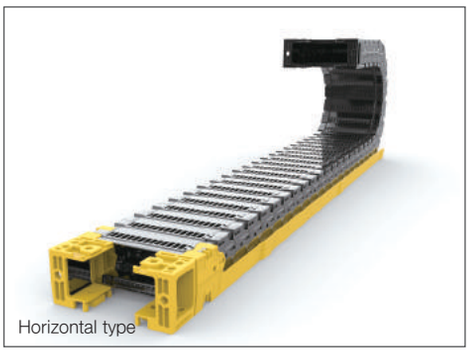
- Sabin Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

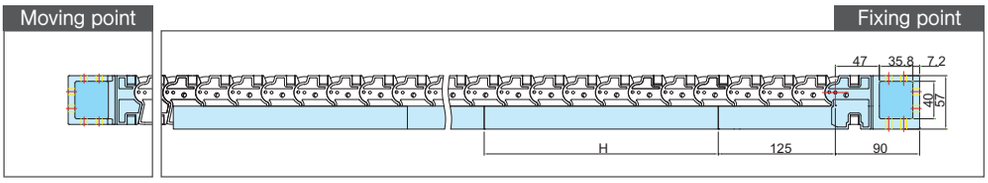
nsb035E- Unity Systems

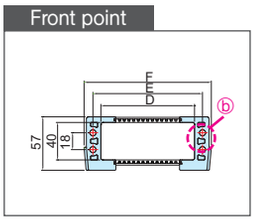
Unity system Application method

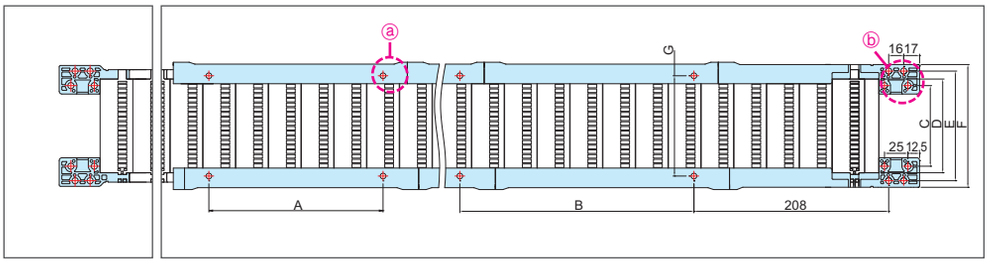
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

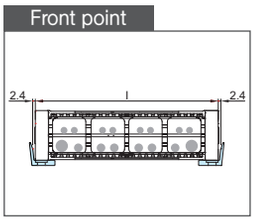

Vertical type


Horizontal type

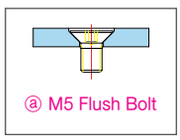


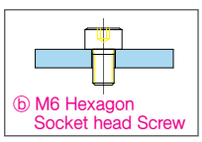






Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 035E	36	50	67	86	57	70
	61	75	92	111	82	95
	86	100	117	136	107	120
	111	125	142	161	132	145
	136	150	167	186	157	170


ⓐ M5 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC250	250	251	186
GC400	400	401	336

(Dimensions in mm)

Ordering

nsb 035E. 100. R90 / F - 1500L : 10ST

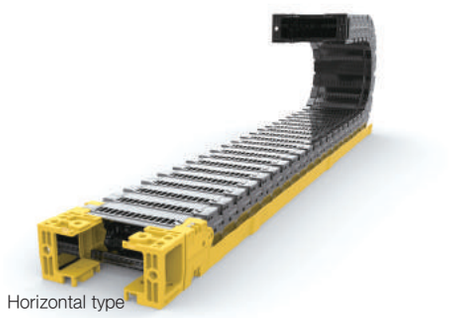
- Sabin Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

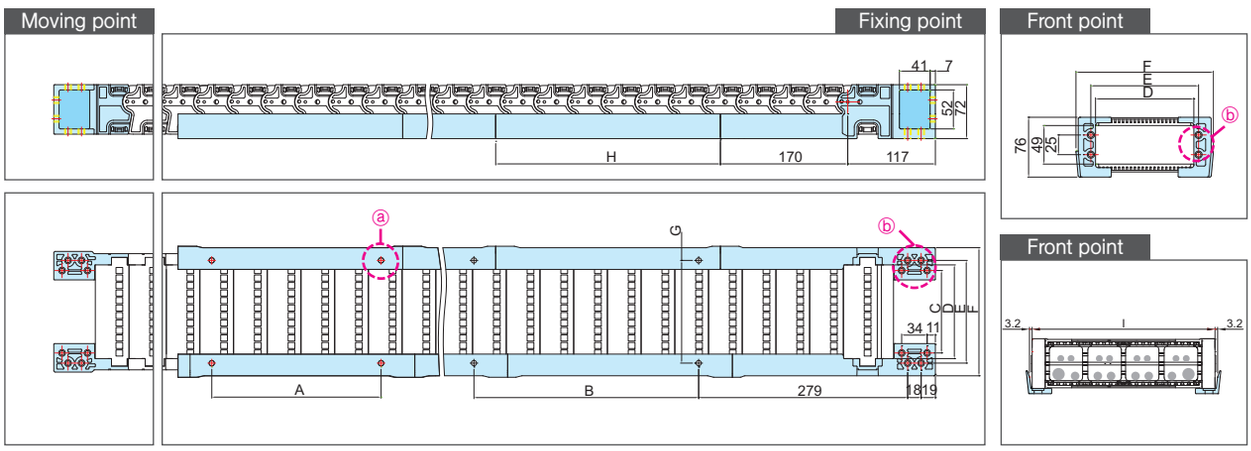
nsb045E- Unity Systems

Unity system Application method

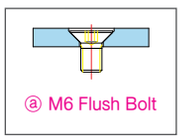
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

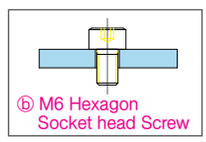
Vertical type


Horizontal type



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 045E	60	75	87	125	87	105
	85	100	112	150	112	130
	110	125	137	175	137	155
	135	150	162	200	162	180


ⓐ M6 Flush Bolt


ⓑ M6 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC300	300	301	226
GC500	500	501	426

(Dimensions in mm)

Ordering

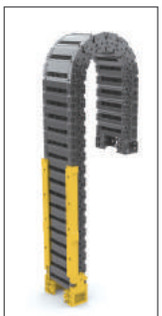
nsb 045E. 100. R135 / F - 2000L : 10ST

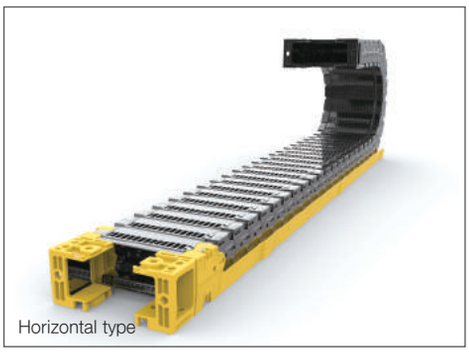
- Sabin Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G: Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

nsb060E- Unity Systems

Unity system Application method

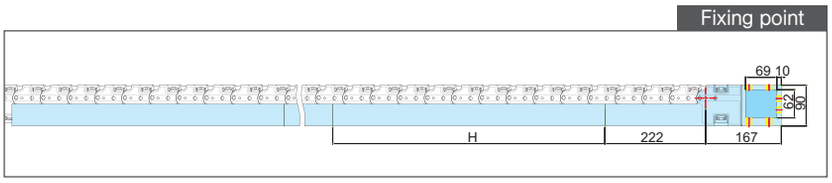
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)


Vertical type

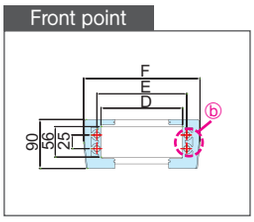

Horizontal type

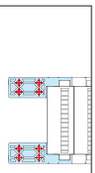
Moving point

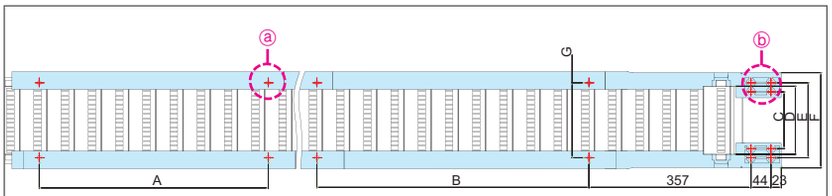
Fixing point



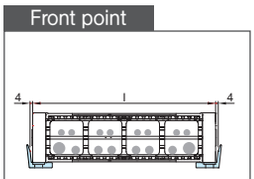
Front point



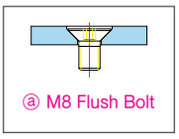


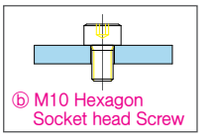


Front point



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 060E	75 125 175	100 150 200	115 165 215	164 214 264	119 169 219	140 190 240


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

(Dimensions in mm)

Ordering

nsb 060E. 200. R230 / F - 2000L : 10ST

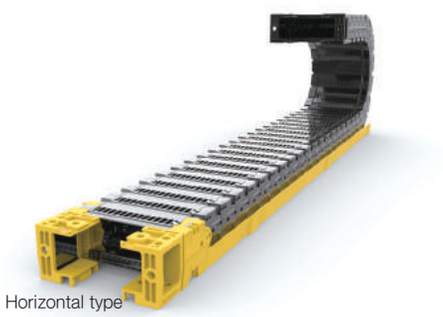
- Sabin Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G : Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

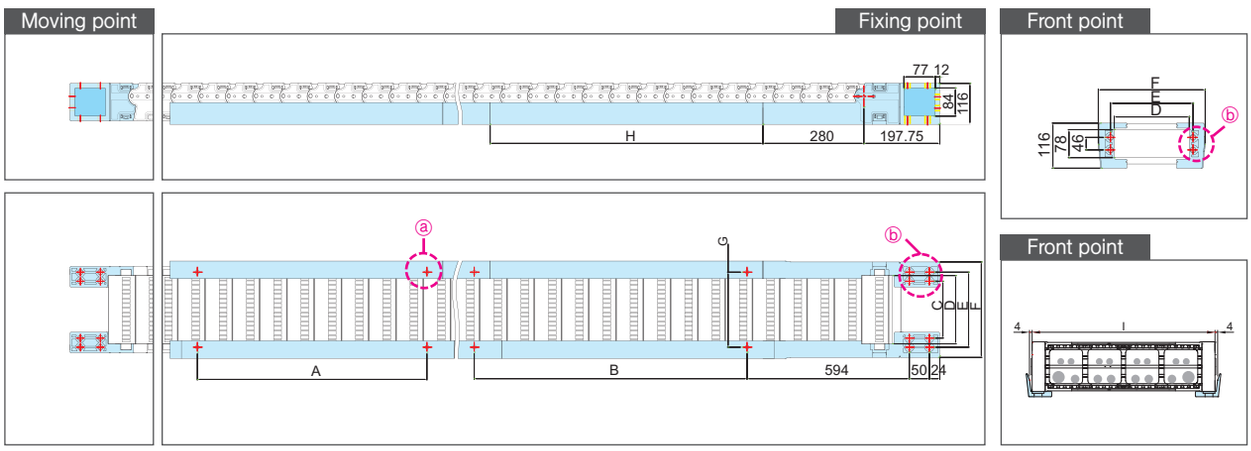
nsb075E- Unity Systems

Unity system Application method

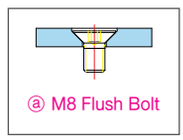
Item	Value
Vertical type	Only 1 set of GC.FEB (End bracket) and 1pcs of GC.EC(End cap)
Horizontal type	1set of GC.FEB + 1pcs of GC.EC(End cap) + ½LS of GC(Guide channel)

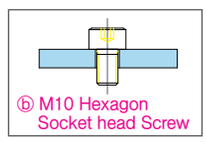
Vertical type


Horizontal type



Chain Type	C FEB fix hole(inner)	D Frame	E FEB hole width	F FEB width	G GC hole width	I FEB width
nsb 075E	122 172 272	150 200 300	179 229 329	214 264 364	169 219 319	190 240 340


ⓐ M8 Flush Bolt


ⓑ M10 Hexagon Socket head Screw

GC Type	H GC length	B GC fixing hole	A GC hole
GC600	600	601	505
GC800	800	801	705

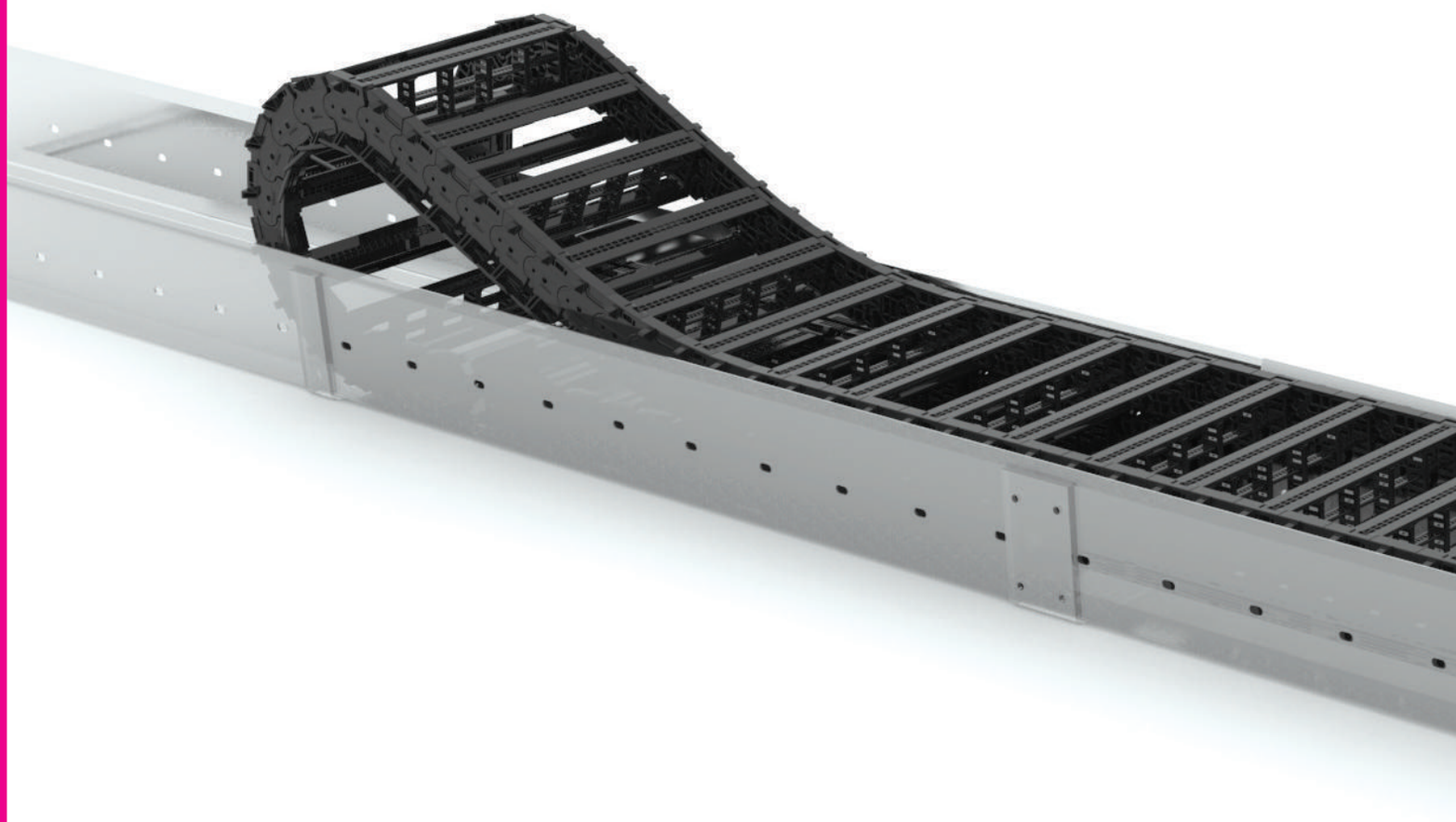
(Dimensions in mm)

Ordering

nsb 075E. 300. R330 / F - 2500L : 10ST

- Sabin Chain
- Enclosed type (E)
- Inside width
- Bending radius
- Bracket Type
  - F : Free End Bracket
  - G: Horizontal Guide Channel Type End Bracket
  - V : Vertical Guide Channel Type End Bracket
  - FT : Tie Wrap
  - FST : System Tie Wrap
- Length(mm)
- Q'ty(set)

Guide Channel System

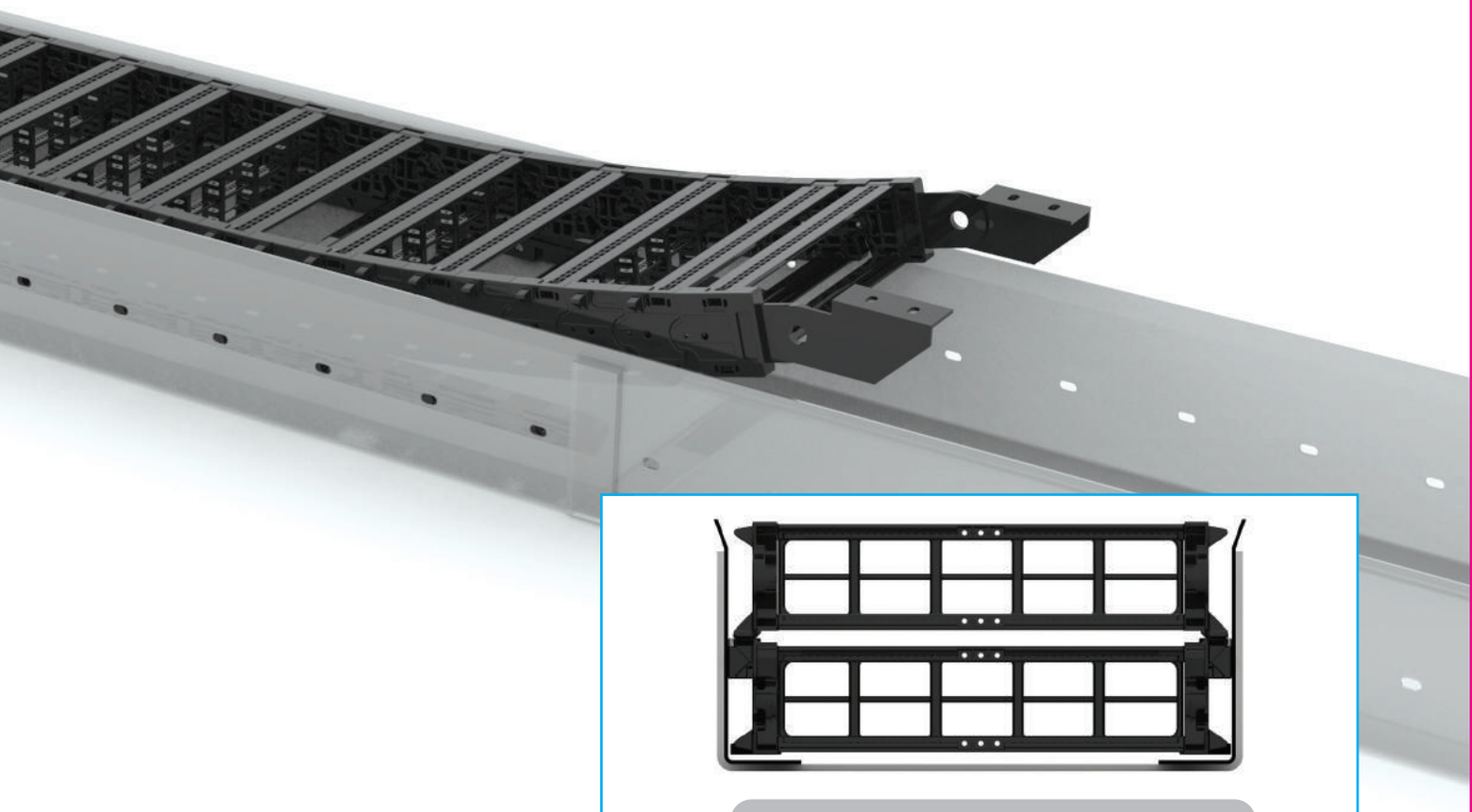


General information

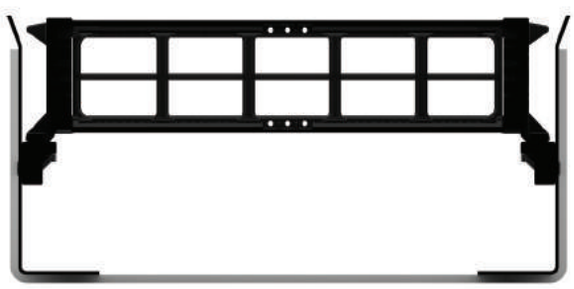
Item	Value
Material	Steel or SUS
Standard-1	Steel + Zn plating
Standard-2	Steel + Zn plating + Powder coating
Color	Silver, Black, Ivory

Available Product list with Guide Channel

Product Model	Product type
Shift Chain	ST044S ST044ES, ST072ES, ST095ES, ST120ES ST044RS, ST072RS, ST095RS, ST120RS, ST150RS ST044ERS, ST072ERS, ST095ERS, ST120ERS
nsb Chain	nsb050S, nsb065S, nsb080S



A-zone

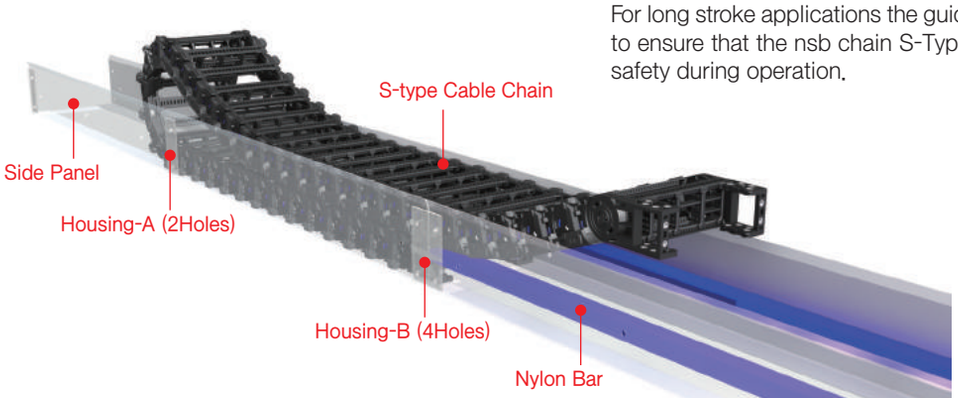


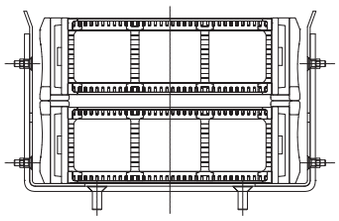
C-zone

Guide Channel System

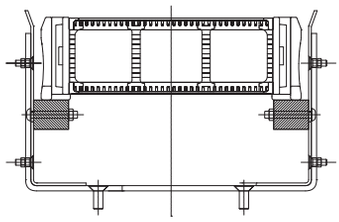
Guide Channel

For long stroke applications the guide channel is applied to ensure that the nsb chain S-Type stays on track and safety during operation.



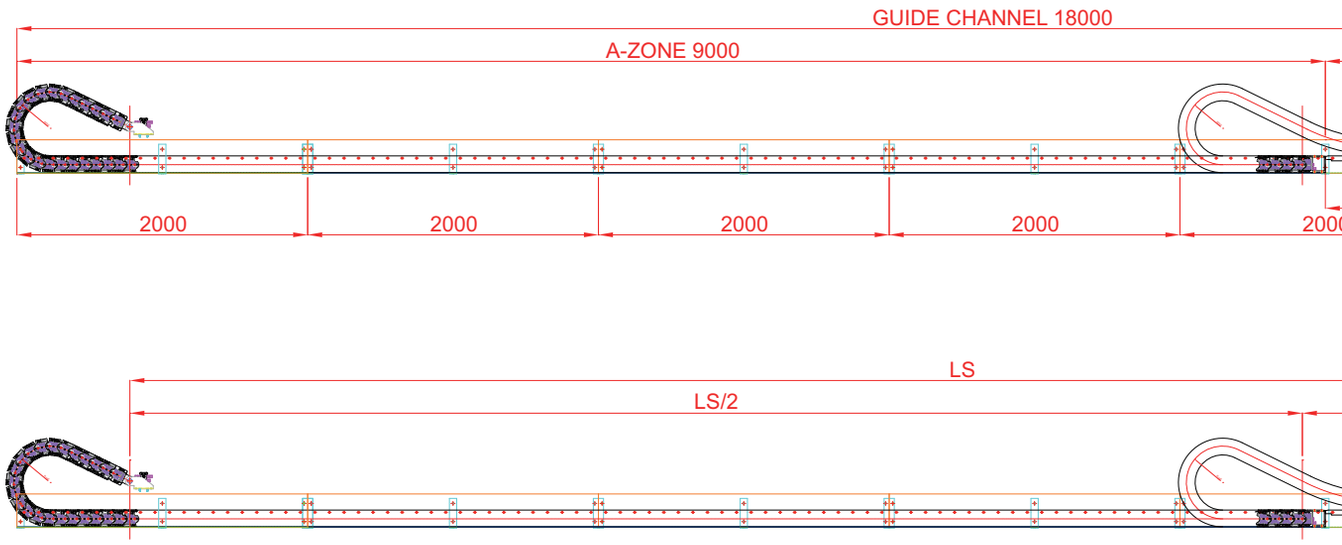


A-zone
Section of touching upper and below each other.



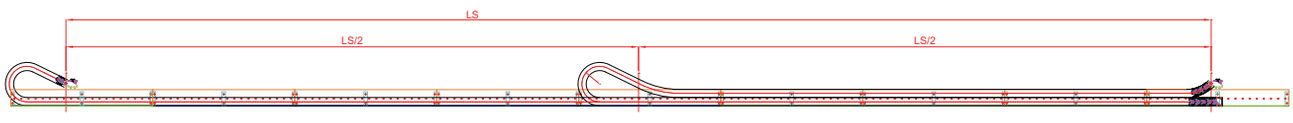
C-zone
Section of touching upper chain and only nylon bar.

Understanding of Guide channel drawing

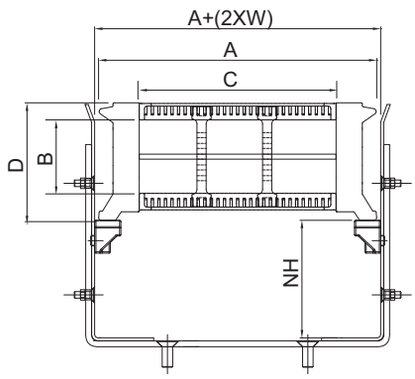


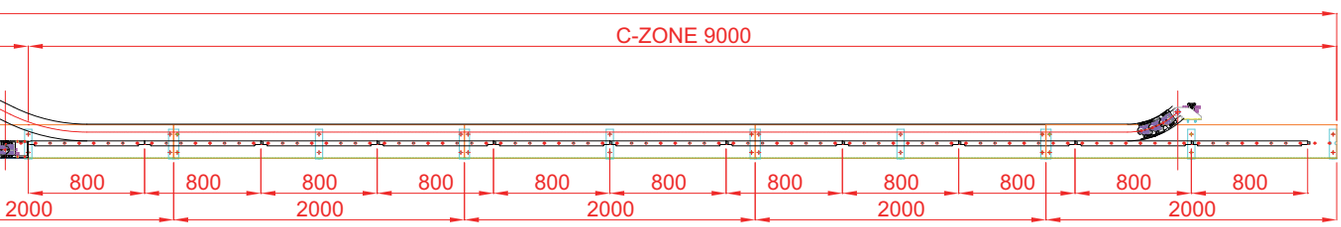
Diverse application of guide channel

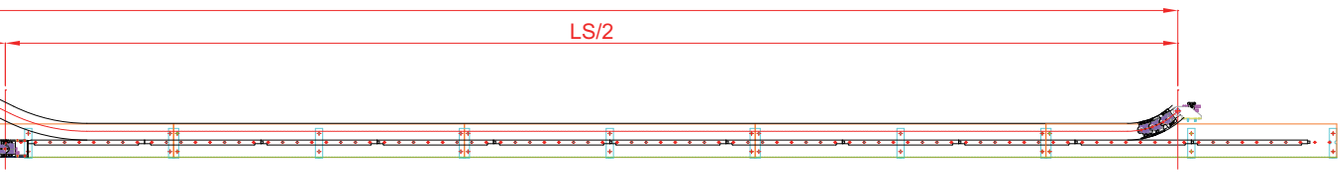
Single Chain application : Fixing bracket should be at the end of guide channel.



Understanding of Guide channel drawing

Section Drawing (C-Zone)	Dim	Contents
	A	Outer width of cable chain
	B	Inner height of cable chain
	C	Inner width of cable chain(=Frame size)
	D	Outer height of cable chain
	W	Space between cabel chain and guide channel
	NH	Height between surface of nylon bar and guide channel.





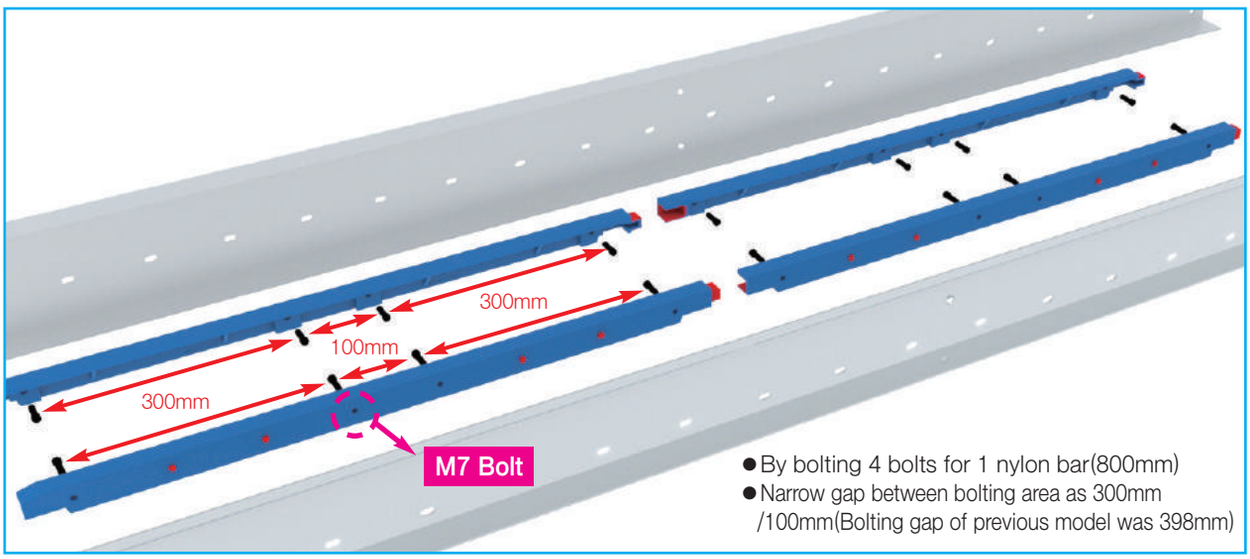
Guide Channel System

Nylon Bar

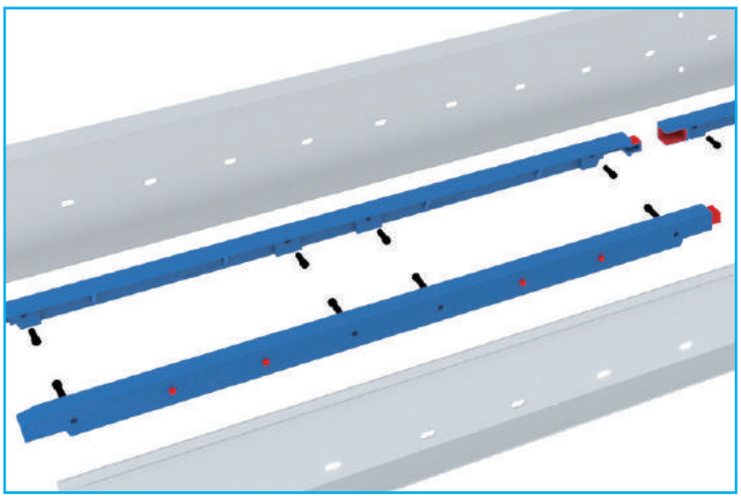
It is a supporting unit for cable chain, when cable chain comes to C-Zone, it has a role of supporting upper cable chain.

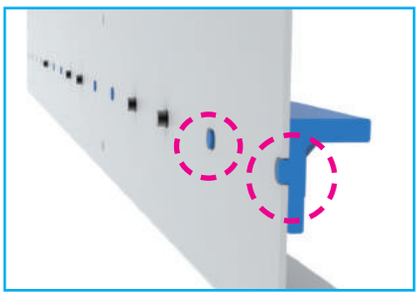
Characteristic of nylon bar

1 Secure and stable structure!

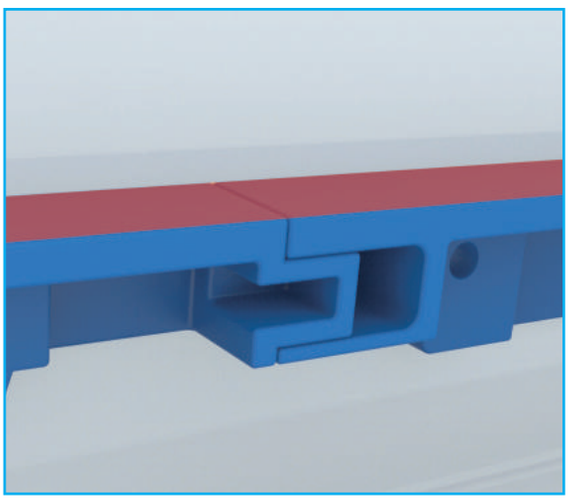


- By bolting 4 bolts for 1 nylon bar(800mm)
- Narrow gap between bolting area as 300mm /100mm(Bolting gap of previous model was 398mm)

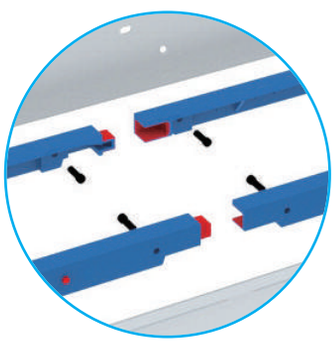




- By making 4 bumps per 1 nylon bar(800mm).
- It can avoid bolt loosening and guarantee long life span.



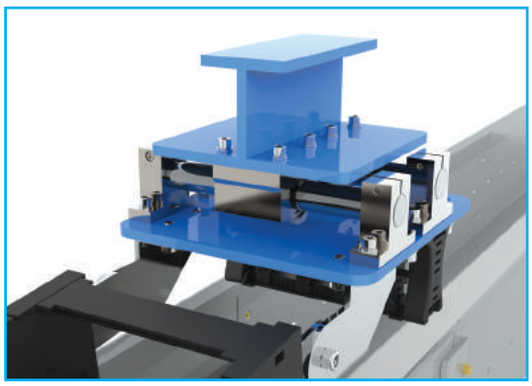
- As each nylon bar gets connected each other, it is more stable than previous one.
- Its design has been changed for being easy to assemble.
- Moreover, as there's no interval(gap), it can make smooth sliding as well.



2 Low dust!

- Same material with chain.
- It is low dust and anti-abrasively due to its raw material which is same with chain(Polyamide6+GF30%)
- By reducing narrow cross-section, abrasion part could be fixed regularly. It can make cable chain move smoothy and stably. It creats long life span compared to pervious model.

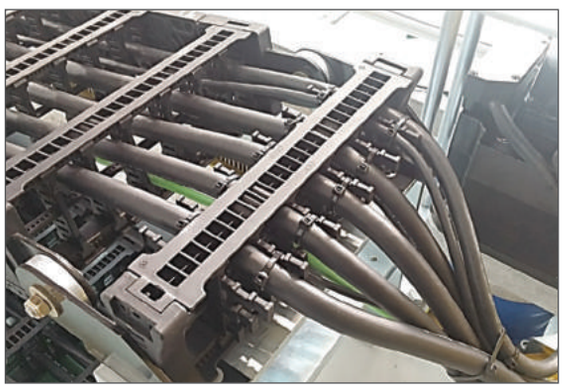
≫ Moving Bracket (Special moving arm)



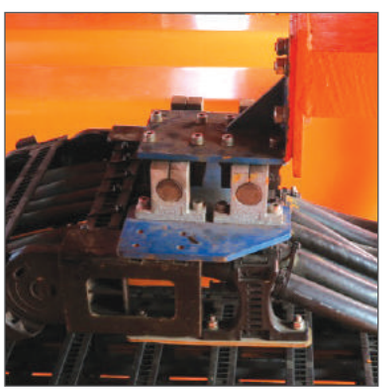
- There are several types of moving brackets and moving arm.
- For over 80meters crane and any kinds of strokes, special moving arm should be considerede to prevent breakage during operation. When you need special moving arm design, please contact to *overseas_info@cpsystem.kr*

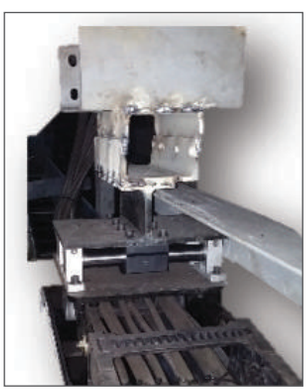
Standard Moving bracket

Standard Moving bracket with System tie wrap(STW)



Special Moving arm





Guide Channel System

≫ Assembly procedure of Guide Channel

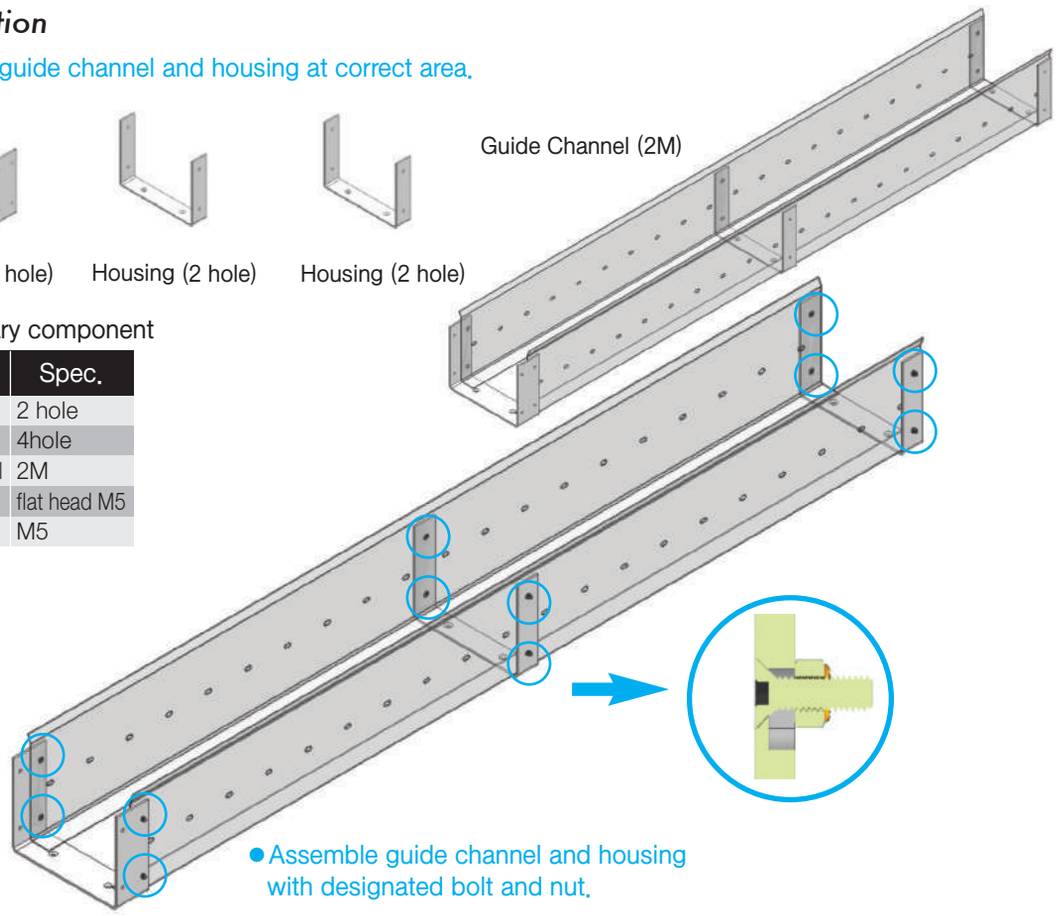
1 A-1 Section

● Position guide channel and housing at correct area.

Housing (4 hole)

Housing (2 hole)

Housing (2 hole)



▶necessary component

Name	Spec.
Housing	2 hole
Housing	4hole
Guide Channel	2M
Bolt	flat head M5
Nut	M5

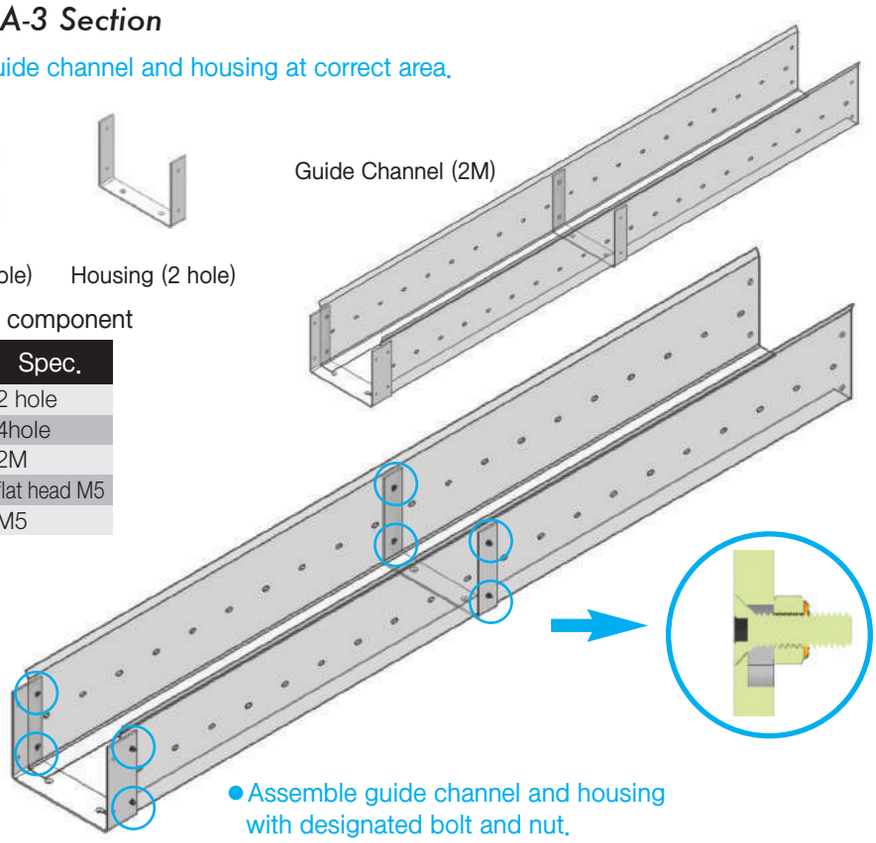
● Assemble guide channel and housing with designated bolt and nut.

2 A-2 and A-3 Section

● Position guide channel and housing at correct area.

Housing (4 hole)

Housing (2 hole)



▶necessary component

Name	Spec.
Housing	2 hole
Housing	4hole
Guide Channel	2M
Bolt	flat head M5
Nut	M5

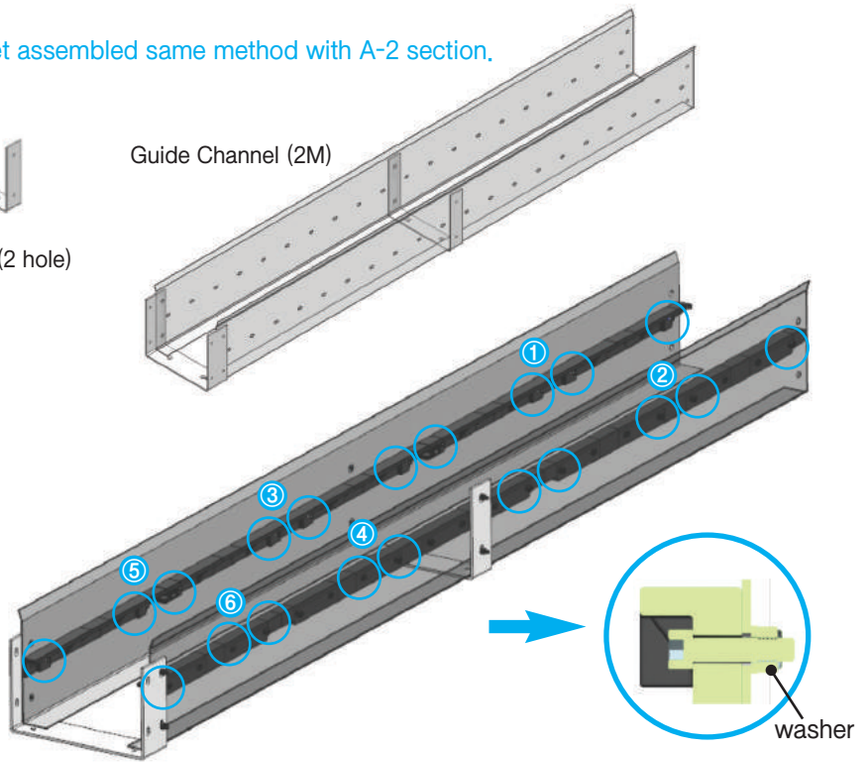
● Assemble guide channel and housing with designated bolt and nut.

3 B-1, B-2 Section

- Prepare guide channel 1 set assembled same method with A-2 section.

Housing (4 hole)

Housing (2 hole)



▶necessary component

Name	Spec.
Housing	2 hole
Housing	4hole
Guide Channel	2M
Bolt	Flat head M5
Nut	M5
Bolt	Hexagon M6
Nut	M6
Washer	Ø20XØ7X3T
Nylon bar	RH
Nylon bar	LH
Nylon bar	Normal type

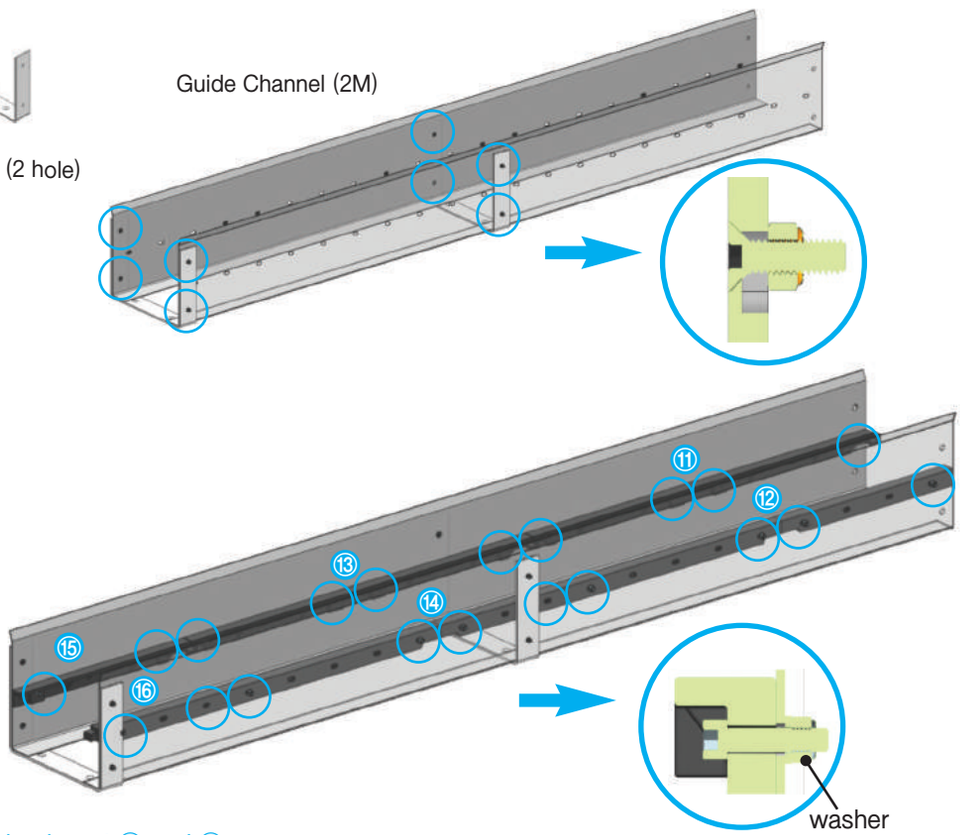
- Assemble nylon bar from ① to ⑥ but do not cut the extra 400mm of nylon bar from each ⑤ and ⑥. They will be assembled with B2 section's guide channel

4 B-3 Section

- Assemble guide channel and housing with designated bolt and nut.

Housing (2 hole)

Housing (2 hole)



▶necessary component

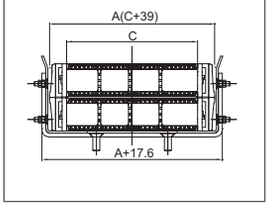
Name	Spec.
Housing	2 hole
Guide Channel	2M
Bolt	Flat head M5
Nut	M5
Bolt	Hexagon M6
Nut	M6
Washer	Ø20XØ7X3T
Nylon bar	Normal type

- Cut the extra 400mm of nylon bar at ⑮ and ⑯
- 12M Guide channel assembly sequence assembly from A-1 , A-2 , A-3 , B-1 , B-2 , and finally B-3.

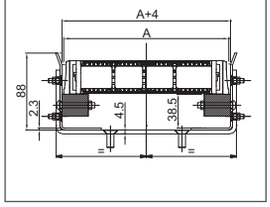
ST044S, ES, RS, ERS

Guide channel

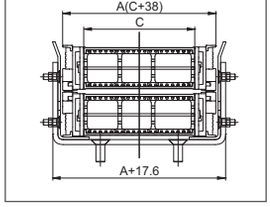
ST044S, ES
A - Zone



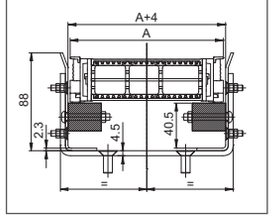
ST044S, ES
C - Zone



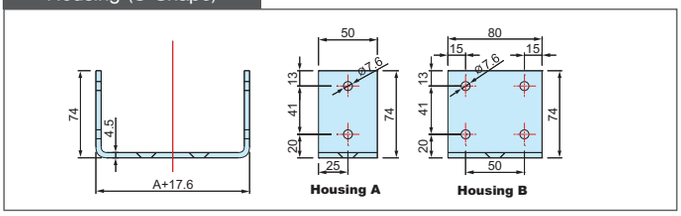
ST044RS, ERS
A - Zone



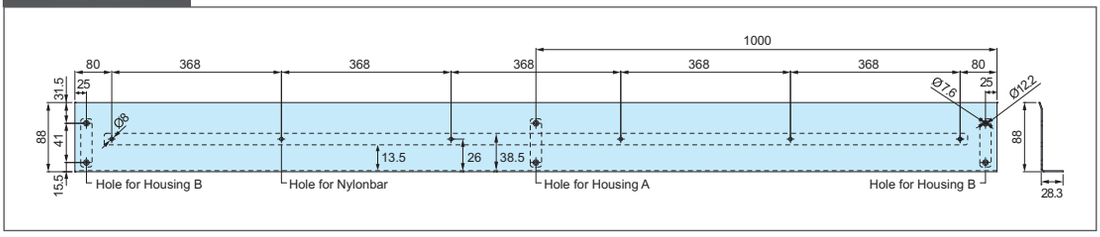
ST044RS, ERS
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Guide channel dimension

ST044S		ST044ES		ST044RS		ST044ERS	
C value	A value	C value	A value	C value	A value	C value	A value
35	74	35	74	35	73	35	73
50	89	55	94	50	88	55	93
55	94	75	114	55	93	75	113
75	114	100	139	75	113	100	138
100	139			100	138		
125	164			125	163		
150	189			150	188		
175	214			175	213		
200	239			200	238		

▶ C value : Frame width
▶ A value : Outer width of cable chain

Guide channel ordering

ST-GCS 044S. 100 : 200M

- Length(mm)
- Inside Width
- Chain Type
- Steel Guide Channel
- Shift Chain

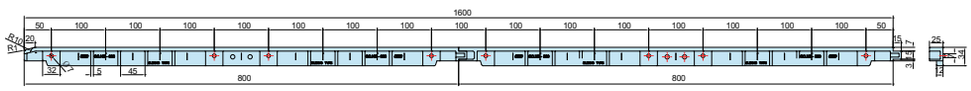
Nylon bar type

GC.NB-800

➡ GC.NB-800-Normal

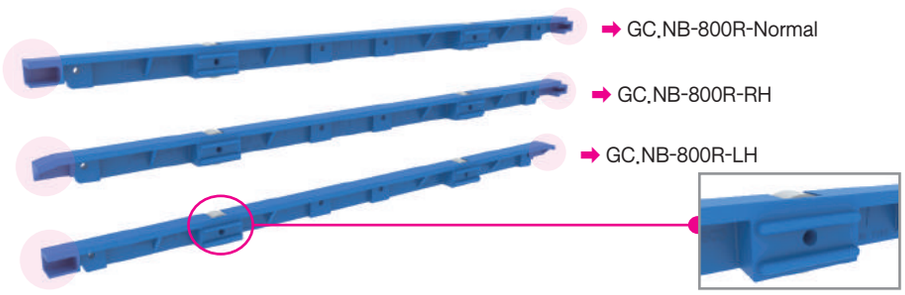
➡ GC.NB-800-RH

➡ GC.NB-800-LH



※ Bilateral symmetry for both RH, LH

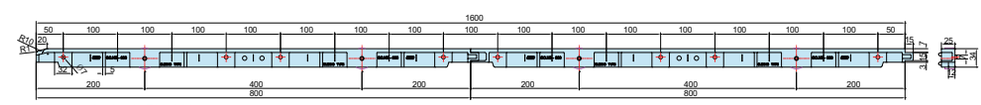
GC.NB-800R (Roller type)



➡ GC.NB-800R-Normal

➡ GC.NB-800R-RH

➡ GC.NB-800R-LH



※ Bilateral symmetry for both RH, LH

(Dimensions in mm)

Nylon bar ordering

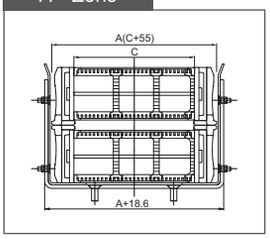
GC.NB-800 R / N : 10ST

- Guide Channel Nylon Bar
- Length(mm) : Fixed
- Roller Type
- Nylon Bar Type -N : Normal -R : RH -L : LH
- Q'ty(set)

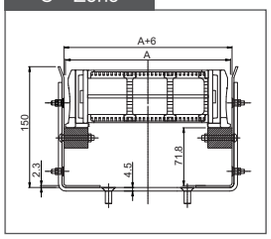
ST072ES, RS, ERS

Guide channel

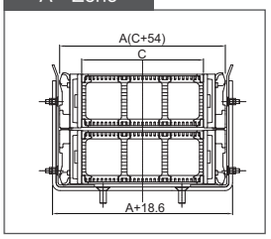
ST072ES
A - Zone



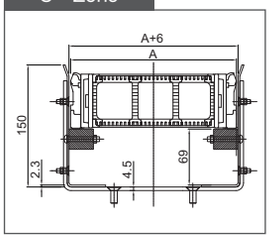
ST072ES
C - Zone



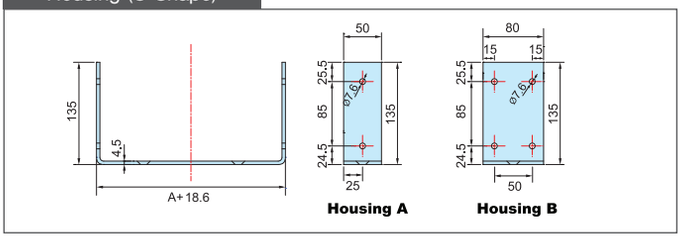
ST072RS, ERS
A - Zone



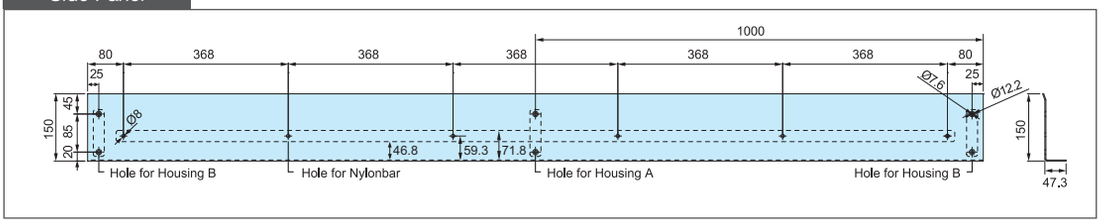
ST072RS, ERS
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Guide channel dimension

ST072ES		ST072RS		ST072ERS	
C value	A value	C value	A value	C value	A value
50	105	50	104	50	104
75	130	75	129	75	129
100	155	100	154	100	154
125	180	125	179	125	179
150	205	140	194	150	204
		150	204		
		165	219		
		175	229		
		190	244		
		200	254		
		240	294		
		250	304		
		300	354		

▶ C value : Frame width
▶ A value : Outer width of cable chain

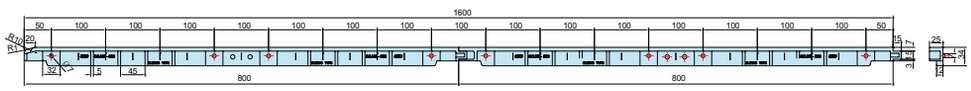
Guide channel ordering

ST-GCS 072ES. 150 : 200M

- Shift Chain
- Steel Guide Channel
- Chain Type
- Inside Width
- Length(mm)

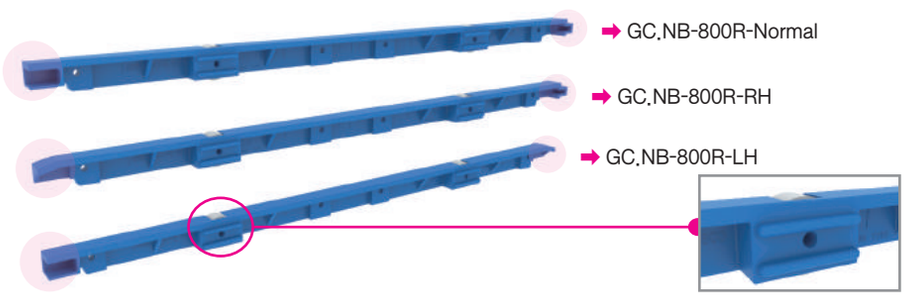
Nylon bar type

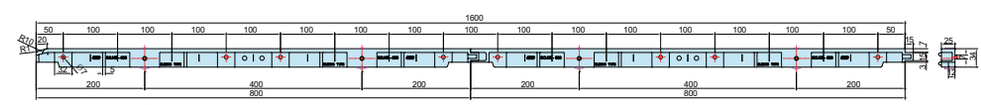
GC.NB-800



※ Bilateral symmetry for both RH, LH

GC.NB-800R (Roller type)





※ Bilateral symmetry for both RH, LH

(Dimensions in mm)

Nylon bar ordering

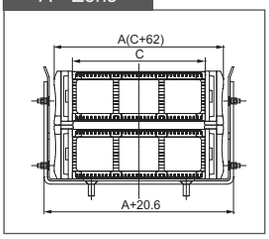
GC.NB-800 R / N : 10ST

- Guide Channel Nylon Bar
- Length(mm) : Fixed
- Roller Type
- Nylon Bar Type -N : Normal -R : RH -L : LH
- Q'ty(set)

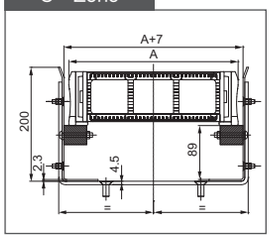
ST095ES, RS, ERS

Guide channel

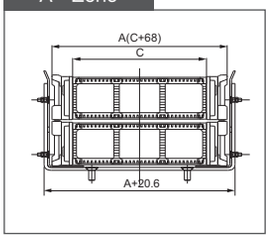
ST095ES
A - Zone



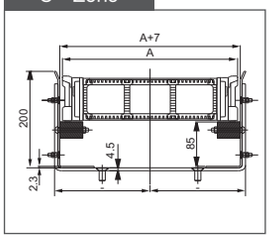
ST095ES
C - Zone



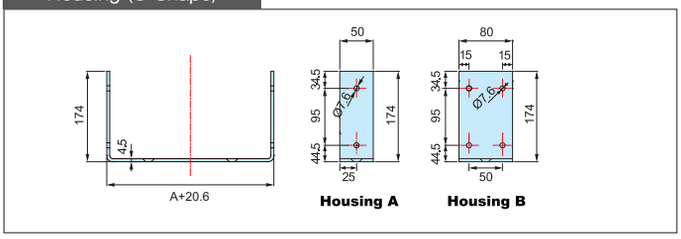
ST095RS, ERS
A - Zone



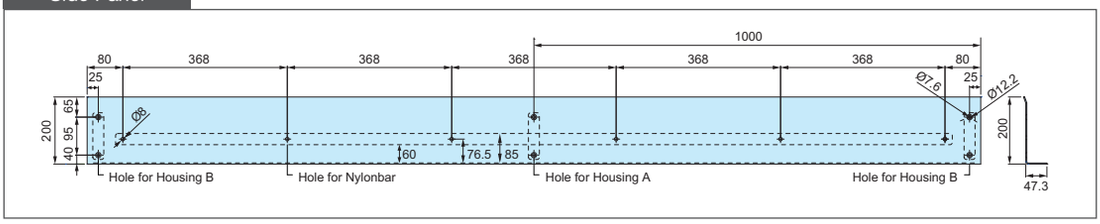
ST095RS, ERS
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Guide channel dimension

ST095ES		ST095RS		ST095ERS	
C value	A value	C value	A value	C value	A value
100	162	75	143	100	168
125	187	100	168	125	193
150	212	125	193	150	218
175	237	150	218	175	243
200	262	175	243	200	268
		190	258		
		200	268		
		240	308		
		250	318		
		300	368		
		350	418		
		400	468		

▶ C value : Frame width
▶ A value : Outer width of cable chain

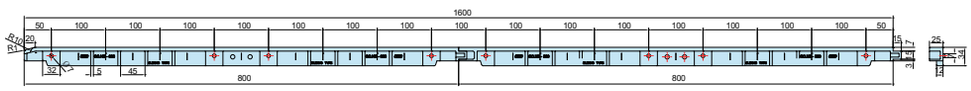
Guide channel ordering

ST-GCS 095ES. 175 : 200M

- Shift Chain
- Steel Guide Channel
- Chain Type
- Inside Width
- Length(mm)

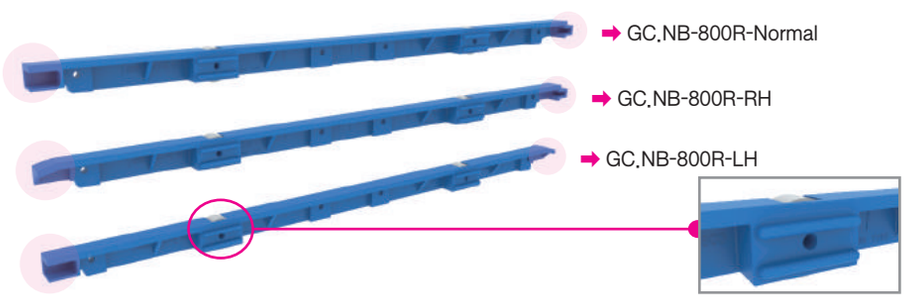
Nylon bar type

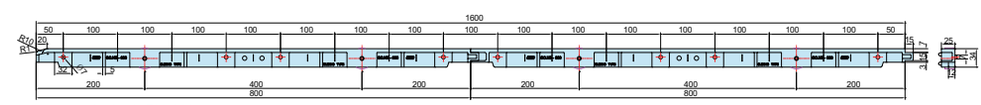
GC.NB-800



※ Bilateral symmetry for both RH, LH

GC.NB-800R (Roller type)





※ Bilateral symmetry for both RH, LH

(Dimensions in mm)

Nylon bar ordering

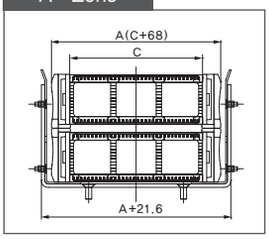
GC.NB-800 R / N : 10ST

- Guide Channel Nylon Bar
- Length(mm) : Fixed
- Roller Type
- Nylon Bar Type -N : Normal -R : RH -L : LH
- Q'ty(set)

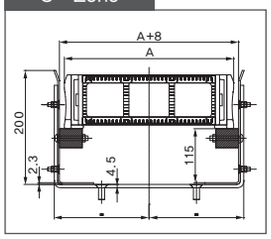
ST120ES, RS, ERS

Guide channel

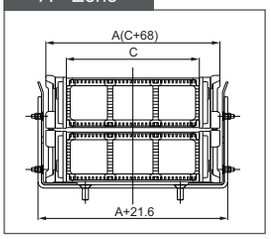
ST120ES
A - Zone



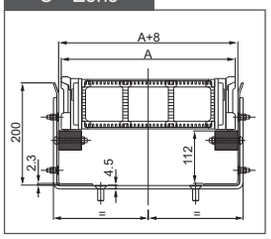
ST120ES
C - Zone



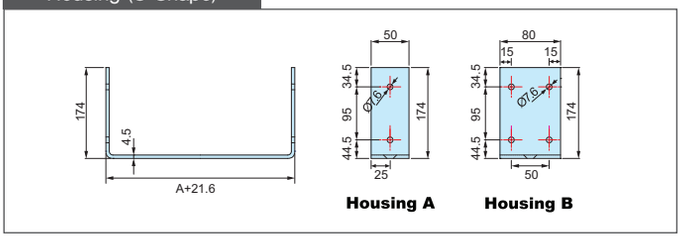
ST120RS, ERS
A - Zone



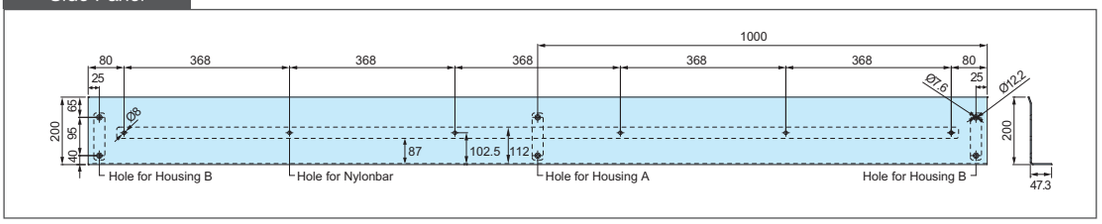
ST120RS, ERS
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Guide channel dimension

ST120ES		ST120RS		ST120ERS	
C value	A value	C value	A value	C value	A value
150	218	75	143	150	218
200	268	100	168	200	268
250	318	115	183	250	318
300	368	125	193	300	368
		150	218		
		175	243		
		200	268		
		240	308		
		250	318		
		290	358		
		300	368		
		350	418		
		400	468		
		450	518		
		500	568		
		550	618		
		600	668		

▶ C value : Frame width
▶ A value : Outer width of cable chain

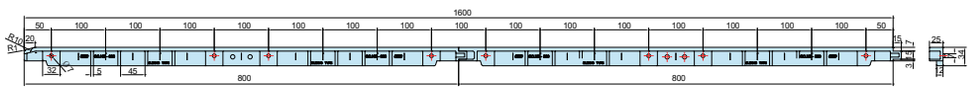
Guide channel ordering

ST-GCS 120ES. 175 : 200M

- Shift Chain
- Steel Guide Channel
- Chain Type
- Inside Width
- Length(mm)

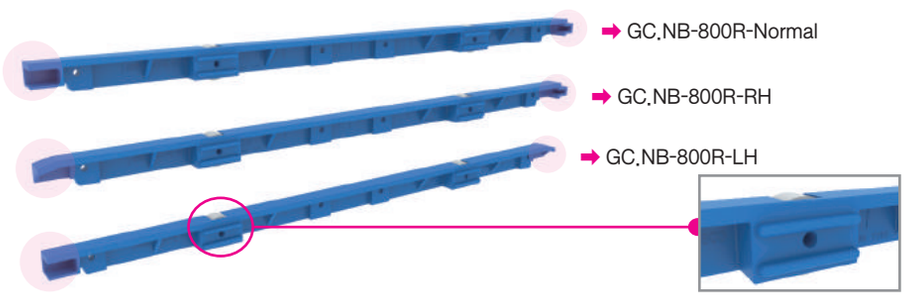
Nylon bar type

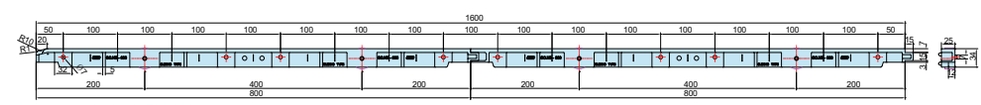
GC.NB-800



※ Bilateral symmetry for both RH, LH

GC.NB-800R (Roller type)





※ Bilateral symmetry for both RH, LH

(Dimensions in mm)

Nylon bar ordering

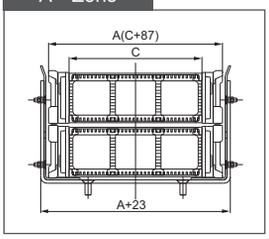
GC.NB-800 R / N : 10ST

- Guide Channel Nylon Bar
- Length(mm) : Fixed
- Roller Type
- Nylon Bar Type -N : Normal -R : RH -L : LH
- Q'ty(set)

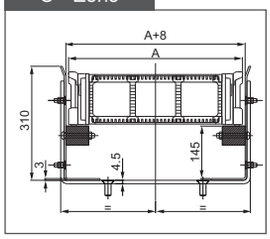
ST150RS, ERS

Guide channel

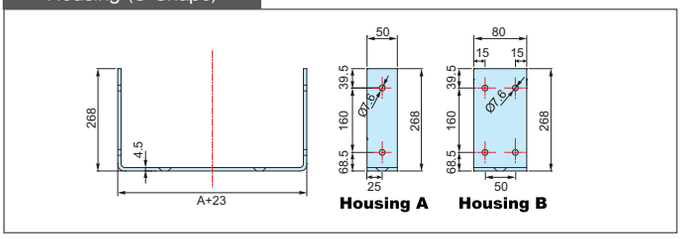
ST150RS, ERS
A - Zone



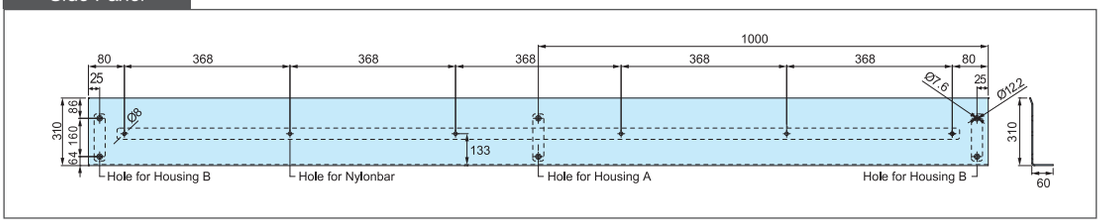
ST150RS, ERS
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Guide channel dimension

ST150RS		ST150ERS	
C value	A value	C value	A value
75	162	200	287
100	187	250	337
115	202	300	387
125	212	350	437
150	237	400	487
175	262		
200	287		
240	327		
250	337		
290	377		
300	387		
350	437		
400	487		
450	537		
500	587		
550	637		
600	687		

▶ C value : Frame width
▶ A value : Outer width of cable chain

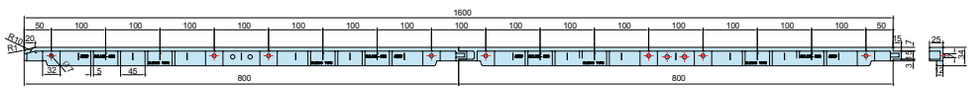
Guide channel ordering

ST-GCS 150RS. 200 : 200M

- Shift Chain
- Steel Guide Channel
- Chain Type
- Inside Width
- Length(mm)

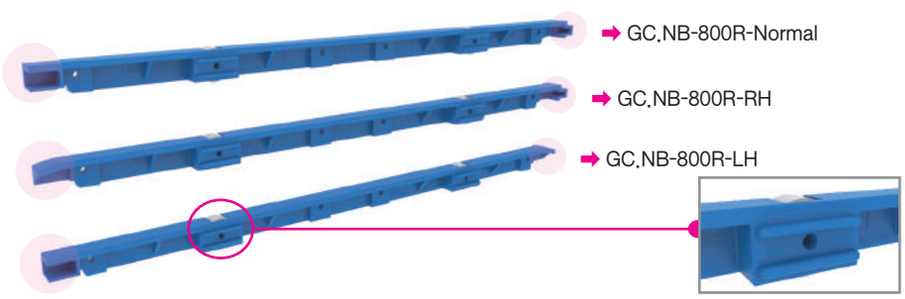
Nylon bar type

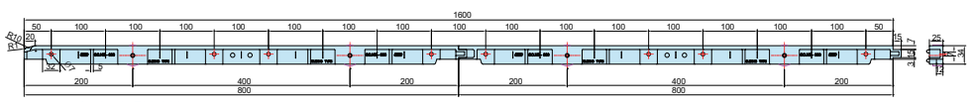
GC.NB-800



※ Bilateral symmetry for both RH, LH

GC.NB-800R (Roller type)





※ Bilateral symmetry for both RH, LH

(Dimensions in mm)

Nylon bar ordering

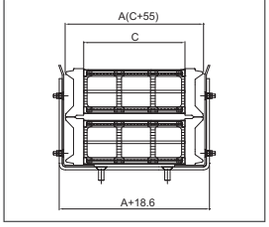
GC.NB-800 R / N : 10ST

- Guide Channel Nylon Bar
- Length(mm) : Fixed
- Roller Type
- Nylon Bar Type -N : Normal -R : RH -L : LH
- Q'ty(set)

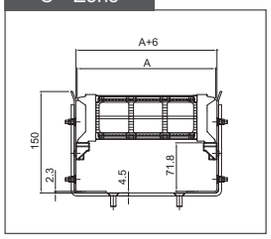
nsb050S

Guide channel

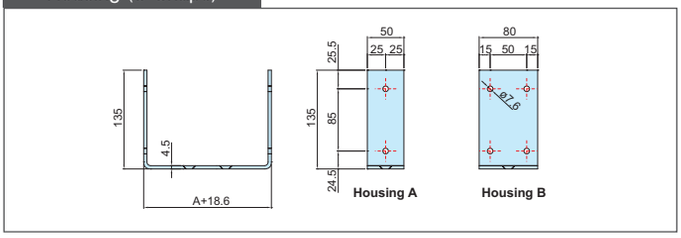
A - Zone



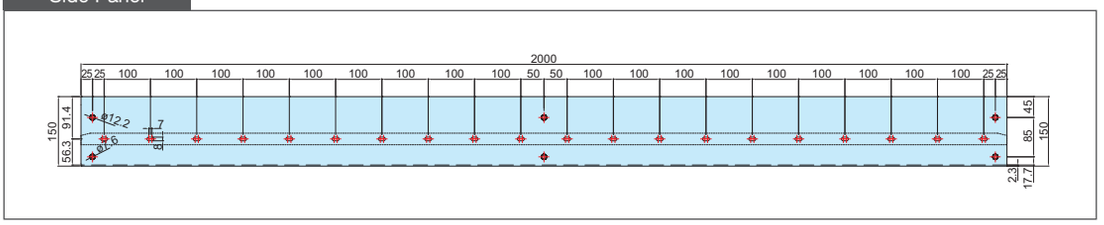
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Guide channel dimension

nsb050S	
C value	A value
50	104
75	129
100	154
125	179
140	194
150	204
165	219
175	229
190	244
200	254
240	294
250	304
300	354

▶ C value : Frame width
▶ A value : Outer width of cable chain

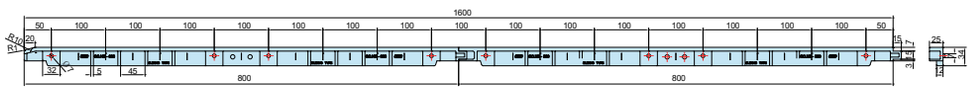
Guide channel ordering

nsb-GCS 050S. 100 : 200M

- Length(mm)
- Inside Width
- Chain Type
- Steel Guide Channel
- sabin Chain

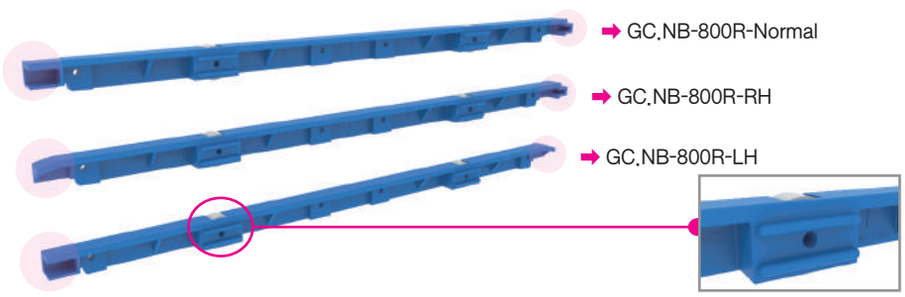
Nylon bar type

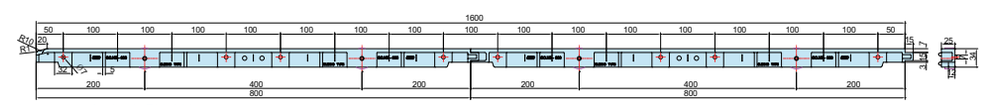
GC.NB-800



※ Bilateral symmetry for both RH, LH

GC.NB-800R (Roller type)





※ Bilateral symmetry for both RH, LH

(Dimensions in mm)

Nylon bar ordering

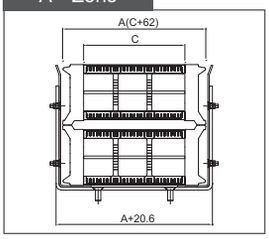
GC.NB-800 R / N : 10ST

- Guide Channel Nylon Bar
- Length(mm) : Fixed
- Roller Type
- Nylon Bar Type -N : Normal -R : RH -L : LH
- Q'ty(set)

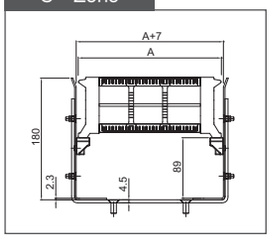
nsb065S

Guide channel

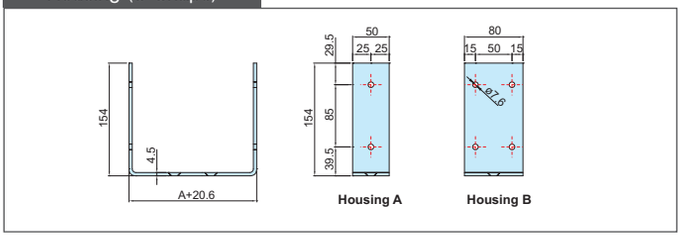
A - Zone



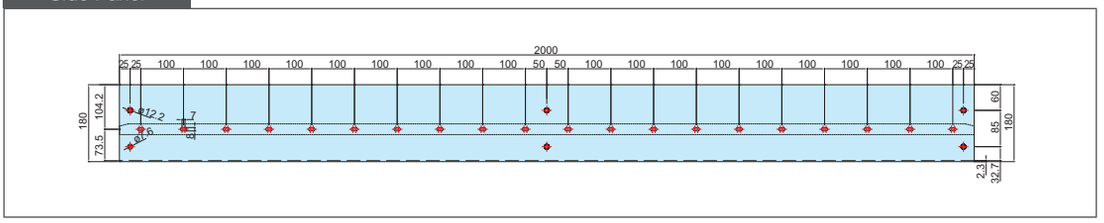
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Guide channel dimension

nsb065S	
C value	A value
75	137
100	162
125	187
150	212
175	237
190	252
200	262
230	292
240	302
250	312
300	362
350	412
400	462

▶ C value : Frame width
▶ A value : Outer width of cable chain

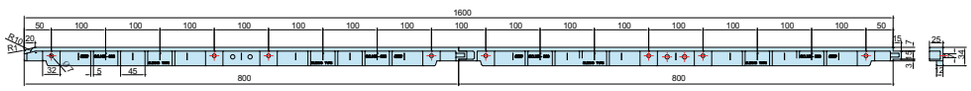
Guide channel ordering

nsb-GCS 065S. 100 : 200M

- Length(mm)
- Inside Width
- Chain Type
- Steel Guide Channel
- sabin Chain

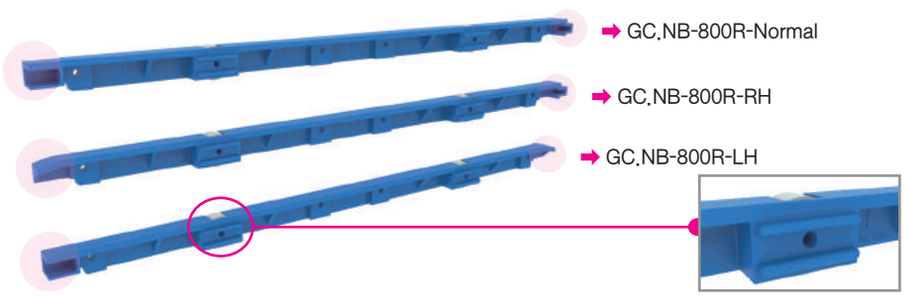
Nylon bar type

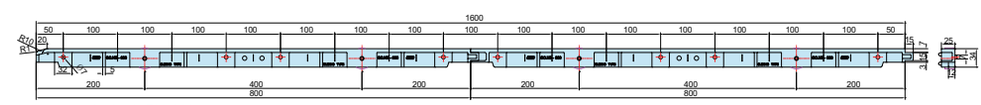
GC.NB-800



※ Bilateral symmetry for both RH, LH

GC.NB-800R (Roller type)





※ Bilateral symmetry for both RH, LH

(Dimensions in mm)

Nylon bar ordering

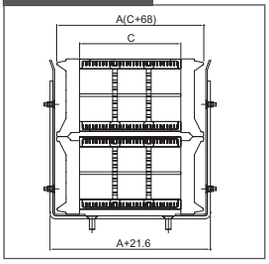
GC.NB-800 R / N : 10ST

- Guide Channel Nylon Bar
- Length(mm) : Fixed
- Roller Type
- Nylon Bar Type -N : Normal -R : RH -L : LH
- Q'ty(set)

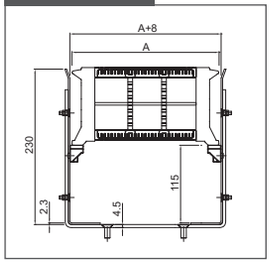
nsb080S

Guide channel

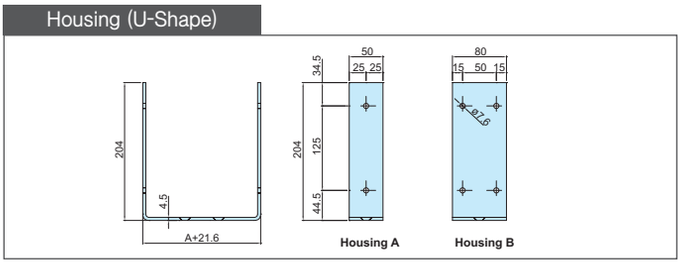
A - Zone



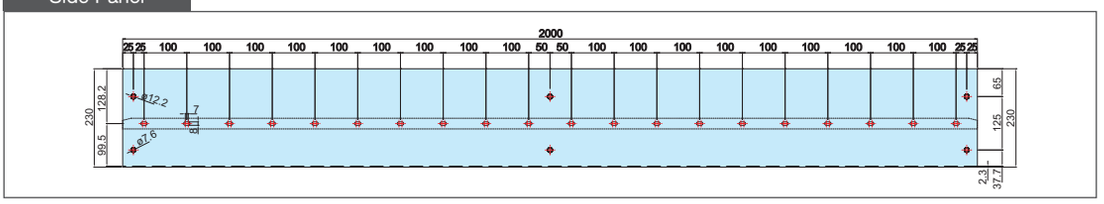
C - Zone



Housing (U-Shape)



Side Panel



(Dimensions in mm)

Guide channel dimension

nsb080S	
C value	A value
75	143
100	168
115	183
125	193
150	218
175	243
200	268
240	308
250	318
290	358
300	368
350	418
400	468
450	518
500	568
550	618
600	668

▶ C value : Frame width
▶ A value : Outer width of cable chain

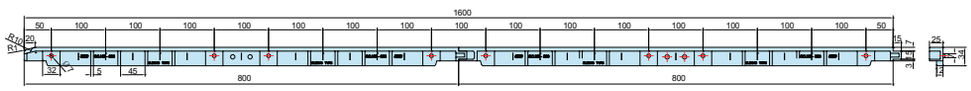
Guide channel ordering

nsb-GCS 080S. 100 : 200M

- Length(mm)
- Inside Width
- Chain Type
- Steel Guide Channel
- sabin Chain

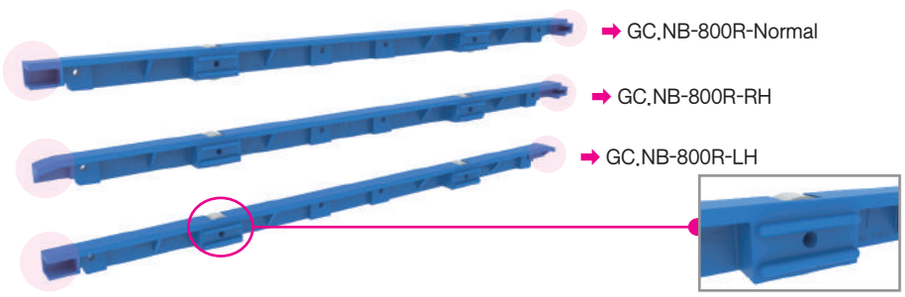
Nylon bar type

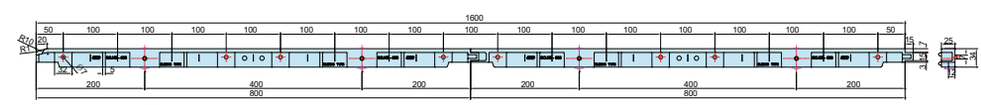
GC.NB-800



※ Bilateral symmetry for both RH, LH

GC.NB-800R (Roller type)





※ Bilateral symmetry for both RH, LH

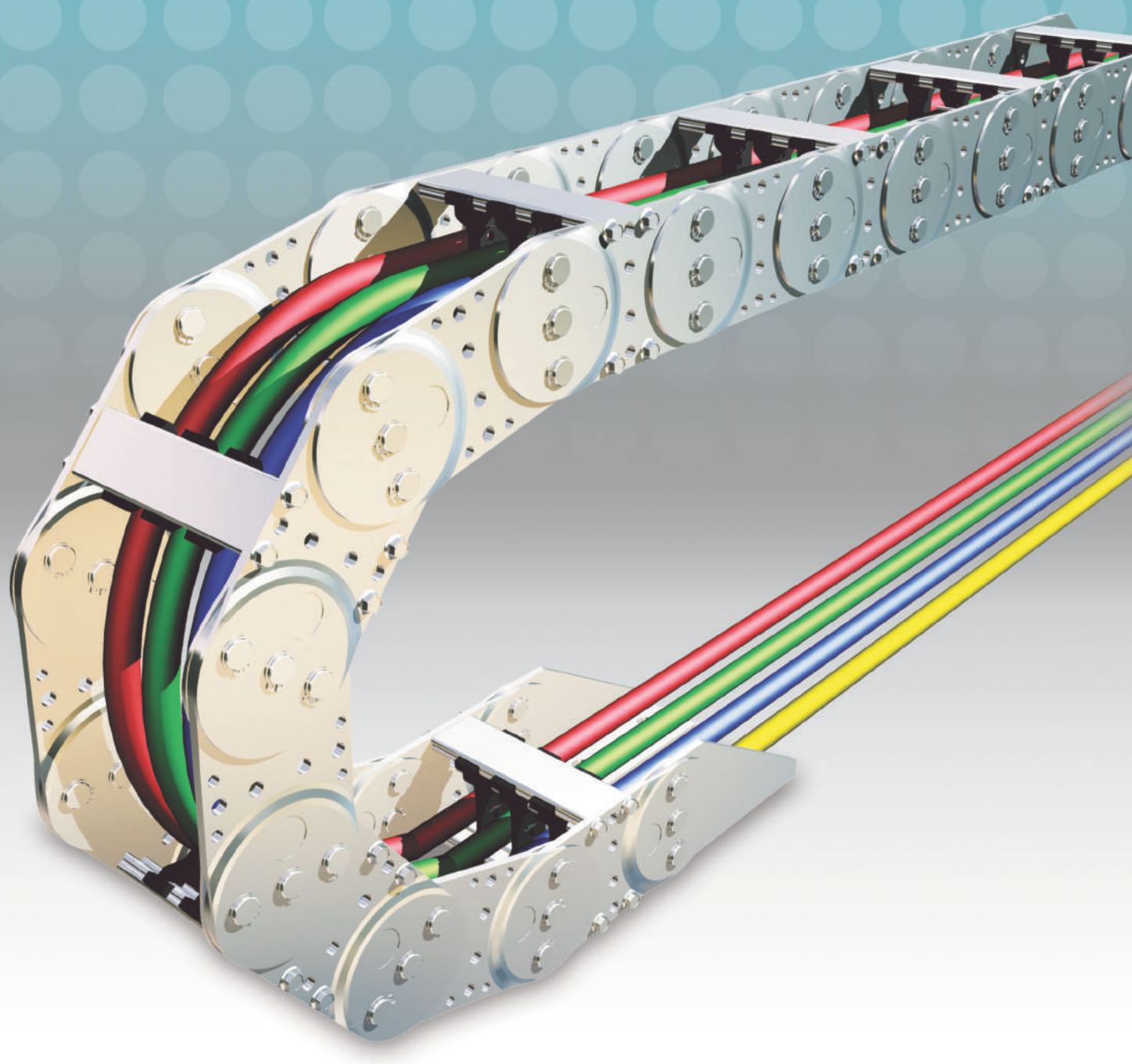
(Dimensions in mm)

Nylon bar ordering

GC.NB-800 R / N : 10ST

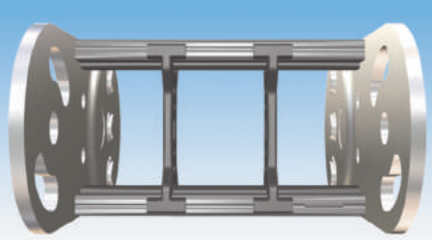
- Guide Channel Nylon Bar
- Length(mm) : Fixed
- Roller Type
- Nylon Bar Type -N : Normal -R : RH -L : LH
- Q'ty(set)

Steel CABLE CHAIN

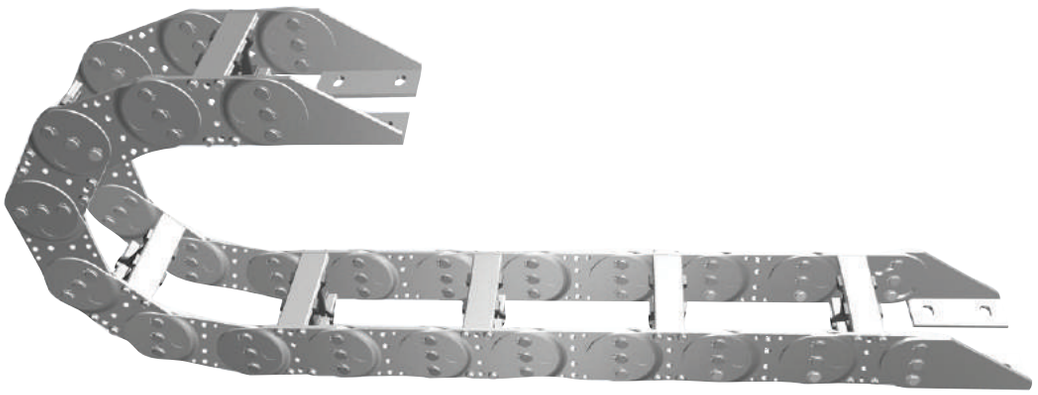


• Hole Type •

• Solid Type •



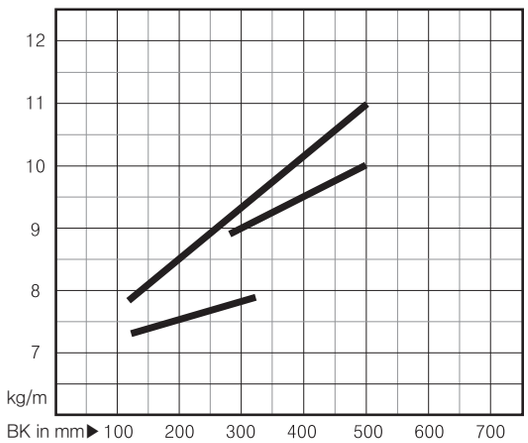
SK70



Calculation of the chain length

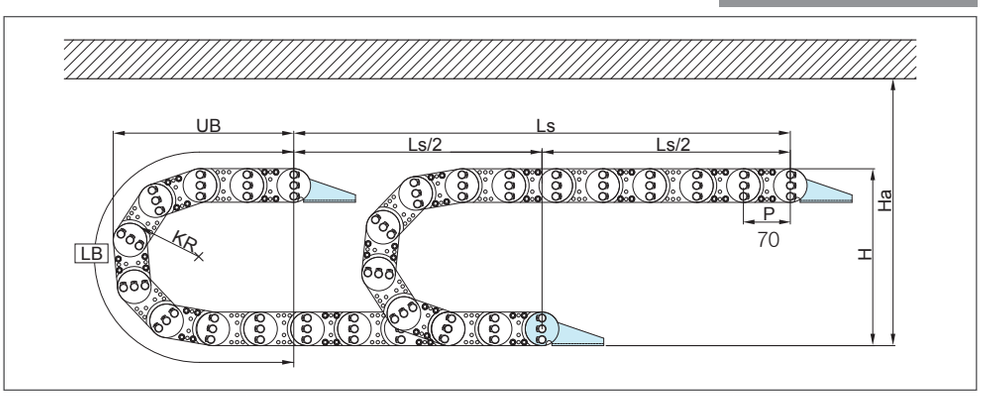
$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Load diagrams of self-supporting length



Layout of cable chain

Ls: Stroke UB: Loop Projection



Bending Radius (KR)	LB Loop Length	Ha Safe Space	H Moving Height
75	515	210	200
90	560	240	230
125	670	310	300
145	735	350	340
200	910	460	450

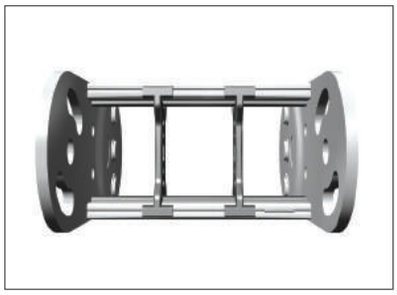
(Dimensions in mm)

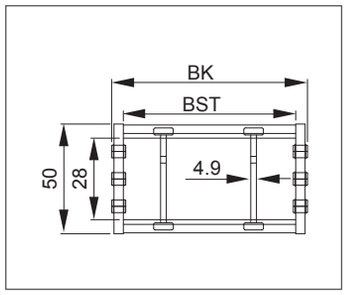
Frame of Standard application

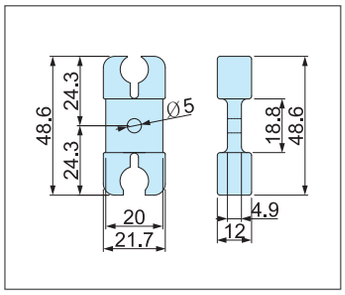
BK Outside width	Q'ty of Divider	BST Frame width
100	2	86
125	2	111
150	3	136
175	3	161
200	4	186
250	5	236
300	6	286
350	7	336

(Dimensions in mm)

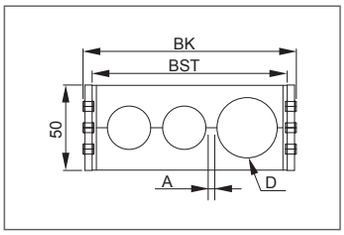
Solid type





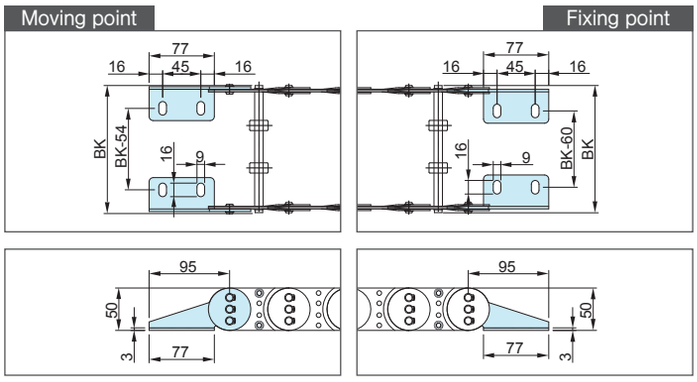


Hole type

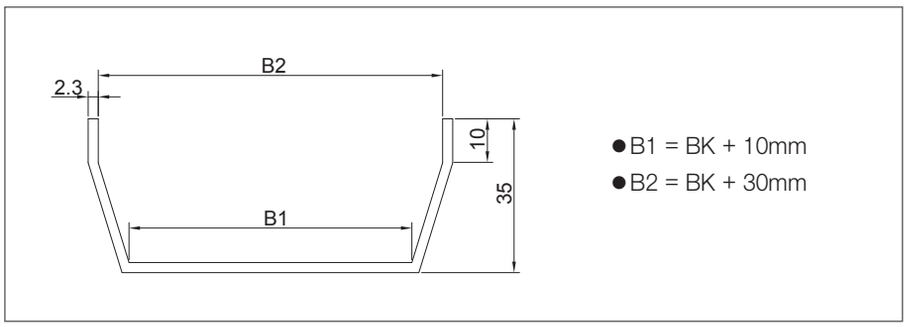


Dmax X 38mm dmax X 35mm Amin 5mm BSTmax X 350mm

Bracket

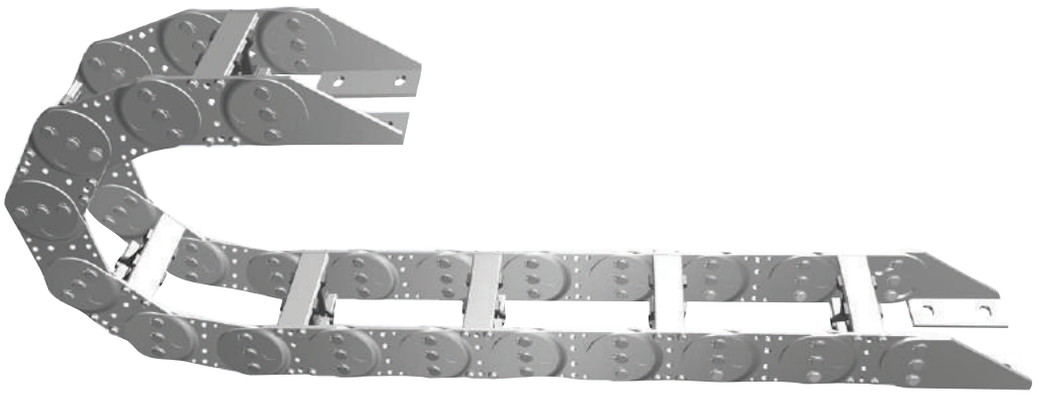


Guide Channel



- B1 = BK + 10mm
- B2 = BK + 30mm

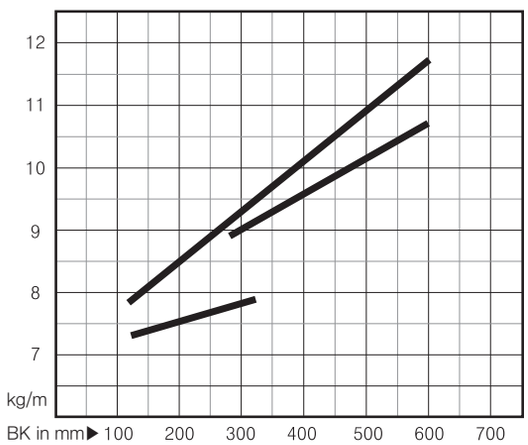
SK95



Calculation of the chain length

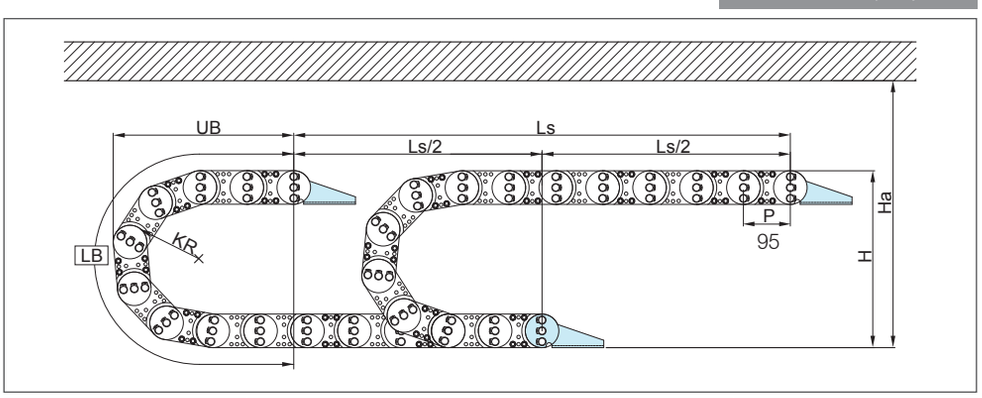
$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Load diagrams of self-supporting length



Layout of cable chain

Ls: Stroke UB: Loop Projection



Bending Radius (KR)	LB Loop Length	Ha Safe Space	H Moving Height
125	770	330	318
145	835	370	358
200	1,000	480	468
250	1,165	580	568
300	1,320	680	668

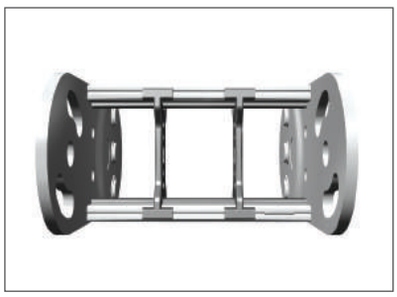
(Dimensions in mm)

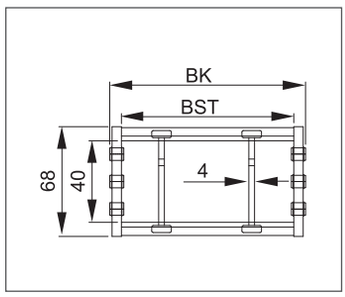
Frame of Standard application

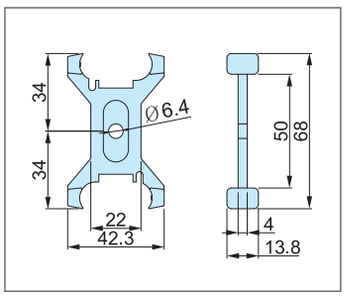
BK Outside width	Q'ty of Divider	BST Frame width
100	1	82
125	1	107
150	2	132
175	3	157
200	4	182
250	5	232
300	6	282
350	7	332
400	8	382
450	9	432
500	10	482
550	11	532
600	12	582

(Dimensions in mm)

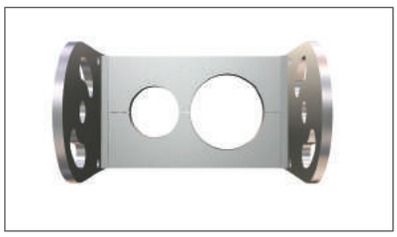
Solid type

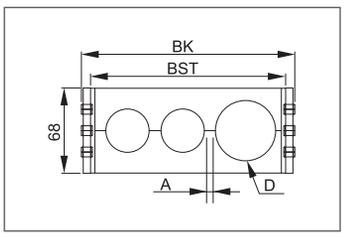






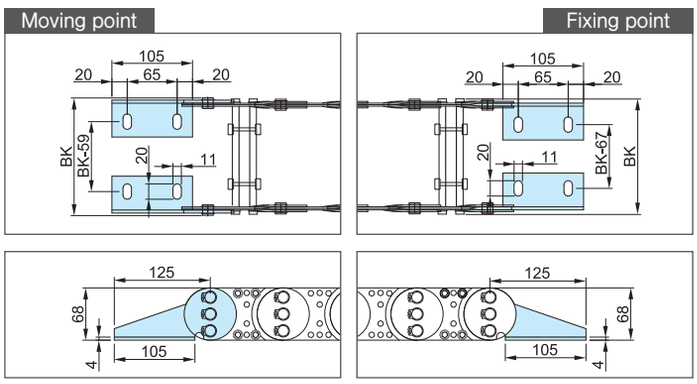
Hole type



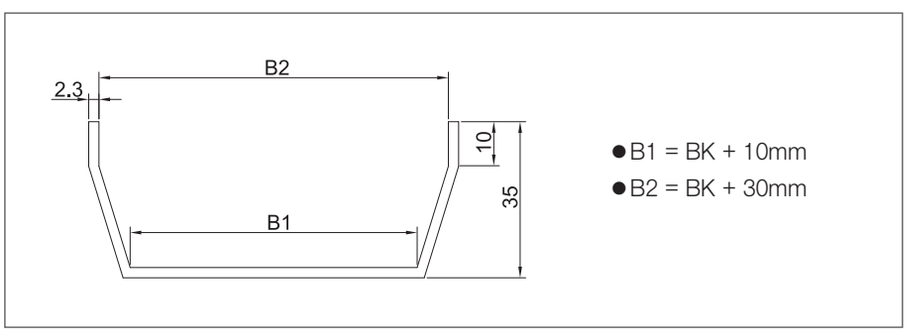


Dmax X 48mm dmax X 44mm Amin 5mm BSTmax X 582mm

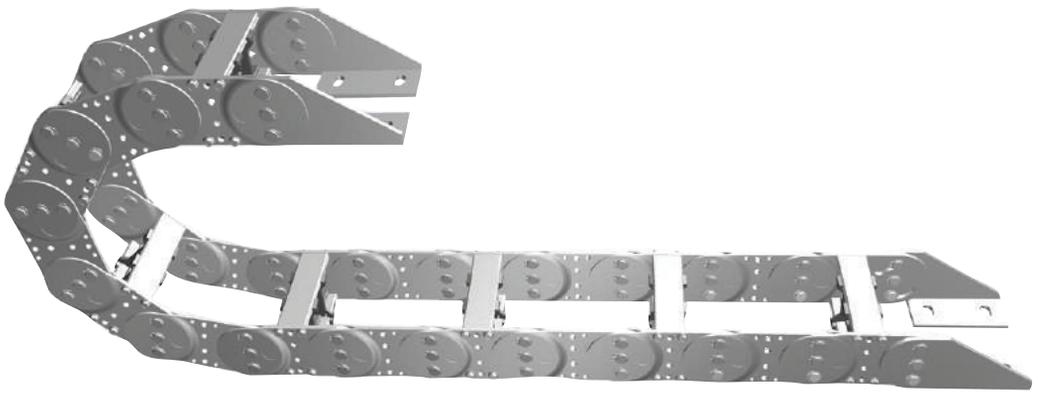
Bracket



Guide Channel



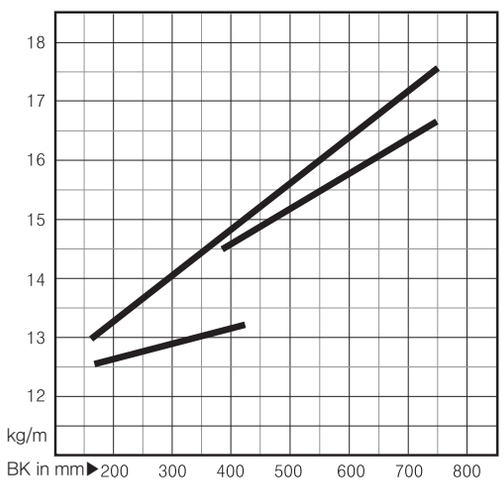
SK130



Calculation of the chain length

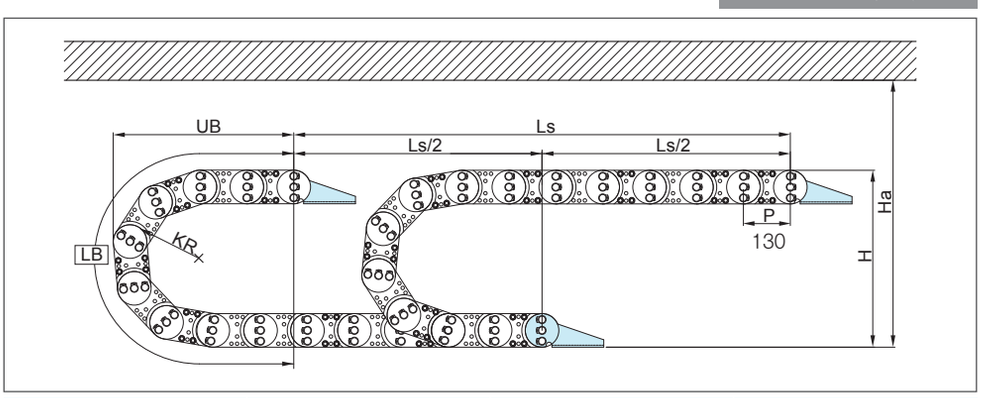
$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Load diagrams of self-supporting length



Layout of cable chain

Ls: Stroke UB: Loop Projection



Bending Radius (KR)	LB Loop Length	Ha Safe Space	H Moving Height
150	990	410	394
200	1140	510	494
250	1300	610	594
300	1460	710	694
340	1580	790	774
400	1770	910	894

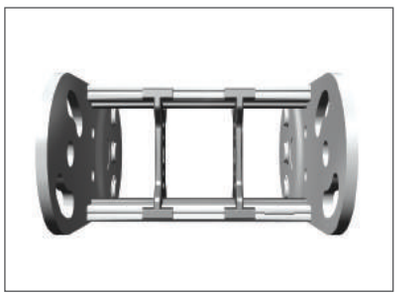
(Dimensions in mm)

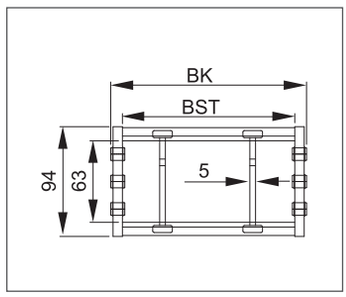
Frame of Standard application

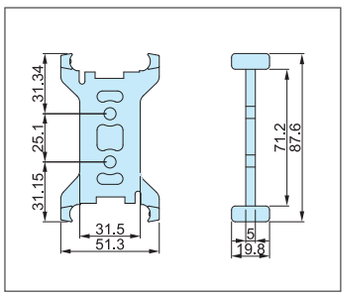
BK Outside width	Q'ty of Divider	BST Frame width
200	3	176
250	4	226
300	5	276
350	5	326
400	6	376
450	6	426
500	7	476
550	8	526
600	9	576
650	10	626
700	11	676
750	12	726
800	12	776

(Dimensions in mm)

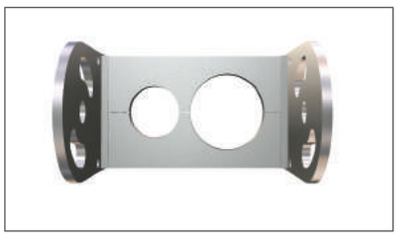
Solid type

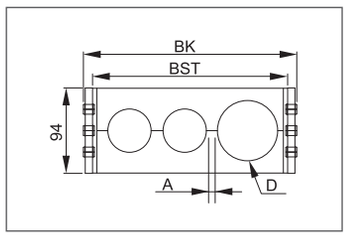






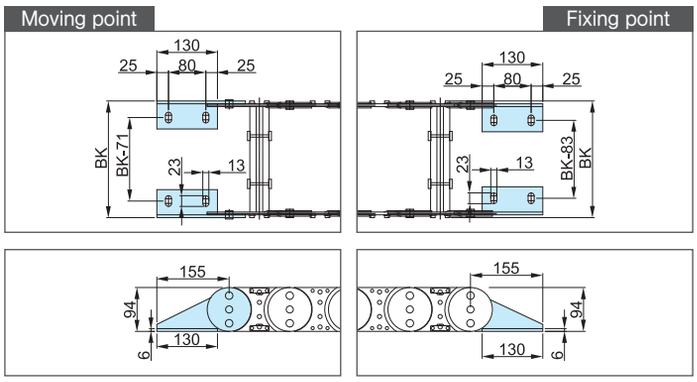
Hole type



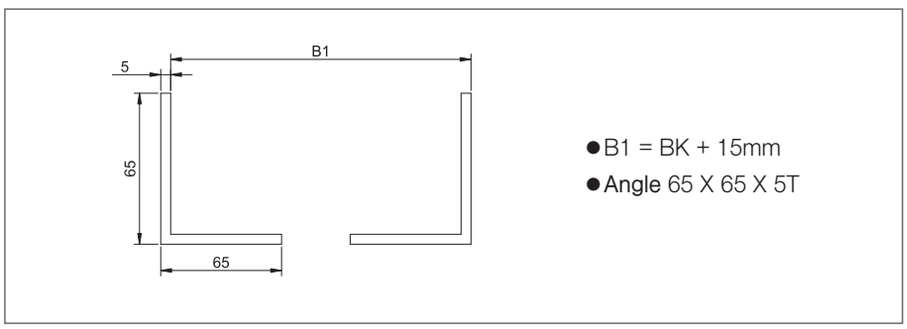


Dmax X 74mm dmax X 70mm Amin 5mm BSTmax X 800mm

Bracket

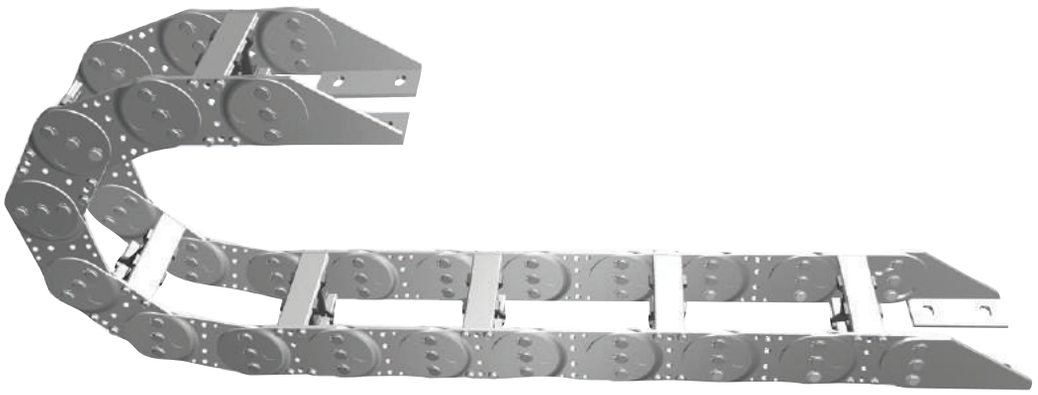


Guide Channel



- B1 = BK + 15mm
- Angle 65 X 65 X 5T

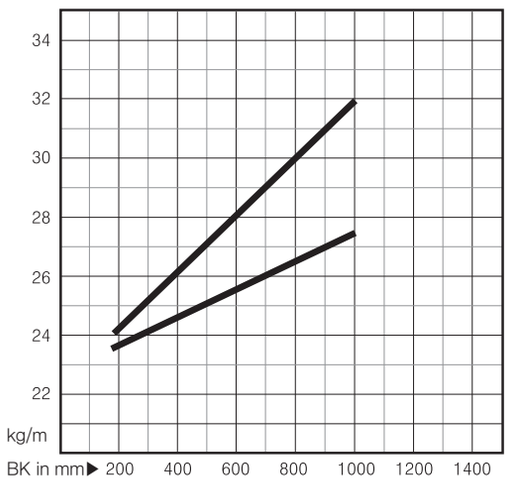
SK180



Calculation of the chain length

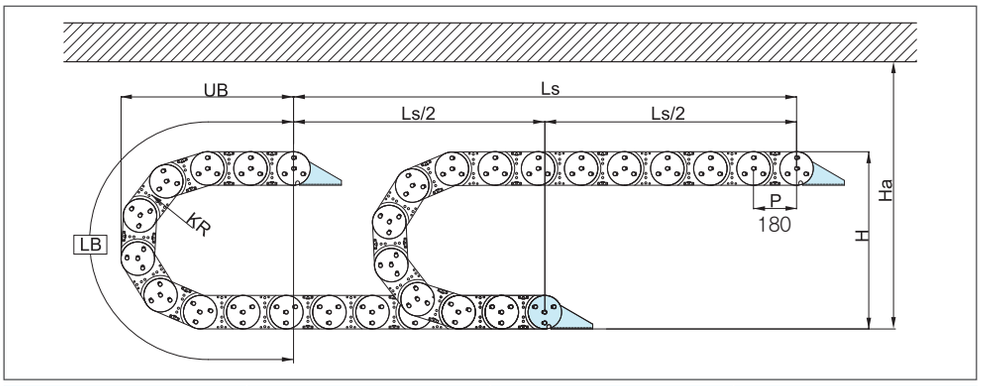
$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Load diagrams of self-supporting length



Layout of cable chain

Ls: Stroke UB: Loop Projection



Bending Radius (KR)	LB Loop Length	Ha Safe Space	H Moving Height
250	1,500	650	640
300	1,660	750	740
400	1,980	950	940
500	2,290	1,150	1,140
600	2,600	1,350	1,340
700	2,920	1,550	1,540

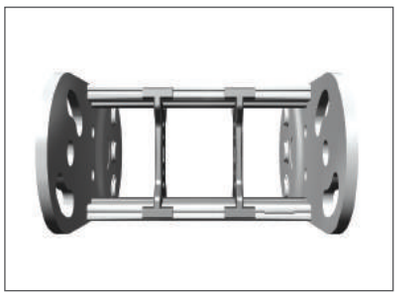
(Dimensions in mm)

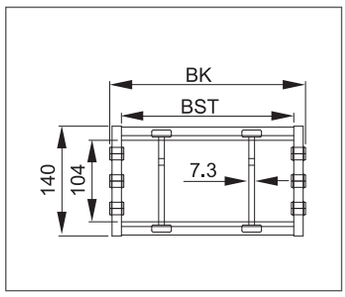
Frame of Standard application

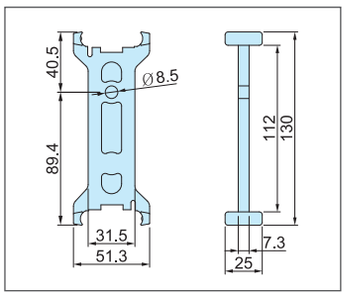
BK Outside width	Q'ty of Divider	Frame width
200	2	171
250	3	221
300	4	271
350	5	321
400	6	371
450	7	421
500	8	471
600	9	571
700	10	671
800	11	771
900	12	871
1,000	13	971
1,100	14	1,071

(Dimensions in mm)

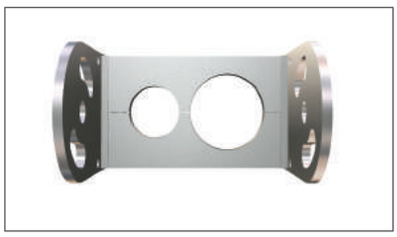
Solid type

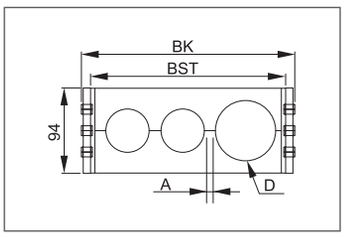






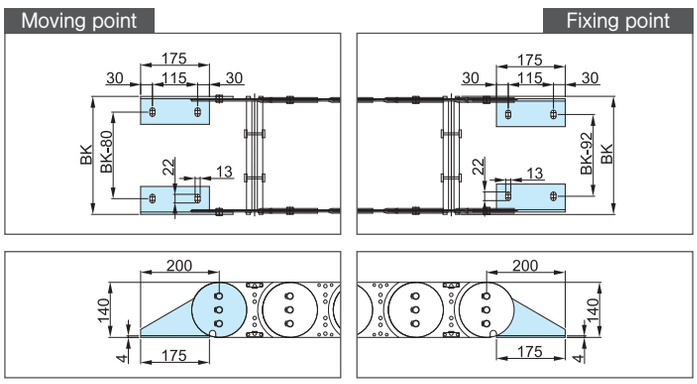
Hole type



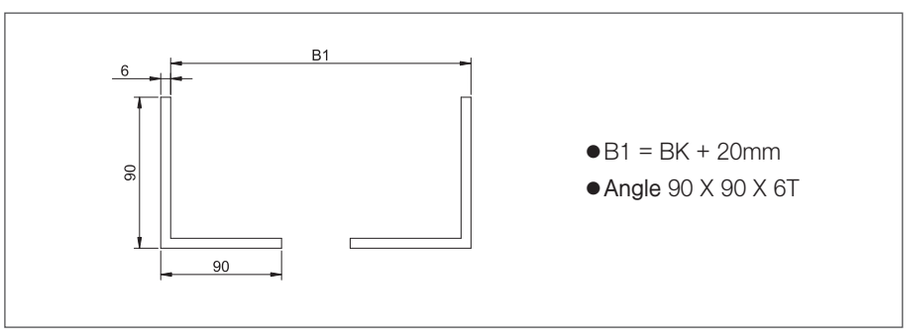


Dmax X 74mm dmax X 70mm Amin 5mm BSTmax X 800mm

Bracket

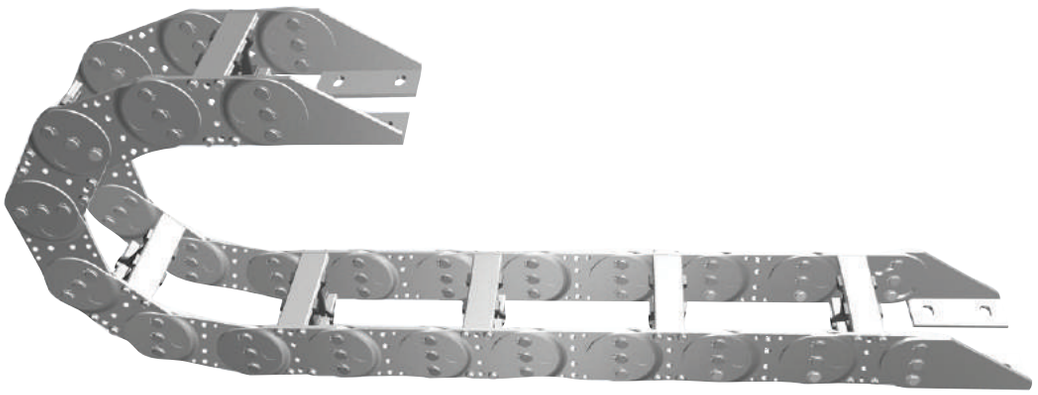


Guide Channel



- B1 = BK + 20mm
- Angle 90 X 90 X 6T

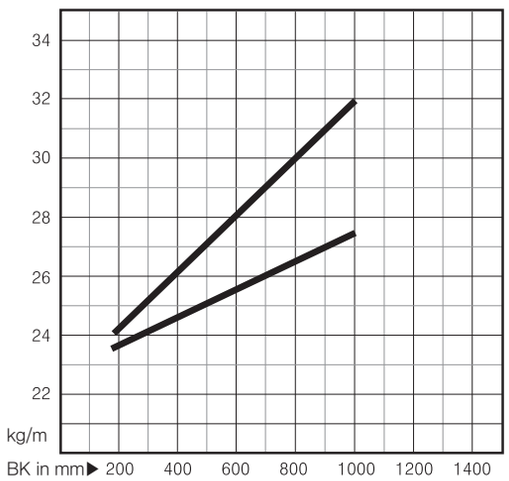
SK250



Calculation of the chain length

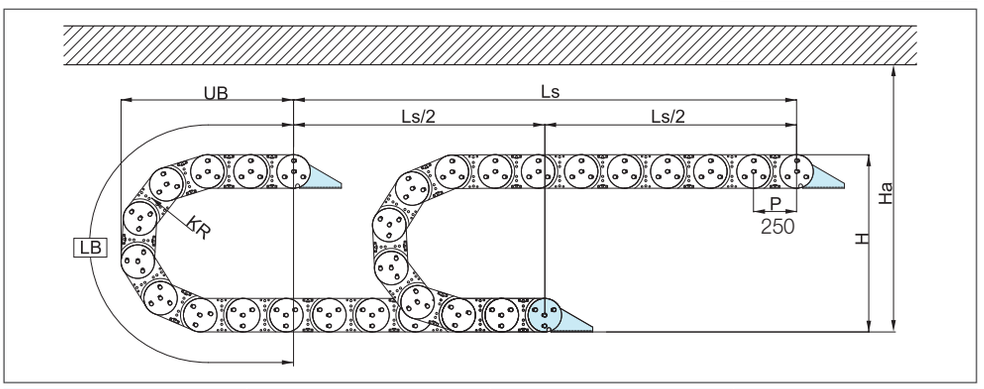
$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Load diagrams of self-supporting length



Layout of cable chain

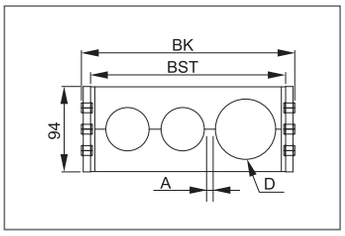
Ls: Stroke UB: Loop Projection



Bending Radius (KR)	LB Loop Length	Ha Safe Space	H Moving Height
250	1,500	650	640
300	1,660	750	740
400	1,980	950	940
500	2,290	1,150	1,140
600	2,600	1,350	1,340
700	2,920	1,550	1,540

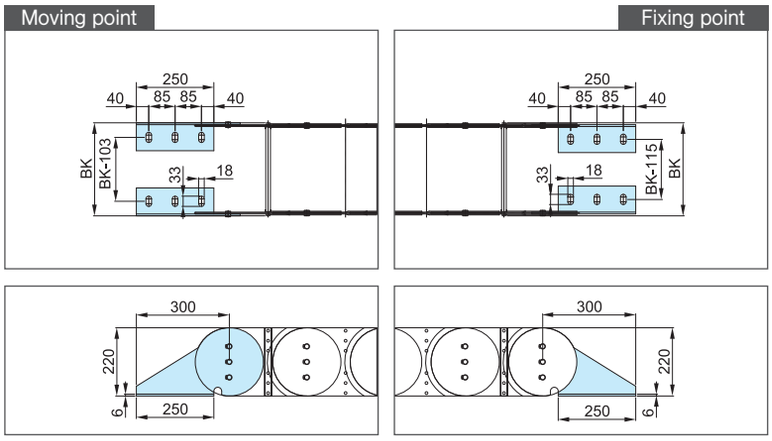
(Dimensions in mm)

Hole type

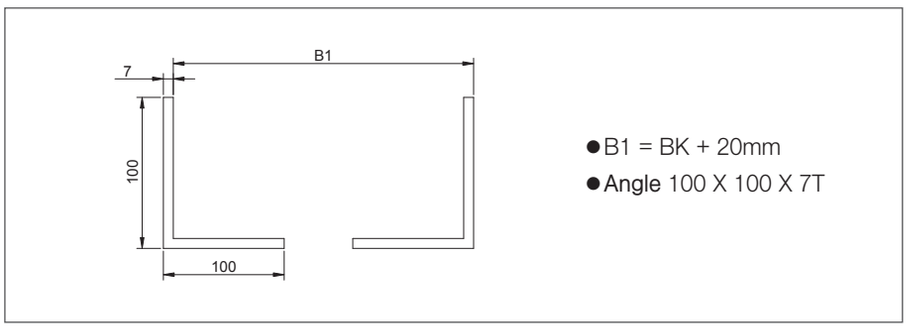


Dmax X 180mm dmax X 165mm Amin 6mm BSTmax X 1,200mm

Bracket



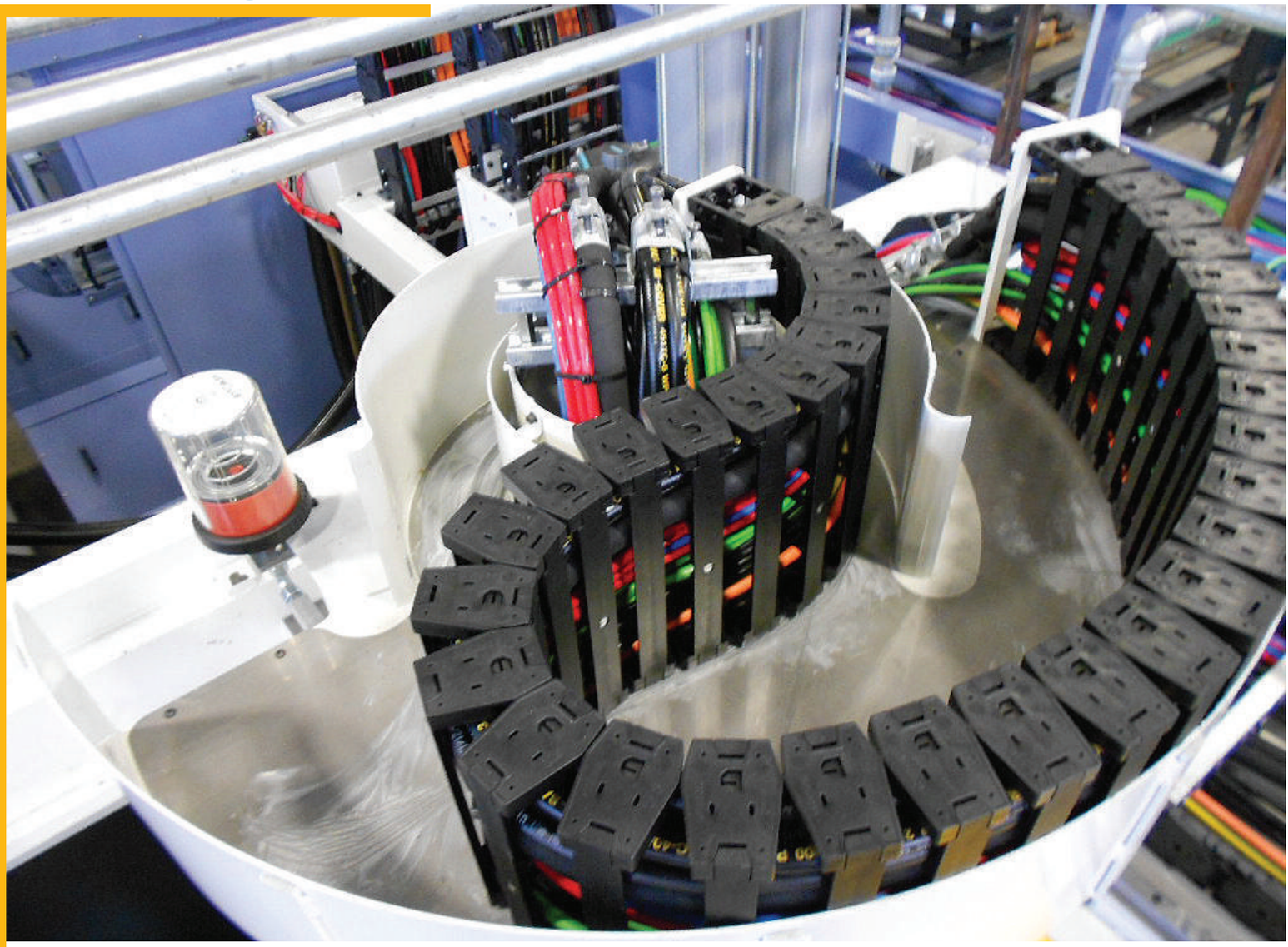
Guide Channel



- B1 = BK + 20mm
- Angle 100 X 100 X 7T

Application of Steel Chain

Revolving chain



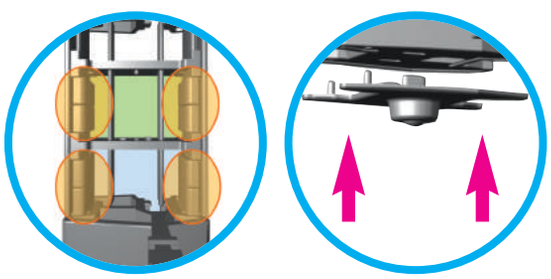
A Automatically control the bending radius and reverse bending radius.

B Maximize the mobility of bending radius.

C Apply to the rotating Machine or Robot.

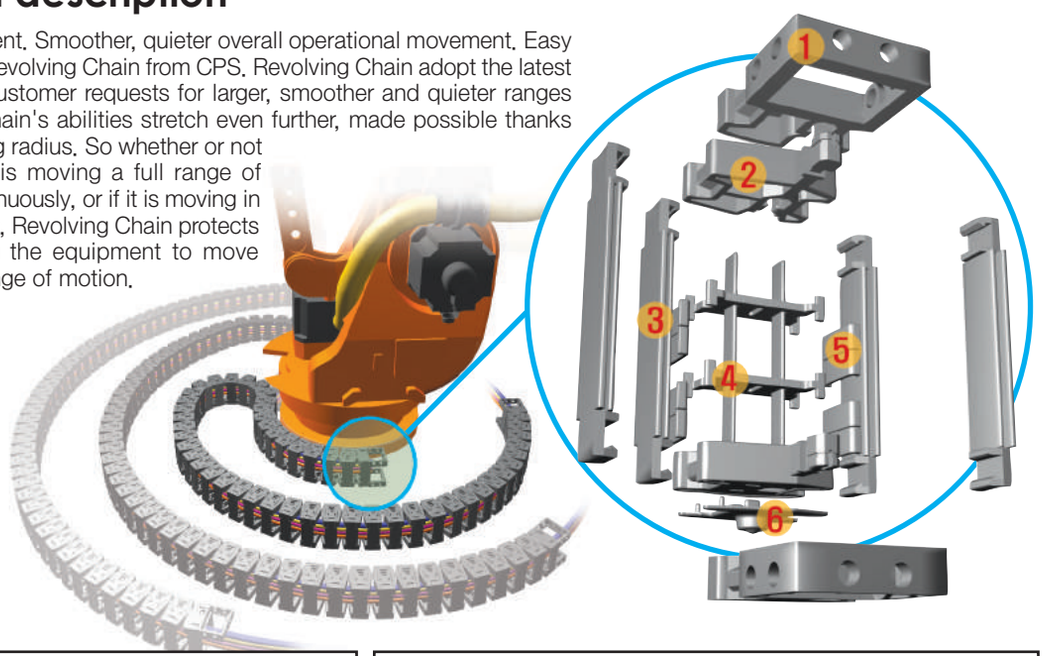
D Low dust and low noise realization.

E Boost the productivity with more secured cable protection system.



Part name and description

Safer equipment management. Smoother, quieter overall operational movement. Easy installation. Patented new Revolving Chain from CPS. Revolving Chain adopt the latest technological efforts with customer requests for larger, smoother and quieter ranges of movement. Revolving Chain's abilities stretch even further, made possible thanks to the patented free-bending radius. So whether or not your operating equipment is moving a full range of more than 360degrees continuously, or if it is moving in different shorter movements, Revolving Chain protects your cables while allowing the equipment to move freely throughout the full range of motion.



❶ Easy Bracket

The end of the cable chain, used to mount the application to the operating machinery or moving apparatus. CPS has improved the end bracket by making it possible to mount the cable chain from the front, side, bottom or top.

❷ Side Band

Developed and patented by CPS. As a result of the sideband connection method, virtually no noise is produced during operation. Which is possible by eliminating all points of friction.

❸ Frame

It is a unit that connects to side band and inner surface is smoothly machined to protect cables from fiction.

❹ Divider & Separator

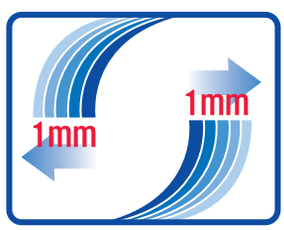
Used to separate the cables inside of the cable chain and protect them from twisting and breaking.

❺ Stopper

It is a unit to adjust the divider's posistion by considering number of cables in cable chain.

❻ Ball Caster

Attached to the bottom of the sidebands, ball casters help to facilitate smooth and quiet movement of the cable chain. CPS ball casters are used every 8 link. (Can be changed according to application environment)

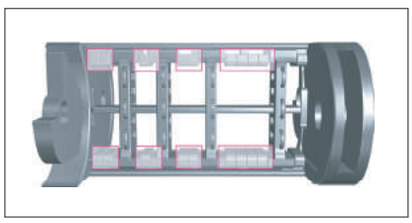


Adjustable Bending Radius per 1mm!

Revolving Chain adjusts to the machine or application movement by creating various bending radius automatically. It can be adjusted by a unit of 1mm.

Stopper System

Stoper decides the location of divider which is settled in side of cable chain and control the position of divider according to the inserted cable's size and quantity.
The items are classified as ST-M1, ST-M2, ST-S1, ST-S2 and please refer following drawings.



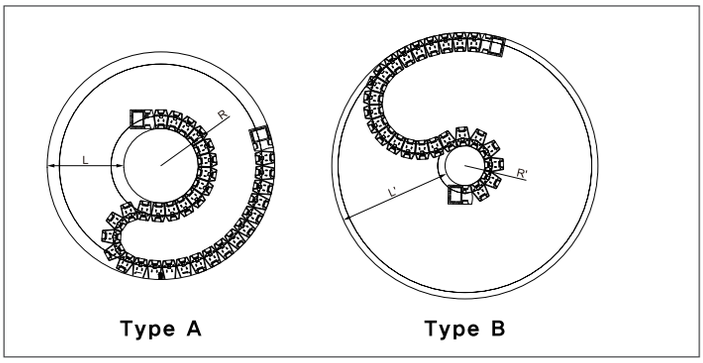
Ordering

RV 048CR. 200. A / F - 1000L : 10ST

- Q'ty(set)
- Length(mm)
- Free End Bracket
- Application Type of Ball Caster
- Inner Height of Chain
- Chain Type (RV020, 028, 040, 048, 060CR)
- Revolving Chain

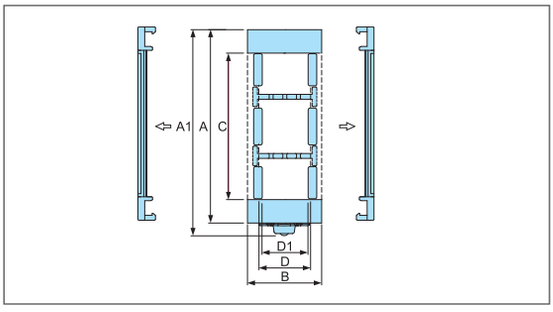
RV020CR

Chain cross section



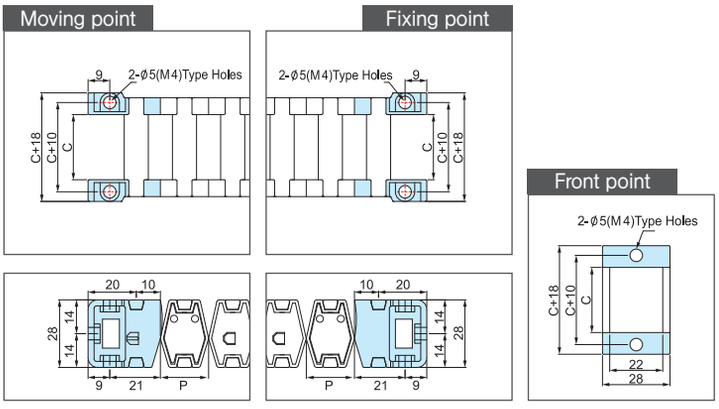
Type A	Minimum distance (L)	130
	Minimum reverse bending (R))	40
Type B	Minimum distance (L')	150
	Minimum reverse bending (R')	30

There are two installation choices, A or B corresponding with the bending radius of the side band. Choose A or B installation when there is insufficient distance between R, R' (Inner Bending Radius) and L, L' (Reverse)



Chain Type	A (A1)	B	C	D (D1)
RV 020CR	30 41 51 61 81 91	28	16 27 37 47 67 77	22

Bracket type

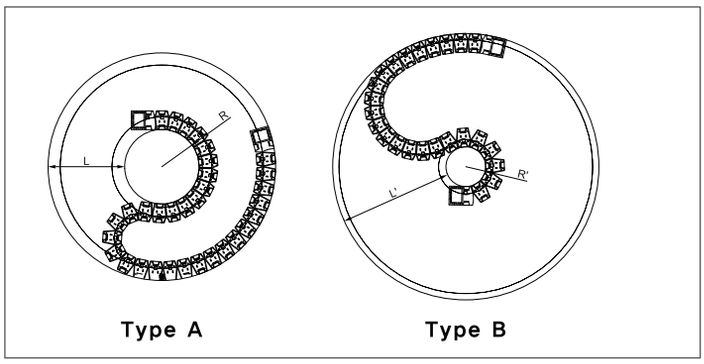


Chain Type	Pitch	C
RV 020CR	20	16 27 37 47 67 77

(Dimensions in mm)

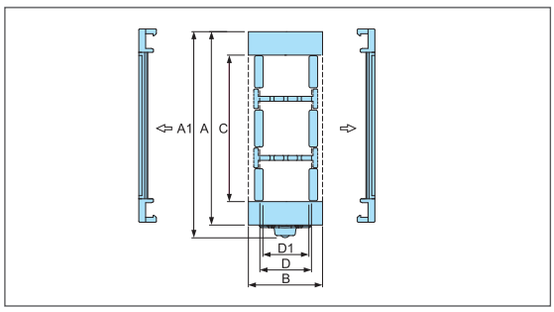
RV028CR

Chain cross section



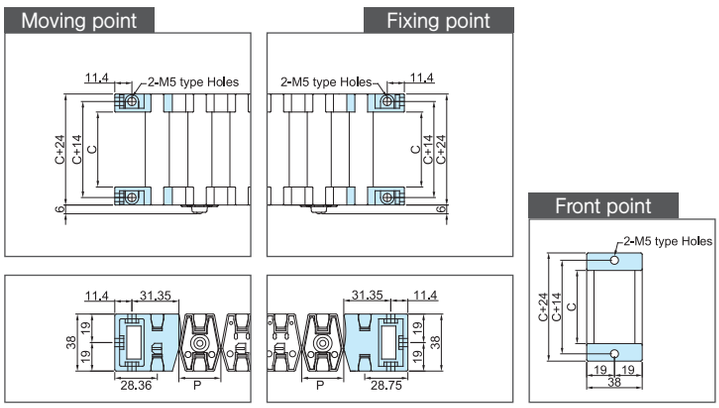
Type A	Minimum distance (L)	170
	Minimum reverse bending (R))	70
Type B	Minimum distance (L')	200
	Minimum reverse bending (R')	50

There are two installation choices, A or B corresponding with the bending radius of the side band. Choose A or B installation when there is insufficient distance between R, R' (Inner Bending Radius) and L, L' (Reverse)



Chain Type	A (A1)	B	C	D (D1)
RV 028CR	59(65) 79(85) 99(105) 124(130) 149(155)	38	35 55 75 100 125	28(25)

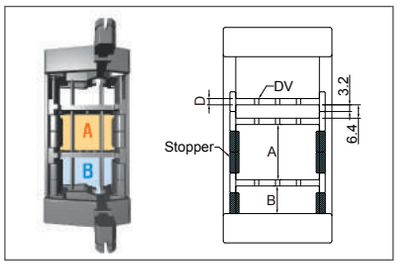
Bracket type



Chain Type	Pitch	C
RV 028CR	28	35 55 75 100 125

(Dimensions in mm)

Application method stopper

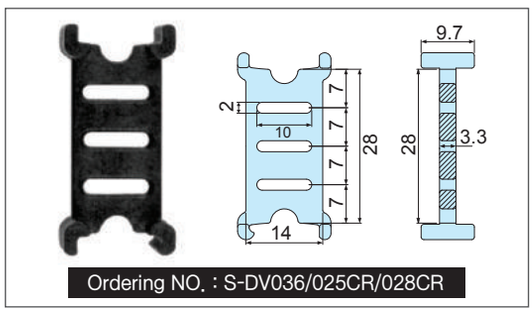


A = 6.4+10XStopper Q'ty
B = 3.2+10XStopper Q'ty

D = RV028CR : 3.3mm
RV040CR : 3.2mm
RV048CR : 3.5mm

Dividers(DV)

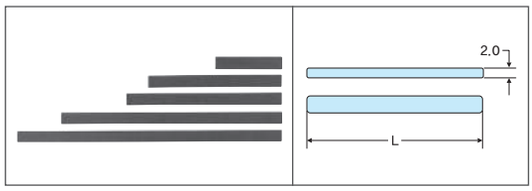
Divider is used when there are more than 2 cables are inserted, which protects twisting and beaking problem.



Ordering NO. : S-DV036/025CR/028CR

(Dimensions in mm)

Separators(SP)



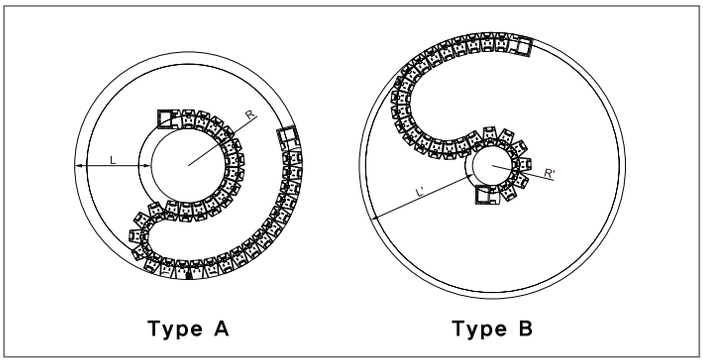
The inserted separators into dividers have the function to separate cables, and lessen the interference of cables, so as it is also used for efficient use of inner chamber space.

Ordering NO.	Length (L)
S-SP/M.35	35
S-SP/M.55	55
S-SP/M.75	75
S-SP/M.100	100
S-SP/M.125	125

(Dimensions in mm)

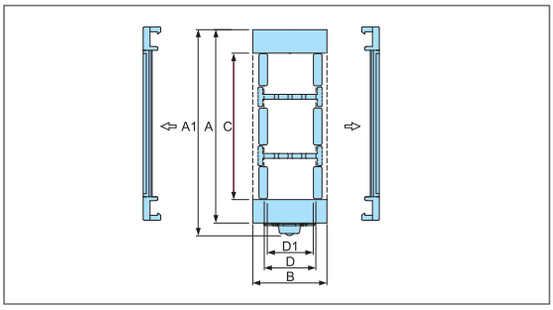
RV040CR

Chain cross section



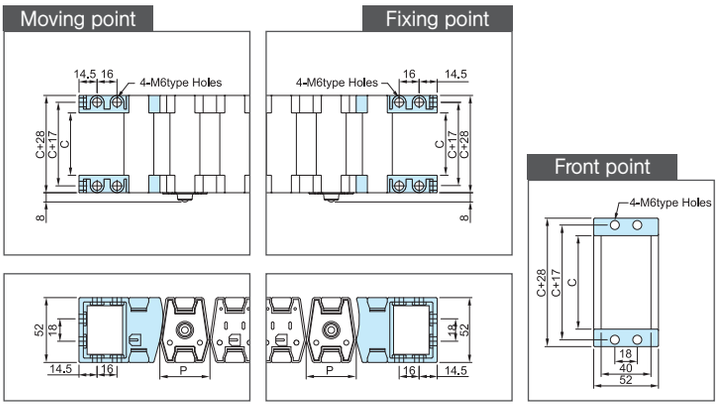
Type A	Minimum distance (L)	230
	Minimum reverse bending (R))	120
Type B	Minimum distance (L')	340
	Minimum reverse bending (R')	70

There are two installation choices, A or B corresponding with the bending radius of the side band. Choose A or B installation when there is insufficient distance between R, R' (Inner Bending Radius) and L, L' (Reverse)



Chain Type	A (A1)	B	C	D (D1)
RV 040CR	78 (86) 103 (111) 128 (136) 138 (146) 153 (161) 178 (186) 203 (211) 228 (236)	52	50 75 100 110 125 150 175 200	40(37)

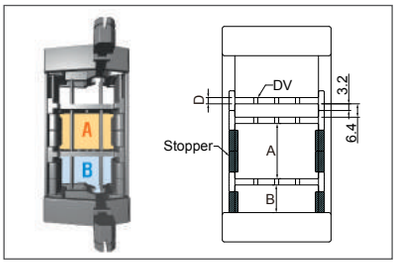
Bracket type



Chain Type	Pitch	C
RV 040CR	40	50 75 100 110 125 150 175 200

(Dimensions in mm)

Application method stopper

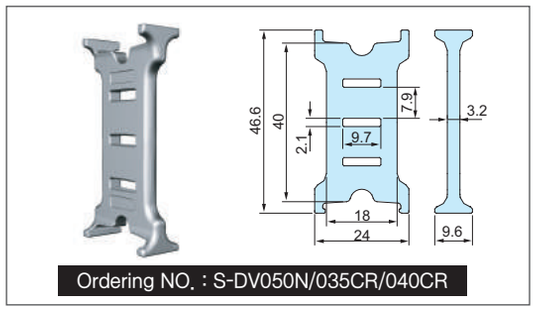


A = 6.4+10XStopper Q'ty
B = 3.2+10XStopper Q'ty

D = RV028CR : 3.3mm
RV040CR : 3.2mm
RV048CR : 3.5mm

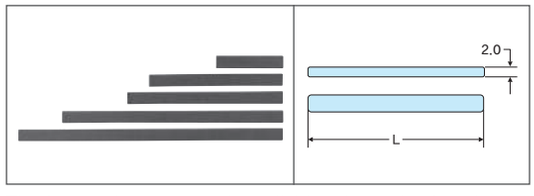
Dividers(DV)

Divider is used when there are more than 2 cables are inserted, which protects twisting and beaking problem.



(Dimensions in mm)

Separators(SP)



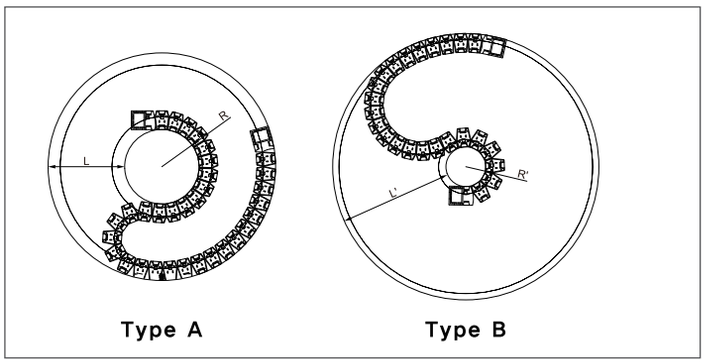
The inserted separators into dividers have the function to separate cables, and lessen the interference of cables, so as it is also used for efficient use of inner chamber space.

Ordering NO.	Length (L)
S-SP/M.50	50
S-SP/M.75	75
S-SP/M.100	100
S-SP/M.110	110
S-SP/M.125	125
S-SP/M.150	150
S-SP/M.175	175
S-SP/M.200	200

(Dimensions in mm)

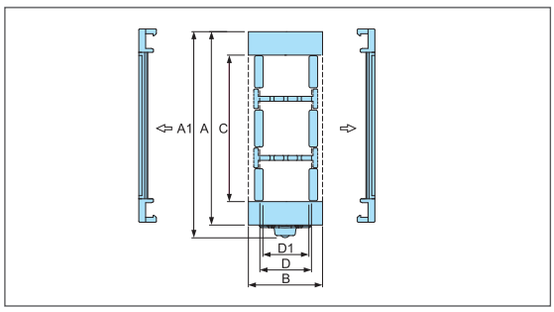
RV048CR

Chain cross section



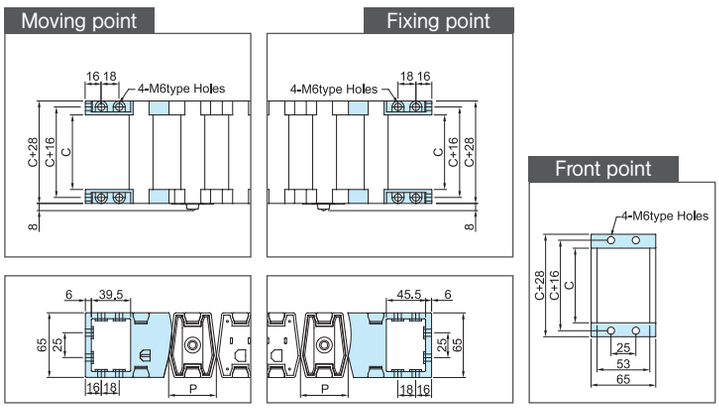
Type A	Minimum distance (L)	300
	Minimum reverse bending (R))	160
Type B	Minimum distance (L')	450
	Minimum reverse bending (R')	90

There are two installation choices, A or B corresponding with the bending radius of the side band. Choose A or B installation when there is insufficient distance between R, R' (Inner Bending Radius) and L, L' (Reverse)



Chain Type	A (A1)	B	C	D (D1)
RV 048CR	78(86)	65	50	53(50)
	103(111)		75	
	128(136)		100	
	153(161)		125	
	178(186)		150	
	203(211)		175	
	228(236)		200	

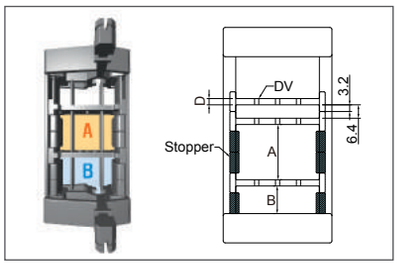
Bracket type



Chain Type	Pitch	C
RV 048CR	48	50 75 100 125 150 175 200

(Dimensions in mm)

Application method stopper

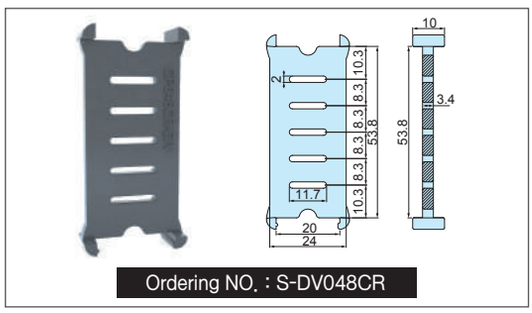


A = 6.4+10XStopper Q'ty
B = 3.2+10XStopper Q'ty

D = RV028CR : 3.3mm
RV040CR : 3.2mm
RV048CR : 3.5mm

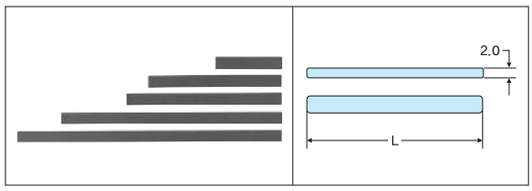
Dividers(DV)

Divider is used when there are more than 2 cables are inserted, which protects twisting and beaking problem.



(Dimensions in mm)

Separators(SP)



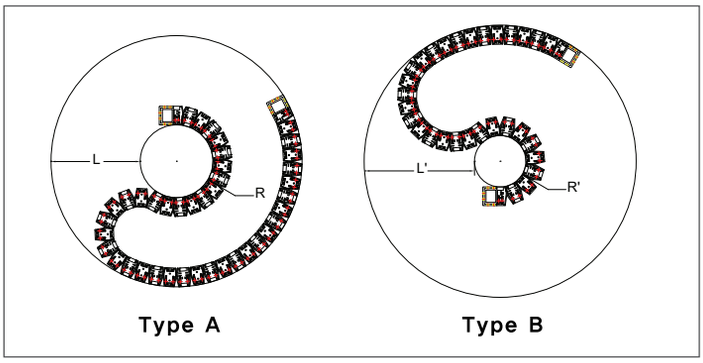
The inserted separators into dividers have the function to separate cables, and lessen the interference of cables, so as it is also used for efficient use of inner chamber space.

Ordering NO.	Length (L)
S-SP/M.50	50
S-SP/M.75	75
S-SP/M.100	100
S-SP/M.125	125
S-SP/M.150	150
S-SP/M.175	175
S-SP/M.200	200

(Dimensions in mm)

RV060CR

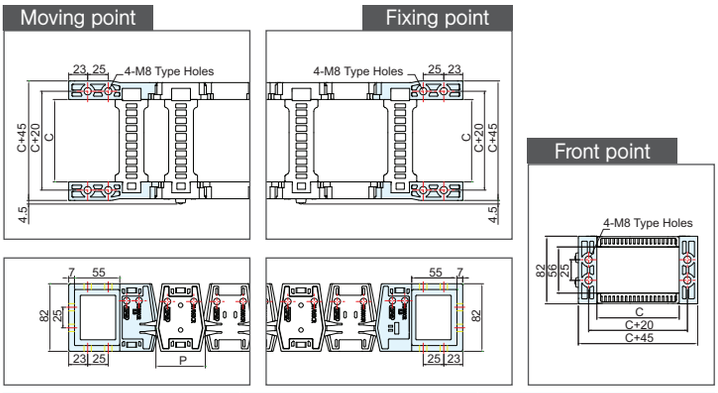
Chain cross section



Type A	Minimum distance (L)	400
	Minimum reverse bending (R))	165
Type B	Minimum distance (L')	485
	Minimum reverse bending (R')	120

There are two installation choices, A or B corresponding with the bending radius of the side band. Choose A or B installation when there is insufficient distance between R, R' (Inner Bending Radius) and L, L' (Reverse)

Bracket type

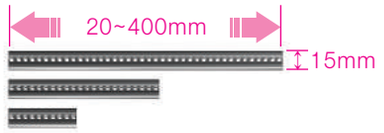


Chain Type	Pitch	C
RV 060CR	60	75 100 125 150 175 190 200 240 250 300 350 400

(Dimensions in mm)

Separators(SP)

Can order according to desired length of section.



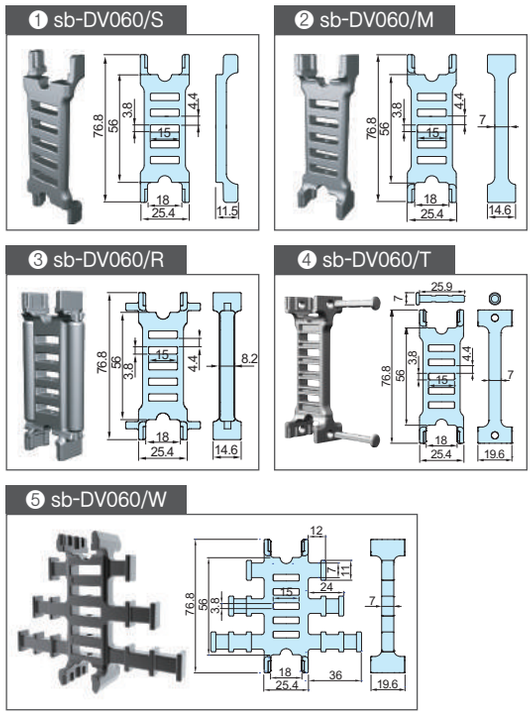
The inserted separators into dividers have the function to separate cables, and lessen the inter ference of cables, so as to prevent them tangle and disconnection, as well as make the efficient use of inner chamber space.

Ordering NO.	Length (L)
S-SP/M.75	75
S-SP/M.100	100
S-SP/M.125	125
S-SP/M.150	150
S-SP/M.175	175
S-SP/M.200	200
S-SP/M.250	250
S-SP/M.300	300
S-SP/M.350	350
S-SP/M.400	400

(Dimensions in mm)

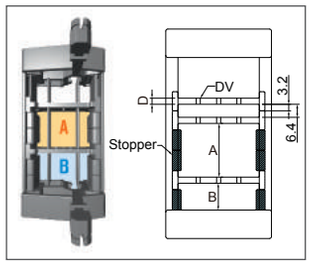
Dividers(DV)

Installed vertically, these dividers separate the carrier's inner chamber and prevent cables from twisting or tangling during operation.



(Dimensions in mm)

Application method stopper



A = 6.4+10XStopper Q'ty
B = 3.2+10XStopper Q'ty

D = RV028CR : 3.3mm
RV040CR : 3.2mm
RV048CR : 3.5mm

Stoppers control divider position and lock the dividers into place during operation.
They are fixed directly to the frames between the dividers at recommended width.

PROTECTION SYSTEM FOR ROBOT CABLES/HOSES

KOREA

MADE IN KOREA

PASSED RELIABILITY TEST!

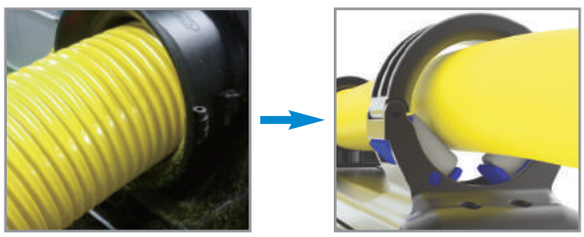
General information

Item	Value
Composition	Roboway, Robo-kit
Application	Welding Robot, Handling Robot
Tube Temperature	-50℃ ~+95℃
Color of Tube	Yellow, Black
Certificate	CE
Certificate	CE, ATEX(Ex)

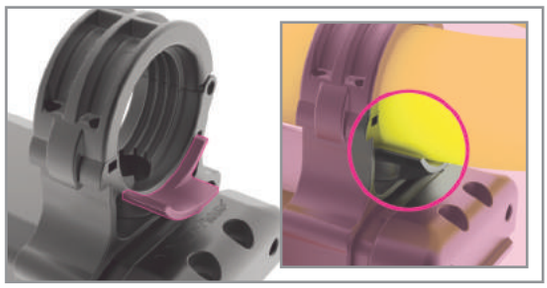
Roboway can protect cables effectively by making tube's movement to one direction while robot arm operates to complicated direction.

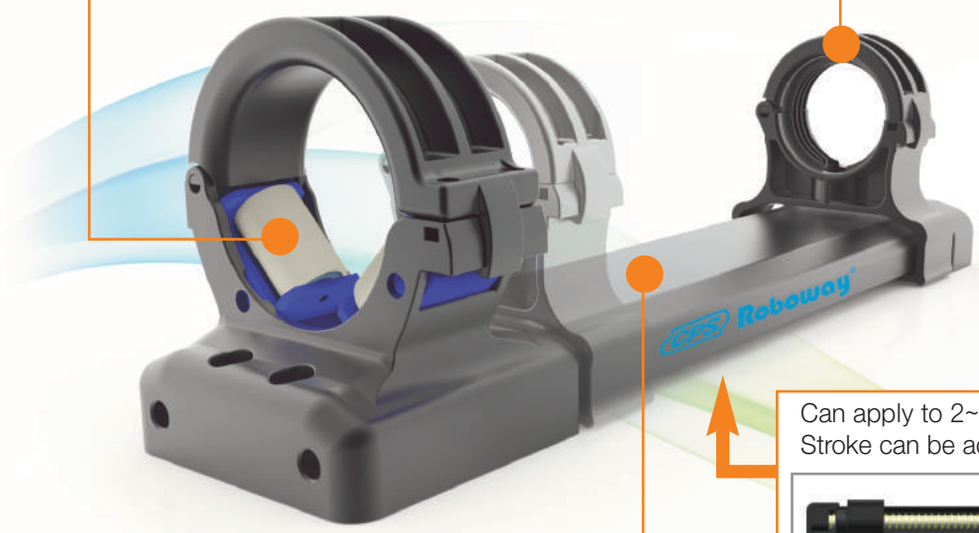
Product characteristic #1

Minimized dust by applying rollers at fixing part.

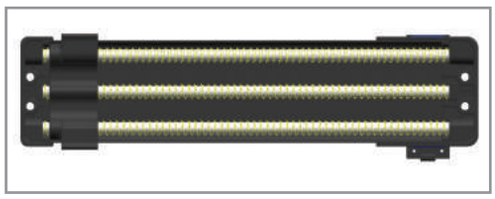


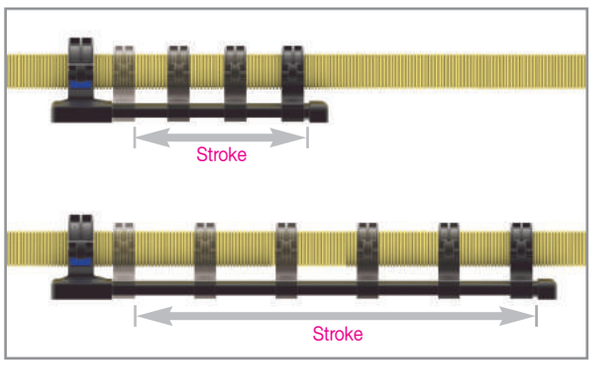
Design the supporting guide to prevent sagging to down side at Moving part.





Can apply to 2~3 special springs.
Stroke can be adjusted.

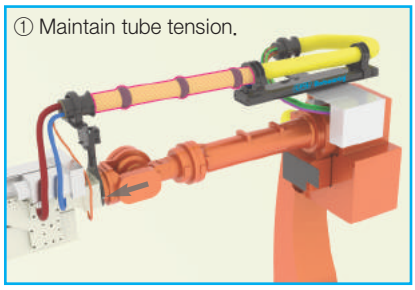


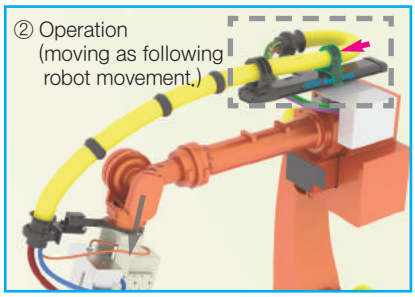


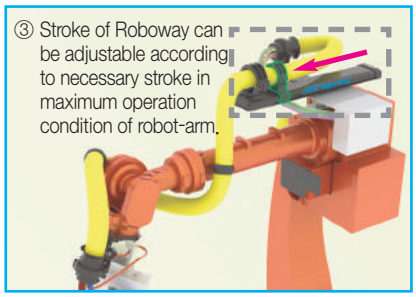
Adjustable stroke structure.

Possible to keep always certain tension to protect tube and cables.

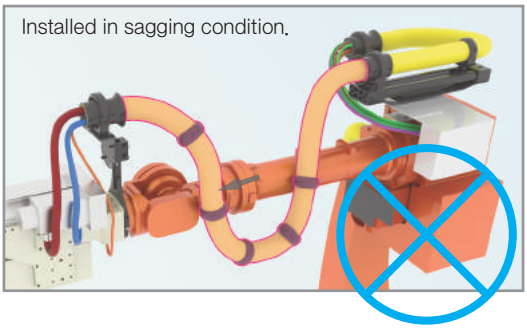
Product characteristic #2



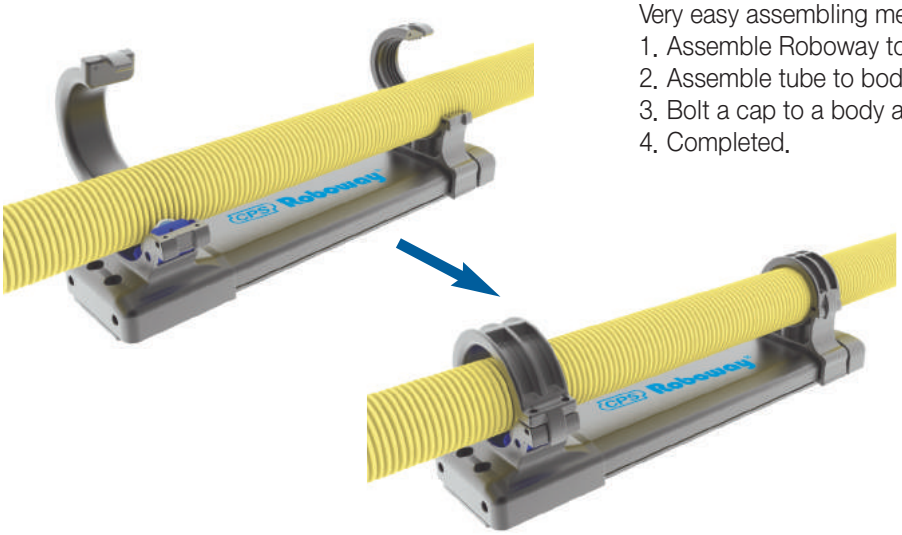




Tube could be damaged or broken when robot-arm operates in sagging condition as it causes tube to bump against robot-arm strongly and many times.

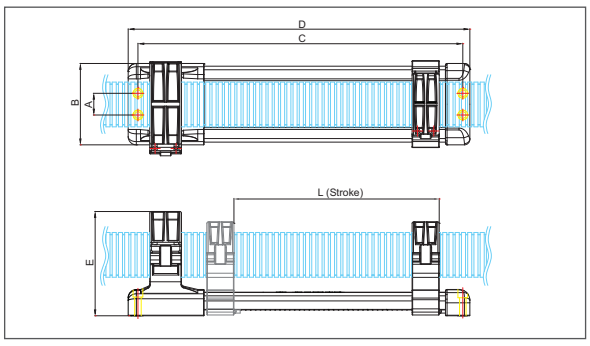


Product characteristic #3



Very easy assembling method as below;
1. Assemble Roboway to main bracket.
2. Assemble tube to body after opening a cap of Roboway.
3. Bolt a cap to a body after closing a cap.
4. Completed.

Roboway Dimension



Ordering

RW-48 400L : 10ST

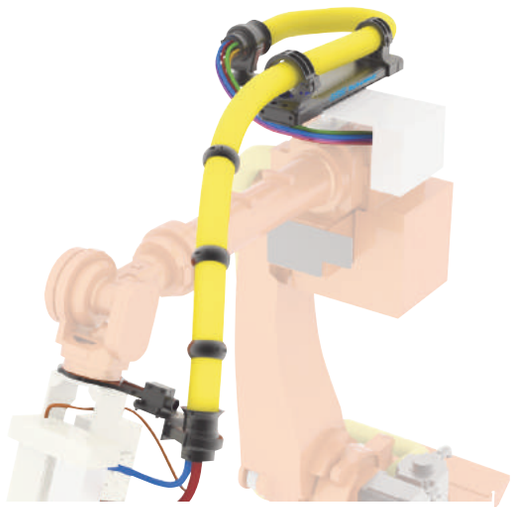
- Roboway®
- Size 36, 48, 56, 70
- Length
- Q'ty(set)

Type	A Bolt hole width	B Width	C Bolt hole width	D Length	E Height	L Stroke
RW-36	30	96	L+202	L+222	137	300 / 400 / 500 / 600
RW-48	30	96	L+202	L+222	137	
RW-56	40	150	L+215.5	L+246.5	192	350 / 450 / 550 / 650
RW-70	40	150	L+215.5	L+246.5	192	

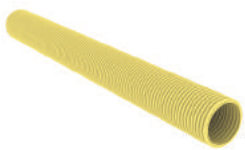
(Dimensions in mm)

≫ Components / A type (48,56,70 size)

※ Roboway® Conponents can be changed by order specification.



● RW (1set)



● PAM (4~5m)

● Cable, Hose (5~10m)

● RKTP (4pcs)

● RKS (2pcs)

● RKC (2pcs)

● RKSC (2pcs)

● RKR (1pcs)

● VCG (2pcs)

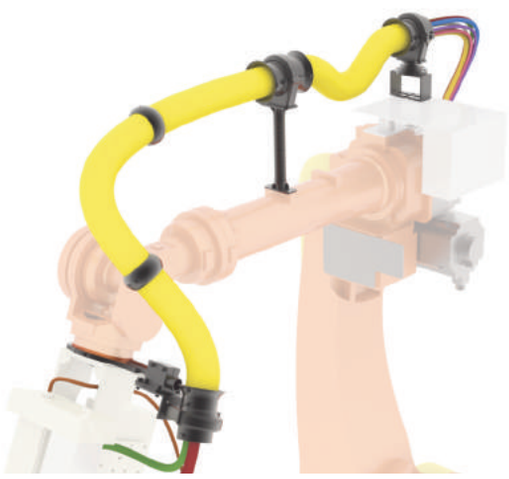
● Column Support : RCS (1pcs)

● Main Bracket : RMB (1pcs)

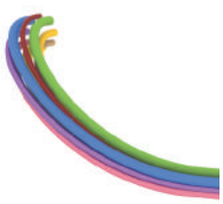
● Sub Bracket : RSB (1pcs)

≫ Components / B type (48,56,70 size)

※ Roboway® Conponents can be changed by order specification.



● PAM (5~6m)



● Cable, Hose (5~10m)

● RKTP (4pcs)

● RKS (3pcs)

● RKC (3pcs)

● RKSC (2pcs)

● RKR (1pcs)

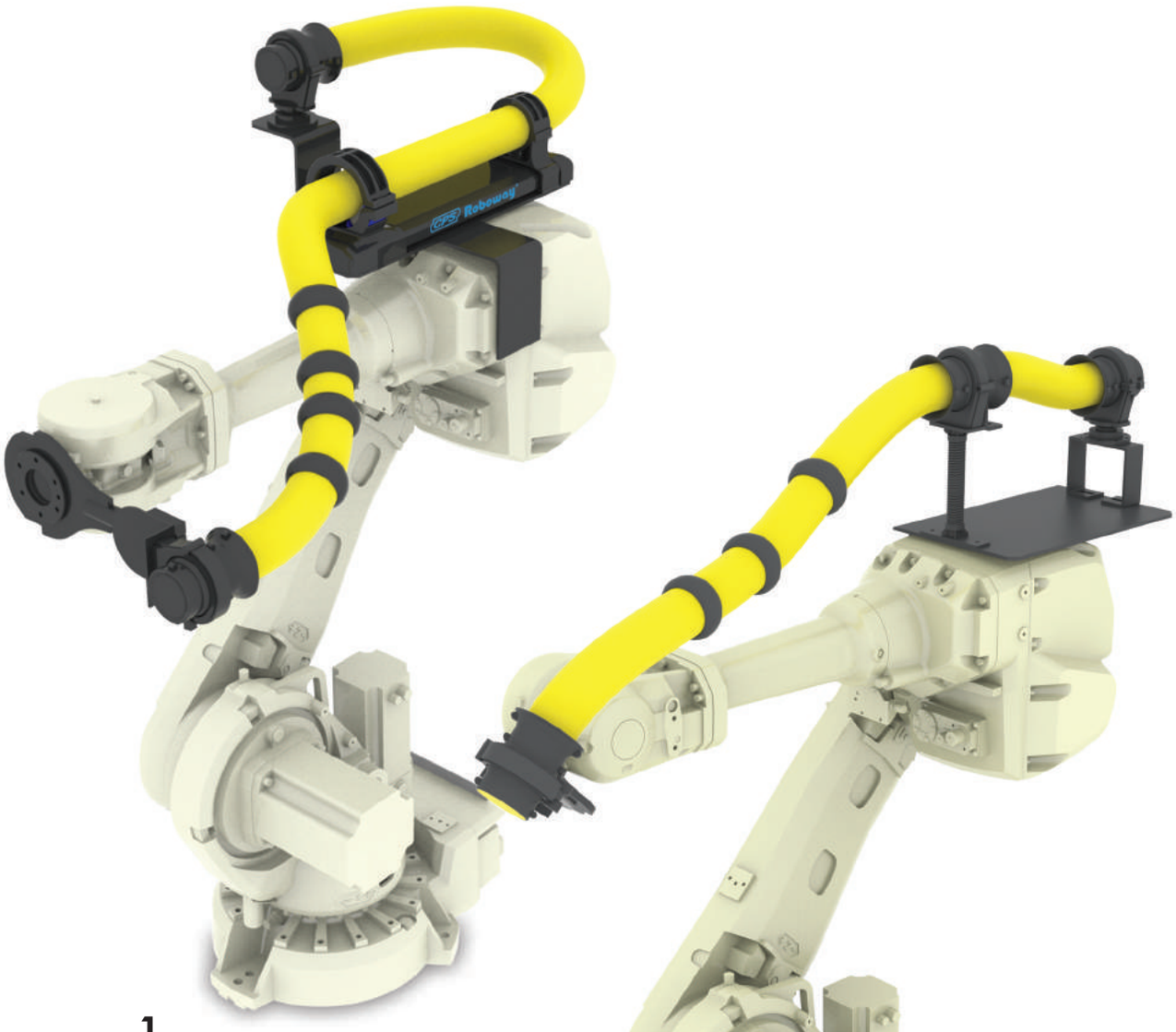
● VCG (2pcs)

● Column Support : RCS (1pcs)

● Pillar Support : RPS (1pcs)

● Bed Plate : RBP (1pcs)

Roboway® Application to ABB



1

2

Part Number	Robot Specification	Description	No.
ROBOWAY-70B (A-type)	ABB 4600	ABB 4600 with Roboway-70B (450mm)	1
ROBOWAY-70B (B-type)	ABB 6640-255	ABB 6640-255	2

2

Part Number	Robot Specification	Description	No.
ROBOWAY-70B (A-type)	IRB 660	-	1
ROBOWAY-70B (B-type)	IRB 6650S	IRB 6650S	2

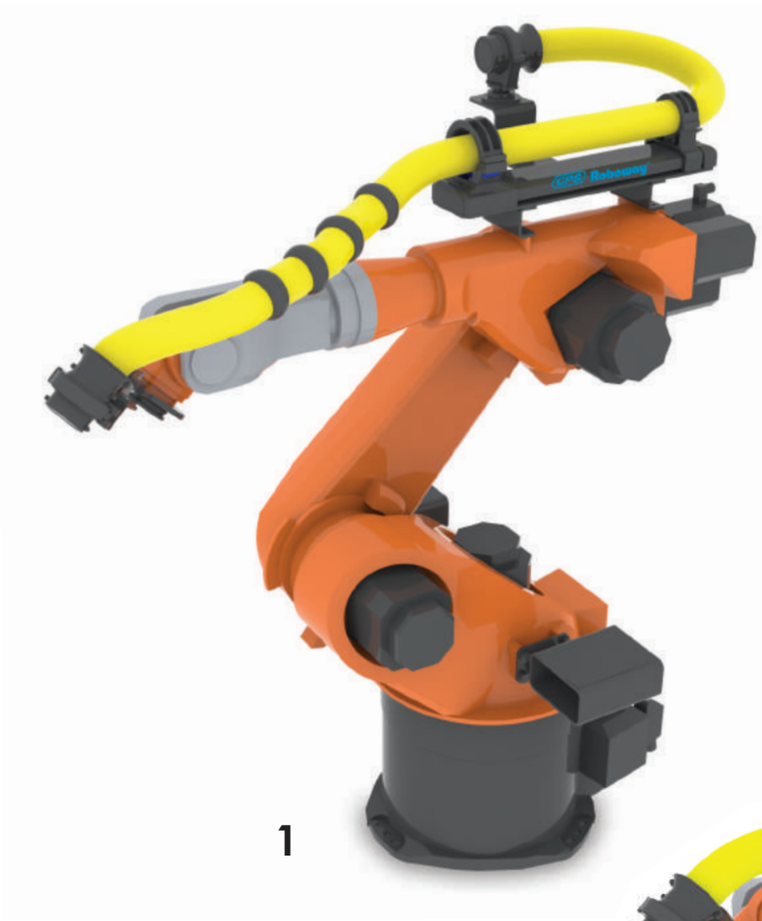
Roboway® Application to ABB

1

2

Part Number	Robot Specification	Description	No.
ROBOWAY-70B (A-type)	IRB 7500	IRB 7500 with Roboway-70B (450mm)	1
ROBOWAY-70B (B-type)	IRB 7500	IRB 7500	2

Roboway® Application to KUKA

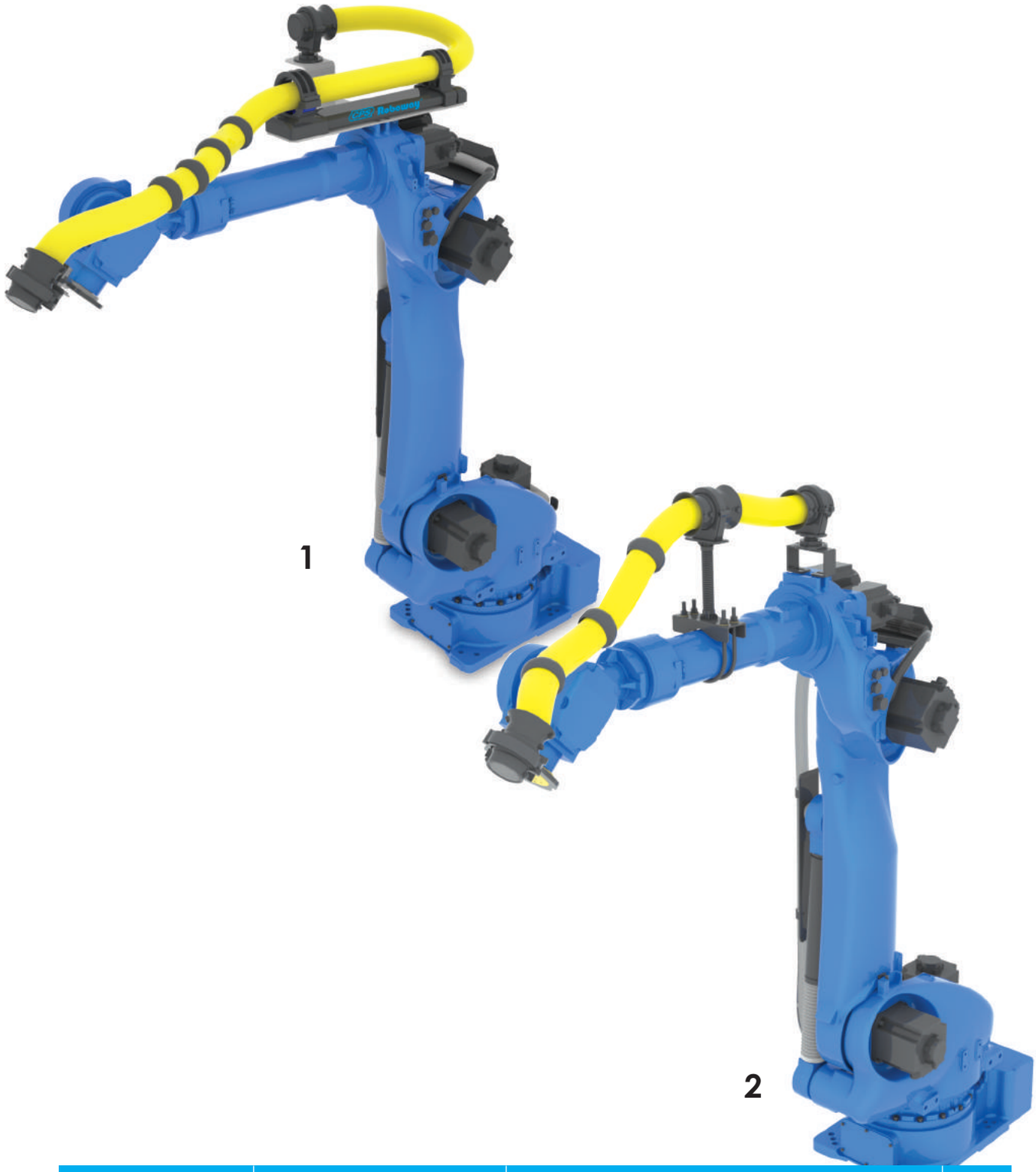


1

2

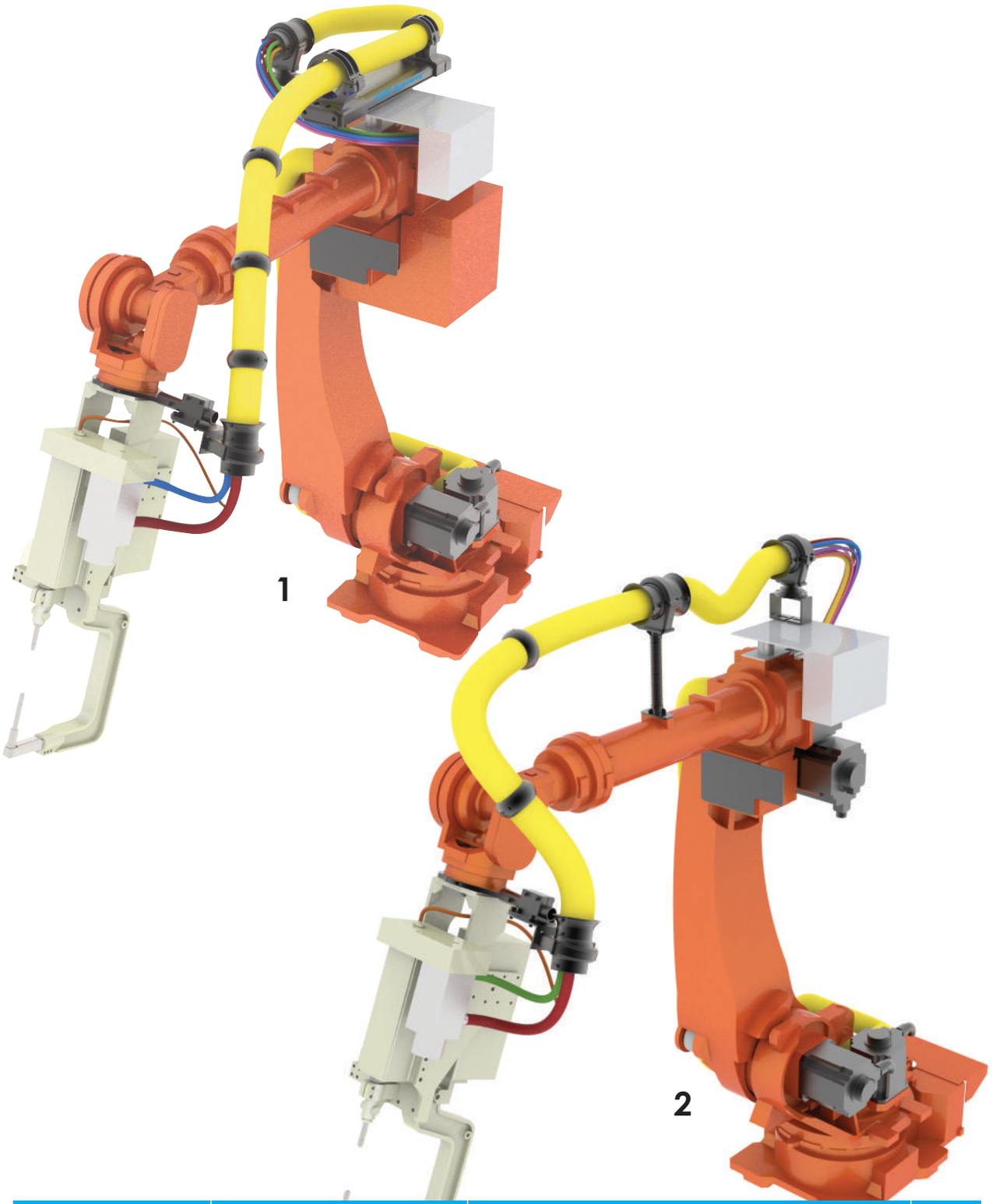
Part Number	Robot Specification	Description	No.
ROBOWAY-70B (A-type)	KR60-3	KR60-3 with Roboway-70B (450mm)	1
ROBOWAY-70B (B-type)	KR60-3	KR60-3	2

Roboway® Application to Yaskawa



Part Number	Robot Specification	Description	No.
ROBOWAY-70B (A-type)	MH180	MH180 with Roboway-70B (450mm)	1
ROBOWAY-70B (B-type)	MH180	MH180	2

Roboway® Application to Hyundai



Part Number	Robot Specification	Description	No.
ROBOWAY-70B (A-type)	HS-180	HS-180 with Roboway-70B (450mm)	1
ROBOWAY-70B (B-type)	HS-180	HS-180	2

Roboway® Application to Fanuc

Part Number	Robot Specification	Description	No.
ROBOWAY-70B (A-type)	Fanuc - 2000iB	Fanuc - 2000iB with Roboway-70B (450mm)	1
ROBOWAY-70B (B-type)	Fanuc - 2000iB	Fanuc - 2000iB	2

FANUC
R-2000iB
KN040-R01-B02
KN040-
R01-B02

Components

RKD
22/28/36/48/56/70
Tube Ball Joint Sleeve
RKD is also tube ball joint like RKS, however, its shape is a little bit different as ball joint direction is bidirectional unlike RKS.

VCG
22/28/36/48/56/70
Cable End Finishing
VCG is clamp for robot cables/hoses at end position of tube.

RKC
22/28/36/48/56/70
Tube Clamps
RKC is tube clamp in combination with RKS+RKRC or RKD+RKRC to holds tube's movement while robot operates.

RKSC
22/28/36/48/56/70
Strain Relief Insert
22~36 of RKSC : It clamp for VCG.
48~70 of RKSC : It clamp for Tube and RKS.

RKR-22/28/36/48/56/70
Rotating Connector
RKR in combination with RKC is to release tube's tension and fatigue as it can rotate with robot-arm movement.

RKTP-22/28/36/48/56/70
Abrasion Protection Connector
RKTP is made of reinforced polyamide 6.
It is to protect abrasion and damage of tube when tube bumps on robot arm.

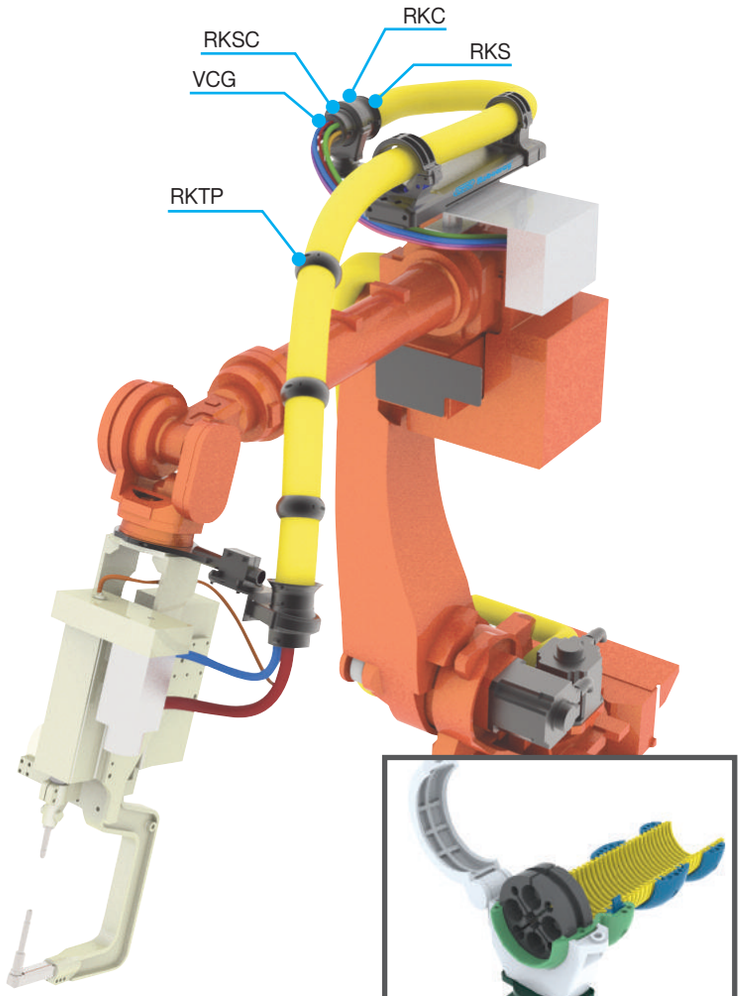
RKTC-48/56/70
If robot tube got damaged such as cut or stretched condition, you don't need to replace total tube by using RKTC as it can cover damaged area.

RKS-22/28/36/48/56/70
Tube Ball Joint
RKS is tube ball joint to strengthen tube's flexibility and release tube's tension loaded by robot operation.

ROBO-KIT Ordering

RKC-70 : 10EA

- Q'ty(set)
- Size 22, 28, 36, 48, 56, 70
- ROBO-KIT® RKC / RKD / RKTP / RKTC RKSC / RKR / VCG / RKS



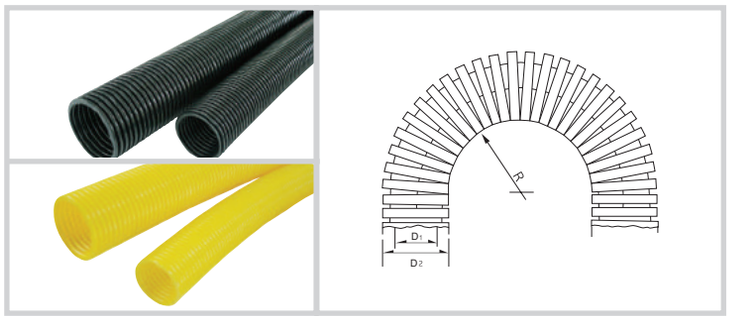
RKR+RKC+RKS+VCG+RKSC

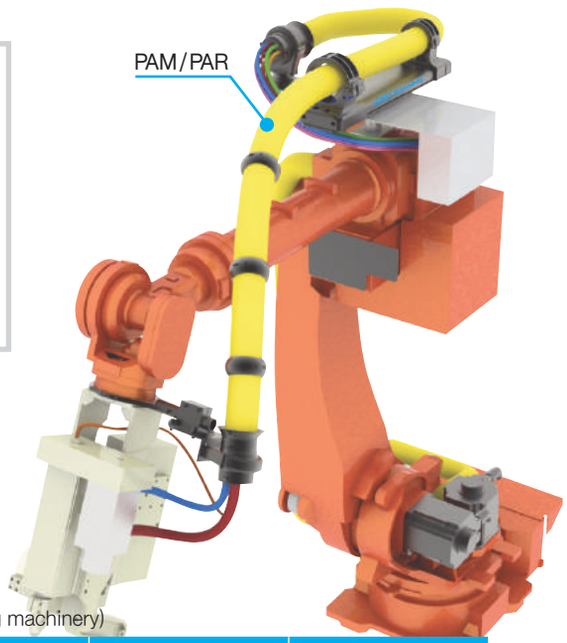
Dimension

Product	Conduit Size	Width	Height	Length	Outer Diameter
RKTP	22 28 36 48 56 70	28.0 30.0 30.0 30.0 40.0 40.0	46.4 53.0 62.0 80.0 93.2 108.0	-	46.4 53.0 62.0 80.0 93.2 108.0
RKTC	48 56 70	50.0 60.0 60.0	78.0 90.2 105	-	78.0 90.2 105
RKC	22 28 36 48 56 70	30.0 30.0 45.0 49.5 40.0 40.0	50.0 59.5 88.3 105.0 138.1 145.5	49.0 58.8 90.2 128.2 150.1 164.9	45.0 53.5 76.0 94.0 116.2 131.0
RKS	22 28 36 48 56 70	50.0 60.0 100.3 89 102 102	23.0 27.0 80.5 92.3 105.3 120.1	23.0 27.0 80.5 92.3 105.3 120.1	23.0 27.0 80.5 92.3 105.3 120.1
RKD	22 28 36	40.0 63.5 120.0	22.0 30.0 83.0	22.0 30.0 83.0	22.0 30.0 83.0
RKSC	22 28 36 48 56 70	10.5 13.0 20.6 22.0 26.0 26.0	29.5 34.5 44.6 67.5 81.2 96.0	-	29.5 34.5 44.6 67.5 81.2 96.0
RKR	22 28 36 48 56 70	43.0 55.0 98.0 98.0 98.0 98.0	18.5 23.0 42.0 42.0 42.0 42.0	-	43.0 55.0 98.0 98.0 98.0 98.0
VCG	22 28 36 48 56 70	10.5 13.0 20.6 24.0 34.0 34.0	25.5 30.5 40.6 62.5 75.8 90.0	-	25.5 30.5 40.6 62.5 75.8 90.0

CPSFLEX®-PAM, PAR Specification

PAM is the highest quality of corrugated tube only for robots.
PAR is corrugated for robots and rotating machinery.





- Material : High Quality Polyamide 11/12 (PAM)
  : High Quality Polyamide 12 (PAR)
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68
- The max. Instantaneous Temperature : -50℃ to +95℃
- Short Term : up to +150℃
- Self-Extinguishing : UL94-V2, Halogen-Free
- Color : Black & Yellow
- Connections : Roboway, Robo-kit, CPSFIX
- Application : Robots (Welding robot, Handling robot, Rotating machinery)

Black	Yellow	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius (R)mm ±10%	Packing meter / roll
PAM/PAR-22B	PAM/PAR-22Y	21.7	28.5	45	50
PAM/PAR-28B	PAM/PAR-28Y	27.8	34.5	55	50
PAM/PAR-36B	PAM/PAR-36Y	36.0	42.5	60	30
PAM/PAR-48B	PAM/PAR-48Y	46.5	54.5	70	30
PAM/PAR-56B	PAM/PAR-56Y	56.3	67.2	110	30
PAM/PAR-70B	PAM/PAR-70Y	70.0	82.5	160	10

(Dimensions in mm)

CPSFLEX®-PAM Ordering ※ Please refer to page K-13 and K-14 more detail.

PAM - 70B : 10M

- CPSFLEX®
- Size 22, 28, 36, 48, 50, 70
- Color (B: Black / Y: Yellow)
- Q'ty(Length)

NORFLEX®-PUR Tube

- Material : Smooth interior and exterior; wall: special premium polyurethane(Pre-PUR®)
- Properties : Fabric reinforced / highly abrasion-proof
  Fighly flexible / crush resistant
  Good resistance to oil, gasoline and chemicals
  Comform to RoHs guideline
- Color : Transparent, Blue, Gray, Black, Red, Green, Yellow
  (TR, BL, GR, BK, RE, GN, YE)
- Application : Suitable to apply at industrial robot, automatic welding facility, especially it has resistance at hot spot welding flame and very suitable to apply at injection molding as a high pressure air or cooling water hose and also some other place need flexible and high anti-abrasion.

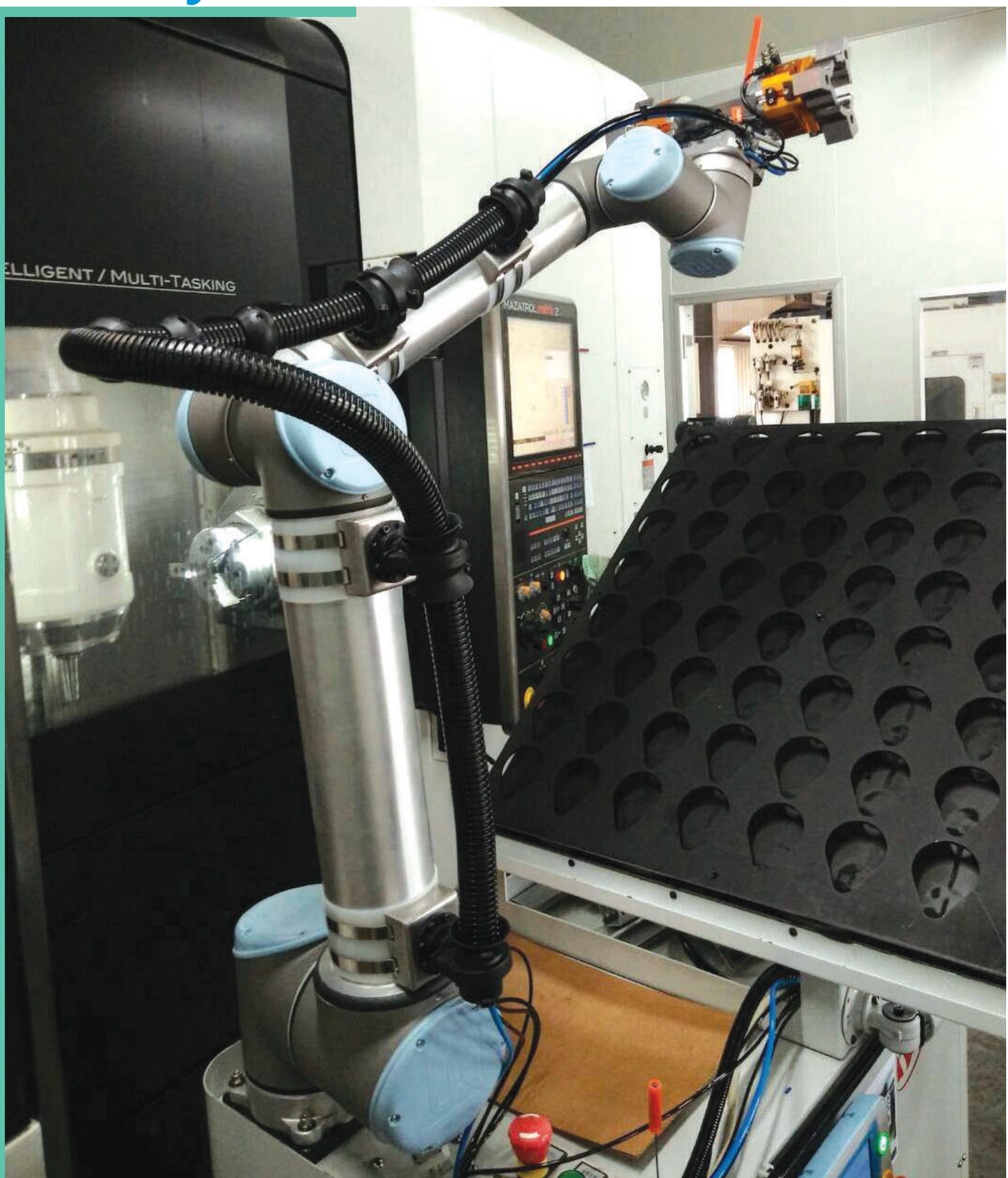
Inner Diameter (in/mm)	Outer Diameter (mm)	min. Burst Pressure (bar)	Bending Radius (mm)	Weight (kg/m)	Packing (m/roll)
3/8" (9.4)	16.0	80	55.3	0.153	50
1/2" (12.8)	19.5	80	68.8	0.230	50

NORFLEX® Ordering

PUR - 9.4 BK : 50M

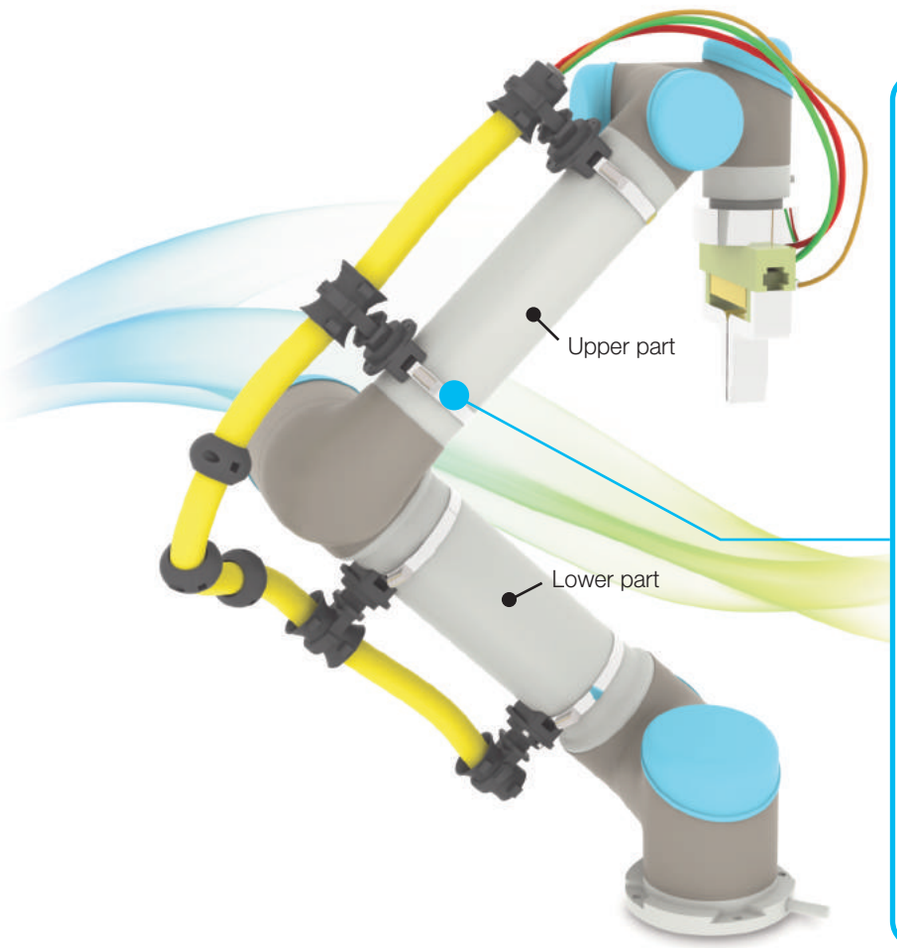
- Norflex®
- Size 9.4 / 12.8
- Color (Refer above PUR color)
- Q'ty(Length)

Roboway® for UR

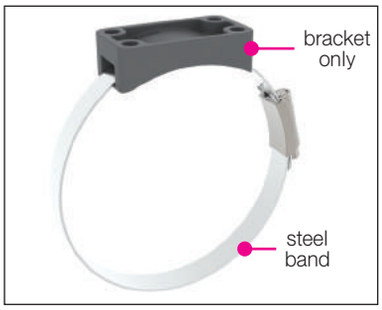


≫ UR.BNAD for UNIVERSAL ROBOT

ROBO-KIT 22/28 can be specially applied to Universal Robot or compact robot to protect outside cables/hoses.



UR.BAND for UNIVERSAL ROBOT



UR.BAND with ROBO-KIT 22/28

≫ UR.BNAD size table only for UNIVERSAL ROBOT

Type	Inner Diameter		Applicable products
● UR5.BAND	Upper part	Ø75	ROBO-KIT 22/28
	Lower part	Ø100	
● UR10.BAND	Upper part	Ø86	
	Lower part	Ø108	

※ UR.BAND consists of brackets and steel band.

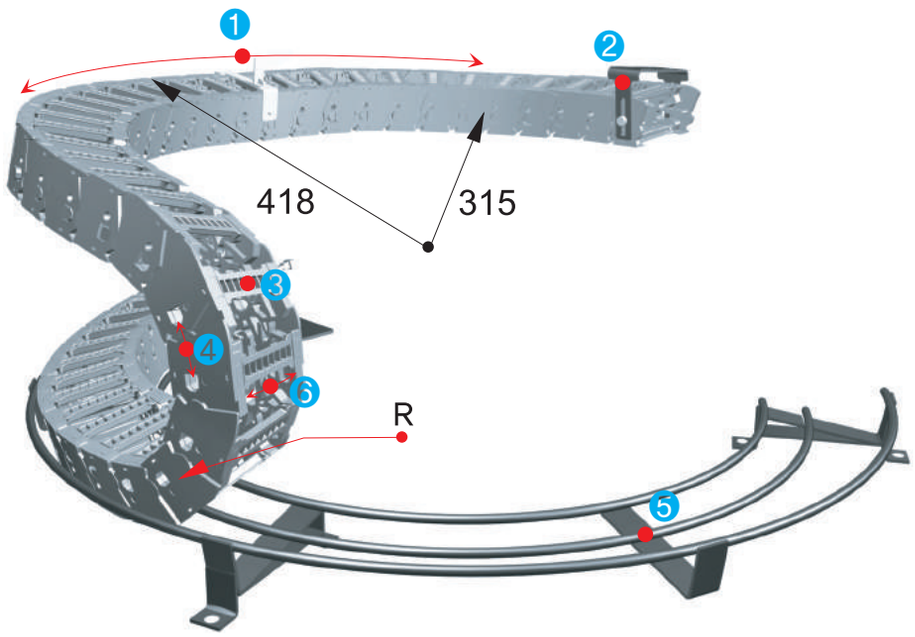
≫ Ordering (ROBO-KIT should be ordered separately.)

UR5.BAND 075 : 2EA

- UR5.BAND — UR. band for UNIVERSAL ROBOT (UR5 / UR10 Bracket and steel band included.)
- 075 — Inner Diameter (Order after check the upper and lower robot body diameter)
- 2EA — Q'ty

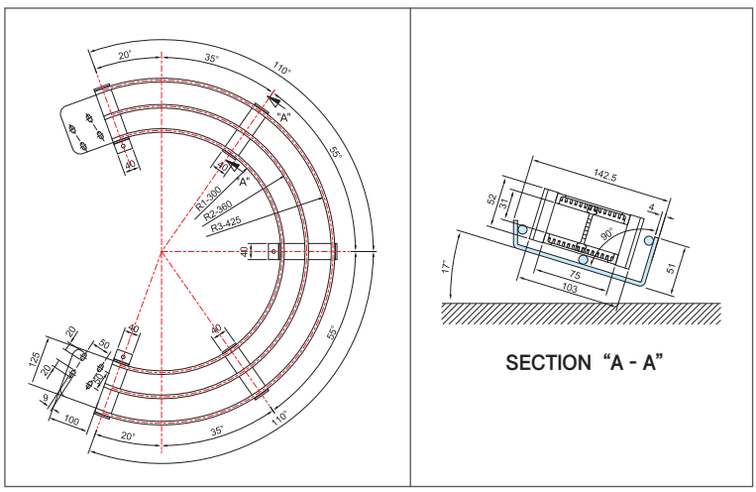
Helix chain is applied to the application with a spiral rotary motion in limited space where 360 degrees robots, roating machines are operated.
It protects cables from external damage and keeps the rotating angles safely.

HX3553



❶ For spiral motion up to 360°
❷ Steel End Bracket
❸ Upside & Downside open frame
❹ Pitch : 53mm
❺ Guide channel
❻ Chain inside width : 75mm

Guide Channel



Bending Radius (R)	
90	140

(Dimensions in mm)

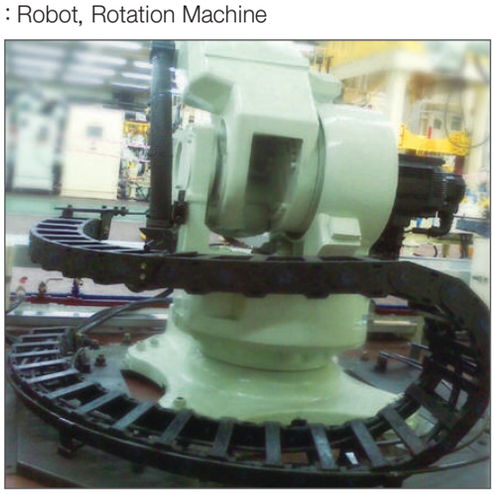
Calculation of required Number of Links

$$N = \left(\frac{\pi \times Or \times B}{360° \times P}\right) + \frac{Lp}{P}$$

N : Number of Links
Or : Outer Radius
B : Rotation angle
P : Chain pitch
Lp : π R+6p

Application

: Robot, Rotation Machine

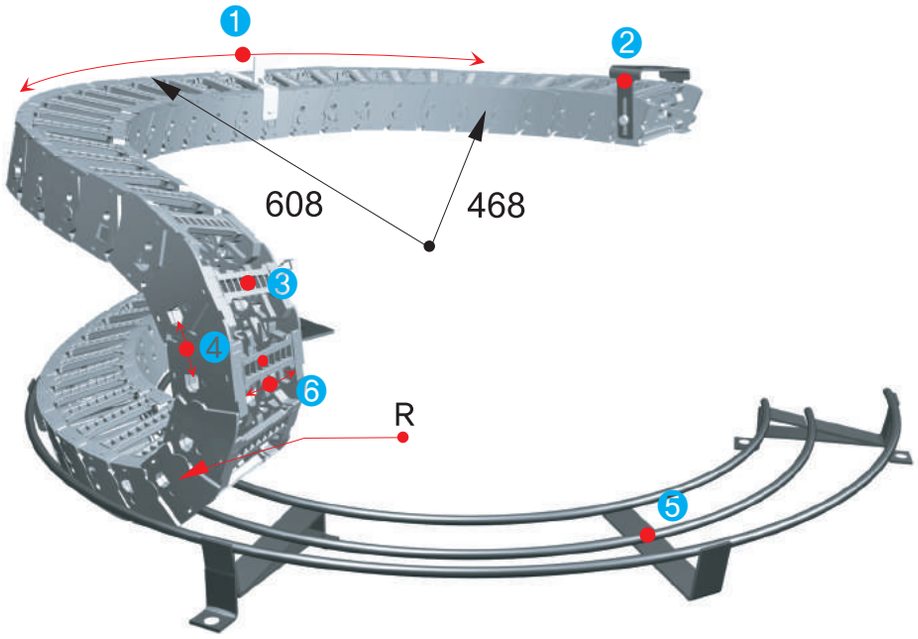


Ordering

HX3553. 075. R90 - 1000L : 10ST

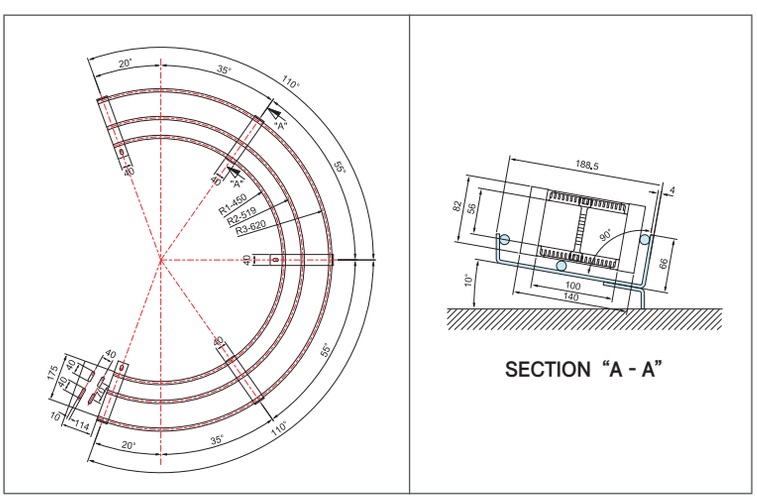
- Helix Chain
- Inside Width
- Bending Radius (R)
- Length(mm)
- Q'ty(set)

HX6075



❶ For spiral motion up to 360°
❷ Steel End Bracket
❸ Upside & Downside open frame
❹ Pitch : 75mm
❺ Guide channel
❻ Chain inside width : 100mm

Guide Channel



Bending Radius (R)			
110	135	185	235

(Dimensions in mm)

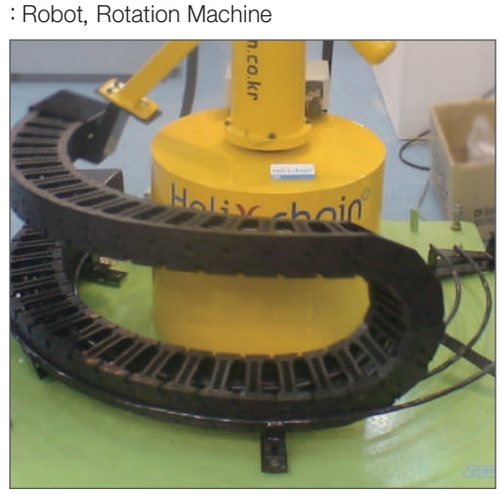
Calculation of required Number of Links

$$N = \left(\frac{\pi \times Or \times B}{360^\circ \times P}\right) + \frac{Lp}{P}$$

N : Number of Links
Or : Outer Radius
B : Rotation angle
P : Chain pitch
Lp : π R+6p

Application

: Robot, Rotation Machine



Ordering

HX6075. 100. R110 - 1000L : 10ST

- Helix Chain
- Inside Width
- Bending Radius (R)
- Length(mm)
- Q'ty(set)

CPSFLEX

≫ Details of CPSFLEX

● *Anyone is able to cut the flexible tube with a cutter easily. Users can save time for installaton.*

● *CPS products have various ranges of flame retardant grade from UL94-HB to Vo.*

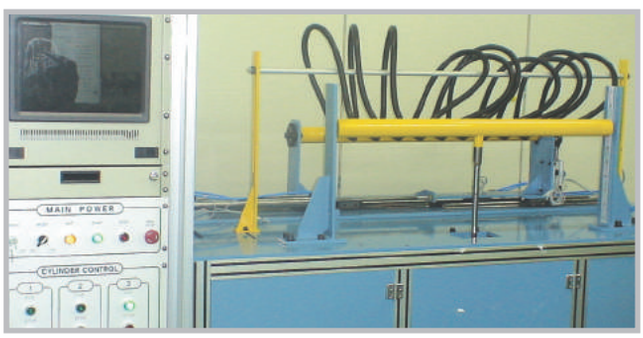
● *RoHS Directive 2002/95/EC*

Raw materials for CPSFLEX are toxic-free, and have passed the test by designated test institute.
In addition, CPS products have been produced according to the directive that Europe regulates.

● *PAH Certificate of Reliability*

The flexible conduit, PAH, was awarded the UL94 certification from Korean Agency after passing reliability test.

Flexibility : angular velocity 5,000 times under ∠40 ± 5°
Tensile Strength : 250N / 30 ± 3 second
Temperature : 4hours under -7 ± 2° 4 hours under / 55 ± 2°
Flammibility : 10 second(UL94)
Durability : 4 million round trip



≫ Ordering

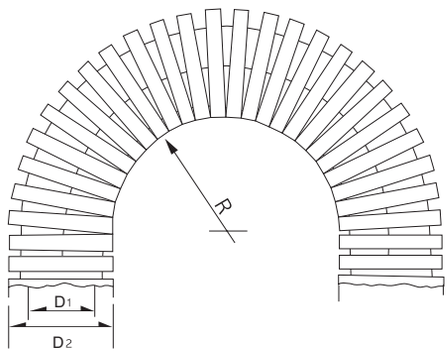
PAH-10B : 100M ▶ Black& Gray are main colors, but it is available to produce light gray color according to customer's request.

- Q'ty (m)
- Color B : Black / G : Gray
  U : U.V Resistant (Black only)
- Size (07, 10, 12, 16, 22, 28, 36, 48, 56, 70, 95)
- Type (CPS / PAH / RAH / POH / PES / PPS / CPSS / PESS / PPSS / PAM / PAR)

>> CPSFLEX Specification

Type	Material	Version	Temperature range	Self-extinguishing UL-94	Resistance	Color	Application
CPS	Polyamide 6	standard version medium-wall, very flexible	-40˚C to +105˚C +130˚C short term	UL94-HB Halogen-Free	alcohol, benzol, greases, mineral oil, diesel fuel, sea water, petrol etc.	Black / Gray UV-resistant	Machine tool, Industrial & Automatic Machinery etc.
PAH	Polyamide 6	standard version medium-wall, very flexible	-40˚C to +105˚C +150˚C short term	UL94-Vo Halogen-Free UL File No.E191879 VDE License No.135369	alcohol, benzol, greases, mineral oil, diesel fuel, sea water, petrol etc.	Black / Gray UV-resistant	Machine tool, industrial & Automatic Machinery, Rolling Stock etc.
RAH	Polyamide 6	standard version medium-wall, very flexible	-40˚C to +105˚C +150˚C short term	UL94-Vo Halogen-Free UL File No.E191879 VDE License No.135369	alcohol, benzol, greases, mineral oil, diesel fuel, sea water, petrol etc.	Black / Gray UV-resistant	Rolling Stock, Machine tool, industrial & Automatic Machinery etc.
POH	Polyamide 6	reinforced version thick-wall, flexible	-40˚C to +105˚C +150˚C short term	UL94-HB Halogen-Free	alcohol, benzol, greases, mineral oil, diesel fuel, sea water, petrol etc.	Black / Gray UV-resistant	Machine tool, Shipbuilding Industrial Machinery, Heavy Industry etc.
PES	Polyethylene	simple version light-weight, flexible	-15˚C to +60˚C +80˚C short term	-	acid, sea water, ammonia etc	Black / Gray	Chemical Machinery, Acid areas, Industrial Machinery etc.
PPS	Polypropylene	simple version light-weight, flexible	-15˚C to +60˚C +80˚C short term	-	acid, sea water, ammonia etc	Black / Gray UV-resistant	Chemical Machinery, Acid areas, Industrial Machinery etc.
CPSS	Polyamide 6	standard version medium-wall, very flexible	-40˚C to +105˚C +130˚C short term	UL94-HB Halogen-Free	alcohol, benzol, greases, mineral oil, diesel fuel, sea water, petrol etc.	Black / Gray	Machine tool, Industrial & Automatic Machinery etc.
PESS	Polyethylene	simple version light-weight, flexible	-15˚C to +60˚C +80˚C short term	-	acid, sea water, ammonia etc	Black / Gray	Chemical Machinery, Acid areas, Industrial Machinery etc.
PAM	Polyamide 11/12	medium -wall very flexible to highly flexible	-50˚C to +95˚C +150˚C short term	UL94-V2 Halogen-Free	alcohol, benzol, mineral oil, diesel fuel, etc	Black / Yellow, UV-resistant (Only black)	Robots
PAR	Polyamide 12	medium -wall very flexible to highly flexible	-50˚C to +95˚C +150˚C short term	UL94-V2 Halogen-Free	alcohol, benzol, mineral oil, diesel fuel, etc	Black / Yellow, UV-resistant (Only black)	Robots

CPS



- Material : High Quality Polyamide 6
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68 acc. EN 60529
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +130℃
- Self-Extinguishing : UL94-HB, Halogen-Free
- Color : Black & Gray, Light gray (MOQ:100rolls)
- Connections : CPSFIX
- Application : Machine tool, Shipbuilding, Tramway Industrial / Automatic Machinery Printing Machine etc.

≫ Product size

Black	Gray	UV-R	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ± 10%	Packing meter / roll
CPS-07B	CPS-07G	CPS-07U	6.4	10.0	15	50/100
CPS-10B	CPS-10G	CPS-10U	9.6	13.0	20	50
CPS-12B	CPS-12G	CPS-12U	11.8	15.8	30	50
CPS-16B	CPS-16G	CPS-16U	15.9	21.2	40	50
CPS-22B	CPS-22G	CPS-22U	21.7	28.5	45	50
CPS-28B	CPS-28G	CPS-28U	27.8	34.5	55	50
CPS-36B	CPS-36G	CPS-36U	36.0	42.5	60	30
CPS-48B	CPS-48G	CPS-48U	46.5	54.5	70	30
CPS-56B	CPS-56G	CPS-56U	56.3	67.2	110	30
CPS-70B	CPS-70G	CPS-70U	70.0	82.5	160	10
CPS-95B	CPS-95G	CPS-95U	91.5	106.0	210	10

(Dimensions in mm)

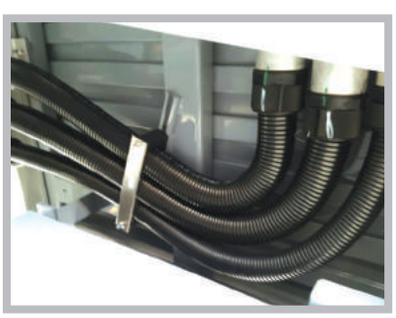
CPSFLEX

NEW

Specially corrugated tube for Railway!

- EN45545-2(HL3)

Applied to train in Korea.

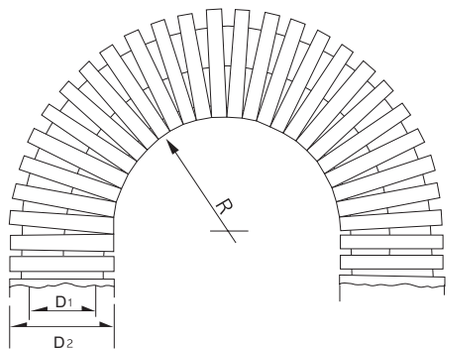


NEW

RAH

EN45545-2(HL3)

Black
Gray



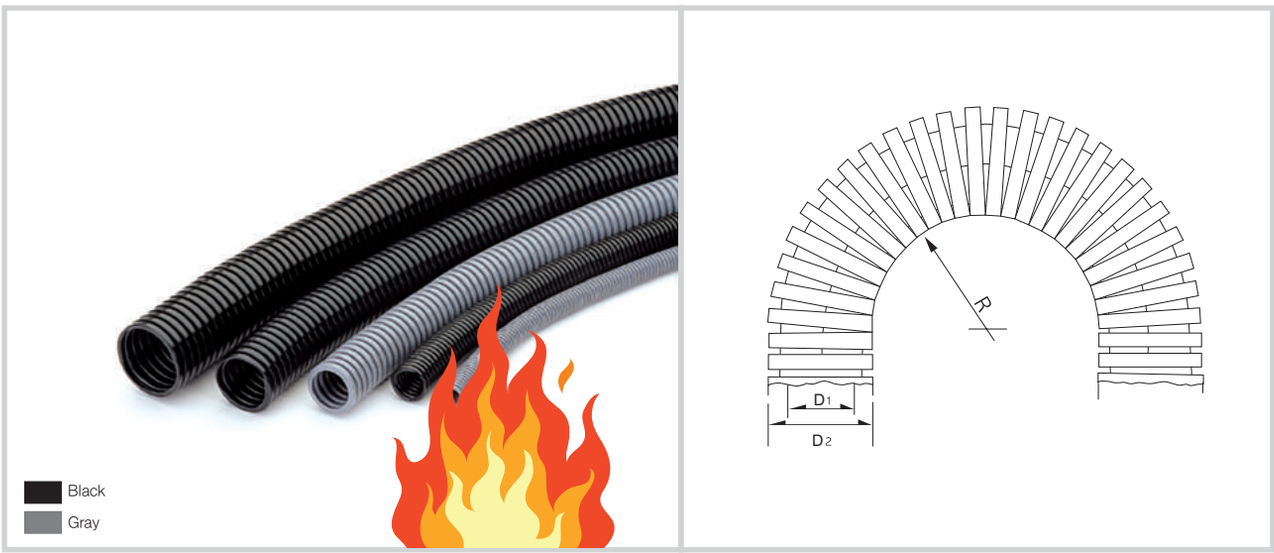
- Material : High Quality Polyamide 6
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68 acc. EN 60529
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150℃
- Self-Extinguishing : UL94-Vo, Halogen-Free
- Color : Black & Gray, Light gray (MOQ:100rolls)
- Connections : CPSFIX
- Application : Machine tool, Shipbuilding, Tramway Industrial, Automatic Machinery, Printing Machine, Rolling Stock, Railway, Subway etc.

≫ Product size

Black	Gray	UV-R	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ± 10%	Packing meter / roll
RAH-07B	RAH-07G	RAH-07U	6.4	10.0	15.0	50/100
RAH-10B	RAH-10G	RAH-10U	9.6	13.0	20.0	50
RAH-12B	RAH-12G	RAH-12U	11.8	15.8	30.0	50
RAH-16B	RAH-16G	RAH-16U	15.9	21.2	40.0	50
RAH-22B	RAH-22G	RAH-22U	21.7	28.5	45.0	50
RAH-28B	RAH-28G	RAH-28U	27.8	34.5	55.0	50
RAH-36B	RAH-36G	RAH-36U	36.0	42.5	60.0	30
RAH-48B	RAH-48G	RAH-48U	46.5	54.5	70.0	30
RAH-56B	RAH-56G	RAH-56U	56.3	67.2	110.0	30
RAH-70B	RAH-70G	RAH-70U	70.0	82.5	160.0	10
RAH-95B	RAH-95G	RAH-95U	91.5	106.0	210.0	10

(Dimensions in mm)

PAH



- Material : High Quality Polyamide 6
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68 acc. EN 60529
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150℃
- Self-Extinguishing : UL94-Vo, Halogen-Free
- Color : Black & Gray, Light gray (MOQ:100rolls)
- Connections : CPSFIX
- Application : Machine tool, Shipbuilding, Tramway Industrial, Automatic Machinery, Printing Machine, Rolling Stock, Railway, Subway etc.
- International Specification :

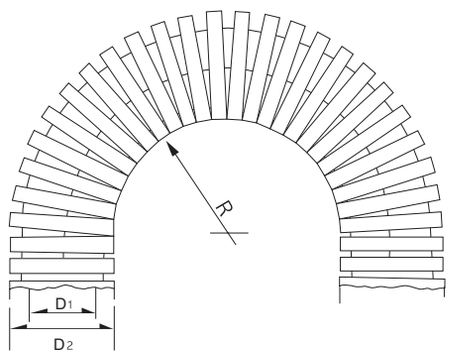
≫ Product size

Black	Gray	UV-R	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ± 10%	Packing meter / roll
PAH-07B	PAH-07G	PAH-07U	6.4	10.0	15	50/100
PAH-10B	PAH-10G	PAH-10U	9.6	13.0	20	50
PAH-12B	PAH-12G	PAH-12U	11.8	15.8	30	50
PAH-16B	PAH-16G	PAH-16U	15.9	21.2	40	50
PAH-22B	PAH-22G	PAH-22U	21.7	28.5	45	50
PAH-28B	PAH-28G	PAH-28U	27.8	34.5	55	50
PAH-36B	PAH-36G	PAH-36U	36.0	42.5	60	30
PAH-48B	PAH-48G	PAH-48U	46.5	54.5	70	30
PAH-56B	PAH-56G	PAH-56U	56.3	67.2	110	30
PAH-70B	PAH-70G	PAH-70U	70.0	82.5	160	10
PAH-95B	PAH-95G	PAH-95U	91.5	106.0	210	10

(Dimensions in mm)

※ Available in Light Gray production.

POH



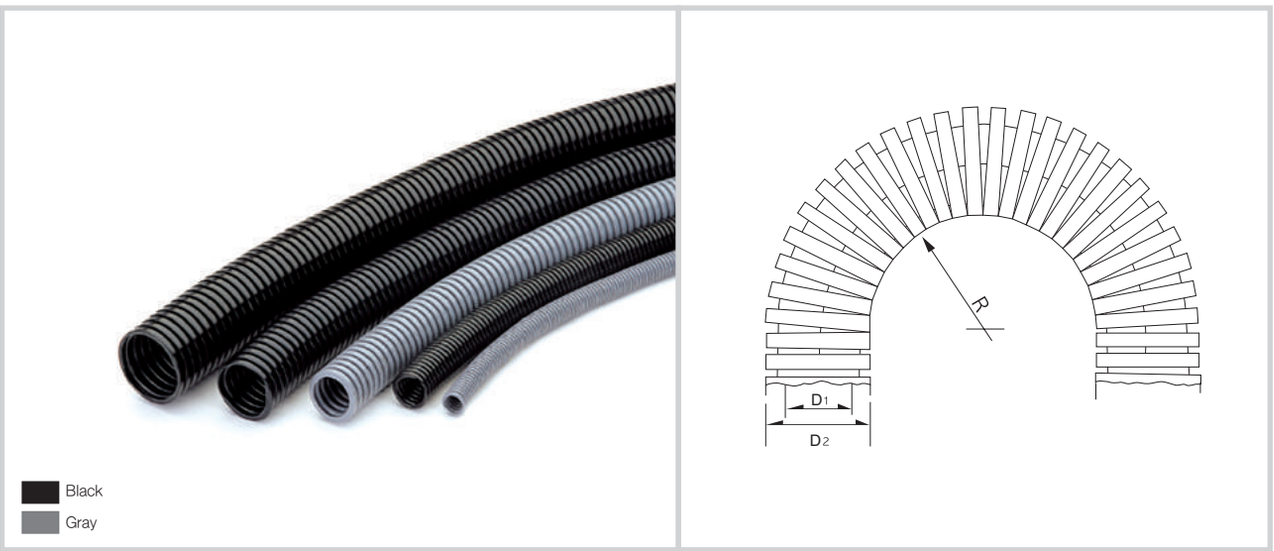
- Material : High Quality Polyamide 6
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68 acc. EN 60529
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150℃
- Self-Extinguishing : UL94-HB, Halogen-Free
- Color : Black & Gray
- Connections : CPSFIX
- Application : Machine tool, Plant Construction Crane and Heavy Machinery etc.

≫ Product size

Black	Gray	UV-R	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm±10%	Packing meter / roll
POH-07B	POH-07G	POH-07U	6.0	10.0	20	50/100
POH-10B	POH-10G	POH-10U	9.0	13.0	25	50
POH-12B	POH-12G	POH-12U	11.5	15.8	35	50
POH-16B	POH-16G	POH-16U	15.5	21.2	45	50
POH-22B	POH-22G	POH-22U	21.3	28.5	50	50
POH-28B	POH-28G	POH-28U	26.8	34.5	60	50
POH-36B	POH-36G	POH-36U	35.2	42.5	70	30
POH-48B	POH-48G	POH-48U	46.0	54.5	80	30
POH-56B	POH-56G	POH-56U	55.3	67.2	110	30
POH-70B	POH-70G	POH-70U	69.0	82.5	160	10
POH-95B	POH-95G	POH-95U	91.5	106.0	210	10

(Dimensions in mm)

PES



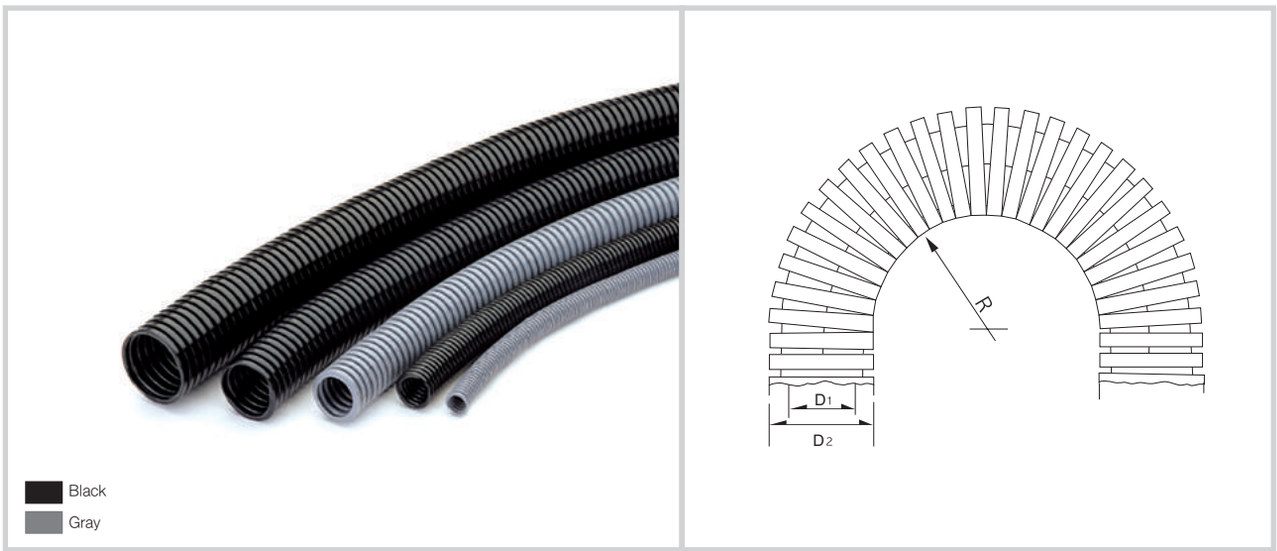
- Material : Soft Polyethylene (PE)
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68
- The max. Instantaneous Temperature : -15℃ to +60℃
- Short Term : up to +80℃
- Color : Black & Gray
- Resistant to : Acid, Alkali
- Application : Machine tool, Plant Construction Crane and Heavy Machinery etc.

≫ Product size

Black	Gray	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ±10%	Packing meter / roll
PES-07B	PES-07G	6.4	10.0	15	50/100
PES-10B	PES-10G	9.6	13.0	20	50
PES-12B	PES-12G	11.8	15.8	30	50
PES-16B	PES-16G	15.9	21.2	40	50
PES-22B	PES-22G	21.7	28.5	45	50
PES-28B	PES-28G	27.8	34.5	55	50
PES-36B	PES-36G	36.0	42.5	60	30
PES-48B	PES-48G	46.5	54.5	70	30
PES-56B	PES-56G	56.3	67.2	110	30
PES-70B	PES-70G	70.0	82.5	160	10
PES-95B	PES-95G	91.5	106.0	210	10

(Dimensions in mm)

PPS



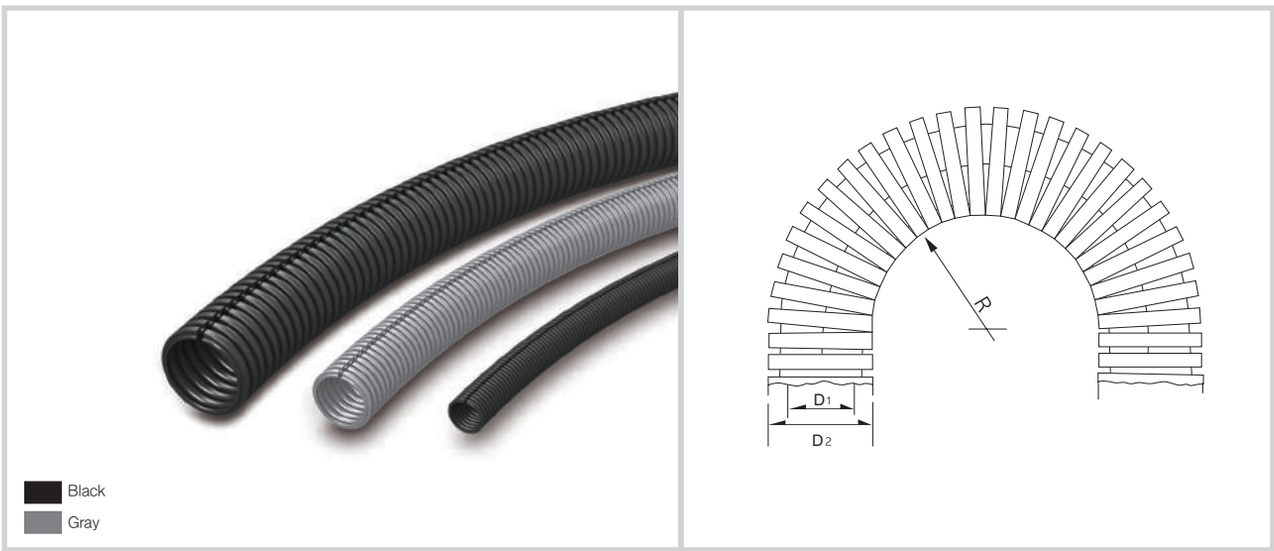
- Material : Polypropylene (PP)
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68
- The max. Instantaneous Temperature : -15℃ to +60℃
- Short Term : up to +80℃
- Color : Black & Gray
- Connections : CPSFIX
- Resistant to : Acid, Alkali
- Application : Machine tool, Industrial Machinery, Chemical Machinery etc.

≫ Product size

Black	Gray	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ±10%	Packing meter / roll
PPS-07B	PPS-07G	6.4	10.0	15	50/100
PPS-10B	PPS-10G	9.6	13.0	20	50
PPS-12B	PPS-12G	11.8	15.8	30	50
PPS-16B	PPS-16G	15.9	21.2	40	50
PPS-22B	PPS-22G	21.7	28.5	45	50
PPS-28B	PPS-28G	27.8	34.5	55	50
PPS-36B	PPS-36G	36.0	42.5	60	30
PPS-48B	PPS-48G	46.5	54.5	70	30
PPS-56B	PPS-56G	56.3	67.2	110	30
PPS-70B	PPS-70G	70.0	82.5	160	10
PPS-95B	PPS-95G	91.5	106.0	210	10

(Dimensions in mm)

CPSS



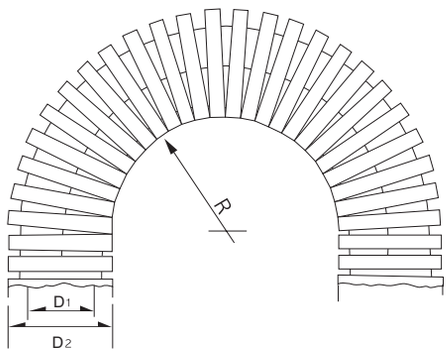
- Material : High Quality Polyamide 6
- Construction : Inside & Outside Corrugated Plastic Hose
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +130℃
- Self-Extinguishing : UL94-HB, Halogen-Free
- Color : Black & Gray, Light gray (MOQ:100rolls)
- Connections : CPSFIX
- Application : Machine tool, Shipbuilding, Tramway Industrial, Automatic Machinery Printing Machinery etc.

≫ Product size

Black	Gray	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ±10%	Packing meter / roll
CPSS-07B	CPSS-07G	6.4	10.0	15	50/100
CPSS-10B	CPSS-10G	9.6	13.0	20	50
CPSS-12B	CPSS-12G	11.8	15.8	30	50
CPSS-16B	CPSS-16G	15.9	21.2	40	50
CPSS-22B	CPSS-22G	21.7	28.5	45	50
CPSS-28B	CPSS-28G	27.8	34.5	55	50
CPSS-36B	CPSS-36G	36.0	42.5	60	30
CPSS-48B	CPSS-48G	46.5	54.5	70	30
CPSS-56B	CPSS-56G	56.3	67.2	110	30
CPSS-70B	CPSS-70G	70.0	82.5	160	10
CPSS-95B	CPSS-95G	91.5	106.0	210	10

(Dimensions in mm)

PESS



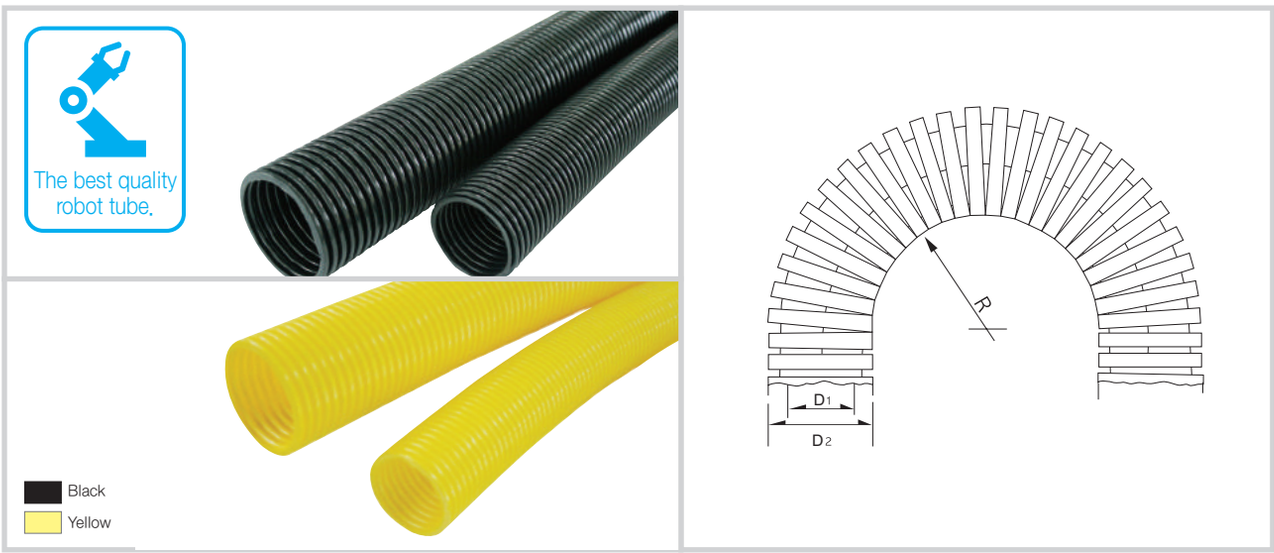
- Material : Soft Polyethylene (PE)
- Construction : Inside & Outside Corrugated Plastic Hose
- The max. Instantaneous Temperature : -15℃ to +60℃
- Short Term : up to +80℃
- Color : Black & Gray
- Resistant to : Acid, Alkali
- Application : Machine tool, Plant Construction Crane and Heavy Machinery etc.

≫ Product size

Black	Gray	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ±10%	Packing meter / roll
PESS-07B	PESS-07G	6.4	10.0	15	50/100
PESS-10B	PESS-10G	9.6	13.0	20	50
PESS-12B	PESS-12G	11.8	15.8	30	50
PESS-16B	PESS-16G	15.9	21.2	40	50
PESS-22B	PESS-22G	21.7	28.5	45	50
PESS-28B	PESS-28G	27.8	34.5	55	50
PESS-36B	PESS-36G	36.0	42.5	60	30
PESS-48B	PESS-48G	46.5	54.5	70	30
PESS-56B	PESS-56G	56.3	67.2	110	30
PESS-70B	PESS-70G	70.0	82.5	160	10
PESS-95B	PESS-95G	91.5	106.0	210	10

(Dimensions in mm)

PAM



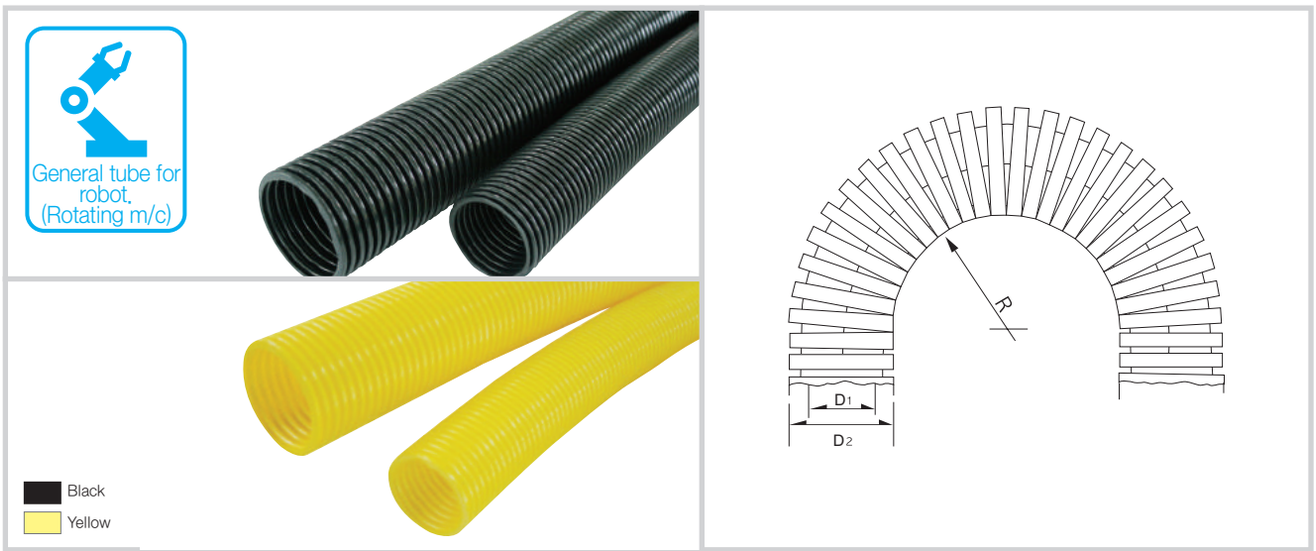
- Material : High Quality Polyamide 11/12
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68
- The max. Instantaneous Temperature : -50℃ to +95℃
- Short Term : up to +150℃
- Self-Extinguishing : UL94-V2, Halogen-Free
- Color : Black & Yellow
- Connections : CPSFIX
- Application : Robots (Welding robot)

≫ Product size

Black	Yellow	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ±10%	Packing meter / roll
PAM-07B	PAM-07Y	6.4	10.0	15	50/100
PAM-10B	PAM-10Y	9.6	13.0	20	50
PAM-12B	PAM-12Y	11.8	15.8	30	50
PAM-16B	PAM-16Y	15.9	21.2	40	50
PAM-22B	PAM-22Y	21.7	28.5	45	50
PAM-28B	PAM-28Y	27.8	34.5	55	50
PAM-36B	PAM-36Y	36.0	42.5	60	30
PAM-48B	PAM-48Y	46.5	54.5	70	30
PAM-56B	PAM-56Y	56.3	67.2	110	30
PAM-70B	PAM-70Y	70.0	82.5	160	10
PAM-95B	PAM-95Y	91.5	106.0	210	10

(Dimensions in mm)

PAR



- Material : High Quality Polyamide 12
- Construction : Inside & Outside Corrugated Plastic Hose
- Degrees of Protection : IP 68
- The max. Instantaneous Temperature : -50℃ to +95℃
- Short Term : up to +150℃
- Self-Extinguishing : UL94-V2, Halogen-Free
- Color : Black & Yellow
- Connections : CPSFIX
- Application : Robots (Heandling robot, Rotating machinery)

≫ Product size

Black	Yellow	UV-R (Only black)	Inner Diameter (D1)	Outer Diameter (D2)	Bending Radius(R) mm ±10%	Packing meter / roll
PAR-07B	PAR-07Y	PAR-07U	6.4	10.0	15	50/100
PAR-10B	PAR-10Y	PAR-10U	9.6	13.0	20	50
PAR-12B	PAR-12Y	PAR-12U	11.8	15.8	30	50
PAR-16B	PAR-16Y	PAR-16U	15.9	21.2	40	50
PAR-22B	PAR-22Y	PAR-22U	21.7	28.5	45	50
PAR-28B	PAR-28Y	PAR-28U	27.8	34.5	55	50
PAR-36B	PAR-36Y	PAR-36U	36.0	42.5	60	30
PAR-48B	PAR-48Y	PAR-48U	46.5	54.5	70	30
PAR-56B	PAR-56Y	PAR-56U	56.3	67.2	110	30
PAR-70B	PAR-70Y	PAR-70U	70.0	82.5	160	10
PAR-95B	PAR-95Y	PAR-95U	91.5	106.0	210	10

(Dimensions in mm)

CPSFLEX - CPS,PAH,PAR,PES Type - Impact

Test Report

CPS-T-160225-001

Issued Date : 2016. 2. 25

CP SYSTEM CO,.LTD
#27-37, Jeonggwansanggok 1-gil,
Jeonggwan-myeon, Gijang-gun, Busan,
Korea

Test No.	: CPS-T-160225-001
Document No.	: R51-160225-5-01
Description	: Impact Test
Sample Items	: CPSFLEX - CPS,PAH,PAR,PES Type
Test organized by	: CP SYSTEM CO,.LTD, Q.C Department
Person in charge	: Min-Uk, Shin
Test Period	: 2016. 2. 25

CPS-T-160225-001

CPSFLEX - CPS,PAH,PAR,PES Type - Impact Test

Content

1. Information of Test Equipment
2. Information of Sample
3. Test Method
4. Test Environment
5. Test Result

품질보증팀 CPS SYSTEM CO., LTD.

(Legally binding signature of the issuer)

CPSFLEX - CPS,PAH,PAR,PES Type - Impact

Test Report CPS-T-160225-001 Issued Date : 2016. 2. 25

1. Information of Test Equipment

· The name of equipmer : Impact test equipment
· Equiptment No. : G1504-01
· Items tested : IZOD & CHARPY Impact test equipment
· On testing

Method	Specification
Pendulum	60kgf
Distance of Striking Center	300mm
Velocity of Striking	3.5m / sec
Angle of Hammer	130°

FIG 1. Impact test equipment

2. Information of Sample

· Sample 1 CPSFLEX - CPS impact specimen : 4EA
· Sample 2 CPSFLEX - PAH impact specimen : 4EA
· Sample 3 CPSFLEX - PAR impact specimen : 4EA
· Sample 4 CPSFLEX - PES impact specimen : 4EA

FIG 2. impact specimen

CPS

Test Report CPS-T-160225-001 Issued Date : 2016. 2. 25

3. Test Method

· Test 1. Measure impact values of spcimens on impact

※ This test is non-standard and random

FIG 3. TEST 1.

4. Test Environment

· Temparature : 21°C
· Humidity : 35%

CPSFLEX - CPS,PAH,PAR,PES Type - Impact

Test Report CPS-T-160225-001 Issued Date : 2016. 2. 25

5. Test Results

Specimen Item	Standard (Based on 2014 catalog)	Impact Strength	Note
CPSFLEX - CPS Type	20 kgf-cm/cm	61.03 kgf-cm/cm	-
		67.78 kgf-cm/cm	
		64.60 kgf-cm/cm	
		70.77 kgf-cm/cm	
CPSFLEX - PAH Type	25 kgf-cm/cm	15.43 kgf-cm/cm	NG
		12.37 kgf-cm/cm	
		16.12 kgf-cm/cm	
		13.55 kgf-cm/cm	
CPSFLEX - PAR Type	15 kgf-cm/cm	58.26 kgf-cm/cm	-
		43.43 kgf-cm/cm	
		46.52 kgf-cm/cm	
		28.21 kgf-cm/cm	
CPSFLEX - PES Type	15 kgf-cm/cm	62.81 kgf-cm/cm	-
		59.05 kgf-cm/cm	
		56.49 kgf-cm/cm	
		57.67 kgf-cm/cm	

FIG 4. CPS Type Impact Test Result

CPSFLEX - CPS,PAH,PAR,PES Type - Impact

CPS

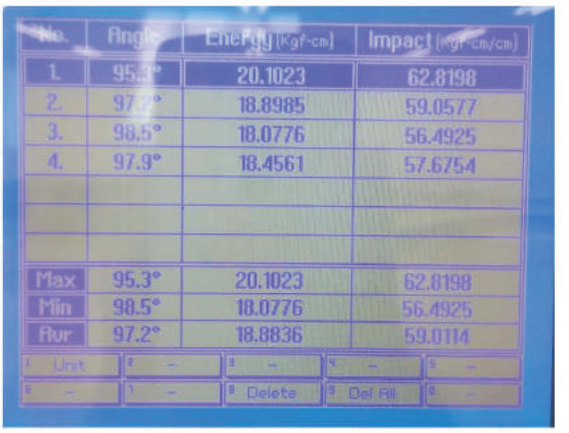
Test Report CPS-T-160225-001 Issued Date : 2016. 2. 25

No.	Angle	Energy (Kgf-cm)	Impact (Kgf-cm/cm)
1.	120.5°	4.9396	15.4362
2.	122.3°	3.9603	12.3759
3.	120.1°	5.1597	16.1241
4.	121.6°	4.3389	13.5590
Max	120.1°	5.1597	16.1241
Min	122.3°	3.9603	12.3759
Avr	121.1°	4.5996	14.3738

→ FIG 5. PAH Type Impact Test Result

No.	Angle	Energy (Kgf-cm)	Impact (Kgf-cm/cm)
1.	97.6°	18.6456	58.2676
2.	105.2°	13.9002	43.4382
3.	103.6°	14.8880	46.5251
4.	113.3°	9.0298	28.2181
Max	97.6°	18.6456	58.2676
Min	113.3°	9.0298	28.2181
Avr	104.9°	14.1159	44.1122

→ FIG 6. PAR Type Impact Test Result



No.	Angle	Energy (Kgf-cm)	Impact (Kgf-cm/cm)
1.	95.3°	20.1023	62.8198
2.	97.2°	18.8985	59.0577
3.	98.5°	18.0776	56.4925
4.	97.9°	18.4561	57.6754
Max	95.3°	20.1023	62.8198
Min	98.5°	18.0776	56.4925
Avr	97.2°	18.8836	59.0114

→ FIG 7. PES Type Impact Test Result

CPSFLEX -OIL-RESIST TEST Report

Issued Date : 2016. 11.23

CP SYSTEM CO,.LTD
#27-37, Jeonggwansanggok 1-gil,
Jeonggwan-myeon, Gijang-gun, Busan,
Korea

Sample Name : CPSFLEX - tube
Department : CP SYSTEM CO,.LTD, Q.C Department
Person in charge : Sung-In Lee (General Manager)
Test Period : 1 Jun, 2016 ~

REPORT OF OIL-RESIST TEST PROCESS and INTERMEDIATE INSPECTION for CPSFLEX

CONTENTS

1. Test Description
2. Sample Details
3. Test Method
4. Test Result

품질보증팀 CPS SYSTEM CO., LTD.

(Legally binding signature of the issuer)

CPSFLEX -OIL-RESIST TEST Report

Issued Date : 2016. 11.23

1. Test Description

· Subject : CPSFLEX (CPS - CPSU - PAH - PAR - PES)

· Test Details : Soak cut tube into listed oil below.

· List of Oils

Category	Names of Goods	Characteristic
Cutting Oil	BW CUT LU-209	for cutting process
Inhibited Oil	BW RUSTOP P-DBH	for rust preventative
CI-Free Cold Forging Oil	Tectyl form cf350	for punching press work
Hydraulic Oil	KIxx RD HD 46	for lubricants, hydraulic fluid

2. Sample Details

· SAMPLE CPSFLEX - 5 different tubes + 3 different sizes of each tube(Total 8 categories), 4 types of oil

FIG 1. Samples for Oil-resist Test

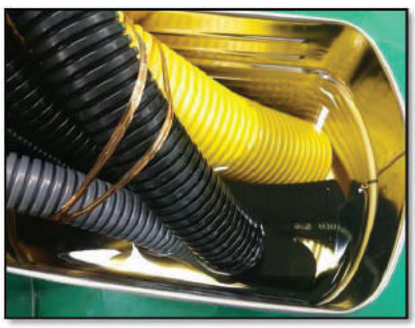
CPSFLEX -OIL-RESIST TEST Report

Issued Date : 2016. 11.23

3. Test Method

· 시험 1. Before the test, record the name and lot number of sample tube, examine its appearance first.
2. Prepare the tube sample which has been cut over 300mm length, and soak it into 4 litres of listed oils.
3. This test should be done indoors, observing the change of its shape every three month.
※ Intermediate inspection is held every three month
4. Make an annual test report, conduct Reliability Test regularly.

※ Non-Standard Condition Test



TEST FIG 3. 1.

TEST FIG 3. 1. Test conducted by oils

4. Test Result

· Experiment start date / 01 Jun, 2016
· Intermediate inspection (05 Sep, 2016)
=>The oil-resist result for (CPS - CPSU - PAH - PAR - PES)
> had found no change in shape and figuration > Conduct regular Reliability Test

PAR-56B Reliability Test

Test Report

CPS-T-160701-001

Issued Date : 2016. 07. 01

CP SYSTEM CO,.LTD
#27-37, Jeonggwansanggok 1-gil,
Jeonggwan-eup, Gijang-gun, Busan,
Korea

Test No : CPS-T-160701-001

Sample Name : CPSYSTEM, PAR 56B - test

Test organized by	: CP SYSTEM CO,.LTD, Q.C Department
rson in charge	: Min wook, Shin
Test Period	: 2015. 11. 30~2016.07.01

Contents

1. TEST EQUIPMENT
2. SAMPLE
3. TEST METHOD
4. TEST RESULTS
5. Photograph

(Legally binding signature of the issuer)

PAR-56B Reliability Test

Test No : CPS-T-160701-001

Sample Name : CPSYSTEM, PAR 56B – test

1. TEST EQUIPMENT

1) The name of test equipment : Reciprocating test equipment for tubes

→ Tubes reciprocate 600mm , (30times / min)

2. SAMPLE

1) PAR-56B Tube

2) Inner diameter of tube : 56mm

3) Raw material of tube : Polyamide 12

3. TEST METHOD

1) Insert 3pcs of 24mm cables and 1 pcs of 19mm into PAR-56B tube

2) 230 of banding radius which is the 10 times of inserted 24mm cable has been applied. (R= 230)

3) The target number of reciprocating test : 7 million times

(999,999 times × 7 tiems)

4) Quality of surface of tubes is checked during test.

→ Refer to photograph and test record

4. TEST RESULT

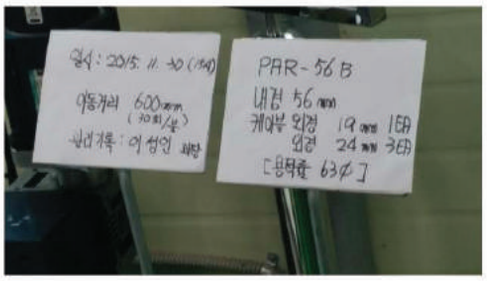
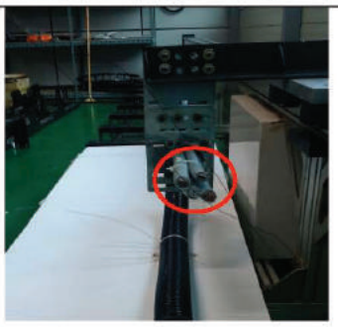
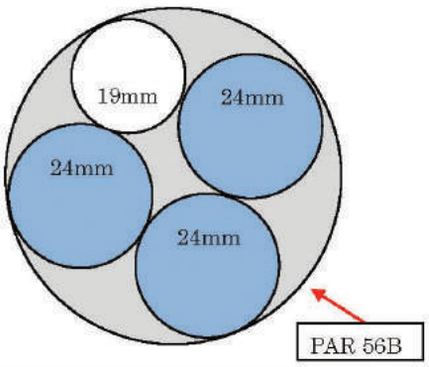
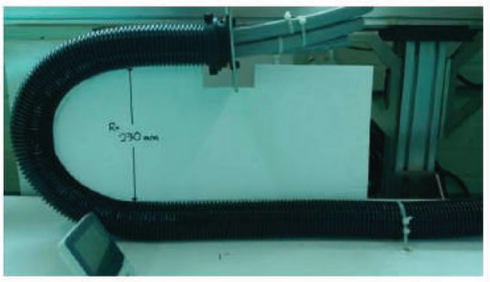
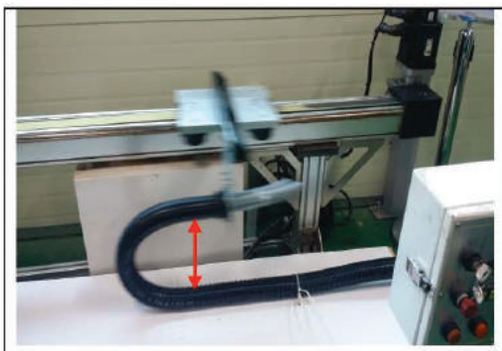
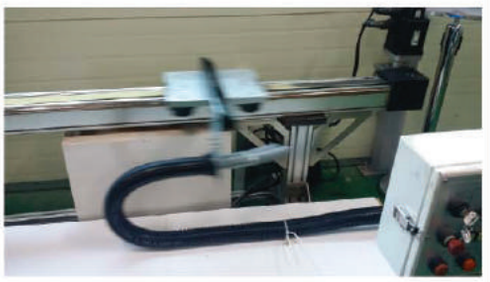
1) 2016.07.01, Completed tested **7,188,392 times**.

2) There's no damage or crack of product

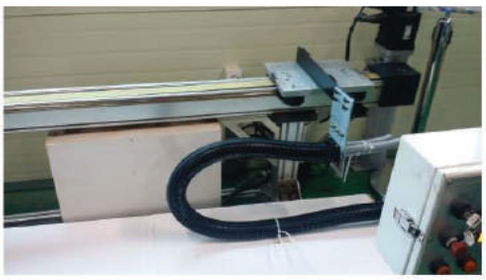
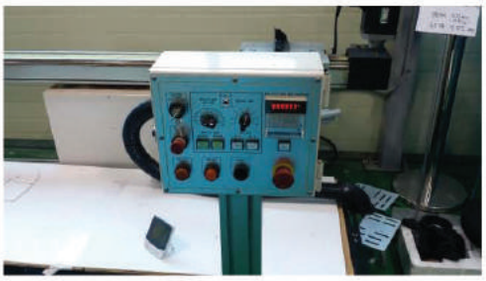
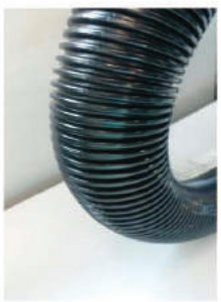
3) The condition of both inside and outside of tube has no problem.

PAR-56B Reliability Test

Photograph (PAR 56B 신뢰성 테스트 진행 Inspection Date: 2016. 07.01)

	
Machinery Stroke 600mm(30times/min)	Cables inserted: 19mm(1ea), 24mm(3ea)
	
Inserted condition in PAR-56B	Apply bending radius of tubes
	
Apply bending radius of 24mm cable 1. Applied less than 10times of the diameter of cable 2. Actual height is under 230mm	Reciprocating test 1.

Photograph (PAR 56B 신뢰성 테스트 진행 Inspection Date: 2016. 07.01)

	
Reciprocating test 2.	Test have been done 0.96million times July 2015. 12.24 (No problem)
	
2016.1.25 DATA (Test have been done 1,999,999times)	2016.2.1 DATA (2,295,645times)
	
Check outside : Good	Check inside : Good

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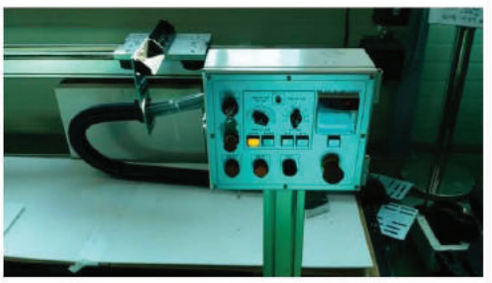
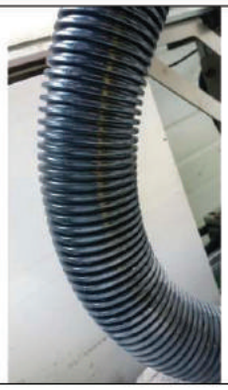
PAR-56B Reliability Test

Photograph (PAR 56B 신뢰성 테스트 진행 Inspection Date: 2016. 07.01)

Test have been done 3 million times July 2016. 02.17 (No problem)	Check inside : Good
	
Check outside : Good	2016. 2.17 DATA (Test have been done 3,000,014times)
Test have been done 4 million times July 2016. 03.17 (No problem)	Check outside/inside : Good

Photograph (PAR 56B 신뢰성 테스트 진행 Inspection Date: 2016. 07.01)

Test have been done 5 million times July 2016. 04.29 (No problem)	Check inside : Good
	
Check outside : Good	2016. 4.29 DATA (Test have been done 5,000,034times)
Test have been done 6 million times July 2016. 05.24 (No problem)	Check inside : Good

PAR-56B Reliability Test

Photograph (PAR 56B 신뢰성 테스트 진행 Inspection Date: 2016. 07.01)

Check outside : Good	2016. 5.24 DATA (Test have been done 6,000,073times)
Test have been done 7 million times July 2016. 06.23 (No problem)	Check inside : Good
Check outside : Good	2016. 6.23 DATA (Test have been done 7,000,025times)

Photograph (PAR 56B 신뢰성 테스트 진행 Inspection Date: 2016. 07.01)

Test have been done 7,188,392 times July 2016. 07.01 (No problem) · Final	Check appearance : Good
Test Completed · 2016. 7.01 DATA (Test have been done 7,188,392times)	

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CPSFIX

1 Easy to assemble and disassemble.

2 Intensified pull-out.

3 Diverse thread available such as G, M, Pg, NPT, UNEF.

CPSFIX Specification

Type	Material	Temperature range	Self-extinguishing	Thread	Tube Size											
					07	10	12	16	22	28	36	42	48	56	70	95
NEW **PNC** IP68 For railroad cars, Male thread, Straight, One touch type ● Black ● Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/4"	●											
				G 1/2"		●	●	●								
				G 3/4"					●							
				G 1"						●						
				G 1 1/4"							●					
				G 1 1/2"									●			
				G 2"									●	●		
				G 2 1/2"											●	
				G 4"												●
				M 12×1.5	●	●	●									
				M 16×1.5	●	●	●	●								
				M 20×1.5	●	●	●	●								
				M 25×1.5				●	●							
				M 32×1.5					●	●						
				M 40×1.5						●	●					
				M 50×1.5							●		●			
				M 63×1.5									●			
				Pg 7	●	●										
				Pg 9	●	●	●									
				Pg 11	●	●	●									
				Pg 13.5	●	●	●	●								
				Pg 16		●	●	●	●							
				Pg 21				●	●							
				Pg 29						●						
				Pg 36							●					
				Pg 48									●			
				NPT 1/2"		●	●	●								
				NPT 3/4"					●							
				NPT 1"						●						
NEW **PWC** IP68 For railroad cars, Male thread, 90° bent, One touch type ● Black ● Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/2"		●	●	●								
				G 3/4"					●							
				G 1"						●						
				G 1 1/4"						●	●					
				G 1 1/2"									●			
				G 2"									●			
				M 12×1.5	●	●										
				M 16×1.5			●									
				M 20×1.5			●	●								
				M 25×1.5					●							
				M 32×1.5						●						
				M 40×1.5							●					
				M 50×1.5									●			
				Pg 7	●											
				Pg 9	●	●										
				Pg 11		●	●									
				Pg 13.5		●	●	●								
				Pg 16			●	●	●							
				Pg 21					●							
				Pg 29						●						
				Pg 36							●					
				Pg 48									●			
NEW **PICC** IP68 For railroad cars, Female thread, Straight, One touch type in which cable gland is inserted ● Black ● Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	1/2-28 UNEF		●										
				5/8-24 UNEF		●	●									
				3/4-20 UNEF		●	●									
				1-20 UNEF			●	●								
				7/8-20 UNEF				●								
				1 3/16-18 UNEF				●	●							
				1 7/16-18 UNEF				●	●	●						
				1 3/4-18 UNEF						●						
				2-18 UNS						●	●					

Type	Material	Temperature range	Self-extinguishing	Thread	Tube Size											
					07	10	12	16	22	28	36	42	48	56	70	95
NEW **PAC** IP68 For railroad cars, Male thread, 45° bent, One touch type ● Black ● Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/2"		●	●	●								
				G 3/4"					●							
				G 1"						●						
				G 1 1/4"							●					
				G 1 1/2"									●			
				G 2"									●			
				M 12×1.5		●										
				M 16×1.5			●									
				M 20×1.5				●								
				M 25×1.5					●							
				M 32×1.5						●						
				M 40×1.5							●					
				M 50×1.5									●			
				Pg 9		●										
				Pg 11		●	●									
				Pg 13.5		●		●								
				Pg 16				●								
				Pg 21					●							
				Pg 29						●						
				Pg 36							●					
				Pg 48									●			
NEW **PIC** IP68 For railroad cars, Female thread, Straight, One touch type ● Black ● Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	1/2-28 UNEF		●										
				5/8-24 UNEF		●	●									
				3/4-20 UNEF		●	●									
				1-20 UNEF			●	●								
				7/8-20 UNEF				●								
				1 3/16 -18 UNEF			●	●	●							
				1 3/8 -8 UNEF				●								
				1 7/16-18 UNEF				●	●	●						
				2-18UNS					●	●	●					
				1 3/4-18UNEF						●						
				M16×1.5			●									
				M25×1.5				●								
				Pg 11			●									
				Pg 13.5			●									
				Pg 16				●								
				Pg 21					●							
NEW **PNCC** IP68 For railroad cars, Male thread, Straight, One touch type in which cable gland is inserted ● Black ● Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/2"		●	●	●	●							
				G 3/4"					●	●						
				G 1"						●						
				G 1 1/4"							●					
				G 2"									●			
				M 12×1.5		●	●									
				M 16×1.5		●	●	●								
				M 20×1.5			●	●	●							
				M 25×1.5					●	●						
				M 32×1.5						●						
				M 40×1.5							●					
				M 50×1.5									●			
				Pg 7		●	●									
				Pg 9		●	●	●								
				Pg 11			●	●	●							
				Pg 13.5			●	●	●							
				Pg 16			●	●	●							
				Pg 21					●	●						
				Pg 29						●						
				Pg 36							●					
				Pg 48									●			
NEW **PNCCL** IP68 For railroad cars, Short male thread, Straight, One touch type in which cable gland is inserted ● Black ● Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/2"		●	●	●								
				Pg 9		●	●									
				Pg 11			●	●								
				Pg 13.5			●	●								
				Pg 16			●	●								
				M 12×1.5		●	●									
				M16×1.5		●	●	●								
				M 20×1.5			●	●								
				M 25×1.5			●									

Type	Material	Temperature range	Self-extinguishing	Thread	Tube Size											
					07	10	12	16	22	28	36	42	48	56	70	95
NEW **PNCL** IP68 For railroad cars, Short male thread, Straight, One touch type Black Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/2"	●	●	●									
				M 12×1.5		●	●									
				M 16×1.5		●	●	●								
				M 20×1.5		●	●	●								
				M 25×1.5				●								
				Pg 9		●	●									
				Pg 11			●									
				Pg 13.5				●								
				Pg 16		●		●								
NEW **PWCL** IP68 For railroad cars, Short male thread, 90°bent, One touch type Black Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/2"	●	●	●	●								
				M 12×1.5		●										
				M 16×1.5			●									
				M 20×1.5			●	●								
				Pg 9		●										
				Pg 11		●	●									
				Pg 13.5		●	●	●								
				Pg 16			●	●								
NEW **PACL** IP68 For railroad cars, Short male thread, 45°bent, One touch type Black Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/2"	●	●	●	●								
				M 12×1.5		●										
				M 16×1.5			●									
				M 20×1.5				●								
				Pg 9		●										
				Pg 11		●	●									
				Pg 13.5		●		●								
				Pg 16				●								
NEW **PIPC** IP68 For railroad cars, Female thread, Straight, One touch type Black Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G 1/2"				●								
				G 3/4"					●							
				G 1"						●						
				G 1 1/4"							●					
				G 1 1/2"									●			
				G 2"									●			
TIS IP67 For detecting sensor, Female, Straight, Transparent one touch type 	Polyacrbonate	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	M 8×1		●										
				M 12×1		●										
				M 18×1		●										
				M 30×1.5		●										
TNRC IP66 Male thread, Straight, For rotating movement Black Gray	Polyamide 6	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	G3/4"					●							
				G1"						●						
				G1 1/4"							●					
				G2"									●			
NEW **SPAC** IP68 For railroad cars, Steel and male thread, 45°bent, One touch type Black Gray	Polyamide 6 + Brass Nickel plated	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	M 12×1.5		●										
				M 16×1.5			●									
				M 20×1.5				●								
				M 25×1.5					●							
				M 32×1.5						●						
				M 40×1.5							●					
				M 50×1.5									●			
				Pg 9		●										
				Pg 11			●									
				Pg 13.5				●								
				Pg 16				●								
				Pg 21					●							
				Pg 29						●						
				Pg 36							●					
				Pg 48									●			

CPSFIX

유 형	재 질	온도 범위	자기소화성	나 사	튜브사이즈 07	10	12	16	22	28	36	42	48	56	70	95
NEW **SPWC** IP68 For railroad cars, Steel and male thread, 90°bent, One touch type Black / Gray	Polyamide 6 + Brass Nickel plated	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	M 12×1.5	●	●										
				M 16×1.5			●									
				M 20×1.5				●								
				M 25×1.5					●							
				M 32×1.5						●						
				M 40×1.5							●					
				M 50×1.5									●			
				Pg 7	●											
				Pg 9		●										
				Pg 11			●									
				Pg 13.5				●								
				Pg 16				●								
				Pg 21					●							
				Pg 29						●						
				Pg 36							●					
				Pg 48									●			
NEW **SPNC** IP68 For railroad cars, Steel and male thread, Straight, One touch type Black / Gray	Polyamide 6 + Brass Nickel plated	-40℃ ~ +105℃ 150℃ Short Term	UL94-HB Free of Halogen Phosphorous and cadmium	M 12×1.5		●										
				M 16×1.5			●									
				M 20×1.5				●								
				M 25×1.5					●							
				M 32×1.5						●						
				M 40×1.5							●					
				M 50×1.5									●			
				Pg 9		●										
				Pg 11			●									
				Pg 13.5			●	●								
				Pg 16				●								
				Pg 21					●							
				Pg 29						●						
				Pg 36							●					
				Pg 48									●			

NEW **PNOC** IP67
For railroad cars, Flange fixed, Straight, One touch type

Black / Gray

Material	Polyamide 6
Temperature range	-40℃ ~ +105℃
Short Term	150℃
Self-extinguishing	UL94-HB Free of Halogen Phosphorous and cadmium

NEW **PWOC** IP67
For railroad cars, Flange fixed, 90°bent, One touch type

Black / Gray

Material	Polyamide 6
Temperature range	-40℃ ~ +105℃
Short Term	150℃
Self-extinguishing	UL94-HB Free of Halogen Phosphorous and cadmium

NEW **PNSC** IP68
For railroad cars, Straight, Both sides connected to tubes

Black / Gray

Material	Polyamide 6
Temperature range	-40℃ ~ +105℃
Short Term	150℃
Self-extinguishing	UL94-HB Free of Halogen Phosphorous and cadmium

FEC IP66

End finishing connector

● Black
● Gray

Material	N.B.R (Nitrile-Butadiene Rubber)
Feature	Tube terminal, assembled by just putting on

TVC IP67

V shape tube separator

● Black
● Gray

Material	Polyamide 6
Feature	CPS distributors guarantee elegant layout and save on cost instead of using distribution boxes. Nominal width from 28, reduceable to 10.

TYC IP67

Y shape tube separator

● Black
● Gray

Material	Polyamide 6
Feature	CPS distributors guarantee elegant layout and save on cost instead of using distribution boxes. Nominal width from 28, reduceable to 10.

TTC IP67

T shape tube separator

● Black
● Gray

Material	Polyamide 6
Feature	CPS distributors guarantee elegant layout and save on cost instead of using distribution boxes. Nominal width from 28, reduceable to 10.

NFH

Flip type connector

● Black
● Gray

Material	Polyamide 6
Temperature range	-40℃ ~ +105℃
Short Term	150℃
Self-extinguishing	UL94-HB Free of Halogen Phosphorous and cadmium

FCG IP68

Male thread, Rubber gland type connector

● Black
● Gray

Material	Polyamide 6
Temperature range	-40℃ ~ +105℃
Short Term	150℃
Self-extinguishing	UL94-HB Free of Halogen Phosphorous and cadmium

FCGL IP68

Short thread FCG connector

● Black
● Gray

Material	Polyamide 6
Temperature range	-40℃ ~ +105℃
Short Term	150℃
Self-extinguishing	UL94-HB Free of Halogen Phosphorous and cadmium

TICG IP68

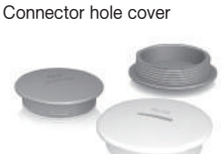
Female thread, rubber gland type connector

● Black
● Gray

Material	Polyamide 6
Temperature range	-40℃ ~ +105℃
Short Term	150℃
Self-extinguishing	UL94-HB Free of Halogen Phosphorous and cadmium

BBS

Connector hole cover



○ White
● Gray

Material	Polyamide 6
Temperature range	-30℃ ~ +80℃
Short Term	150℃

FWH

Rubber washer

Material	Rubber

FLN

Nut

● Black
● Gray

Material	Polyamide 6

SLN

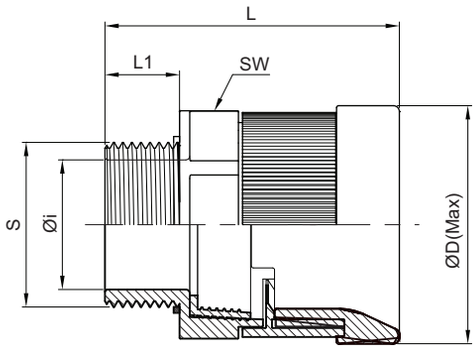
Steel nut

Material	Steel

PNC IP68

EN45545-2(HL3)

Black
Gray



● G(PF) ● M ● Pg ● NPT

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector
- Certification :

≫ Product size

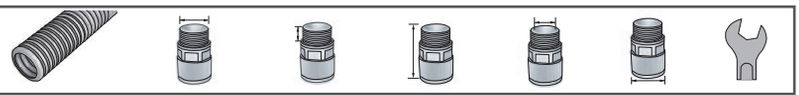
Ordering No.	

PF Thread (JIS B0202)

Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
PNC-G07B	PNC-G07G	G1/4"	07	13.1	11.0	34.0	8.5	25.0	14.0
PNC-G10B	PNC-G10G	G1/2"	10	20.9	13.0	44.2	12.0	25.0	19.7
PNC-G12B	PNC-G12G	G1/2"	12	20.9	13.0	43.1	15.0	27.6	22.8
PNC-G16B	PNC-G16G	G1/2"	16	20.9	13.0	45.0	15.2	33.0	28.0
PNC-G22B	PNC-G22G	G3/4"	22	26.4	15.0	54.7	22.0	43.0	37.5
PNC-G28B	PNC-G28G	G1"	28	33.2	15.0	62.4	27.0	48.8	43.0
PNC-G36B	PNC-G36G	G1 1/4"	36	41.9	19.0	76.6	34.0	60.6	52.2
PNC-G42B	PNC-G42G	G1 1/2"	48	47.8	21.0	81.4	40.8	71.8	64.0
PNC-G48B	PNC-G48G	G2"	48	59.6	21.0	81.4	50.0	71.8	64.0

※ Available in Light Gray production.

(Dimensions in mm)

Ordering No.	

Metric Thread (EN 60423)

(Dimensions in mm)

Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
PNC-M107B	PNC-M107G	M12 X 1.5	07	12.0	11.0	34.0	8.5	25.0	14.0
PNC-M127B	PNC-M127G	M16 X 1.5	07	16.0	11.0	34.0	8.5	25.0	14.0
PNC-M167B	PNC-M167G	M20 X 1.5	07	20.0	11.0	34.0	8.5	25.0	14.0
PNC-M10B	PNC-M10G	M12 X 1.5	10	12.0	13.0	43.5	7.5	25.0	19.7
PNC-M120B	PNC-M120G	M16 X 1.5	10	16.0	13.0	43.5	10.0	25.0	19.7
PNC-M20B	PNC-M20G	M20 X 1.5	10	20.0	13.0	43.5	12.0	25.0	19.7
PNC-M102B	PNC-M102G	M12 X 1.5	12	12.0	13.0	43.1	8.0	27.6	22.8
PNC-M12B	PNC-M12G	M16 X 1.5	12	16.0	13.0	43.1	12.0	27.6	22.8
PNC-M202B	PNC-M202G	M20 X 1.5	12	20.0	13.0	43.1	15.0	27.6	22.8
PNC-M126B	PNC-M126G	M16 X 1.5	16	16.0	13.0	45.0	12.0	33.0	28.0
PNC-M16B	PNC-M16G	M20 X 1.5	16	20.0	13.0	45.0	15.2	33.0	28.0
PNC-M226B	PNC-M226G	M25 X 1.5	16	25.0	13.0	45.0	17.5	33.0	28.0
PNC-M22B	PNC-M22G	M25 X 1.5	22	25.0	15.0	54.7	20.6	43.0	37.5
PNC-M3222B	PNC-M3222G	M32 X 1.5	22	32.0	15.0	54.7	22.0	43.0	37.5
PNC-M28B	PNC-M28G	M32 X 1.5	28	32.0	15.0	62.4	27.0	48.8	43.0
PNC-M4028B	PNC-M4028G	M40 X 1.5	28	40.0	15.0	62.4	30.5	48.8	43.0
PNC-M36B	PNC-M36G	M40 X 1.5	36	40.0	19.0	76.6	34.0	60.6	52.2
PNC-M5036B	PNC-M5036G	M50 X 1.5	36	50.0	19.0	76.6	36.0	60.6	52.2
PNC-M48B	PNC-M48G	M50 X 1.5	48	50.0	21.0	81.4	42.0	71.8	64.0
PNC-M6348B	PNC-M6348G	M63 X 1.5	48	63.0	21.0	81.4	50.0	71.8	64.0

Pg Thread (DIN 40430)

Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
PNC-P077B	PNC-P077G	Pg 07	07	12.5	11.0	34.0	8.5	16.8	14.0
PNC-P097B	PNC-P097G	Pg 09	07	15.2	11.0	34.0	8.5	25.0	14.0
PNC-P117B	PNC-P117G	Pg 11	07	18.6	11.0	34.0	8.5	25.0	14.0
PNC-P137B	PNC-P137G	Pg 13.5	07	20.4	11.0	34.0	8.5	25.0	14.0
PNC-P070B	PNC-P070G	Pg 07	10	12.5	13.0	43.5	8.0	25.0	19.7
PNC-P09B	PNC-P09G	Pg 09	10	15.2	13.0	43.5	10.0	25.0	19.7
PNC-P110B	PNC-P110G	Pg 11	10	18.6	13.0	43.5	12.0	25.0	19.7
PNC-P130B	PNC-P130G	Pg 13.5	10	20.4	13.0	43.5	12.0	25.0	19.7
PNC-P160B	PNC-P160G	Pg 16	10	22.5	13.0	43.5	12.0	25.0	19.7
PNC-P0912B	PNC-P0912G	Pg 09	12	15.2	13.0	43.1	12.0	27.6	22.8
PNC-P11B	PNC-P11G	Pg 11	12	18.6	13.0	43.1	12.0	27.6	22.8
PNC-P132B	PNC-P132G	Pg 13.5	12	20.4	13.0	43.1	15.0	27.6	22.8
PNC-P162B	PNC-P162G	Pg 16	12	22.5	13.0	43.1	15.0	27.6	22.8
PNC-P136B	PNC-P136G	Pg 13.5	16	20.4	13.0	45.0	15.2	33.0	28.0
PNC-P16B	PNC-P16G	Pg 16	16	22.5	13.0	45.0	15.2	33.0	28.0
PNC-P216B	PNC-P216G	Pg 21	16	28.3	13.0	45.0	17.5	33.0	28.0
PNC-P163B	PNC-P163G	Pg 16	22	22.5	13.0	54.7	18.0	43.0	37.5
PNC-P21B	PNC-P21G	Pg 21	22	28.3	15.0	54.7	22.0	43.0	37.5
PNC-P29B	PNC-P29G	Pg 29	28	37.0	15.0	62.4	30.5	48.8	43.0
PNC-P36B	PNC-P36G	Pg 36	36	47.0	19.0	76.6	36.0	60.6	52.2
PNC-P48B	PNC-P48G	Pg 48	48	59.3	21.0	81.4	50.0	71.8	64.0

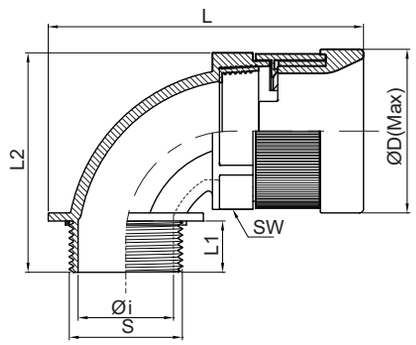
NPT Thread (ANSI/ASME B1.20.1)

Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
PNC-N10B	PNC-N10G	NPT 1/2"	10	21.2	13.0	43.5	12.0	25.0	19.7
PNC-N12B	PNC-N12G	NPT 1/2"	12	21.2	13.0	43.1	15.0	27.6	22.8
PNC-N16B	PNC-N16G	NPT 1/2"	16	21.2	13.0	45.0	15.2	33.0	28.0
PNC-N22B	PNC-N22G	NPT 3/4"	22	26.5	15.0	54.7	22.0	43.0	37.5
PNC-N28B	PNC-N28G	NPT 1"	28	33.2	15.0	62.4	27.0	48.8	43.0

PWC IP68

EN45545-2(HL3)

Black
Gray

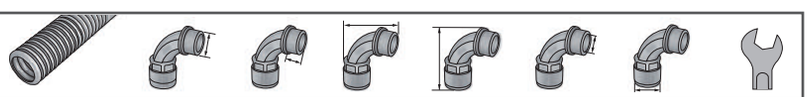


● G(PF) ● M ● Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector
- Certification :

≫ Product size

Ordering No.

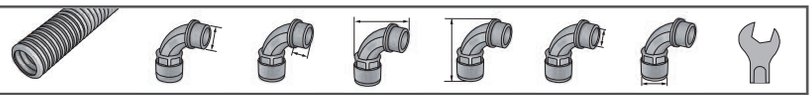


PF Thread (JIS B0202)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PWC-G10B	PWC-G10G	G1/2"	10	20.9	13.0	45.1	60.7	12.0	25.0	19.7
PWC-G12B	PWC-G12G	G1/2"	12	20.9	13.0	45.8	60.8	15.0	27.6	22.8
PWC-G16B	PWC-G16G	G1/2"	16	20.9	13.0	51.4	68.2	15.2	33.0	28.0
PWC-G22B	PWC-G22G	G3/4"	22	26.4	15.0	62.6	85.2	22.0	43.0	37.5
PWC-G28B	PWC-G28G	G1"	28	33.2	15.0	71.6	100.9	27.0	48.8	43.0
PWC-G368B	PWC-G368G	G1 1/4"	28	41.9	15.0	71.6	100.9	30.5	48.8	43.0
PWC-G36B	PWC-G36G	G1 1/4"	36	41.9	19.0	81.3	116.9	33.0	60.6	52.2
PWC-G42B	PWC-G42G	G1 1/2"	48	47.8	19.0	97.0	135.4	40.8	71.8	64.0
PWC-G48B	PWC-G48G	G2"	48	59.6	19.0	97.0	135.4	50.0	71.8	64.0

※ Available in Light Gray production.

(Dimensions in mm)

Ordering No.	

Metric Thread (EN 60423)

(Dimensions in mm)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PWC-M107B	PWC-M107G	M12 X 1.5	07	12.0	11.0	35.6	47.0	7.5	17.9	14.0
PWC-M10B	PWC-M10G	M12 X 1.5	10	12.0	13.0	45.1	60.7	8.0	25.0	19.7
PWC-M12B	PWC-M12G	M16 X 1.5	12	16.0	13.0	45.8	60.8	12.0	27.6	22.8
PWC-M202B	PWC-M202G	M20 X 1.5	12	20.0	13.0	45.8	60.8	15.0	27.6	22.8
PWC-M16B	PWC-M16G	M20 X 1.5	16	20.0	13.0	51.4	68.2	15.2	33.0	28.0
PWC-M22B	PWC-M22G	M25 X 1.5	22	25.0	15.0	62.6	85.2	20.6	43.0	37.5
PWC-M28B	PWC-M28G	M32 X 1.5	28	32.0	15.0	71.6	100.9	27.0	48.8	43.0
PWC-M36B	PWC-M36G	M40 X 1.5	36	40.0	19.0	81.3	116.9	33.0	60.6	52.2
PWC-M48B	PWC-M48G	M50 X 1.5	48	50.0	19.0	97.0	135.4	42.0	71.8	64.0

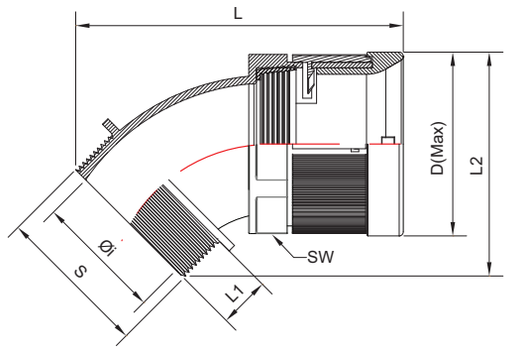
Pg Thread (DIN 40430)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PWC-P077B	PWC-P077G	Pg07	07	12.5	11.0	35.6	47.0	8.5	17.9	14.0
PWC-P097B	PWC-P097G	Pg09	07	15.2	11.0	35.6	47.0	8.5	17.9	14.0
PWC-P09B	PWC-P09G	Pg09	10	15.2	13.0	45.1	60.7	11.0	25.0	19.7
PWC-P110B	PWC-P110G	Pg11	10	18.6	13.0	45.1	60.7	12.0	25.0	19.7
PWC-P130B	PWC-P130G	Pg13.5	10	20.4	13.0	45.1	60.7	12.0	25.0	19.7
PWC-P11B	PWC-P11G	Pg11	12	18.6	13.0	45.8	60.8	13.0	27.6	22.8
PWC-P132B	PWC-P132G	Pg13.5	12	20.4	13.0	45.8	60.8	15.0	27.6	22.8
PWC-P162B	PWC-P162G	Pg16	12	22.5	13.0	45.8	60.8	15.0	27.6	22.8
PWC-P136B	PWC-P136G	Pg13.5	16	20.4	13.0	51.4	68.2	15.2	33.0	28.0
PWC-P16B	PWC-P16G	Pg16	16	22.5	13.0	51.4	68.2	17.5	33.0	28.0
PWC-P163B	PWC-P163G	Pg16	22	22.5	15.0	62.6	85.2	18.0	43.0	37.5
PWC-P21B	PWC-P21G	Pg21	22	28.3	15.0	62.6	85.2	22.0	43.0	37.5
PWC-P29B	PWC-P29G	Pg29	28	37.0	15.0	71.6	100.9	30.5	48.8	43.0
PWC-P36B	PWC-P36G	Pg36	36	47.0	19.0	81.3	116.9	33.0	60.6	52.2
PWC-P48B	PWC-P48G	Pg48	48	59.3	19.0	97.0	135.4	50.0	71.8	64.0

PAC IP68

EN45545-2(HL3)

Black
Gray

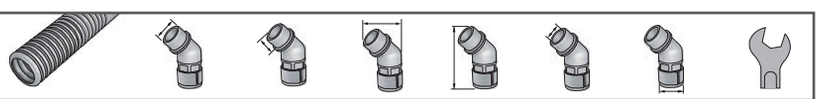


● G(PF) ● M ● Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector
- Certification :

≫ Product size

Ordering No.



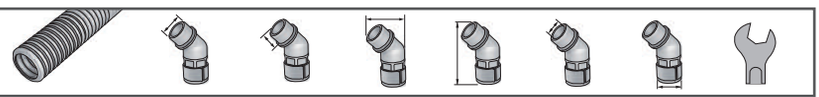
PF Thread (JIS B0202)

(단위 : mm)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PAC-G10B	PAC-G10G	G1/2"	10	21.0	13.0	35.5	61.5	15.1	24.5	19.7
PAC-G12B	PAC-G12G	G1/2"	12	21.0	13.0	37.6	62.7	15.1	27.6	22.8
PAC-G16B	PAC-G16G	G1/2"	16	21.0	13.0	41.1	66.4	15.3	33.0	28.0
PAC-G22B	PAC-G22G	G3/4"	22	26.5	15.0	50.8	80.7	22.2	43.0	37.5
PAC-G28B	PAC-G28G	G1"	28	33.3	15.0	56.6	92.7	27.2	48.8	43.0
PAC-G36B	PAC-G36G	G1 1/4"	36	41.9	20.0	71.3	111.7	34.3	60.6	52.2
PAC-G42B	PAC-G42G	G1 1/2"	48	47.8	20.0	80.1	121.5	41.1	71.8	64.0
PAC-G48B	PAC-G48G	G2"	48	59.6	20.0	84.1	125.5	50.4	71.8	64.0

※ Available in Light Gray production.

(Dimensions in mm)

Ordering No.	

Metric Thread (EN 60423)

(Dimensions in mm)

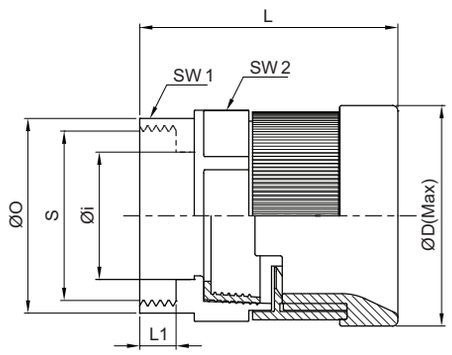
Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PAC-M10B	PAC-M10G	M12 X 1.5	10	12.0	13.0	32.2	58.6	8.1	24.5	19.7
PAC-M12B	PAC-M12G	M16 X 1.5	12	16.0	13.0	35.8	61.3	12.1	27.6	22.8
PAC-M202B	PAC-M202G	M20 X 1.5	12	20.0	13.0	37.2	62.7	15.1	27.6	22.8
PAC-M16B	PAC-M16G	M20 X 1.5	16	20.0	13.0	40.6	66.3	15.3	33.0	28.0
PAC-M22B	PAC-M22G	M25 X 1.5	22	25.0	15.0	50.2	80.6	20.8	43.0	37.5
PAC-M28B	PAC-M28G	M32 X 1.5	28	32.0	15.0	56.4	92.5	27.2	48.8	43.0
PAC-M36B	PAC-M36G	M40 X 1.5	36	40.0	20.0	70.5	111.5	34.3	60.6	52.2
PAC-M48B	PAC-M48G	M50 X 1.5	48	50.0	20.0	81.3	122.5	42.3	71.8	64.0

Pg Thread (DIN 40430)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PAC-P09B	PAC-P09G	Pg09	10	15.5	13.0	33.7	59.8	11.1	24.5	19.7
PAC-P110B	PAC-P110G	Pg11	10	18.6	13.0	34.8	60.9	15.1	24.5	19.7
PAC-P130B	PAC-P130G	Pg13.5	10	20.4	13.0	35.4	61.5	15.1	24.5	19.7
PAC-P11B	PAC-P11G	Pg11	12	18.6	13.0	37.1	62.2	14.1	27.6	22.8
PAC-P136B	PAC-P136G	Pg13.5	16	20.4	13.0	41.1	66.5	15.3	33.0	28.0
PAC-P16B	PAC-P16G	Pg16	16	22.5	13.0	41.8	67.3	17.6	33.0	28.0
PAC-P21B	PAC-P21G	Pg21	22	28.3	15.0	51.7	81.7	22.2	43.0	37.5
PAC-P29B	PAC-P29G	Pg29	28	37.0	15.0	57.8	94.1	31.2	48.8	43.0
PAC-P36B	PAC-P36G	Pg36	36	47.0	20.0	73.3	113.9	40.3	60.6	52.2
PAC-P48B	PAC-P48G	Pg48	48	59.3	20.0	84.6	125.9	50.4	71.8	64.0

EN45545-2(HL3)

Black
Gray



UNEF M Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector
- Certification :

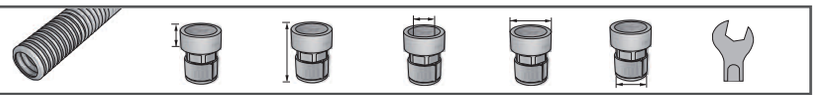
>> Product size

Ordering No.

UNEF Thread (ASME B1.1)

Black	Gray	Thread	Tube Size	Shell Size	L1	L	Øi	ØO	ØD	SW
PIC-U1010B	PIC-U1010G	1/2-28UNEF	10	8S, 10S	10.0	45.4	9.0	18.4	25.2	20.0
PIC-U1210B	PIC-U1210G	5/8-24UNEF	10	10SL, 12S	10.0	45.4	9.0	20.6	25.2	20.0
PIC-U1410B	PIC-U1410G	3/4-20UNEF	10	14, 14S	10.0	45.4	9.0	24.0	25.2	20.0
PIC-U1212B	PIC-U1212G	5/8-24UNEF	12	10SL, 12S	10.0	43.8	11.0	20.6	27.6	22.4
PIC-U1412B	PIC-U1412G	3/4-20UNEF	12	14, 14S	10.0	43.8	11.0	24.0	27.6	22.4
PIC-U1812B	PIC-U1812G	1-20UNEF	12	18	10.0	43.8	11.0	31.0	27.6	22.4
PIC-U2012B	PIC-U2012G	1 3/16-18UNEF	12	20, 22	10.0	43.8	11.0	35.5	27.6	22.4
PIC-U1616B	PIC-U1616G	7/8-20UNEF	16	16, 16S	10.0	45.8	13.0	28.0	33.0	28.0
PIC-U1816B	PIC-U1816G	1-20UNEF	16	18	10.0	45.8	13.0	31.0	33.0	28.0
PIC-U2016B	PIC-U2016G	1 3/16-18UNEF	16	20,22	10.0	45.8	13.0	35.5	33.0	28.0
PIC-U2316B	PIC-U2316G	1 3/8-8UNEF	16	20,22	10.0	45.8	13.0	40.0	33.0	28.0
PIC-U2816B	PIC-U2816G	1 7/16-18UNEF	16	24, 28	10.0	45.8	13.0	42.0	33.0	28.0
PIC-U2222B	PIC-U2222G	1 3/16-18UNEF	22	20, 22	9.5	54.0	18.0	35.5	43.0	36.7
PIC-U2822B	PIC-U2822G	1 7/16-18UNEF	22	24,28	9.5	54.0	18.0	42.0	43.0	36.7
PIC-U3622B	PIC-U3622G	2-18UNS	22	36	9.5	54.0	18.0	56.5	43.0	36.7
PIC-U2828B	PIC-U2828G	1 7/16-18UNEF	28	24,28	10.0	62.2	25.0	41.5	48.8	42.7
PIC-U3228B	PIC-U3228G	1 3/4-18UNS	28	32	10.0	62.2	25.0	49.5	48.8	42.7
PIC-U3628B	PIC-U3628G	2-18UNS	28	36	10.0	62.2	25.0	56.5	48.8	42.7
PIC-U3636B	PIC-U3636G	2-18UNS	36	36	10.0	71.0	35.0	53.5	60.6	52.0

(Dimensions in mm)

Ordering No.	

Metric Thread (EN 60423)

(Dimensions in mm)

Black	Gray	Thread	Shell Size	L1	L	Øi	ØO	ØD	SW
PIC-M12B	PIC-M12G	M16 X 1.5	12	10.0	43.8	11.0	20.6	27.6	22.4
PIC-M226B	PIC-M226G	M25 X 1.5	16	10.2	46.0	13.0	35.5	33.0	28.0

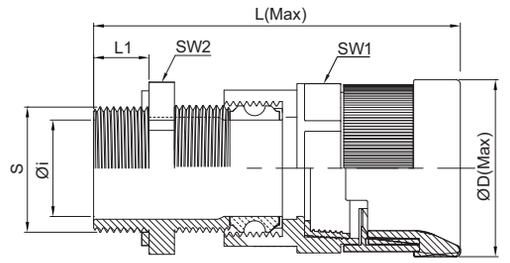
Pg Thread (DIN 40430)

Black	Gray	Thread	Shell Size	L1	L	Øi	ØO	ØD	SW
PIC-P11B	PIC-P11G	Pg11	12	10.0	43.8	11.0	20.6	27.6	22.4
PIC-P132B	PIC-P132G	Pg13.5	12	10.0	43.8	11.0	24.0	27.6	22.4
PIC-P16B	PIC-P16G	Pg16	16	10.0	45.8	13.0	28.0	33.0	28.0
PIC-P21B	PIC-P21G	Pg21	22	9.5	59.7	13.0	35.5	43.0	36.7

PNCC IP68

EN45545-2(HL3)

Black
Gray



G(PF) M Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
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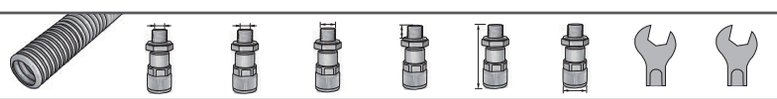
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector, Connector to avoid the cutoff of the cable in the machine.

Product size

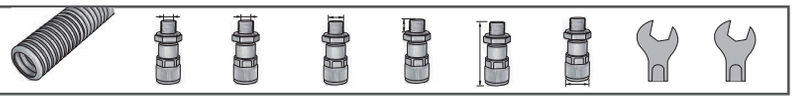
Ordering No.



PF Thread (JIS B0202)

Black	Gray	Thread	Tube Size	Øi(Min)	Øi(Max)	S	L1	L	ØD	SW1	SW2
PNCC-G10B	PNCC-G10G	G1/2"	10	3.5	6.5	20.9	15.0	74.2	25.0	19.7	20.3
PNCC-G12B	PNCC-G12G	G1/2"	12	4.0	8.0	20.9	15.0	73.1	27.6	22.8	22.7
PNCC-G16B	PNCC-G16G	G1/2"	16	7.0	12.3	20.9	15.0	77.3	33.0	28.0	27.7
PNCC-G1622B	PNCC-G1622G	G1/2"	22	12.0	15.2	20.9	15.0	90.3	43.0	37.5	36.9
PNCC-G22B	PNCC-G22G	G3/4"	22	12.0	18.0	26.4	15.0	90.3	43.0	37.5	36.9
PNCC-G228B	PNCC-G228G	G3/4"	28	18.0	20.3	26.4	15.0	97.2	48.8	43.0	43.0
PNCC-G28B	PNCC-G28G	G1"	28	18.0	26.0	33.2	15.0	97.2	48.8	43.0	43.0
PNCC-G36B	PNCC-G36G	G1 1/4"	36	22.0	33.0	41.9	19.0	120.2	60.6	52.2	52.2
PNCC-G48B	PNCC-G48G	G2"	48	30.0	38.0	59.6	19.0	130.0	71.8	64.0	64.1

(Dimensions in mm)

Ordering No.	

Metric Thread (EN 60423)

(Dimensions in mm)

Black	Gray	Thread	Tube Size	Øi(Min)	Øi(Max)	S	L1	L	ØD	SW1	SW2
PNCC-M10B	PNCC-M10G	M12 X 1.5	10	3.5	6.5	12.0	15.0	74.2	25.0	19.7	20.3
PNCC-M120B	PNCC-M120G	M16 X 1.5	10	3.5	6.5	16.0	15.0	74.2	25.0	19.7	20.3
PNCC-M102B	PNCC-M102G	M12 X 1.5	12	4.0	7.1	12.0	15.0	73.1	27.6	22.8	22.7
PNCC-M12B	PNCC-M12G	M16 X 1.5	12	4.0	8.0	16.0	15.0	73.1	27.6	22.8	22.7
PNCC-M162B	PNCC-M162G	M20 X 1.5	12	4.0	8.0	20.0	15.0	73.1	27.6	22.8	22.7
PNCC-M126B	PNCC-M126G	M16 X 1.5	16	7.0	10.9	16.0	15.0	77.3	33.0	28.0	27.7
PNCC-M16B	PNCC-M16G	M20 X 1.5	16	7.0	12.3	20.0	15.0	77.3	33.0	28.0	27.7
PNCC-M1622B	PNCC-M1622G	M20 X 1.5	22	12.0	14.5	25.0	15.0	90.3	33.0	28.0	36.9
PNCC-M22B	PNCC-M22G	M25 X 1.5	22	12.0	18.0	25.0	15.0	90.3	43.0	37.5	36.9
PNCC-M228B	PNCC-M228G	M25 X 1.5	28	18.0	19.5	32.0	15.0	97.2	43.0	37.5	43.0
PNCC-M28B	PNCC-M28G	M32 X 1.5	28	18.0	26.0	30.0	15.0	97.2	48.8	43.0	43.0
PNCC-M36B	PNCC-M36G	M40 X 1.5	36	22.0	33.0	40.0	19.0	120.2	60.6	52.2	52.2
PNCC-M48B	PNCC-M48G	M50 X 1.5	48	30.0	38.0	50.0	19.0	130.0	71.8	64.0	64.1

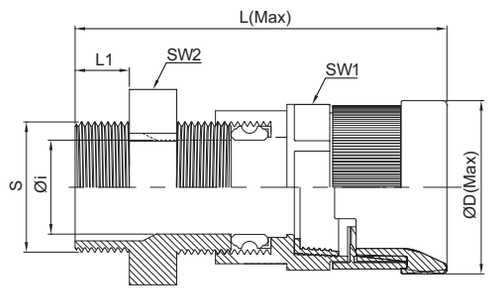
Pg Thread (DIN 40430)

Black	Gray	Thread	Tube Size	Øi(Min)	Øi(Max)	S	L1	L	ØD	SW1	SW2
PNCC-P07B	PNCC-P07G	Pg07	10	3.5	6.5	12.5	15.0	74.2	25.0	19.7	20.3
PNCC-P09B	PNCC-P09G	Pg09	10	6.5	6.5	15.2	15.0	74.2	25.0	19.7	20.3
PNCC-P072B	PNCC-P072G	Pg07	12	4.0	8.0	12.5	15.0	73.1	27.6	22.8	22.7
PNCC-P092B	PNCC-P092G	Pg09	12	4.0	8.0	15.2	15.0	73.1	27.6	22.8	22.7
PNCC-P11B	PNCC-P11G	Pg11	12	4.0	8.0	18.6	15.0	73.1	27.6	22.8	22.7
PNCC-P132B	PNCC-P132G	Pg13.5	12	4.0	8.0	20.4	15.0	73.1	27.6	22.8	22.7
PNCC-P162B	PNCC-P162G	Pg16	12	4.0	8.0	22.5	15.0	73.1	27.6	22.8	22.7
PNCC-P096B	PNCC-P096G	Pg09	16	7.0	10.6	15.2	15.0	77.3	33.0	28.0	27.7
PNCC-P116B	PNCC-P116G	Pg11	16	7.0	12.3	18.6	15.0	77.3	33.0	28.0	27.7
PNCC-P13B	PNCC-P13G	Pg13.5	16	7.0	12.3	20.4	15.0	77.3	33.0	28.0	27.7
PNCC-P16B	PNCC-P16G	Pg16	16	7.0	12.3	22.5	15.0	77.3	33.0	28.0	27.7
PNCC-P122B	PNCC-P122G	Pg11	22	12.0	13.9	18.6	15.0	90.3	43.0	37.5	36.9
PNCC-P1322B	PNCC-P1322G	Pg13.5	22	12.0	14.8	20.4	15.0	90.3	43.0	37.5	36.9
PNCC-P1622B	PNCC-P1622G	Pg16	22	12.0	17.3	22.5	15.0	90.3	43.0	37.5	36.9
PNCC-P21B	PNCC-P21G	Pg21	22	12.0	18.0	28.3	15.0	90.3	43.0	37.5	36.9
PNCC-P218B	PNCC-P218G	Pg21	28	18.0	22.5	28.3	15.0	97.2	48.8	43.0	43.0
PNCC-P29B	PNCC-P29G	Pg29	28	18.0	26.0	37.0	15.0	97.2	48.8	43.0	43.0
PNCC-P36B	PNCC-P36G	Pg36	36	22.0	33.0	47.0	19.0	120.2	60.6	52.2	52.2
PNCC-P48B	PNCC-P48G	Pg48	48	30.0	38.0	59.3	19.0	130.0	71.8	64.0	64.1

PNCCL IP68

EN45545-2(HL3)

Black
Gray



● G(PF) ● M ● Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
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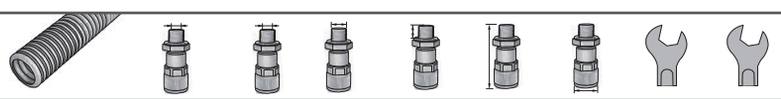
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector, Connector to avoid the cutoff of the cable in the machine.

≫ Product size

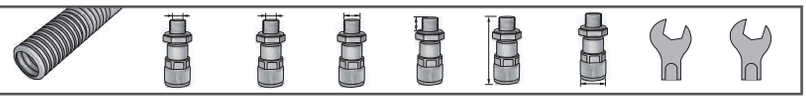
Ordering No.



PF Thread (JIS B0202)

Black	Gray	Thread	Tube Size	Øi(Min)	Øi(Max)	S	L1	L	ØD	SW1	SW2
PNCCL-G10B	PNCCL-G10G	G1/2"	10	3.5	6.5	20.9	9.0	68.2	25.0	19.7	20.3
PNCCL-G12B	PNCCL-G12G	G1/2"	12	4.0	8.0	20.9	6.0	67.1	27.6	22.8	22.7
PNCCL-G16B	PNCCL-G16G	G1/2"	16	7.0	12.3	20.9	6.0	71.3	33.0	28.0	27.7

(Dimensions in mm)

Ordering No.	

Metric Thread (EN 60423)

(Dimensions in mm)

검정색	회색	나사	튜브사이즈	Øi (최소)	Øi (최대)	S	L1	L	ØD	SW1	SW2
PNCCL-M10B	PNCCL-M10G	M12 X 1.5	10	3.5	6.5	12.0	9.0	68.2	25.0	19.7	20.3
PNCCL-M120B	PNCCL-M120G	M16 X 1.5	10	3.5	6.5	16.0	9.0	68.2	25.0	19.7	20.3
PNCCL-M102B	PNCCL-M102G	M12 X 1.5	12	4.0	7.1	12.0	9.0	67.1	27.6	22.8	22.7
PNCCL-M12B	PNCCL-M12G	M16 X 1.5	12	4.0	8.0	16.0	9.0	67.1	27.6	22.8	22.7
PNCCL-M162B	PNCCL-M162G	M20 X 1.5	12	4.0	8.0	20.0	9.0	67.1	27.6	22.8	22.7
PNCCL-M126B	PNCCL-M126G	M16 X 1.5	16	7.0	10.9	16.0	6.0	71.3	33.0	28.0	27.7
PNCCL-M16B	PNCCL-M16G	M20 X 1.5	16	7.0	12.3	20.0	9.0	71.3	33.0	28.0	27.7
PNCCL-M216B	PNCCL-M216G	M25 X 1.5	16	12.0	14.5	25.0	6.0	71.3	33.0	28.0	36.9

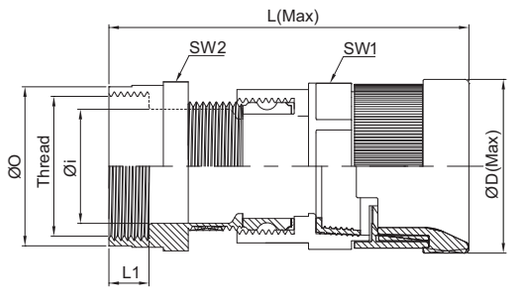
Pg Thread (DIN 40430)

검정색	회색	나사	튜브사이즈	Øi (최소)	Øi (최대)	S	L1	L	ØD	SW1	SW2
PNCCL-P09B	PNCCL-P09G	Pg09	10	6.5	6.5	15.2	9.0	68.2	25.0	19.7	20.3
PNCCL-P092B	PNCCL-P092G	Pg09	12	4.0	8.0	15.2	9.0	67.1	27.6	22.8	22.7
PNCCL-P11B	PNCCL-P11G	Pg11	12	4.0	8.0	18.6	9.0	67.1	27.6	22.8	22.7
PNCCL-P132B	PNCCL-P132G	Pg13.5	12	4.0	8.0	20.4	9.0	67.1	27.6	22.8	22.7
PNCCL-P162B	PNCCL-P162G	Pg16	12	4.0	8.0	22.5	9.0	67.1	27.6	22.8	22.7
PNCCL-P116B	PNCCL-P116G	Pg11	16	7.0	12.3	18.6	9.0	71.3	33.0	28.0	27.7
PNCCL-P13B	PNCCL-P13G	Pg13.5	16	7.0	12.3	20.4	9.0	71.3	33.0	28.0	27.7
PNCCL-P16B	PNCCL-P16G	Pg16	16	7.0	12.3	22.5	9.0	71.3	33.0	28.0	27.7

PICC IP68

EN45545-2(HL3)

Black
Gray



UNEF

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- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
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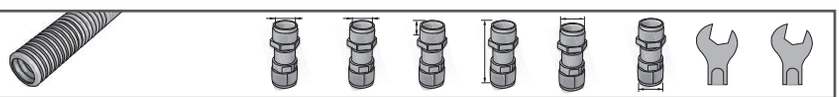
>> Product size

Ordering No.



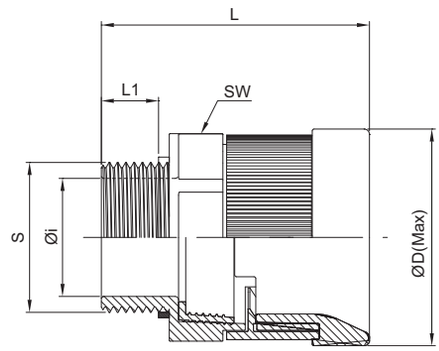
UNEF Thread (ASME B1.1)

Black	Gray	Thread	Tube Size	Shell Size	Øi(Min)	Øi(Max)	L1	L	ØO	ØD	SW1	SW2
PICC-U1010B	PICC-U1010G	1/2-28UNEF	10	8S, 10S	3.5	6.5	10.0	74.2	18.4	25.2	20.0	22.6
PICC-U1210B	PICC-U1210G	5/8-24UNEF	10	10SL, 12S	3.5	6.5	10.0	74.2	20.6	25.2	20.0	22.6
PICC-U1410B	PICC-U1410G	3/4-20UNEF	10	14, 14S	3.5	6.5	10.0	74.2	24.0	25.2	20.0	22.6
PICC-U1212B	PICC-U1212G	5/8-24UNEF	12	10SL, 12S	4.0	8.0	10.0	73.1	20.6	27.6	22.4	25.5
PICC-U1412B	PICC-U1412G	3/4-20UNEF	12	14, 14S	4.0	8.0	10.0	73.1	24.0	27.6	22.4	25.5
PICC-U1812B	PICC-U1812G	1-20UNEF	12	18	4.0	8.0	10.0	73.1	31.0	27.6	22.4	25.5
PICC-U1616B	PICC-U1616G	7/8-20UNEF	16	16, 16S	7.0	12.3	10.0	77.3	28.0	33.0	28.0	25.4
PICC-U1816B	PICC-U1816G	1-20UNEF	16	18	7.0	12.3	10.0	77.3	31.0	33.0	28.0	25.4
PICC-U2016B	PICC-U2016G	1 3/16-18UNEF	16	20, 22	7.0	12.3	10.0	77.3	35.5	33.0	28.0	25.4
PICC-U2816B	PICC-U2816G	1 7/16-18UNEF	16	24, 28	7.0	12.3	10.0	77.3	42.0	33.0	28.0	25.4
PICC-U2222B	PICC-U2222G	1 3/16-18UNEF	22	20, 22	12.0	16.0	9.5	90.3	35.5	43.0	36.7	34.0
PICC-U2822B	PICC-U2822G	1 7/16-18UNEF	22	24, 28	12.0	16.0	9.5	90.3	42.0	43.0	36.7	34.0
PICC-U2828B	PICC-U2828G	1 7/16-18UNEF	28	24, 28	18.0	26.0	10.0	97.2	50.0	48.8	42.7	43.4
PICC-U3228B	PICC-U3228G	13/4-18UNS	28	32	18.0	26.0	10.0	97.2	50.0	48.8	42.7	43.4
PICC-U3628B	PICC-U3628G	2-18UNS	28	36	18.0	26.0	10.0	97.2	56.5	48.8	42.7	53.0
PICC-U3636B	PICC-U3636G	2-18UNS	36	36	22.0	33.0	10.0	122.0	56.5	60.6	52.0	66.5

(Dimensions in mm)

EN45545-2(HL3)

Black
Gray

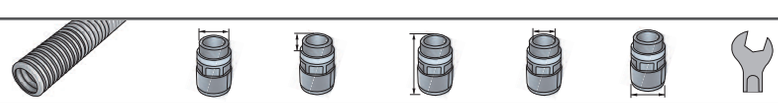


● G(PF) ● M ● Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector, Connector for jointing into Limit-Switch.

≫ Product size

Ordering No.



PF Thread (JIS B0202)

Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
PNCL-G10B	PNCL-G10G	G1/2"	10	20.9	8.0	44.2	12.0	25.0	19.7
PNCL-G12B	PNCL-G12G	G1/2"	12	20.9	8.0	43.1	15.0	27.6	22.8
PNCL-G16B	PNCL-G16G	G1/2"	16	20.9	8.0	45.0	15.2	33.0	28.0

Metric Thread / Straight (EN 60423)

Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
PNCL-M10B	PNCL-M10G	M12 X 1.5	10	12.0	8.0	43.5	7.5	25.0	19.7
PNCL-M120B	PNCL-M120G	M16 X 1.5	10	16.0	8.0	43.5	10.0	25.0	19.7
PNCL-M20B	PNCL-M20G	M20 X 1.5	10	20.0	8.0	43.5	12.0	25.0	19.7
PNCL-M102B	PNCL-M102G	M12 X 1.5	12	12.0	8.0	43.1	8.0	27.6	22.8
PNCL-M12B	PNCL-M12G	M16 X 1.5	12	16.0	8.0	43.1	12.0	27.6	22.8
PNCL-M202B	PNCL-M202G	M20 X 1.5	12	20.0	8.0	43.1	15.0	27.6	22.8
PNCL-M126B	PNCL-M126G	M16 X 1.5	16	16.0	8.0	45.0	12.0	33.0	28.0
PNCL-M16B	PNCL-M16G	M20 X 1.5	16	20.0	8.0	45.0	15.2	33.0	28.0
PNCL-M226B	PNCL-M226G	M25 X 1.5	16	25.0	8.0	45.0	17.5	33.0	28.0

Pg Thread / Straight (DIN 40430)

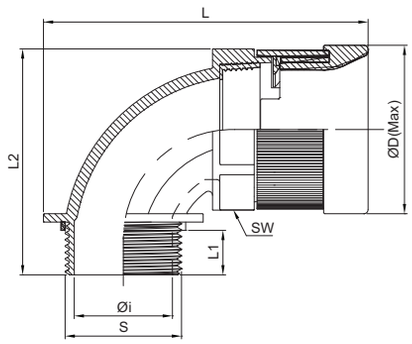
Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
PNCL-P09B	PNCL-P09G	Pg09	10	15.2	8.0	43.5	10.0	25.0	19.7
PNCL-P160B	PNCL-P160G	Pg16	10	22.5	8.0	43.5	12.0	25.0	19.7
PNCL-P0912B	PNCL-P0912G	Pg09	12	15.2	8.0	43.1	12.0	27.6	22.8
PNCL-P11B	PNCL-P11G	Pg11	12	18.6	8.0	43.1	12.0	27.6	22.8
PTNCL-P136B	PNCL-P136G	Pg13.5	16	20.4	8.0	45.0	15.2	33.0	28.0
PNCL-P16B	PNCL-P16G	Pg16	16	22.5	8.0	45.0	15.2	33.0	28.0

(Dimensions in mm)

PWCL IP68

EN45545-2(HL3)

Black
Gray

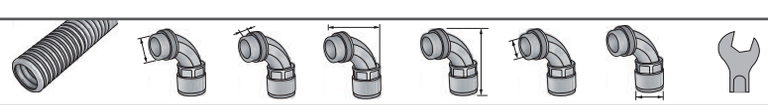


G(PF) M Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector, Connector for jointing into Limit-Switch.

>> Product size

Ordering No.



PF Thread (JIS B0202)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PWCL-G10B	PWCL-G10G	G1/2"	10	20.9	8.0	45.1	60.7	12.0	24.5	19.7
PWCL-G12B	PWCL-G12G	G1/2"	12	20.9	8.0	45.8	60.8	15.0	27.6	22.8
PWCL-G16B	PWCL-G16G	G1/2"	16	20.9	8.0	51.4	68.2	15.2	33.0	28.0

Metric Thread / 90°Elbow (EN 60423)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PWCL-M10B	PWCL-M10G	M12 X 1.5	10	12.0	8.0	45.1	60.7	8.0	24.5	19.7
PWCL-M12B	PWCL-M12G	M16 X 1.5	12	16.0	8.0	45.8	60.8	12.0	27.6	22.8
PWCL-M202B	PWCL-M202G	M20 X 1.5	12	20.0	8.0	45.8	60.8	15.0	27.6	22.8
PWCL-M16B	PWCL-M16G	M20 X 1.5	16	20.0	8.0	51.4	68.2	15.2	33.0	28.0

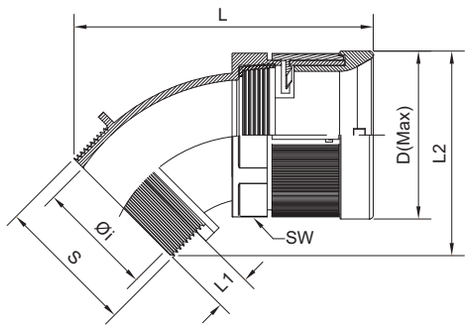
Pg Thread / 90°Elbow (DIN 40430)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PWCL-P09B	PWCL-P09G	Pg09	10	15.2	8.0	45.1	60.7	11.0	24.5	19.7
PWCL-P110B	PWCL-P110G	Pg11	10	18.6	8.0	45.1	60.7	12.0	24.5	19.7
PWCL-P130B	PWCL-P130G	Pg13.5	10	20.4	8.0	45.1	60.7	12.0	24.5	19.7
PWCL-P11B	PWCL-P11G	Pg11	12	18.6	8.0	45.8	60.8	13.0	27.6	22.8
PWCL-P132B	PWCL-P132G	Pg13.5	12	20.4	8.0	45.8	60.8	15.0	27.6	22.8
PWCL-P162B	PWCL-P162G	Pg16	12	22.5	8.0	45.8	60.8	15.0	27.6	22.8
PWCL-P136B	PWCL-P136G	Pg13.5	16	20.4	8.0	51.4	68.2	15.2	33.0	28.0
PWCL-P16B	PWCL-P16G	Pg16	16	22.5	8.0	51.4	68.2	17.5	33.0	28.0

(Dimensions in mm)

EN45545-2(HL3)

Black
Gray

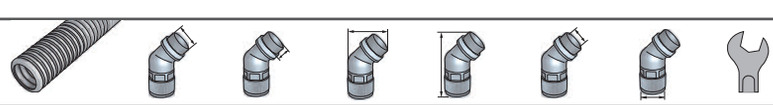


G(PF) M Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Joint box with connector, Connector for jointing into Limit-Switch.

>> Product size

Ordering No.



PF Thread / 45°Elbow (JIS B0202)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PACL-G10B	PACL-G10G	G1/2"	10	21.0	8.0	35.5	61.5	15.1	24.5	19.7
PACL-G12B	PACL-G12G	G1/2"	12	21.0	8.0	37.6	62.7	15.1	27.6	22.8
PACL-G16B	PACL-G16G	G1/2"	16	21.0	8.0	41.1	66.4	15.3	33.0	28.0

Metric Thread / 45°Elbow (EN 60423)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PACL-M10B	PACL-M10G	M12 X 1.5	10	12.0	8.0	32.2	58.6	8.1	24.5	19.7
PACL-M12B	PACL-M12G	M16 X 1.5	12	16.0	8.0	35.8	61.3	12.1	27.6	22.8
PACL-M16B	PACL-M16G	M20 X 1.5	16	20.0	8.0	37.2	62.7	15.1	27.6	22.8

Pg Thread / 45°Elbow (DIN 40430)

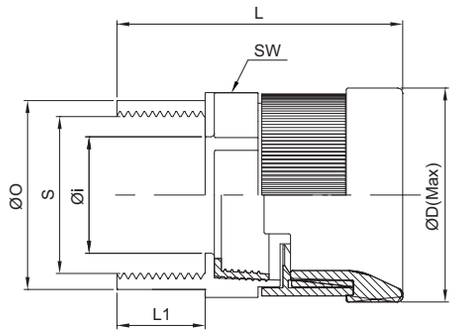
Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
PACL-P09B	PACL-P09G	Pg09	10	15.5	8.0	33.7	59.8	11.1	24.5	19.7
PACL-P110B	PACL-P110G	Pg11	10	18.6	8.0	34.8	60.9	15.1	24.5	19.7
PACL-P130B	PACL-P130G	Pg13.5	10	20.4	8.0	35.4	61.5	15.1	24.5	19.7
PACL-P11B	PACL-P11G	Pg11	12	18.6	8.0	37.1	62.2	14.1	27.6	22.8
PACL-P136B	PACL-P136G	Pg13.5	16	20.4	8.0	41.1	66.5	15.3	33.0	28.0
PACL-P16B	PACL-P16G	Pg16	16	22.5	8.0	41.8	67.3	17.6	33.0	28.0

(Dimensions in mm)

PIPC IP68

EN45545-2(HL3)

Black
Gray

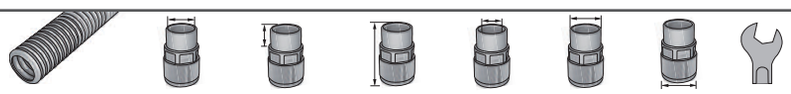


G(PF)

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Pipe with connector.

≫ Product size

Ordering No.

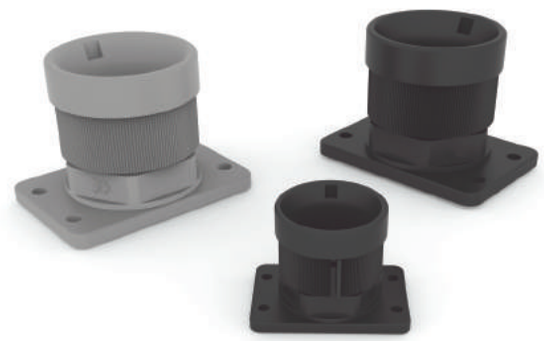


PF Thread (JIS B0202)

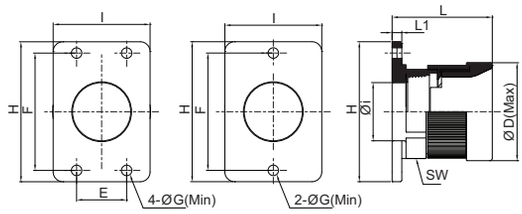
Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØO	ØD	SW
PIPC-G16B	PIPC-G16G	G1/2"	16	18.6	13.8	45.7	15.2	28.0	33.0	28.0
PIPC-G22B	PIPC-G22G	G3/4"	22	24.1	15.0	54.7	22.0	35.0	43.0	37.5
PIPC-G28B	PIPC-G28G	G1"	28	30.2	15.0	62.7	27.0	41.5	48.8	43.0
PIPC-G36B	PIPC-G36G	G1 1/4"	36	38.9	29.0	84.7	33.0	53.0	60.6	52.2
PIPC-G42B	PIPC-G42G	G1 1/2"	48	44.8	29.0	89.1	40.8	66.0	71.8	64.0
PIPC-G48B	PIPC-G48G	G2"	48	56.6	29.0	89.1	50.0	66.0	71.8	64.0

(Dimensions in mm)

EN45545-2(HL3)



Black
Gray



- Material : High Quality Polyamide 6
- Degrees of Protection : IP 67 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Pipe with connector.

≫ Product size

Ordering No.

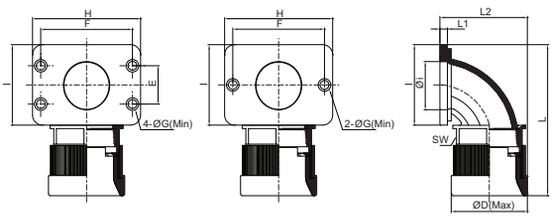
Black	Gray	Tube Size	E	F	G	H	I	L1	L	Øi	ØD	SW
PNOC-12B	PNOC-12G	12	-	36.5	5.5	46.0	32.0	5.0	35.1	15.0	27.6	22.8
PNOC-16B	PNOC-16G	16	-	36.5	5.5	46.0	32.0	5.0	37.0	17.5	33.0	28.0
PNOC-22B	PNOC-22G	22	30.5	53.5	5.5	65.0	45.0	5.0	44.7	22.0	43.0	37.5
PNOC-28B	PNOC-28G	28	31.0	54.8	6.5	64.8	45.0	6.0	53.4	27.0	48.8	43.0
PNOC-36B	PNOC-36G	36	31.0	72.6	6.5	86.6	60.0	6.0	62.0	36.0	60.6	52.2
PNOC-48B	PNOC-48G	48	30.5	72.6	6.5	86.6	73.0	6.0	66.4	50.0	71.8	64.0

(Dimensions in mm)

PWOC IP67

EN45545-2(HL3)

Black
Gray



- Material : High Quality Polyamide 6
- Degrees of Protection : IP 67 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Control box with connector.

≫ Product size

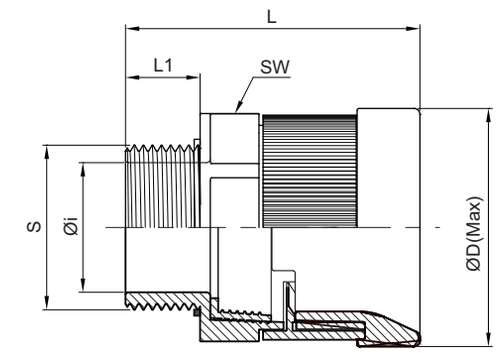
Ordering No.

Black	Gray	Tube Size	E	F	G	H	I	L1	L2	L	Øi	ØD	SW
PWOC-12B	PWOC-12G	12	-	36.5	5.5	45.0	32.0	5.0	38.9	64.1	15.0	27.6	22.8
PWOC-16B	PWOC-16G	16	-	36.5	5.5	44.0	32.0	5.0	44.6	69.0	17.5	33.0	28.0
PWOC-22B	PWOC-22G	22	30.5	53.5	5.5	65.0	45.0	5.0	53.6	87.2	22.0	43.0	37.5
PWOC-28B	PWOC-28G	28	31.0	55.0	6.0	65.0	45.0	6.0	63.5	100.9	27.0	48.8	43.0
PWOC-36B	PWOC-36G	36	30.5	73.0	7.0	86.0	64.0	6.0	69.6	120.1	36.0	60.6	52.2
PWOC-48B	PWOC-48G	48	30.5	73.0	7.0	86.0	78.0	6.0	84.9	139.4	50.0	71.8	64.0

(Dimensions in mm)

EN45545-2(HL3)

Black
Gray

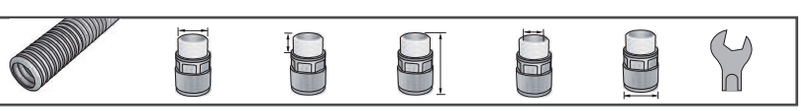


M Pg

- Material : High Quality Polyamide 6 + Brass Nickel plated
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Tramway Vehicle Construction etc.

≫ Product size

Ordering No.



Pg Thread (DIN 40430)

Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
SPNC-P09B	SPNC-P09G	Pg09	10	15.2	13.0	43.5	10.0	25.0	19.7
SPNC-P11B	SPNC-P11G	Pg11	12	18.6	13.0	43.1	12.0	27.6	22.8
SPNC-P132B	SPNC-P132G	Pg13.5	12	20.4	13.0	42.0	12.0	25.0	22.7
SPNC-P136B	SPNC-P136G	Pg13.5	16	20.4	13.0	45.0	15.2	33.0	28.0
SPNC-P16B	SPNC-P16G	Pg16	16	22.5	13.0	45.0	15.2	33.0	28.0
SPNC-P21B	SPNC-P21G	Pg21	22	28.3	15.0	54.7	22.0	43.0	37.5
SPNC-P29B	SPNC-P29G	Pg29	28	37.0	15.0	62.4	30.5	48.8	43.0
SPNC-P36B	SPNC-P36G	Pg36	36	47.0	19.0	76.6	36.0	60.6	52.2
SPNC-P48B	SPNC-P48G	Pg48	48	59.3	21.0	81.4	50.0	71.8	64.0

Metric Thread (EN 60423)

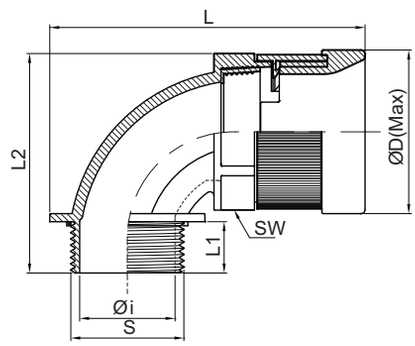
Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
SPNC-M10B	SPNC-M10G	M12 X 1.5	10	12.0	13.0	43.5	7.5	25.0	19.7
SPNC-M12B	SPNC-M12G	M16 X 1.5	12	16.0	13.0	43.1	12.0	27.6	22.8
SPNC-M16B	SPNC-M16G	M20 X 1.5	16	20.0	13.0	45.0	15.2	33.0	28.0
SPNC-M22B	SPNC-M22G	M25 X 1.5	22	25.0	15.0	54.7	20.6	43.0	37.5
SPNC-M28B	SPNC-M28G	M32 X 1.5	28	32.0	15.0	62.4	27.0	48.8	43.0
SPNC-M36B	SPNC-M36G	M40 X 1.5	36	40.0	19.0	76.6	34.0	60.6	52.2
SPNC-M48B	SPNC-M48G	M50 X 1.5	48	50.0	21.0	81.4	42.0	71.8	64.0

(Dimensions in mm)

SPWC IP68 ※ Under development

EN45545-2(HL3)

Black
Gray

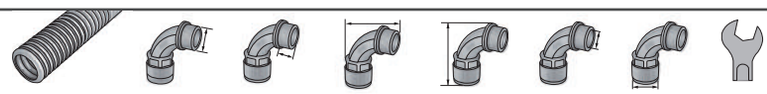


M Pg

- Material : High Quality Polyamide 6 + Brass Nickel plated
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Tramway Vehicle Construction etc.

>> Product size

Ordering No.



Pg Thread (DIN 40430)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
SPWC-P077B	SPWC-P077G	Pg07	07	12.5	11.0	33.0	41.0	6.0	17.0	14.2
SPWC-P09B	SPWC-P09G	Pg09	10	15.2	13.0	53.0	62.0	8.0	25.0	19.8
SPWC-P11B	SPWC-P11G	Pg11	12	18.6	13.0	53.0	60.0	9.0	25.0	22.7
SPWC-P136B	SPWC-P136G	Pg13.5	16	20.4	13.0	62.0	66.0	12.0	30.0	28.0
SPWC-P16B	SPWC-P16G	Pg16	16	22.5	13.0	62.0	66.0	12.0	30.0	28.0
SPWC-P21B	SPWC-P21G	Pg21	22	28.3	15.0	71.0	81.0	18.0	41.0	37.5
SPWC-P29B	SPWC-P29G	Pg29	28	37.0	15.0	77.0	96.0	25.0	47.0	43.0
SPWC-P36B	SPWC-P36G	Pg36	36	47.0	19.0	97.0	119.0	31.0	56.0	52.2
SPWC-P48B	SPWC-P48G	Pg48	48	59.3	19.0	112.0	141.0	42.0	68.0	64.1

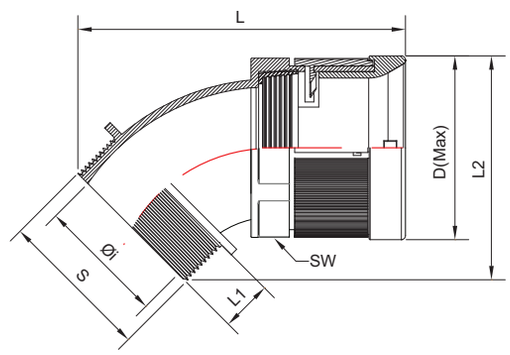
Metric Thread (EN 60423)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
SPWC-M107B	SPWC-M107G	M12 X 1.5	07	12.0	11.0	33.0	41.0	6.0	17.0	14.2
SPWC-M10B	SPWC-M10G	M12 X 1.5	10	12.0	13.0	53.0	62.0	6.0	25.0	19.8
SPWC-M12B	SPWC-M12G	M16 X 1.5	12	16.0	13.0	53.0	60.0	9.0	25.0	22.7
SPWC-M16B	SPWC-M16G	M20 X 1.5	16	20.0	13.0	62.0	66.0	12.0	30.0	28.0
SPWC-M22B	SPWC-M22G	M25 X 1.5	22	25.0	15.0	71.0	81.0	16.0	41.0	37.5
SPWC-M28B	SPWC-M28G	M32 X 1.5	28	32.0	15.0	77.0	96.0	23.0	47.0	43.0
SPWC-M36B	SPWC-M36G	M40 X 1.5	36	40.0	19.0	97.0	119.0	31.0	56.0	52.2
SPWC-M48B	SPWC-M48G	M50 X 1.5	48	50.0	19.0	112.0	141.0	41.0	68.0	64.1

(Dimensions in mm)

EN45545-2(HL3)

Black
Gray

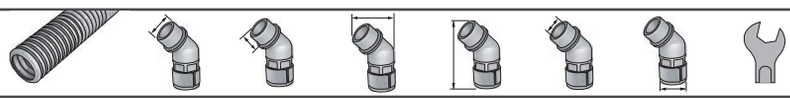


M Pg

- Material : High Quality Polyamide 6 + Brass Nickel plated
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Tramway Vehicle Construction etc.

≫ Product size

Ordering No.



Pg Thread (DIN 40430)

Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
SPAC-P09B	SPAC-P09G	Pg09	10	15.5	13.0	33.7	59.8	11.1	24.5	19.7
SPAC-P11B	SPAC-P11G	Pg11	12	18.6	13.0	37.1	62.2	14.1	27.6	22.8
SPAC-P136B	SPAC-P136G	Pg13.5	16	20.4	13.0	41.1	66.5	15.3	33.0	28.0
SPAC-P16B	SPAC-P16G	Pg16	16	22.5	13.0	41.8	67.3	17.6	33.0	28.0
SPAC-P21B	SPAC-P21G	Pg21	22	28.3	15.0	51.7	81.7	22.2	43.0	37.5
SPAC-P29B	SPAC-P29G	Pg29	28	37.0	15.0	57.8	94.1	31.2	48.8	43.0
SPAC-P36B	SPAC-P36G	Pg36	36	47.0	20.0	73.3	113.9	40.3	60.6	52.2
SAC-P48B	SPAC-P48G	Pg48	48	59.3	20.0	84.6	125.9	50.4	71.8	64.0

Metric Thread (EN 60423)

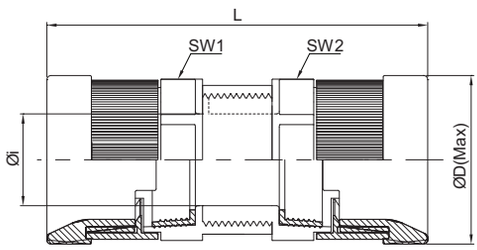
Black	Gray	Thread	Tube Size	S	L1	L2	L	Øi	ØD	SW
SPAC-M10B	SPAC-M10G	M12 X 1.5	10	12.0	13.0	32.2	58.6	8.1	24.5	19.7
SPAC-M12B	SPAC-M12G	M16 X 1.5	12	16.0	13.0	35.8	61.3	12.1	27.6	22.8
SPAC-M16B	SPAC-M16G	M20 X 1.5	16	20.0	13.0	40.6	66.3	15.3	33.0	28.0
SPAC-M22B	SPAC-M22G	M25 X 1.5	22	25.0	15.0	50.2	80.6	20.8	43.0	37.5
SPAC-M28B	SPAC-M28G	M32 X 1.5	28	32.0	15.0	56.4	92.5	27.2	48.8	43.0
SPAC-M36B	SPAC-M36G	M40 X 1.5	36	40.0	20.0	70.5	111.5	34.3	60.6	52.2
SPAC-M48B	SPAC-M48G	M50 X 1.5	48	50.0	20.0	81.3	122.5	42.3	71.8	64.0

(Dimensions in mm)

PNSC IP68 ※ Under development

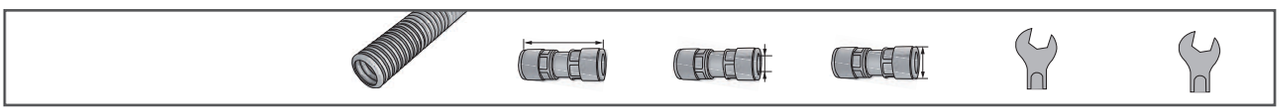
EN45545-2(HL3)

Black
Gray



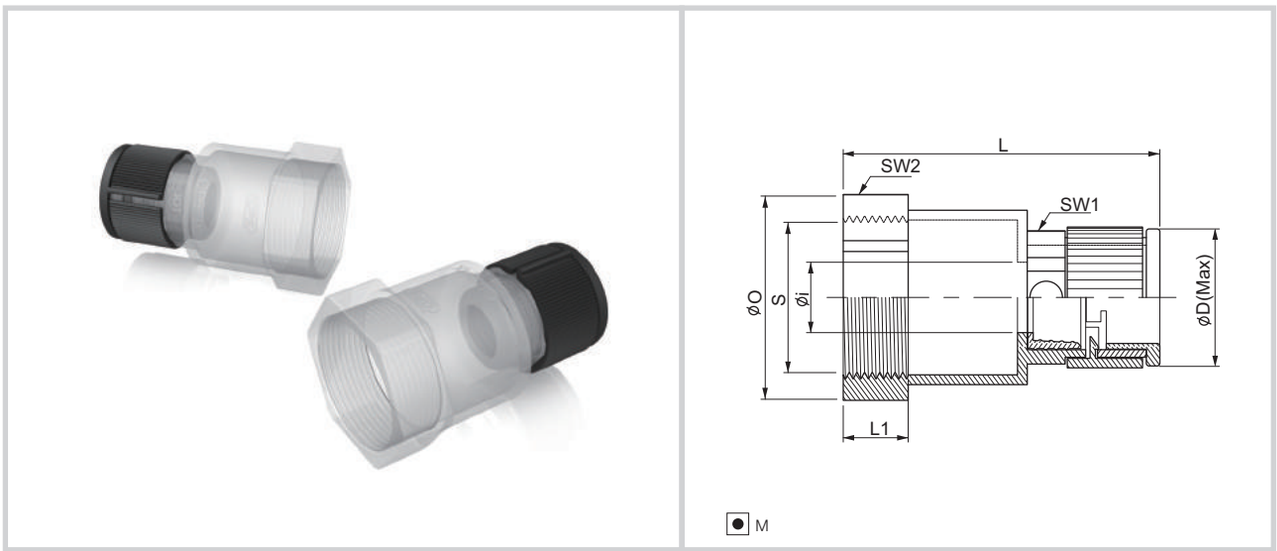
- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : The connector which can connect tube and tube each other.

≫ Product size



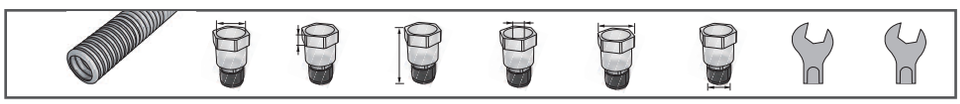
Black	Gray	Tube Size	L	Øi	ØD	SW1	SW2
PNSC-10B	PNSC-10G	10 + 10	78.4	8.0	25.0	19.7	19.7
PNSC-12B	PNSC-12G	12 + 12	78.9	11.0	27.6	22.8	22.8
PNSC-16B	PNSC-16G	16 + 16	82.7	12.5	33.0	28.0	28.0
PNSC-22B	PNSC-22G	22 + 22	109.2	19.0	43.0	37.5	37.5
PNSC-28B	PNSC-28G	28 + 28	117.2	22.0	48.8	43.0	43.0
PNSC-36B	PNSC-36G	36 + 36	140.6	30.0	60.6	52.2	52.2
PNSC-48B	PNSC-48G	48 + 48	149.8	42.0	71.8	64.0	64.0

(Dimensions in mm)



- Material : High Quality Polycarbonate
- Degrees of Protection : IP 67 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Transparency
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Sencer with connector.

>> Product size

Ordering No.	

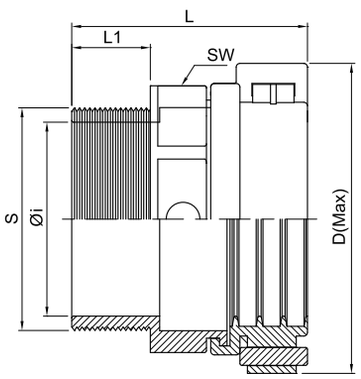
Metric Thread (EN 60423)

Black	Gray	Tube Size	S	L1	L	Øi	ØO	ØD	SW1	SW2
TIS-M08T	M8 X 1.0	10	7.7	12.8	61.5	5.0	17.5	23.0	20.0	16.0
TIS-M12T	M12 X 1.0	10	11.6	12.8	61.5	9.0	20.0	23.0	20.0	18.3
TIS-M18T	M18 X 1.0	10	17.7	12.8	61.5	9.0	24.0	23.0	20.0	22.0
TIS-M30T	M30 X 1.5	10	28.5	12.8	61.5	9.0	38.0	23.0	20.0	34.0

(Dimensions in mm)

TNRC IP66

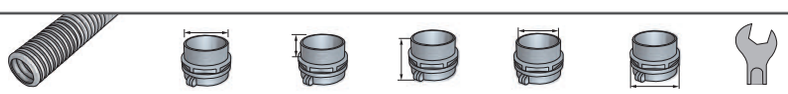
Black
Gray



G(PF)

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 66 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Machine tool, Shipbuilding, Tramway, Industrial / Automatic Machinery, Printing Machine etc. Applied in control box or moving point.

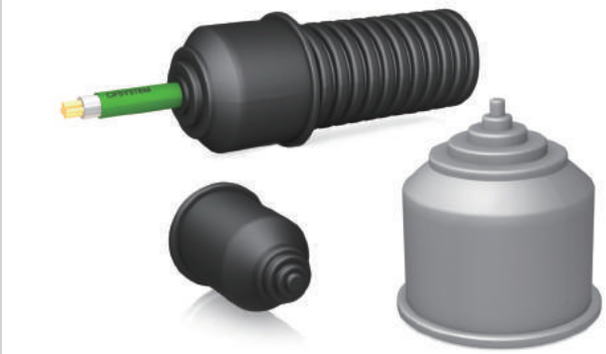
>> Product size

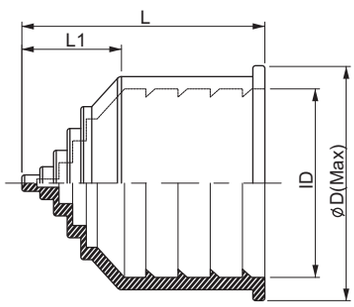
Ordering No.	

PF Thread (JIS B0202)

Black	Gray	Thread	Tube Size	S	L1	L	Øi	ØD	SW
TNRC-G22B	TNRC-G22G	G3/4"	22	26.4	15.0	50.8	19.4	50.6	36.9
TNRC-G28B	TNRC-G28G	G1"	28	33.2	15.0	49.0	26.2	57.7	42.7
TNRC-G36B	TNRC-G36G	G1 1/4"	36	41.6	19.0	60.0	35.0	70.0	52.2
TNRC-G48B	TNRC-G48G	G2"	48	58.7	21.0	63.3	51.0	85.0	64.1

(Dimensions in mm)





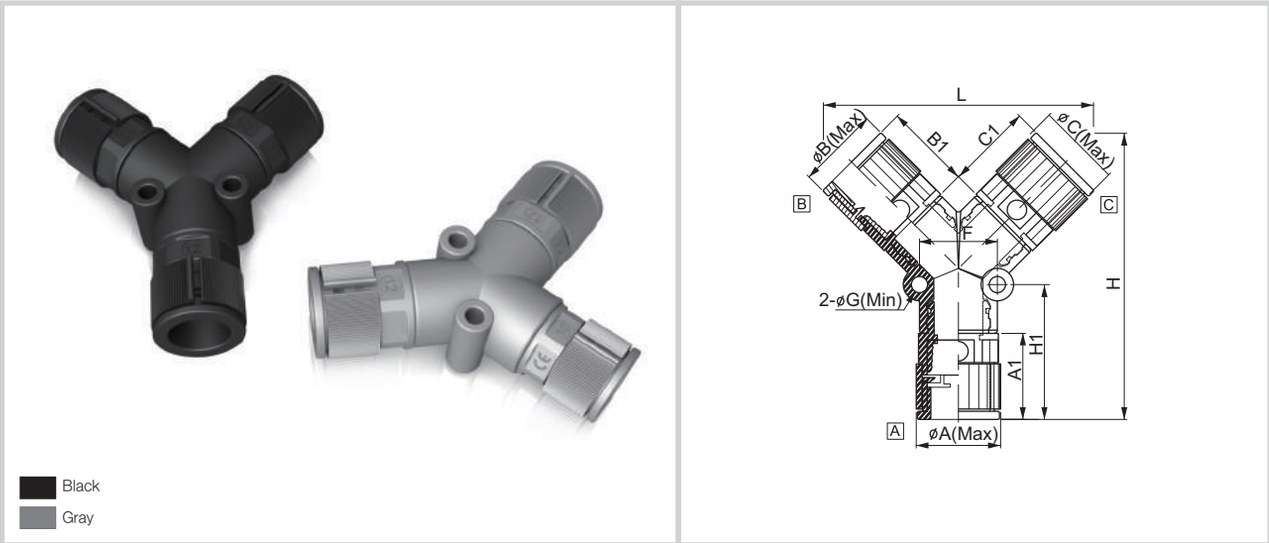
- Material : N.B.R (Nitrile-Gutadiene Rubber)
- Properties : Tube terminal, assembled by just putting on
- Degrees of Protection : IP 66 (EN 60529)
- Color : Black & Gray
- For tube type : Corrugated tubes, type of CPSFLEX

Product size

Ordering No.								
Black	Gray	Tube Size	Min	Max	L1	L	ID	ØD
FEC-07B	FEC-07G	07	2.0	7.0	8.0	24.0	10.0	16.0
FEC-10B	FEC-10G	10	3.0	10.0	11.0	33.0	12.5	17.0
FEC-12B	FEC-12G	12	4.2	12.	11.0	33.0	16.0	23.5
FEC-16B	FEC-16G	16	6.0	160.	12.5	34.5	21.2	29.0
FEC-22B	FEC-22G	22	6.0	220	16.0	43.0	28.5	37.0
FEC-28B	FEC-28G	28	6.0	28.0	16.0	43.0	34.5	43.0
FEC-36B	FEC-36G	36	6.0	36.0	24.0	58.5	42.5	52.0
FEC-48B	FEC-48G	48	6.0	48.0	24.0	58.5	54.5	64.0
FEC-56B	FEC-56G	56	9.0	56.0	29.0	71.0	67.2	76.7
FEC-70B	FEC-70G	70	10.0	70.0	36.0	86.0	82.5	92.0
FEC-95B	FEC-95G	95	13.0	95.0	45.0	110.0	106.0	115.5

(Dimensions in mm)

TVC IP67



• Feature : CPS distributors guarantee elegant layout and save on cost instead of using distribution boxes.
Available to use not only their basic shape TYC, TTC & TVC but also various configurations.
One Standard model can be changed into 6 different shapes.
Nominal width from 28, reduceable to 10.

>> Ordering

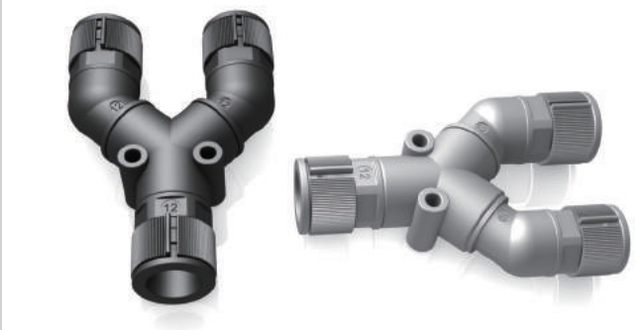
TVC - 10 10 10B : 100EA

- CPSFIX
- Basic Hole A
- Divided Hole B
- Divided Hole C
- Color (B : Black / G : Gray)
- Q'ty

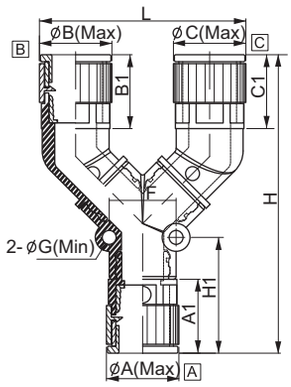
>> Product size

Black	Gray	A	B	C	ØA	A1	ØB	B1	ØC	C1	ØG	F	H1	H	L
TVC-101010B	TVC-101010G	10	10	10	23	26.6	23	26.6	23	26.6	5.0	24	41.6	86	80.0
TVC-121010B	TVC-121010G	12	10	10	25	26.5	23	26.6	23	26.6	5.0	24	41.5	86	80.0
TVC-121210B	TVC-121210G	12	12	10	25	26.5	25	26.5	23	26.6	5.0	24	41.5	88	83.0
TVC-121212B	TVC-121212G	12	12	12	25	26.5	25	26.5	25	26.5	5.0	24	41.5	88	83.0
TVC-161010B	TVC-161010G	16	10	10	30	28.5	23	26.6	23	26.6	5.0	24	43.5	88	83.0
TVC-161210B	TVC-161210G	16	12	10	30	28.5	25	26.5	23	26.6	5.0	24	43.5	90	81.0
TVC-161212B	TVC-161212G	16	12	12	30	28.5	25	26.5	25	26.5	5.0	24	43.5	90	83.0
TVC-161616B	TVC-161616G	16	16	16	30	28.5	30	28.5	30	28.5	5.0	24	43.5	93	89.8
TVC-222222B	TVC-222222G	22	22	22	41	33.3	41	33.3	41	33.3	5.6	39	48.2	112	112.0
TVC-282222B	TVC-282222G	28	22	22	47	39.0	41	33.3	41	33.3	5.6	39	53.9	118	112.0
TVC-282822B	TVC-282822G	28	28	22	47	39.0	47	39.0	41	33.3	5.6	39	53.9	124	118.0
TVC-282828B	TVC-282828G	28	28	28	47	39.0	47	39.0	47	39.0	5.6	39	53.9	124	124.0

(Dimensions in mm)



Black
Gray



• Feature : CPS distributors guarantee elegant layout and save on cost instead of using distribution boxes.
Available to use not only their basic shape TYC, TTC & TVC but also various configurations.
One Standard model can be changed into 6 different shapes.
Nominal width from 28, reduceable to 10.

Ordering

TYC - 10 10 10B : 100EA

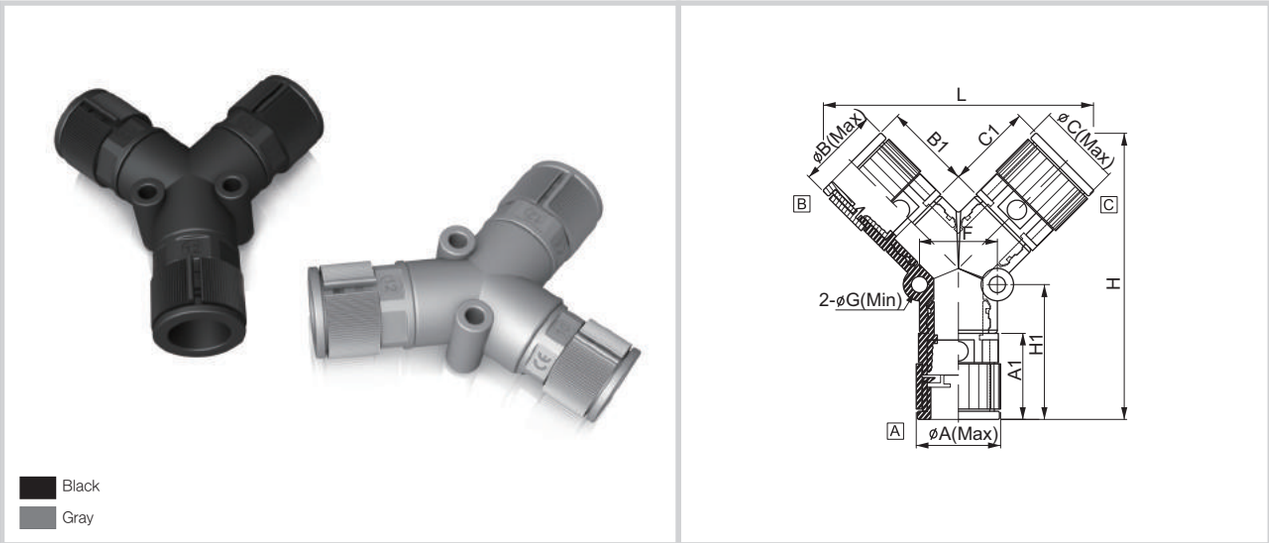
- CPSFIX
- Basic Hole A
- Divided Hole B
- Divided Hole C
- Color (B : Black / G : Gray)
- Q'ty

Product size

Black	Gray	A	B	C	ØA	A1	ØB	B1	ØC	C1	ØG	F	H1	H	L
TYC-101010B	TYC-101010G	10.0	10.0	10.0	23.0	26.6	23.0	24.0	23.0	24.0	5.0	24.0	41.6	104.0	67.0
TYC-121010B	TYC-121010G	12.0	10.0	10.0	25.0	26.5	23.0	24.0	23.0	24.0	5.0	24.0	41.5	104.0	67.0
TYC-121210B	TYC-121210G	12.0	12.0	10.0	25.0	26.5	25.0	24.4	23.0	24.0	5.0	24.0	41.5	107.0	69.7
TYC-121212B	TYC-121212G	12.0	12.0	12.0	25.0	26.5	25.0	24.4	25.0	24.4	5.0	24.0	41.5	107.0	73.5
TYC-161010B	TYC-161010G	16.0	10.0	10.0	30.0	28.5	23.0	24.0	23.0	24.0	5.0	24.0	43.5	105.7	67.0
TYC-161210B	TYC-161210G	16.0	12.0	10.0	30.0	28.5	25.0	24.4	23.0	24.0	5.0	24.0	43.5	108.7	69.7
TYC-161212B	TYC-161212G	16.0	12.0	12.0	30.0	28.5	25.0	24.4	25.0	24.4	5.0	24.0	43.5	108.7	73.0
TYC-161616B	TYC-161616G	16.0	16.0	16.0	30.0	28.5	30.0	26.0	30.0	26.0	5.0	24.0	43.5	110.8	83.0
TYC-222222B	TYC-222222G	22.0	22.0	22.0	41.0	33.3	41.0	33.5	41.0	33.5	5.6	39.0	48.2	134.5	108.0
TYC-282222B	TYC-282222G	28.0	22.0	22.0	47.0	39.0	41.0	33.5	41.0	33.5	5.6	39.0	53.9	142.0	108.0
TYC-282822B	TYC-282822G	28.0	28.0	22.0	47.0	39.0	47.0	39.5	41.0	33.5	5.6	39.0	53.9	150.0	111.0
TYC-282828B	TYC-282828G	28.0	28.0	28.0	47.0	39.0	47.0	39.5	47.0	39.5	5.6	39.0	53.9	150.0	114.0

(Dimensions in mm)

TTC IP67

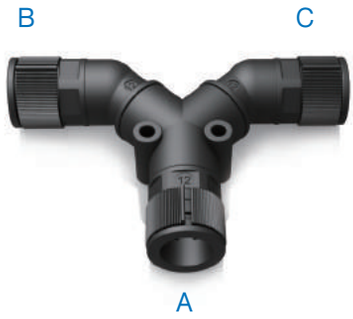


• Feature : CPS distributors guarantee elegant layout and save on cost instead of using distribution boxes.
Available to use not only their basic shape TYC, TTC & TVC but also various configurations.
One Standard model can be changed into 6 different shapes.
Nominal width from 28, reduceable to 10.

>> Ordering

TTC - 10 10 10B : 100EA

- CPSFIX
- Basic Hole A
- Divided Hole B
- Divided Hole C
- Color (B : Black / G : Gray)
- Q'ty



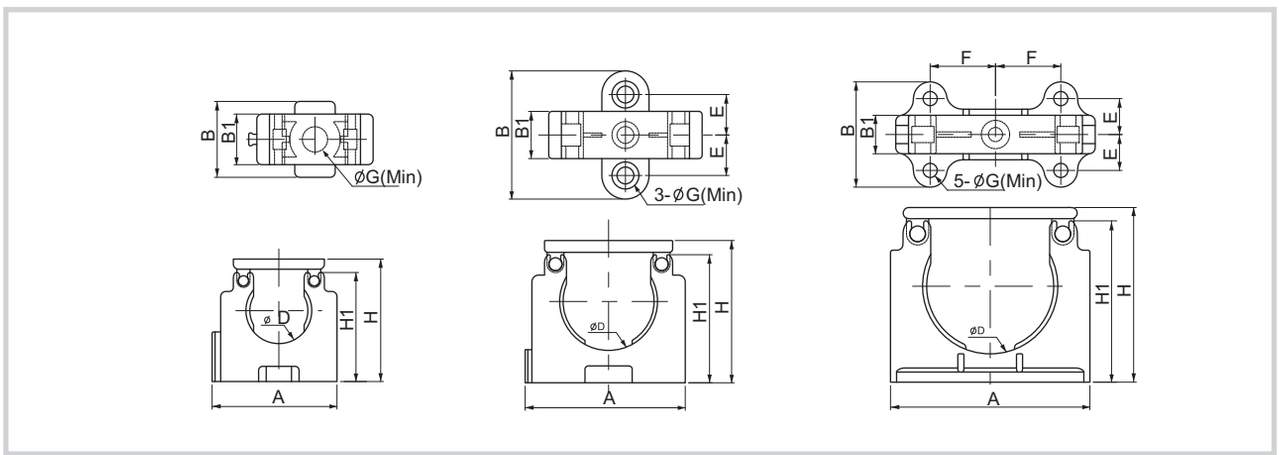
>> Product size

Black	Gray	A	B	C	ØA	A1	ØB	B1	ØC	C1	ØG	F	H1	H	L
TTC-101010B	TTC-101010G	10.0	10.0	10.0	23.0	26.6	23.0	24.0	23.0	24.0	5.0	24.0	41.6	81.0	114.0
TTC-121010B	TTC-121010G	12.0	10.0	10.0	25.0	26.5	23.0	24.0	23.0	24.0	5.0	24.0	41.5	81.0	114.0
TTC-121210B	TTC-121210G	12.0	12.0	10.0	25.0	26.5	25.0	24.4	23.0	24.0	5.0	24.0	41.5	83.0	118.0
TTC-121212B	TTC-121212G	12.0	12.0	12.0	25.0	26.5	25.0	24.4	25.0	24.4	5.0	24.0	41.5	83.0	120.0
TTC-161010B	TTC-161010G	16.0	10.0	10.0	30.0	28.5	23.0	24.0	23.0	24.0	5.0	24.0	43.5	82.0	114.0
TTC-161210B	TTC-161210G	16.0	12.0	10.0	30.0	28.5	25.0	24.4	23.0	24.0	5.0	24.0	43.5	85.0	118.0
TTC-161212B	TTC-161212G	16.0	12.0	12.0	30.0	28.5	25.0	24.4	25.0	24.4	5.0	24.0	43.5	85.0	120.0
TTC-161616B	TTC-161616G	16.0	16.0	16.0	30.0	28.5	30.0	26.0	30.0	26.0	5.0	24.0	43.5	90.0	124.0
TTC-222222B	TTC-222222G	22.0	22.0	22.0	41.0	33.3	41.0	33.5	41.0	33.5	5.6	39.0	48.2	110.0	156.0
TTC-282222B	TTC-282222G	28.0	22.0	22.0	47.0	39.0	41.0	33.5	41.0	33.5	5.6	39.0	53.9	116.0	156.0
TTC-282822B	TTC-282822G	28.0	28.0	22.0	47.0	39.0	47.0	39.5	41.0	33.5	5.6	39.0	53.9	120.0	165.0
TTC-282828B	TTC-282828G	28.0	28.0	28.0	47.0	39.0	47.0	39.5	47.0	39.5	5.6	39.0	53.9	120.0	174.0

(Dimensions in mm)

NFH

- Material : High Quality Polyamide 6
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Fixing tubes
  By making more screw holes, the clip is more stable and the hinge cover is easy to use. This new clip was developed to facilitate straight arrangement and be installable at any size.

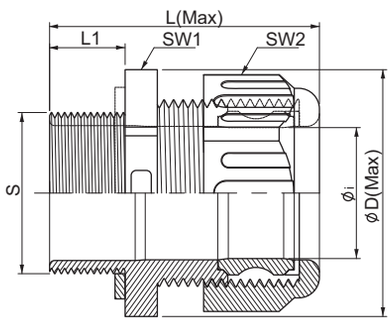


>> Product size

Black	Gray	Tube Size	ØD	A	H	H1	B	B1	E	F	ØG	Bolt
NFH-07B	NFH-07G	07	10.0	16.6	20.5	17.9	14.5	10.0	-	-	5.0	1-M4
NFH-10B	NFH-10G	10	13.0	23.0	24.2	21.6	15.0	10.0	-	-	5.0	1-M4
NFH-12B	NFH-12G	12	16.0	27.5	25.7	22.5	33.0	14.0	11.30	-	5.4	3-M5
NFH-16B	NFH-16G	16	21.5	34.2	33.0	29.5	36.0	14.0	12.00	-	5.4	3-M5
NFH-22B	NFH-22G	22	29.0	45.5	42.2	38.0	38.0	14.0	12.00	-	6.4	3-M6
NFH-28B	NFH-28G	28	35.0	55.0	49.8	45.3	37.0	14.0	12.50	17.00	6.4	5-M6
NFH-36B	NFH-36G	36	42.0	66.0	59.5	54.3	41.5	14.0	13.50	18.75	6.4	5-M6
NFH-48B	NFH-48G	48	54.0	84.9	73.2	66.9	41.5	14.0	13.50	28.00	6.4	5-M6
NFH-56B	NFH-56G	56	66.8	98.6	86.3	79.7	52.0	19.0	17.75	32.30	6.4	5-M6
NFH-70B	NFH-70G	70	82.0	121.0	105.8	97.6	63.0	23.0	21.50	39.50	8.4	5-M8
NFH-95B	NFH-95G	95	105.6	155.4	136.3	125.8	82.0	30.0	28.00	51.70	8.4	5-M8

FCG IP68

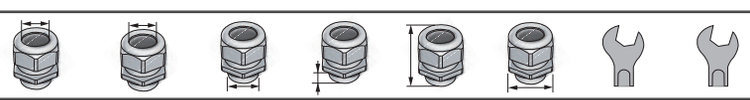
Black
Gray



G(PF) M Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Connector for control box radio box or cables from electric machine. Water & Dust, Oil proof halogen free.

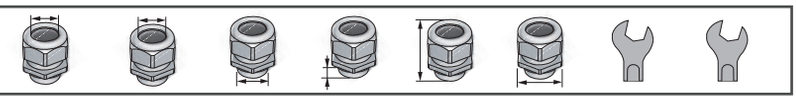
>> Product size

Ordering No.	

PF Thread (JIS B0202)

Black	Gray	Thread	Øi (Min)	Øi (Max)	S	L1	L	ØD	SW1	SW2
FCG-G10B	FCG-G10G	G1/2"	3.5	6.5	20.9	15.0	43.9	24.4	22.6	18.0
FCG-G12B	FCG-G12G	G1/2"	4.0	8.0	20.9	15.0	46.2	28.8	25.5	21.3
FCG-G16B	FCG-G16G	G1/2"	7.0	12.3	20.9	15.0	47.2	28.6	25.4	25.4
FCG-G1622B	FCG-G1622G	G1/2"	12.0	15.2	20.9	15.0	53.4	38.2	34.0	34.0
FCG-G22B	FCG-G22G	G3/4"	12.0	18.0	26.4	15.0	53.4	38.2	34.0	34.0
FCG-G228B	FCG-G228G	G3/4"	18.0	20.3	26.4	15.0	53.4	49.0	43.4	43.4
FCG-G28B	FCG-G28G	G1"	18.0	26.0	33.2	15.0	53.4	49.0	43.4	43.4
FCG-G36B	FCG-G36G	G1 1/4"	22.0	33.0	41.9	19.0	67.7	59.0	53.0	51.6
FCG-G48B	FCG-G48G	G2"	36.0	42.0	59.6	19.0	69.7	74.0	66.5	67.0

(Dimensions in mm)

Ordering No.	

Metric Thread (EN 60423)

Black	Gray	Thread	Øi (Min)	Øi (Max)	S	L1	L	ØD	SW1	SW2
FCG-M10B	FCG-M10G	M12 X 1.5	3.5	6.5	12.0	15.0	43.9	25.4	22.6	18.0
FCG-M120B	FCG-M120G	M16 X 1.5	3.5	6.5	16.0	15.0	43.9	25.4	22.6	18.0
FCG-M102B	FCG-M102G	M12 X 1.5	4.0	7.1	12.0	15.0	46.2	28.8	25.5	21.3
FCG-M12B	FCG-M12G	M16 X 1.5	4.0	8.0	16.0	15.0	46.2	28.8	25.5	21.3
FCG-M162B	FCG-M162G	M20 X 1.5	4.0	8.0	20.0	15.0	46.2	28.8	25.5	21.3
FCG-M126B	FCG-M126G	M16 X 1.5	7.0	10.9	16.0	15.0	47.2	28.6	25.4	25.4
FCG-M16B	FCG-M16G	M20 X 1.5	7.0	12.3	20.0	15.0	47.2	28.6	25.4	25.4
FCGM1622B	FCGM1622G	M20 X 1.5	12.0	14.5	20.0	15.0	53.4	38.2	34.0	34.0
FCG-M22B	FCG-M22G	M25 X 1.5	12.0	18.0	25.0	15.0	53.4	38.2	34.0	34.0
FCG-M228B	FCG-M228G	M25 X 1.5	18.0	19.5	25.0	15.0	53.4	49.0	43.4	43.4
FCG-M28B	FCG-M28G	M32 X 1.5	18.0	26.0	32.0	15.0	53.4	49.0	43.4	43.4
FCG-M36B	FCG-M36G	M40 X 1.5	22.0	33.0	40.0	19.0	67.7	59.0	53.0	51.6
FCG-M48B	FCG-M48G	M50 X 1.5	36.0	42.0	50.0	19.0	69.7	74.0	66.5	67.0

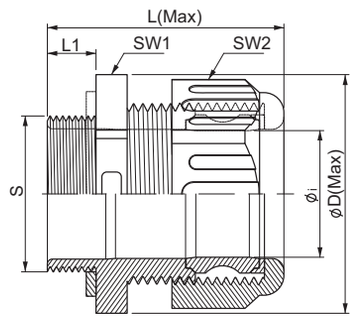
Pg Thread (DIN 40430)

Black	Gray	Thread	Øi (Min)	Øi (Max)	S	L1	L	ØD	SW1	SW2
FCG-P07B	FCG-P07G	Pg07	3.5	6.5	12.5	15.0	43.9	25.4	22.6	18.0
FCG-P09B	FCG-P09G	Pg09	3.5	6.5	15.2	15.0	43.9	25.4	22.6	18.0
FCG-P072B	FCG-P072G	Pg07	4.0	8.0	12.5	15.0	46.2	28.8	25.5	21.3
FCG-P092B	FCG-P092G	Pg09	4.0	8.0	15.2	15.0	46.2	28.8	25.5	21.3
FCG-P11B	FCG-P11G	Pg11	4.0	8.0	18.6	15.0	46.2	28.8	25.5	21.3
FCG-P132B	FCG-P132G	Pg13.5	4.0	8.0	20.4	15.0	46.2	28.8	25.5	21.3
FCG-P162B	FCG-P162G	Pg16	4.0	8.0	22.5	15.0	46.2	28.8	25.5	21.3
FCG-P096B	FCG-P096G	Pg09	7.0	10.6	15.2	15.0	47.2	28.6	25.4	25.4
FCG-P116B	FCG-P116G	Pg11	7.0	12.3	18.6	15.0	47.2	28.6	25.4	25.4
FCG-P13B	FCG-P13G	Pg13.5	7.0	12.3	20.4	15.0	47.2	28.6	25.4	25.4
FCG-P16B	FCG-P16G	Pg16	7.0	12.3	22.5	15.0	47.2	28.6	25.4	25.4
FCG-P122B	FCG-P122G	Pg11	12.0	13.9	18.6	15.0	53.4	38.2	34.0	34.0
FCG-P1322B	FCG-P1322G	Pg13.5	12.0	14.8	20.4	15.0	53.4	38.2	34.0	34.0
FCG-P1622B	FCG-P1622G	Pg16	12.0	17.3	22.5	15.0	53.4	38.2	34.0	34.0
FCG-P21B	FCG-P21G	Pg21	12.0	18.0	28.3	15.0	53.4	38.2	34.0	34.0
FCG-P218B	FCG-P218G	Pg21	18.0	22.5	28.3	15.0	53.4	49.0	43.4	43.4
FCG-P29B	FCG-P29G	Pg29	18.0	26.0	37.0	15.0	53.4	49.0	43.4	43.4
FCG-P36B	FCG-P36G	Pg36	22.0	33.0	47.0	19.0	67.7	59.0	53.0	51.6
FCG-P48B	FCG-P48G	Pg48	36.0	42.0	59.3	19.0	69.7	74.0	66.5	67.0

(Dimensions in mm)

FCGL IP68

Black
Gray

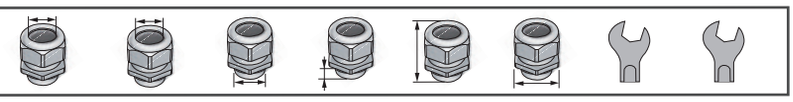


● G(PF) ● M ● Pg

- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150˚C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Connector for control box radio box or cables from electric machine. Water & Dust, Oil proof halogen free.

≫ Product size

Ordering No.



PF Thread (JIS B0202)

Black	Gray	Thread	Øi (Min)	Øi (Max)	S	L1	L	ØD	SW1	SW2
FCGL-G10B	FCGL-G10G	G1/2"	3.5	6.5	20.9	9.0	37.9	25.4	22.6	18.0
FCGL-G12B	FCGL-G12G	G1/2"	4.0	8.0	20.9	9.0	40.2	28.8	25.5	21.3
FCGL-G16B	FCGL-G16G	G1/2"	7.0	12.3	20.9	9.0	41.2	28.6	25.4	25.4

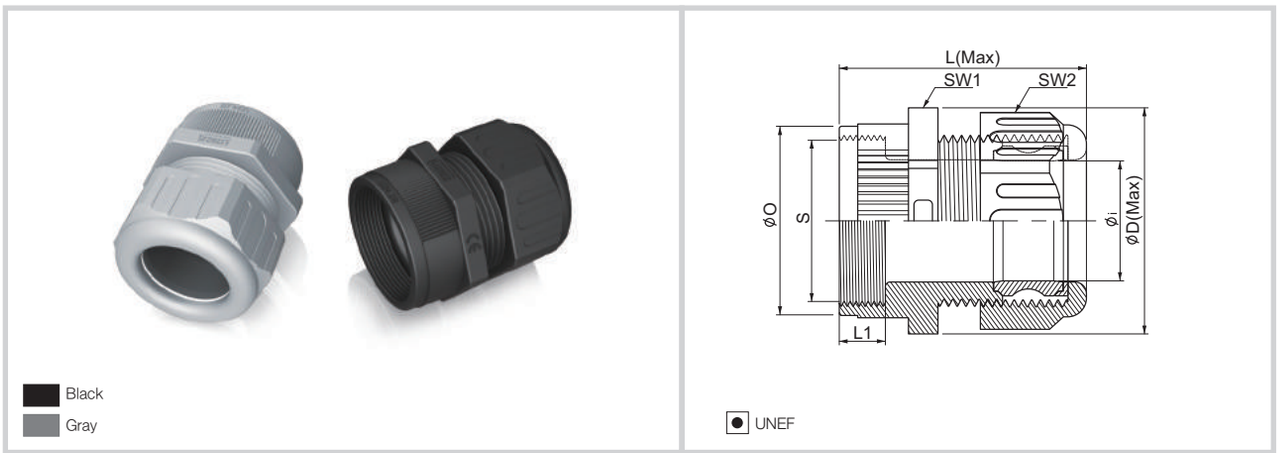
Metric Thread (EN 60423)

Black	Gray	Thread	Øi (Min)	Øi (Max)	S	L1	L	ØD	SW1	SW2
FCGL-M10B	FCGL-M10G	M12 X 1.5	3.5	6.5	12.0	9.0	37.9	25.4	22.6	18.0
FCGL-M120B	FCGL-M120G	M16 X 1.5	3.5	6.5	16.0	9.0	37.9	25.4	22.6	18.0
FCGL-M102B	FCGL-M102G	M12 X 1.5	4.0	7.1	12.0	9.0	40.2	28.8	25.5	21.3
FCGL-M12B	FCGL-M12G	M16 X 1.5	4.0	8.0	16.0	9.0	40.2	28.8	25.5	21.3
FCGL-M162B	FCGL-M162G	M20 X 1.5	4.0	8.0	20.0	9.0	40.2	28.8	25.5	21.3
FCGL-M126B	FCGL-M126G	M16 X 1.5	7.0	10.9	16.0	9.0	41.2	28.6	25.4	25.4
FCGL-M16B	FCGL-M16G	M20 X 1.5	7.0	12.3	20.0	9.0	41.2	28.6	25.4	25.4
FCGL-M216B	FCGL-M216G	M25 X 1.5	7.0	12.3	25.0	9.0	41.2	28.6	25.4	25.4

Pg Thread (DIN 40430)

Black	Gray	Thread	Øi (Min)	Øi (Max)	S	L1	L	ØD	SW1	SW2
FCGL-P09B	FCGL-P09G	Pg09	3.5	6.5	15.2	9.0	37.9	25.4	22.6	18.0
FCGL-P092B	FCGL-P092G	Pg09	4.0	8.0	15.2	9.0	40.2	28.8	25.5	21.3
FCGL-P11B	FCGL-P11G	Pg11	4.0	8.0	18.6	9.0	40.2	28.8	25.5	21.3
FCGL-P132B	FCGL-P132G	Pg13.5	4.0	8.0	20.4	9.0	40.2	28.8	25.5	21.3
FCGL-P162B	FCGL-P162G	Pg16	4.0	8.0	22.5	9.0	40.2	28.8	25.5	21.3
FCGL-P116B	FCGL-P116G	Pg11	7.0	12.3	18.6	9.0	41.2	28.6	25.4	25.4
FCGL-P13B	FCGL-P13G	Pg13.5	7.0	12.3	20.4	9.0	41.2	28.6	25.4	25.4
FCGL-P16B	FCGL-P16G	Pg16	7.0	12.3	22.5	9.0	41.2	28.6	25.4	25.4

(Dimensions in mm)



- Material : High Quality Polyamide 6
- Degrees of Protection : IP 68 (EN 60529)
- The max. Instantaneous Temperature : -40℃ to +105℃
- Short Term : up to +150° C
- Self-Extinguishing : UL94-HB / Free of Halogen Phosphorous and cadmium
- Color : Black & Gray
- Application : Connector for control box radio box or cables from electric machine. Water & Dust, Oil proof halogen free.

≫ Product size

Ordering No.	

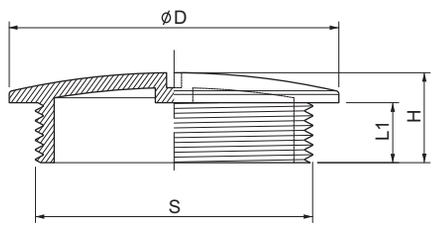
UNEF Thread (ASME B1.1)

Black	Gray	Thread	Shell Size	Øi(Min)	Øi(Max)	L1	L	ØO	ØD	SW1	SW2
TICG-U1010B	TICG-U1010G	1/2-28UNEF	8S, 10S	3.5	6.5	10.0	43.9	18.4	25.4	22.6	18.0
TICG-U1210B	TICG-U1210G	5/8-24UNEF	10SL, 12S	3.5	6.5	10.0	43.9	20.6	25.4	22.6	18.0
TICG-U1410B	TICG-U1410G	3/4-20UNEF	14, 14S	3.5	6.5	10.0	43.9	24.0	25.4	22.6	18.0
TICG-U1610B	TICG-U1610G	7/8-20UNEF	16, 16S	3.5	6.5	10.0	43.9	28.0	25.4	22.6	18.0
TICG-U1810B	TICG-U1810G	1-20UNEF	18	3.5	6.5	10.0	43.9	31.0	25.4	22.6	18.0
TICG-U2010B	TICG-U2010G	1 3/16-18UNEF	20, 22	3.5	6.5	10.0	43.9	35.5	25.4	22.6	18.0
TICG-U2810B	TICG-U2810G	1 7/16-18UNEF	24, 28	3.5	6.5	10.0	43.9	42.0	25.4	22.6	18.0
TICG-U1212B	TICG-U1212G	5/8-24UNEF	10SL, 12S	4.0	8.0	10.0	46.2	20.6	28.8	25.5	21.3
TICG-U1412B	TICG-U1412G	3/4-20UNEF	14, 14S	4.0	8.0	10.0	46.2	24.0	28.8	25.5	21.3
TICG-U1612B	TICG-U1612G	7/8-20UNEF	16, 16S	4.0	8.0	10.0	46.2	28.0	28.8	25.5	21.3
TICG-U1812B	TICG-U1812G	1-20UNEF	18	4.0	8.0	10.0	46.2	31.0	28.8	25.5	21.3
TICG-U2012B	TICG-U2012G	1 3/16-18UNEF	20, 22	4.0	8.0	10.0	46.2	35.5	28.8	25.5	21.3
TICG-U2812B	TICG-U2812G	1 7/16-18UNEF	24, 28	4.0	8.0	10.0	46.2	42.0	28.8	25.5	21.3
TICG-U1616B	TICG-U1616G	7/8-20UNEF	16, 16S	7.0	12.3	10.0	47.2	28.0	28.6	25.4	25.4
TICG-U1816B	TICG-U1816G	1-20UNEF	18	7.0	12.3	10.0	47.2	31.0	28.6	25.4	25.4
TICG-U2016B	TICG-U2016G	1 3/16-18UNEF	20, 22	7.0	12.3	10.0	47.2	35.5	28.6	25.4	25.4
TICG-U2816B	TICG-U2816G	1 7/16-18UNEF	24, 28	7.0	12.3	10.0	47.2	42.0	28.6	25.4	25.4
TICG-U2222B	TICG-U2222G	1 3/16-18UNEF	20, 22	12.0	18.0	10.0	53.4	35.5	38.2	34.0	34.0
TICG-U2822B	TICG-U2822G	1 7/16-18UNEF	24, 28	12.0	18.0	10.0	53.4	42.0	38.2	34.0	34.0
TICG-U3222B	TICG-U3222G	1 3/4-18UNS	32	12.0	18.0	10.0	53.4	50.0	38.2	34.0	34.0
TICG-U3622B	TICG-U3622G	2-18UNS	36	12.0	18.0	10.0	53.4	56.5	38.2	34.0	34.0
TICG-U3228B	TICG-U3228G	1 3/4-18UNS	32	18.0	26.0	10.0	53.4	50.0	49.0	43.4	43.4
TICG-U3628B	TICG-U3628G	2-18UNS	36	18.0	26.0	10.0	67.7	56.5	59.0	53.0	51.6
TICG-U3636B	TICG-U3636G	2-18UNS	36	22.0	33.0	10.0	69.7	56.5	74.0	66.5	67.0

(Dimensions in mm)

BBS CPSNUT

White
Gray



Pg

- Material : High Quality Polyamide 6
- The max. Instantaneous Temperature : -30℃ to +80℃
- Short Term : up to +150˚C
- Color : Gray & White

>> Product size

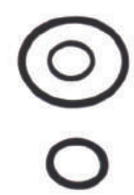
Ordering No.

Pg Thread (DIN 40430)

White	Gray	Thread	S	L1	H	ØD
BBS-P07W	BBS-P07G	Pg07	12.5	6.0	8.0	15.0
BBS-P09W	BBS-P09G	Pg09	15.2	6.0	9.0	19.0
BBS-P11W	BBS-P11G	Pg11	18.6	6.0	10.0	22.0
BBS-P13W	BBS-P13G	Pg13.5	20.4	6.0	10.0	25.0
BBS-P16W	BBS-P16G	Pg16	22.5	6.0	10.0	27.0
BBS-P21W	BBS-P21G	Pg21	28.3	8.0	12.0	33.0
BBS-P29W	BBS-P29G	Pg29	37.0	8.0	12.0	44.0
BBS-P36W	BBS-P36G	Pg36	47.0	10.0	15.0	55.0

(Dimensions in mm)

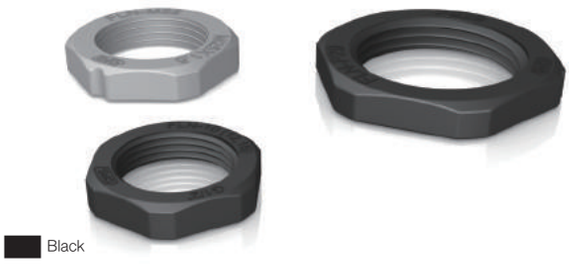
FWH CPS WASHER



PF(G) Thread	Metric Thread	Pg Thread
-	-	FWH-P07
FWH-G10	FWH-M10	FWH-P09
FWH-G12	FWH-M12	FWH-P11
FWH-G16	FWH-M16	FWH-P13
FWH-G22	FWH-M22	FWH-P16
FWH-G28	FWH-M28	FWH-P21
FWH-G36	FWH-M36	FWH-P29
FWH-G42	-	FWH-P36
FWH-G48	FWH-M48	FWH-P48

FLN / SLN

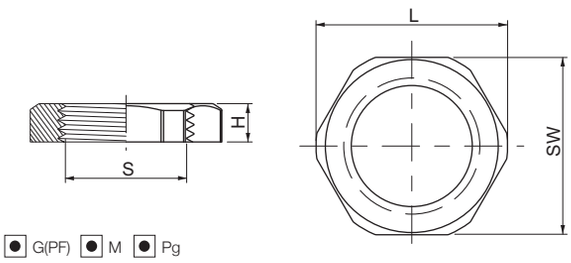
FLN • Material : High Quality Polyamide 6



Black
Gray

SLN • Material : High Quality Polyamide 6

Steel



G(PF) M Pg

Product size

PF Thread (JIS B0202)

Black	Gray	Thread	S	H	L	SW	
FLN-G07B	FLN-G07G	G1/4"	13.0	6.0	20.7	19.0	SLN-G07
FLN-G10B	FLN-G10G	G1/2"	20.9	6.0	29.5	27.3	SLN-G10
FLN-G12B	FLN-G12G	G1/2"	20.9	6.0	29.5	27.3	SLN-G12
FLN-G16B	FLN-G16G	G1/2"	20.9	6.0	29.5	27.3	SLN-G16
FLN-G22B	FLN-G22G	G3/4"	26.4	6.8	38.4	36.0	SLN-G22
FLN-G28B	FLN-G28G	G1"	33.2	6.8	47.8	44.0	SLN-G28
FLN-G36B	FLN-G36G	G1 1/4"	41.9	8.0	52.3	49.0	SLN-G36
FLN-G42B	FLN-G42G	G1 1/2"	47.8	8.0	72.3	65.0	SLN-G42
FLN-G48B	FLN-G48G	G2"	59.6	8.0	76.5	70.0	SLN-G48

Metric Thread (EN 60423)

Black	Gray	Thread	S	H	L	SW	
FLN-M10B	FLN-M10G	M12 X 1.5	12.0	6.0	18.6	17	SLN-M10
FLN-M12B	FLN-M12G	M16 X 1.5	16.0	6.0	24.0	22	SLN-M12
FLN-M16B	FLN-M16G	M20 X 1.5	20.0	6.0	28.0	26	SLN-M16
FLN-M22B	FLN-M22G	M25 X 1.5	25.0	6.8	35.6	33	SLN-M22
FLN-M28B	FLN-M28G	M32 X 1.5	32.0	6.8	43.6	40	SLN-M28
FLN-M36B	FLN-M36G	M40 X 1.5	40.0	8.0	54.0	50	SLN-M36
FLN-M48B	FLN-M48G	M50 X 1.5	50.0	8.0	65.4	60	SLN-M48

Pg Thread (DIN 40430)

Black	Gray	Thread	S	H	L	SW	
FLN-P07B	FLN-P07G	Pg07	12.5	4.0	21.1	19.0	SLN-P07
FLN-P09B	FLN-P09G	Pg09	15.2	4.0	23.9	22.0	SLN-P09
FLN-P11B	FLN-P11G	Pg11	18.6	6.0	25.8	24.0	SLN-P11
FLN-P13B	FLN-P13G	Pg13.5	20.4	6.0	28.7	27.0	SLN-P13
FLN-P16B	FLN-P16G	Pg16	22.5	6.0	32.1	30.3	SLN-P16
FLN-P21B	FLN-P21G	Pg21	28.3	6.8	38.5	36.0	SLN-P21
FLN-P29B	FLN-P29G	Pg29	37.0	6.8	49.7	46.0	SLN-P29
FLN-P36B	FLN-P36G	Pg36	47.0	8.0	66.5	60.0	SLN-P36
FLN-P48B	FLN-P48G	Pg48	59.3	8.0	78.1	70.2	SLN-P48

(Dimensions in mm)

PNC pull-out Test Report

Test Report **CPS-T-170417-001** Issued Date : 2017. 4. 17

CP SYSTEM CO,.LTD
#27-37, Jeonggwansanggok 1-gil,
Jeonggwan-myeon, Gijang-gun, Busan,
Korea

Test No.	: CPS-T-170417-001
Document No.	: CP SYSTEM(P) 17 - 053
Description	: PULLING OUT Test
Sample Name	: CP SYSTEM PNC connector + CPS TUBE
Testing Dept.	: CP SYSTEM CO,.LTD, Q.C Department
Test person	: Minwook Shin
Test Period	: 2017.04.17

CPS-T-170417-001

CPSYSTEM PNC connector + CPS TUBE

Contents

1. Experimental equipment data
2. Sample data
3. Testing method
4. Test environment
5. Examination result

(Legally binding signature of the issuer)

PNC pull-out Test Report

Test Report CPS-T-170417-001 Issued Date : 2017. 4. 17

1. Experimental equipment data

· Name : Whole material tester, mechanical, tensile, compressive
· No of equipment : TM-141224-001
· Test category : Material tensile, material compression, material tensile elongation test

Method	Specification
Max. Load Capacity	2,000 kgf
Load Sensor	Load Cell
Measurement Accuracy	Within ± 0.3%
Max. Stroke	999 mm

FIG 1. Whole material tester

2. Sample data

· Specimen A : PNC connector + CPS tube (07~48)

FIG 2. PNC connector + CPS tube (07~48)

PNC pull-out Test Report

CPS

Test Report CPS-T-170417-001 Issued Date : 2017. 4. 17

3. Test method

· Strech a specimen by speed, 30mm/min and measure maximum weight when tube and connector are separated.

※ Arbitrary and non-standard test

FIG 3. PULLING OUT TEST (07,10,12,22)

4. Test environment

· Temperature : 20℃
· Humidity : 23%

PNC pull-out Test Report

Test Report CPS-T-170417-001 Issued Date : 2017. 4. 17

5. Examination result

Specimen	SIZE	Measured value
A (PNC connector + CPS tube)	07	7.6 kgf
	10	9.9 kgf
	12	22.1 kgf
	16	27.4 kgf
	22	29.9 kgf
	28	52.2 kgf
	36	52.6 kgf
	48	52.1 kgf

※ Refer to attached file to see test graph

PNC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

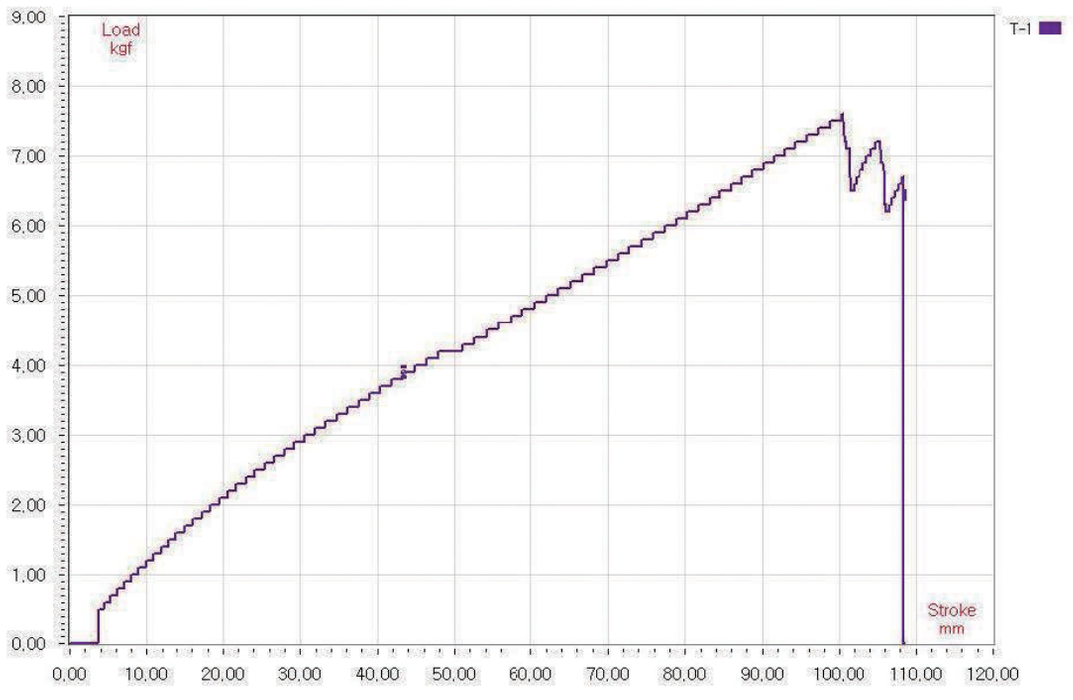
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PNC-07	7.60	4.92	3.90	2.53	108.41	---	OK
Aver.	---	7.60	4.92	3.90	2.53	108.41	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PNC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

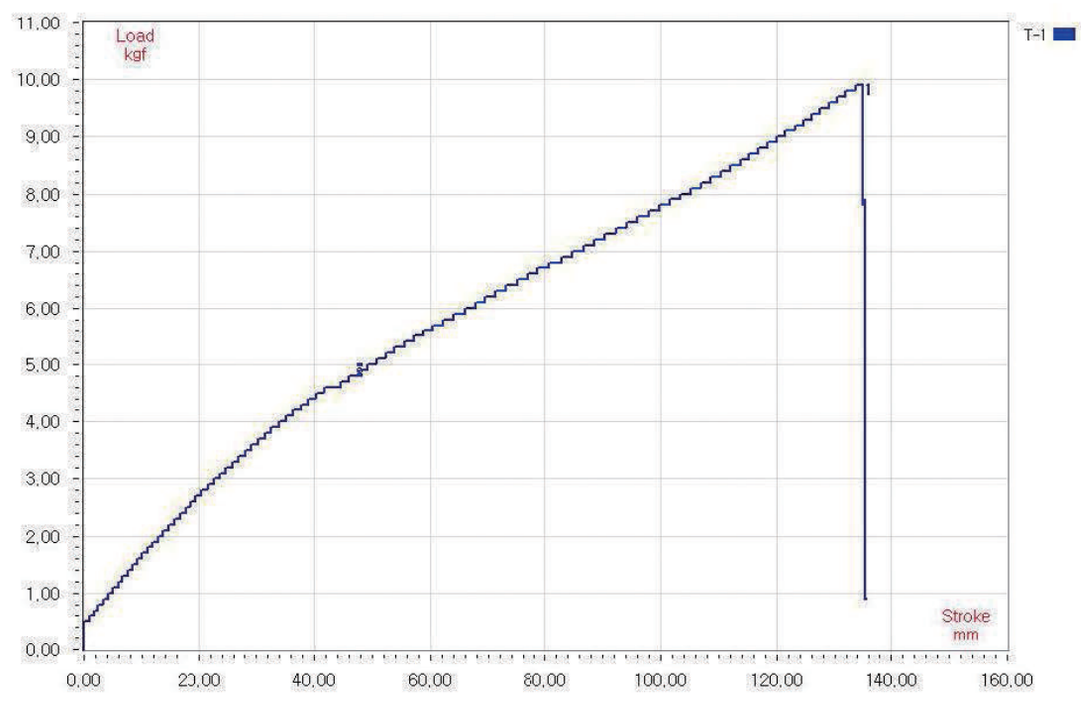
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PNC-10	9,90	6,41	4,90	3,17	135,35	---	OK
Aver.	---	9,90	6,41	4,90	3,17	135,35	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PNC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

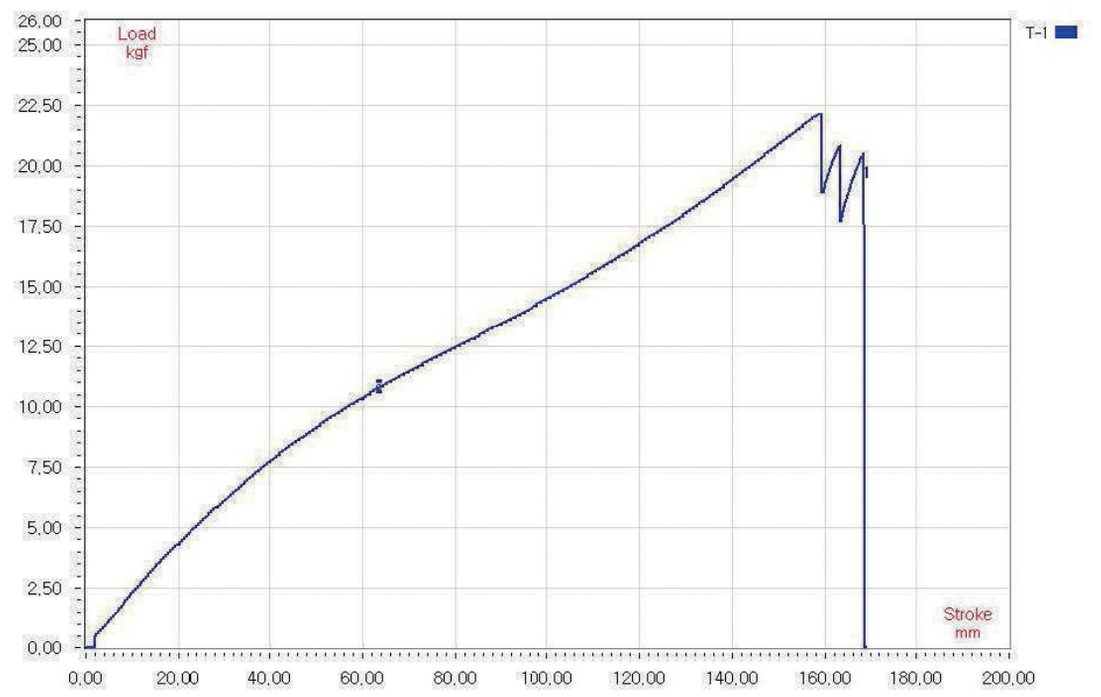
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PNC-12	22.10	14.32	10.80	7.00	168.57	---	OK
Aver.	---	22.10	14.32	10.80	7.00	168.57	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PNC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

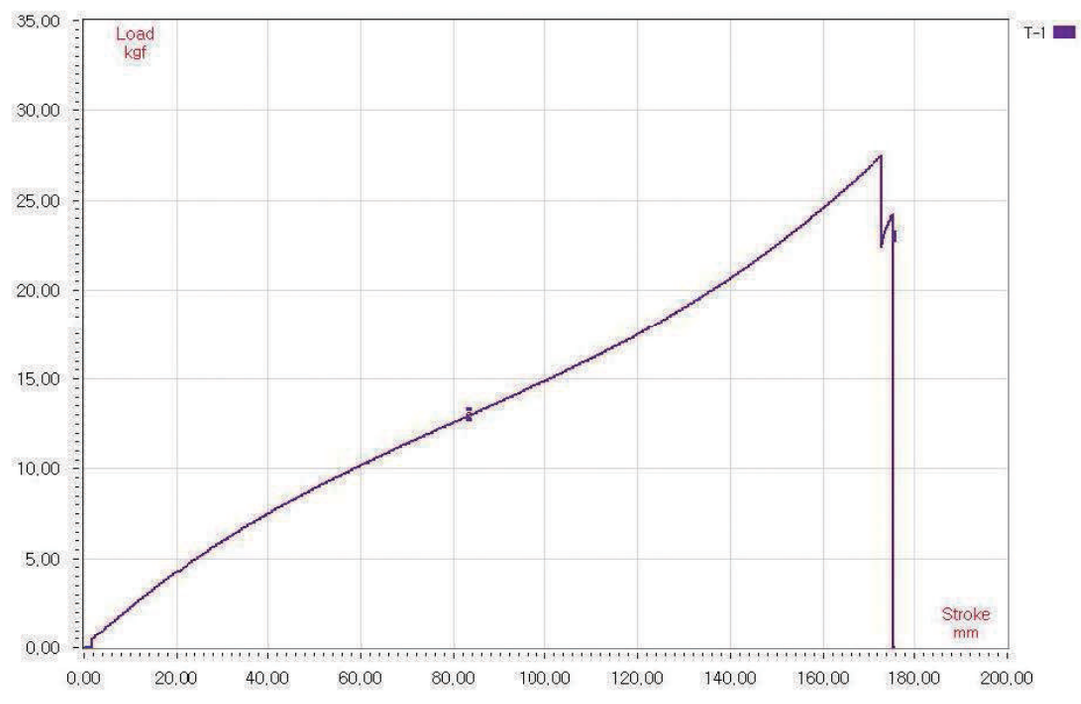
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PNC-16	27.40	17.75	13.00	8.42	175.38	---	OK
Aver.	---	27.40	17.75	13.00	8.42	175.38	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PNC pull-out Test Report

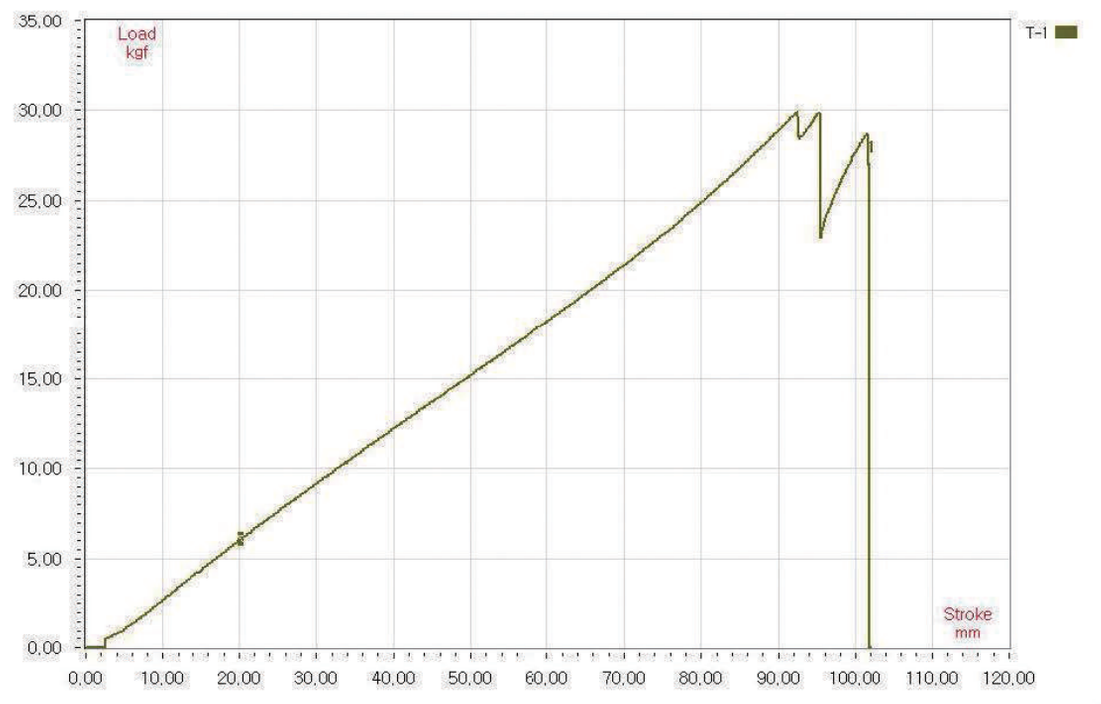
인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PNC-22	29.90	19.37	6.10	3.95	101.78	---	OK
Aver.	---	29.90	19.37	6.10	3.95	101.78	---	---
[Test Spec]								
Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PNC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

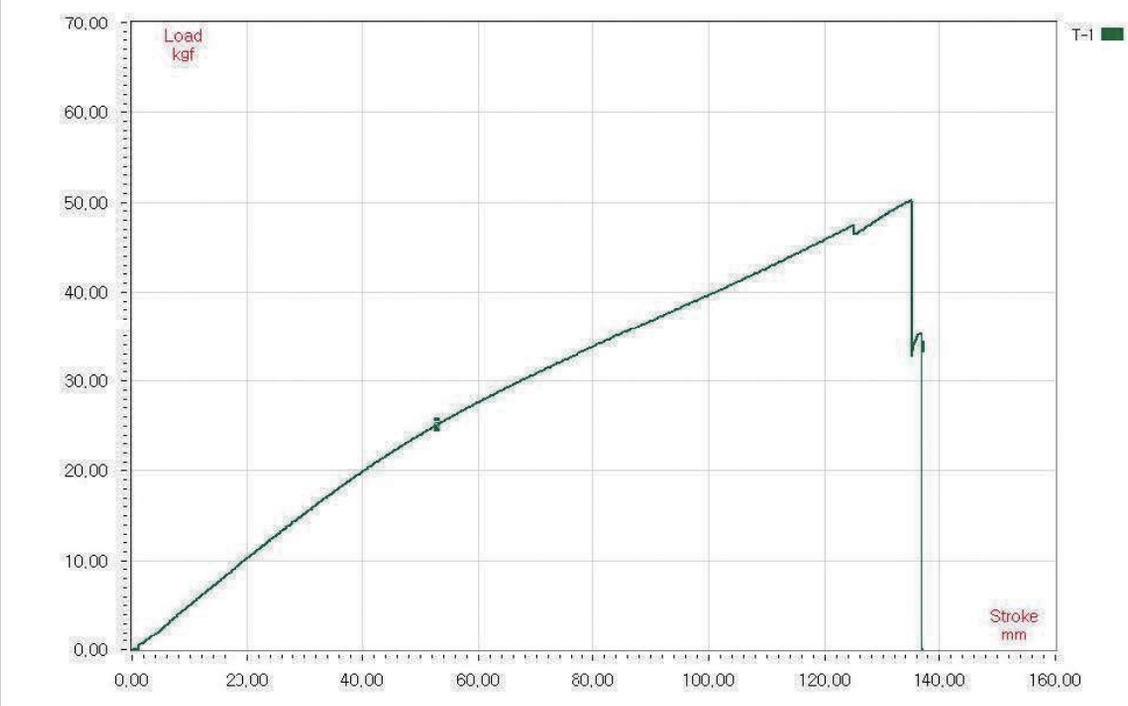
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PNC-28	50,20	32,52	25,10	16,26	137,01	---	OK
Aver.	---	50,20	32,52	25,10	16,26	137,01	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PNC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

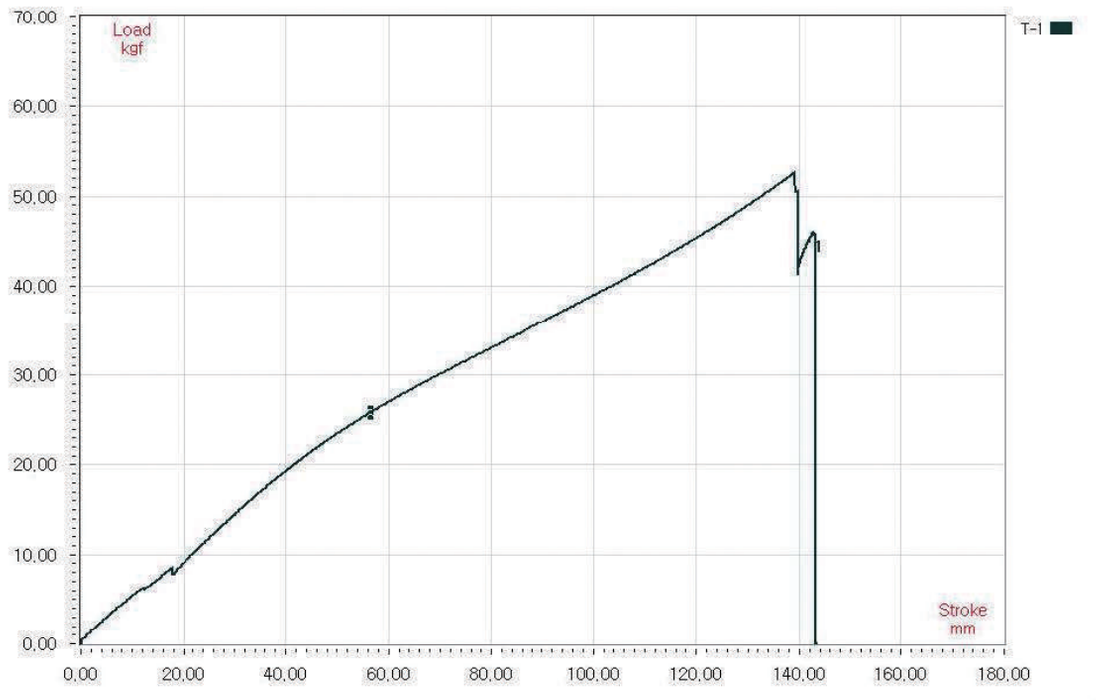
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PNC-36	52.60	34.08	25.80	16.71	143.21	---	OK
Aver.	---	52.60	34.08	25.80	16.71	143.21	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PNC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

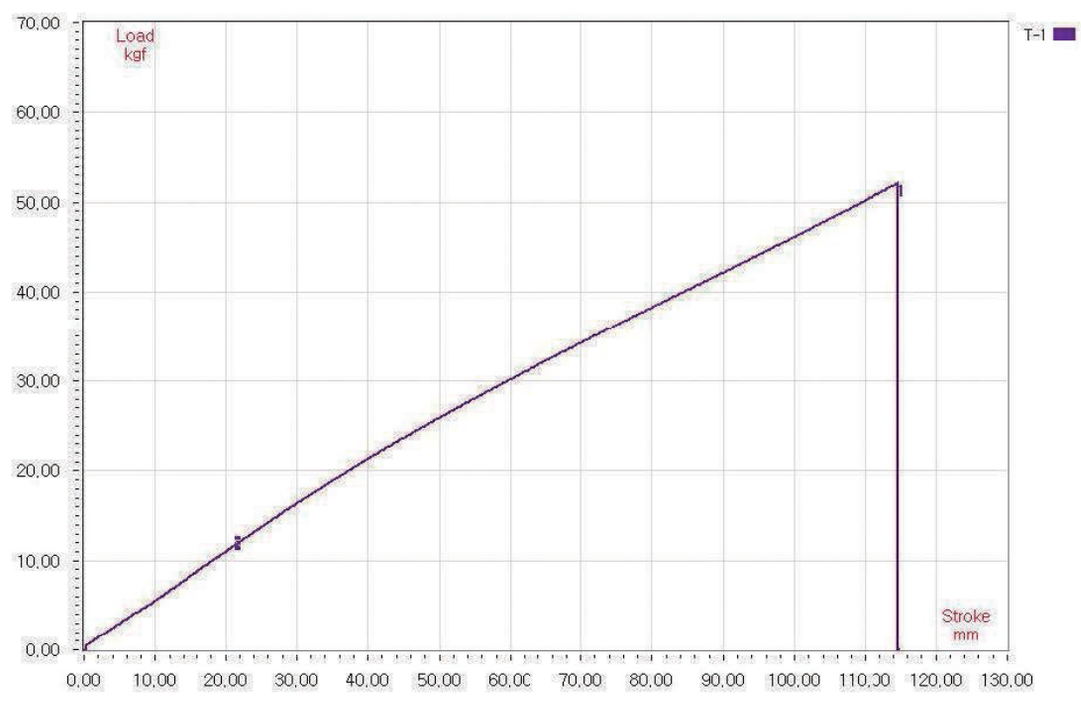
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PNC-48	52.10	33.75	11.90	7.71	114.68	---	OK
Aver.	---	52.10	33.75	11.90	7.71	114.68	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PWC pull-out Test Report

Test Report

CPS-T-170417-002

Issued Date : 2017. 4. 17

CP SYSTEM CO,.LTD
#27-37, Jeonggwansanggok 1-gil,
Jeonggwan-myeon, Gijang-gun, Busan,
Korea

Test No.	: CPS-T-170417-002
Document No.	: CP System 17 - 054
Description	: PULLING OUT Test
Sample Name	: CPSYSTEM PWC connector + CPS TUBE
Testing dept.	: CP SYSTEM CO,.LTD, Q.C Department
시험 담당자	: Minwook Shin
Test Period	: 2017.04.17

CPS-T-170417-001

CPSYSTEM PWC connector + CPS TUBE

Contents

1. Experimental equipment data
2. Sample data
3. Testing method
4. Test environment
5. Examination result

품질보증팀 CPS CPSYSTEM CO., LTD.

(Legally binding signature of the issuer)

PWC pull-out Test Report

Test Report CPS-T-170417-002 Issued Date : 2017. 4. 17

1. Experimental equipment data

· Name : Whole material tester, mechanical, tensile, compressive
· No of equipment : TM-141224-001
· Test category : Material tensile, material compression, material tensile elongation test

Method	Specification
Max. Load Capacity	2,000 kgf
Load Sensor	Load Cell
Measurement Accuracy	Within ± 0.3%
Max. Stroke	999 mm

FIG 1. Whole material tester

2. Sample data

· Specimen A : PWC connector + CPS tube (07~48)

FIG 2. PWC connector + CPS tube (07~48)

PWC pull-out Test Report

CPS

Test Report CPS-T-170417-002 Issued Date : 2017. 4. 17

3. Test method

· Strech a specimen by speed, 30mm/min and measure weight when tube and connector are separated.

※ Arbitrary and non-standard test

FIG 3. PULLING OUT TEST

4. Test environment

· Temperature : 20℃
· Humidity : 23%

PWC pull-out Test Report

Test Report CPS-T-170417-002 Issued Date : 2017. 4. 17

5. Examination result

Specimen	SIZE	Measured value
A (PWC connector + CPS tube)	07	8.2 kgf
	10	13.3 kgf
	12	22.9 kgf
	16	26.4 kgf
	22	52.9 kgf
	28	39.4 kgf
	36	44.8 kgf
	48	48.2 kgf

※ Refer to attached file to see test graph

PWC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

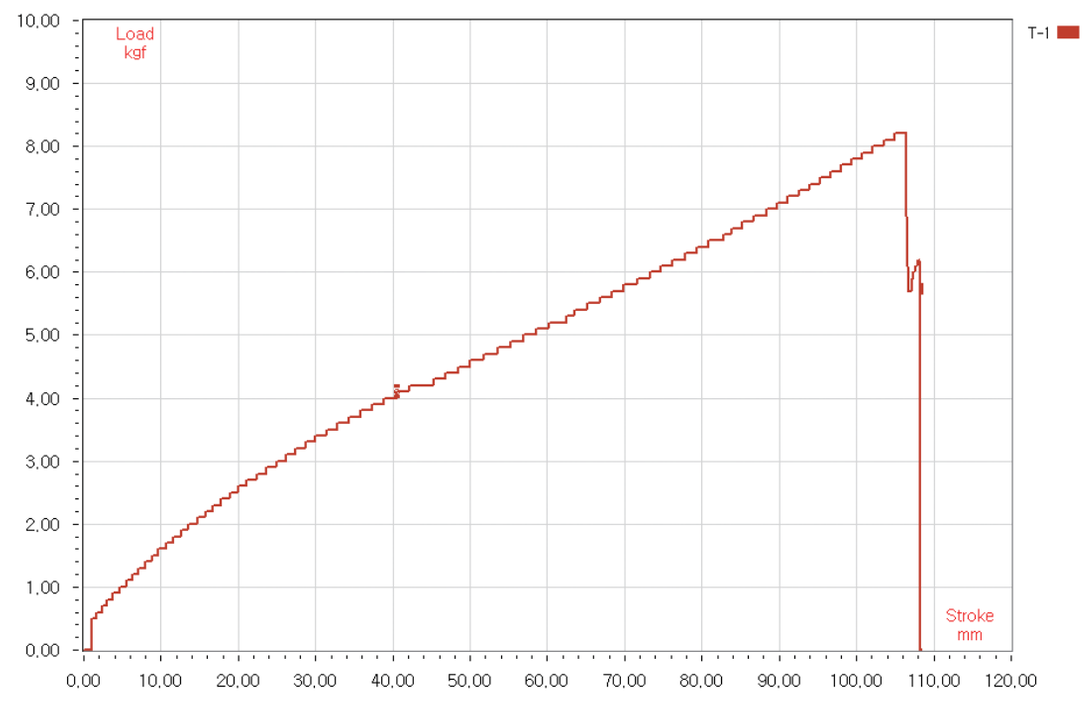
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PWC-07	8,20	5,31	4,10	2,66	108,20	---	OK
Aver.	---	8,20	5,31	4,10	2,66	108,20	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PWC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

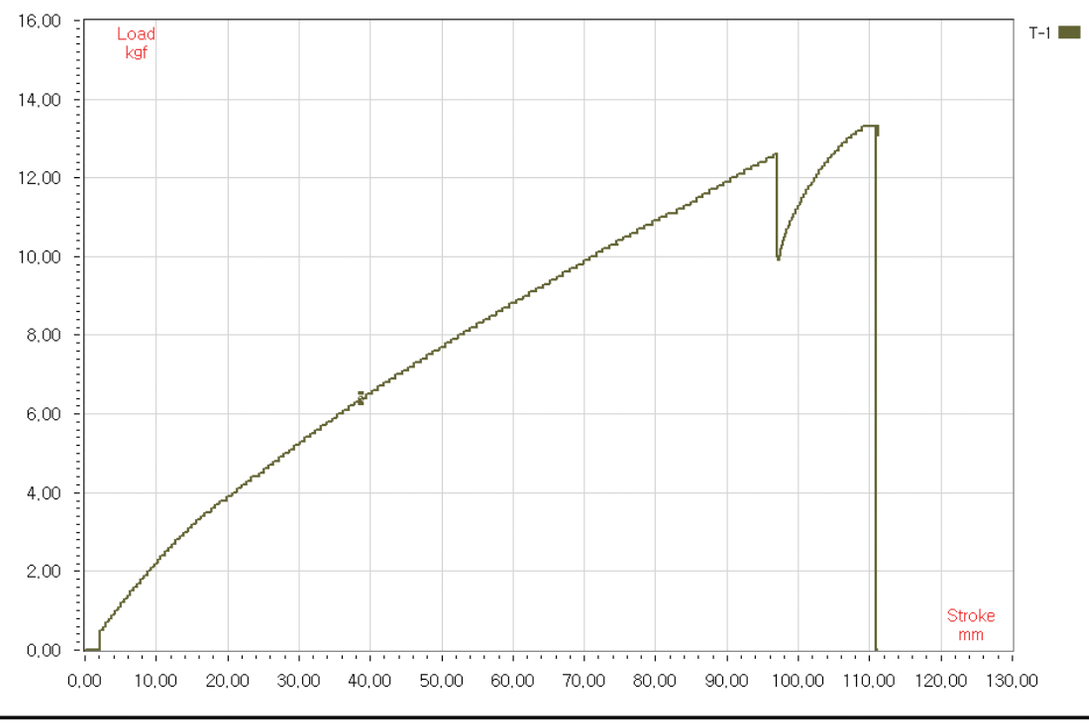
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PWC-10	13,30	8,62	6,40	4,15	110,89	---	OK
Aver.	---	13,30	8,62	6,40	4,15	110,89	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PWC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

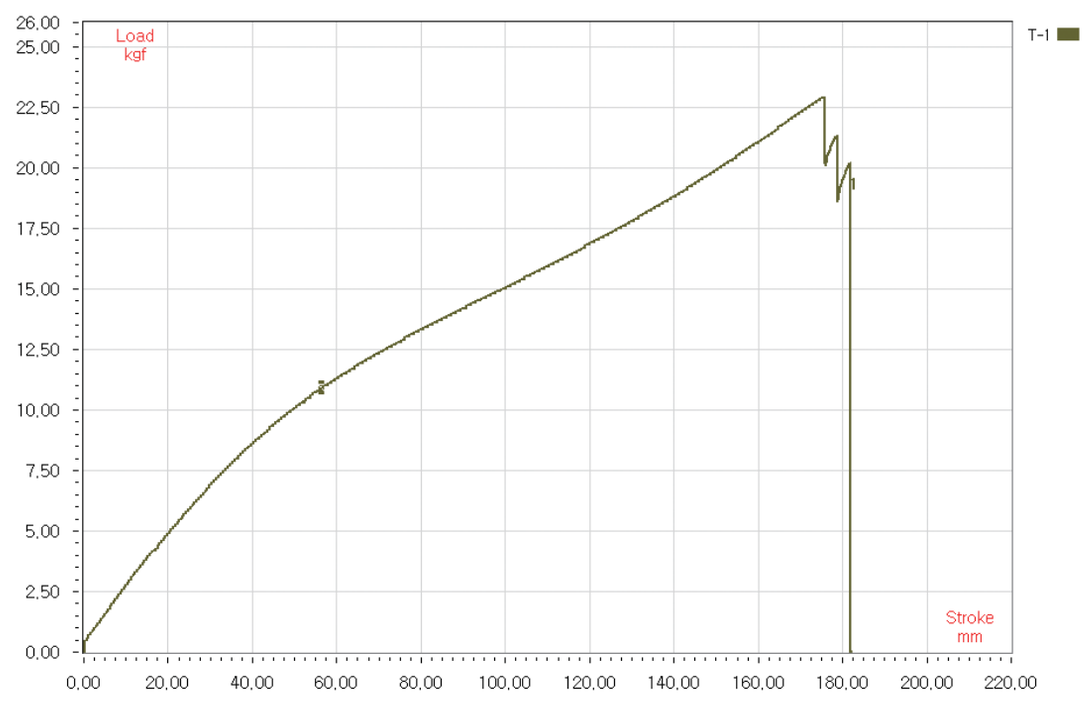
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PWC-12B	22.90	14.84	10.90	7.06	181.90	---	OK
Aver.	---	22.90	14.84	10.90	7.06	181.90	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PWC pull-out Test Report

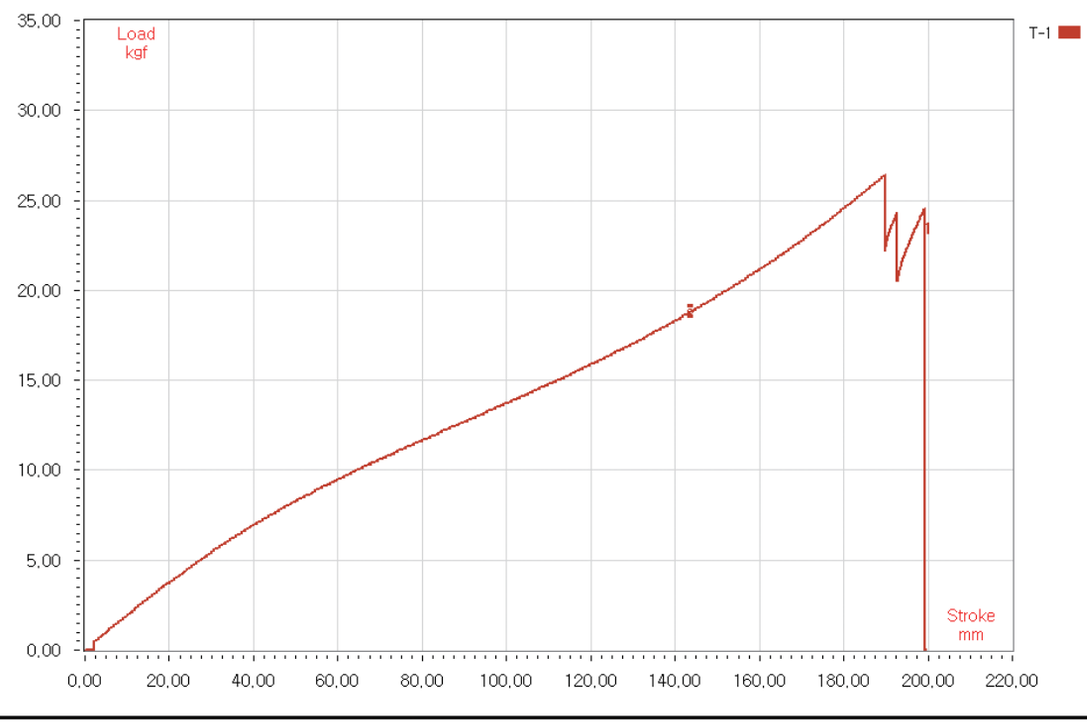
인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PWC-16B	26.40	17.10	18.80	12.18	199.33	---	OK
Aver.	---	26.40	17.10	18.80	12.18	199.33	---	---
[Test Spec]								
Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PWC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

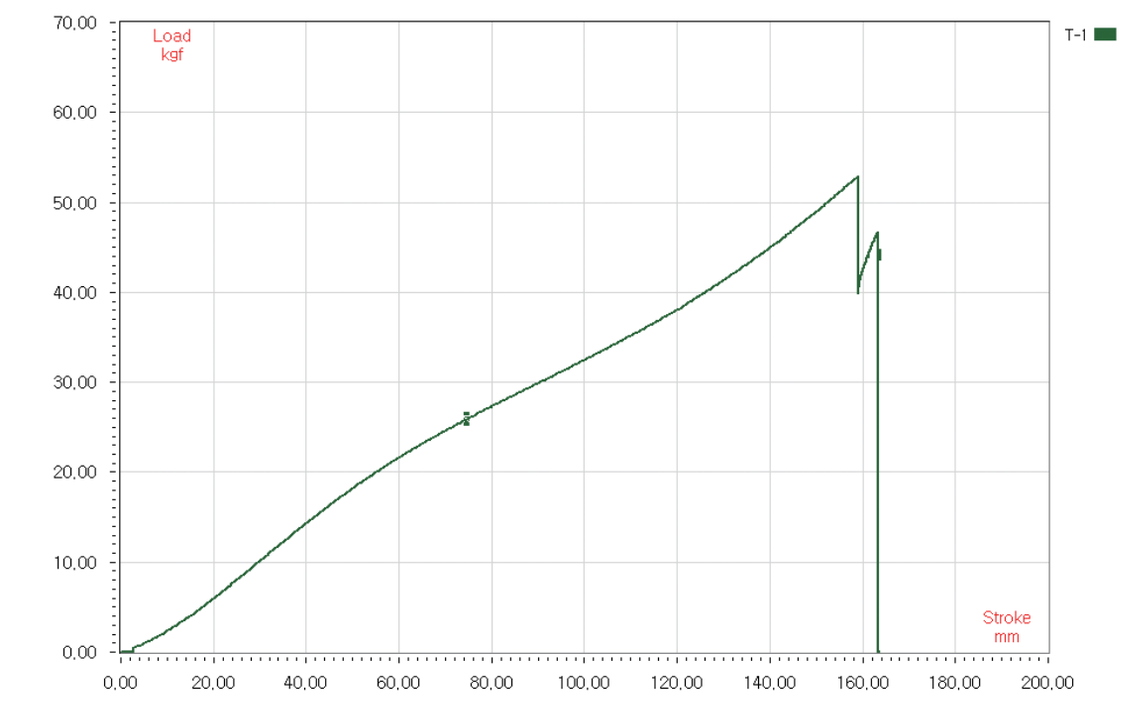
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PWC-22	52.90	34.27	25.90	16.78	163.39	---	OK
Aver.	---	52.90	34.27	25.90	16.78	163.39	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PWC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

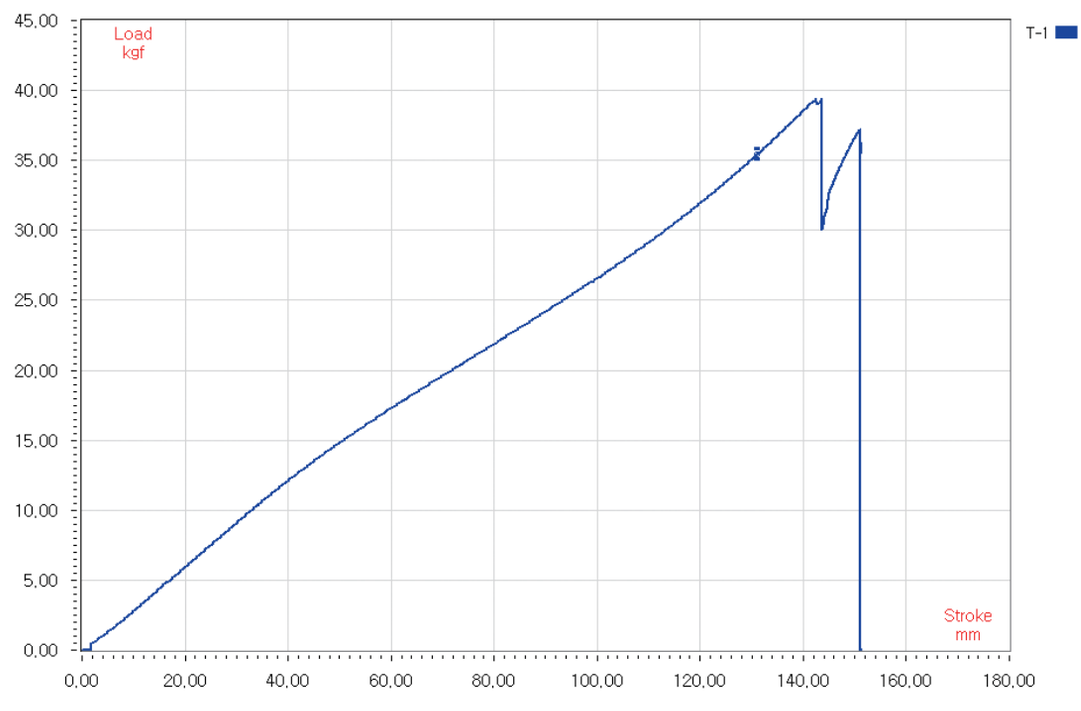
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PWC-28	39.40	25.53	35.40	22.93	151.08	---	OK
Aver.	---	39.40	25.53	35.40	22.93	151.08	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PWC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

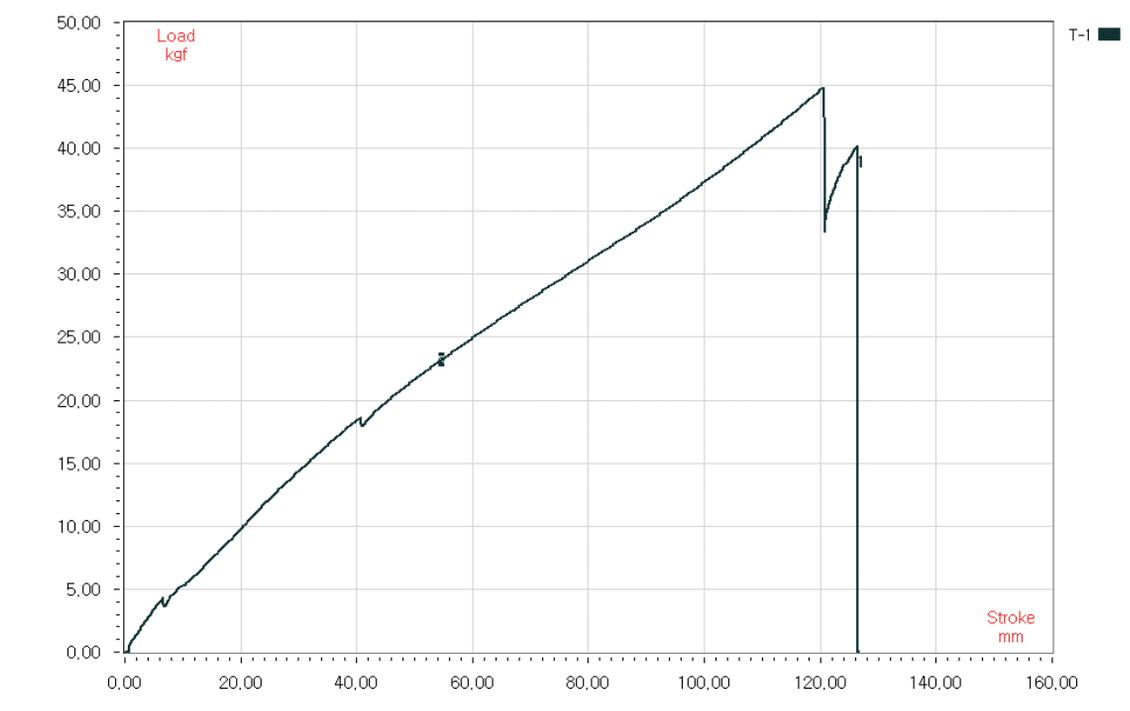
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PWC-36	44.80	2.99	23.20	1.55	126.50	---	OK
Aver.	---	44.80	2.99	23.20	1.55	126.50	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

PWC pull-out Test Report

인장 시험 성적서
(Tensile Test Certificate)

Tested by	Reviewed by	Certified by

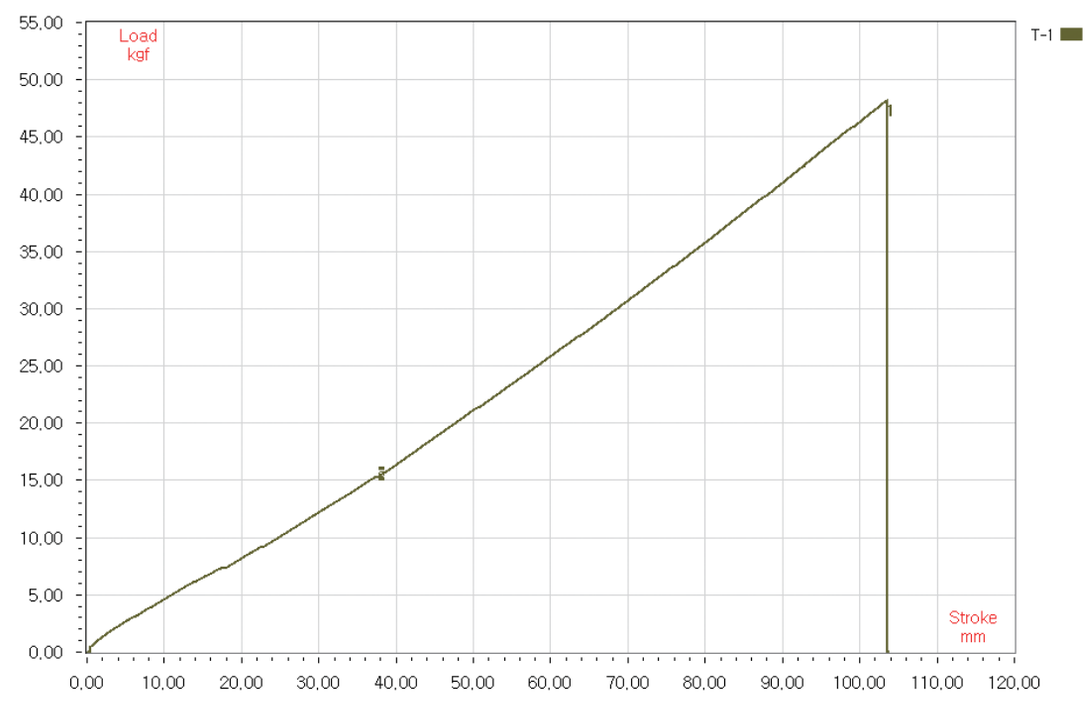
[Test Result]

시료 번호 No.	시료명 Test Name	최대 하중 Max.Load (kgf)	인장 강도 T.Stren (kgf/cm²)	항복 하중 Y.Load (kgf)	항복 강도 Y.Stren (kgf/cm²)	최대 변위 Max.Disp (mm)	경 도 (Hardness)	판 정 (NG/OK)
1	PWC-48	48.20	31.23	15.60	10.11	103.60	---	OK
Aver.	---	48.20	31.23	15.60	10.11	103.60	---	---

[Test Spec]

Min.	---	---	---	---	---	---	---	---
Max.	---	---	---	---	---	---	---	---

[Test Graph]



[Remark]

씨피시스템(주)

Chemical test

Chemical resistance of Polyamide Detailed information on request

acetone	resistant	phosphoric acid, watery	resistantpoash lye,
ammonia	resistant	potashlye, watery	resistant
aresenic acid, water	resistant	propane, liquid	resistant
beer	resistant	sel solution, watery	resistant
benzol	resistant	sea water	resistant
borax, watery	resistant	sebum	resistant
boron acid, watery	conditional resistant	silicic acid, watery	resistant
butance, gaseous	resistant	skydrol	resistant
		soap suds	resistant
calcium chloride, watery	resistant	sodium chloride	resistant
carbon disulphide	resistant	sodium hydroxide	resistant
carbonic acid	resistant	sparks erosion liquids	resistant
copper sulphate, watery	conditional resistant	starch, white	resistant
		stearin acid	resistant
diesel oil, watery	resistant	sulphuric acid	non-resistant
ethyl acetate	resistant	terpentine	resistant
ethyl ether	resistant	toluol	resistant
ethyl alcohol	conditional resistant	transformer oil	resistant
fatty acid conditional	resistant	urine	resistant
fruit juice	resistant		
formic acid, watery	non-resistant	vinegar and acetic acid, watery	resistant
glucose, watery	resistant	wine acid, watery	non-resistant
glycerine	resistant		
		xylol	resistant
heating oil	resistant		
hydraulics oil	resistant	zinc sulphate, watery	conditional resistant
hydrogen	resistant	zyan potash, watery	resistant
hydrogen sulphide	resistant	Oil and Grease	
		- mineral without additive, at20℃	resistant
iron chloride	conditional resistant	- ASTM oil no1, 20℃	resistant
		- ASTM oil no2, 20℃	resistant
lactic acid, watery	conditional resistant	- ASTM oil no3, 20℃	resistant
		- animal	resistant
methyl acetate	resistant	- vegetable	resistant
methyl alcohol	resistant	- transformer oil(pyranole)	resistant
mineral oil	resistant	- on silicone basis	resistant
		- diesel oil	resistant
nitric acid, hydrochloride acid, watery	non-resistant	- heating	resistant
		- hydraulic oil based on	
ozone	conditional resistant	- mineral oil	resistant
		- phoshate ester	resistant
paraffin	resistant	- drilling oil	resistant
petrol	resistant	- cutting oil	resistant

Made of Protection

code Degree of Protection (Water)

Protection against contacting and penetrating foreign materals

FIRST INDEX

CODE	Degree of Protection (contact and foreign materials)	
0	no protection	no contact protection, no protection against. solid foreign materials.
1	protection against arge foreign materials	protection against large contact area with hands, protection against foreign materials with ϕ >50mm.
2	protection against medium-sized foreign materials	protection against contact with fingers, protection against foreign materials with ϕ >12mm.
3	protection against small foreign materials	protection against tool contact, wire or the like with ϕ >12mm, protection against foreign material with ϕ >2.5mm.
4	protection against foreign grains	see 3, but ϕ >1mm.
5	protection against dual deposits.	full contact protection, protection against dust deposits inside.
6	protection against penetration	full contact protection, protection against dust penetration.

Protection against fluids

SECOND INDEX

CODE	Degree of Protection (contact and foreign materials)	
0	no protection	no protection against water
1	protection against dripping water	protection against vertical water drops
2	protection against inclined water drops	protection against inclined water drops (any < up to 15° to vertical line)
3	protection against spray water	protection against splash water from all directions, 60° to vertical line
4	protection against splash water	protection against splash water from all directions.
5	protection against jet water	protection against water jets from any <
6	protection against flooding	protection against temporary flooding.
7	protection against immersion	protection against water penetration 1m below water
8	protection against submersion	protection against pressure water for an indefinite time(customer tailored)

example : code IP67

All techincal details without engagement. All dimensions in mm. Changes without announcement, Range of tolerance : ±10%

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