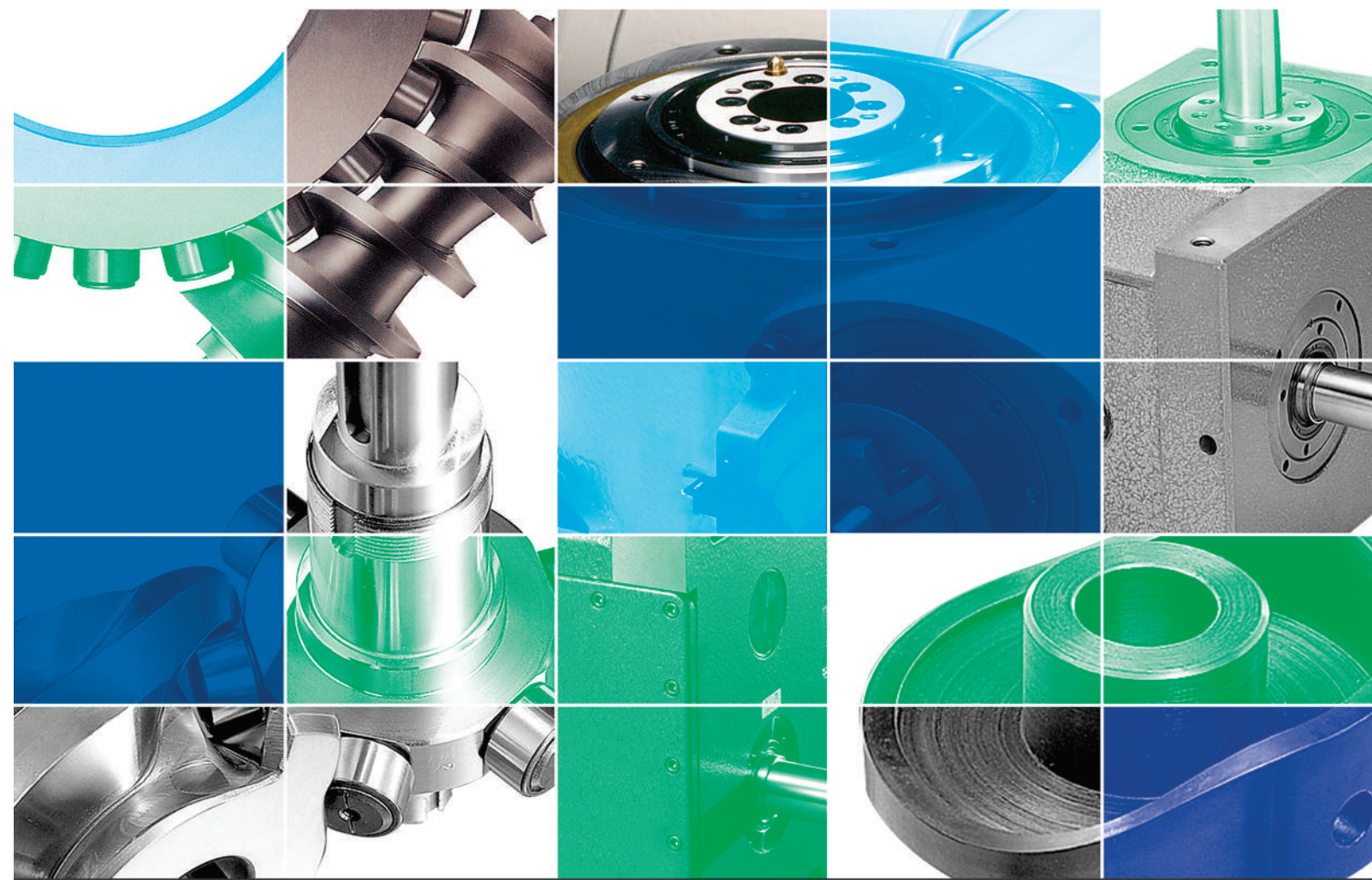


INDXIA
TORQUE SHIELD
CUSTOM CAM



HISTORY

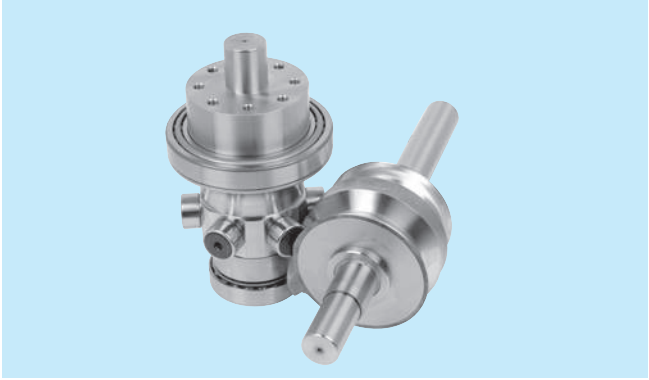
- 1994 11** Entered into a partnership contract with Sankyo seisakusho in Japan
- 1995 03** Established Sankyo Korea (Sihwa industrial complex 3ra816ho)
- 08** Manufacture and sell the SANDEX DL Series. Also Export to japan Samgong production center, Inc
- 1997 10** Installed 5 faces machine tool for SANDEX case processing
- 12** Built new building at Sihwa complex 1na304ho
- 1998 01** Exported SANDEX DL SERIES to Japan and the East Asia
- 08** Develop and start to sell the SANDEX MOTOR integrated type alpha series
- 1999 12** Manufactured our own M/C which is only for fabricating CAM and start to manufacture order made cam which is known as CUSTOM CAM.
- 2000 08** Developed & sold the super high speed type FH handler index (Axial distance 60, 80 mm/600rpm)
- 2002 03** Manufactured our own M/C which is only for fabricating Roller gear cam.
- 11** Certified as a clean business place
- 2003 07** Manufactured our own high speed M/C which is only for fabricating Custom Cam.
- 09** Manufacture and sell the SANDEX PXX Series.
- Purchased 2nd M/C which is only for fabricating Sandex Housing.
- 2005 05** Obtained the ISO9001:2000 quality system certification
- Manufactured our own 2nd M/C which is only for fabricating Roller gear cam.
- 10** Purchased M/C which is only for fabricating turret.
- 2006 01** Localized the SANDEX alpha series (Center distance 190, 230mm)
- 2007 10** Obtained a reliability certification for parts materials of a roller gear cam(indexing drive)
- 2008 02** Purchased M/C for fabricating FMS Housing. (10 Pallet)
- 2009 12** Localized 8FH(800RPM) high-speed. indexing handlers
- 2011 09** Excellant capital goods development in the korea machinery Fair
- 2013 01** Acquisition of the new trademark
INDXIA
Torque Shield
DynaStation
- 2013 12** Termination of join veture and technical cooperation
- 2014 04** Acquisition of the Inno-Biz Certification
- 06** Changed company name
Sankyo Korea Co., Ltd → HANNZ MOTROL Co., Ltd.
- 12** Completion of the 2nd factory construction and beginning of manufacture



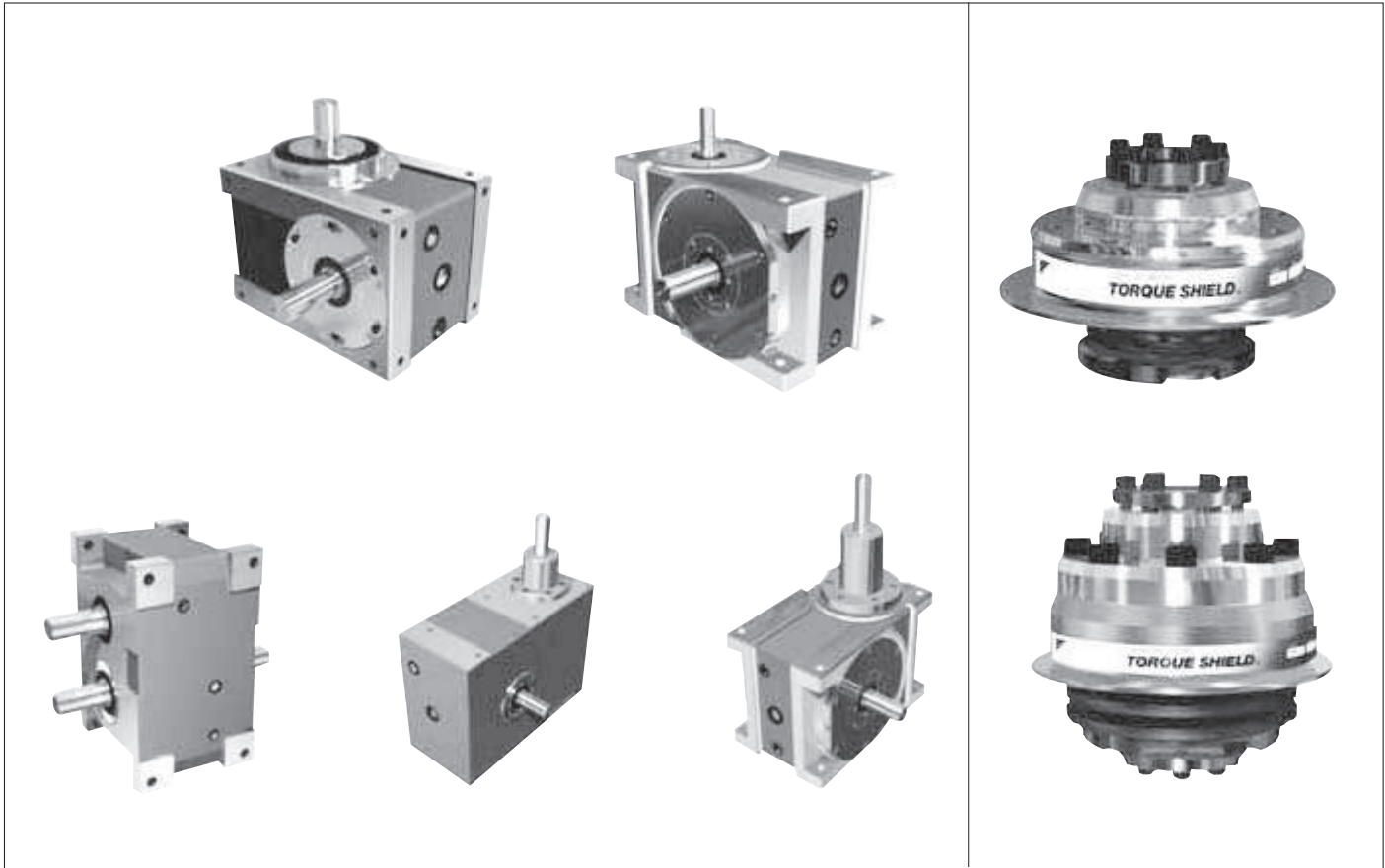
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>> About Roller Gear Cam mechanism



Roller gear cam mechanism is composed of the roller gear cam, cam follower and turret. The characteristic of this mechanism is that the precise delivery of the motion is possible since there is no backlash regarding the rated load, as the 2 cam followers are solidarized as the pre load state to the taper lib of roller gear cam. The configuration of roller gear cam and turret enables the gaining of balance in terms of mechanics, so that it is idealistic, compact and strong. Moreover, every conveyance of the load is done by the rolling contact, which minimizes the friction loss and motor loss. The grading device of the roller cam device which has the feature of splendid high speed • spotting is creating the broad demand of the industry.



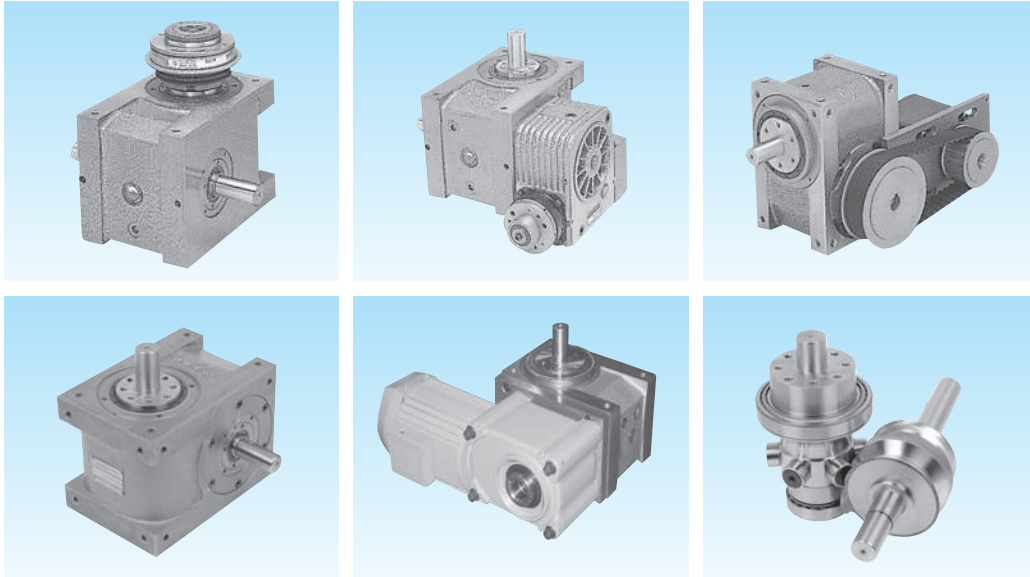
INDXIA

Roller Gear Cam Type Index Device

Type with the integration of shaft type and flange-type

HDseries

• INDEXING DRIVE • OSCILLATING DRIVE • REDUCER TYPE
• REDUCER • TORQUE SHIELD

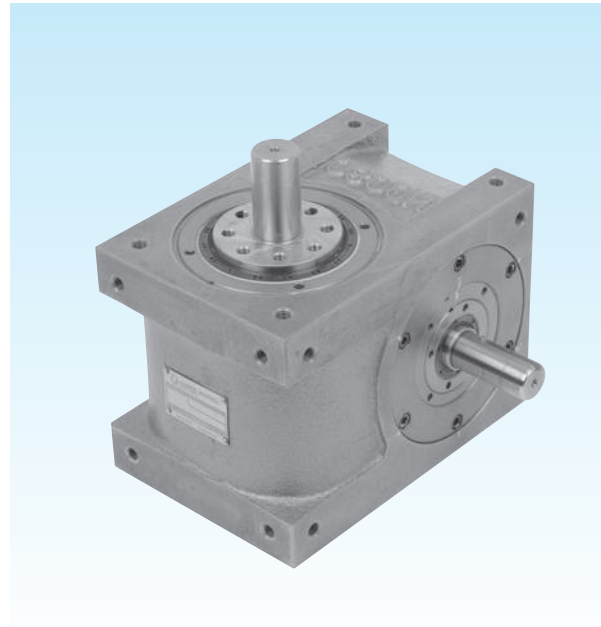


- Option Specifications
- Mounting of TORQUE SHIED
 - Mounting of Speed Reducer
 - Mounting of Motor

Characteristics of HD Series

- The completed type of roller cam which is the main drive unit in the automation equipment.
- Applicable in every industry area which requires the automated manufacturing line and save of manpower.
- Prompt response, fast delivery and reasonable price (All CAD data are available on our home page)
- The quality of all models such as accuracy of dividing angle, repeatability and etc are controlled by our QC department and Roller gear cam is fabricated by our own M/C which is used only for fabricating the roller gear cam.
- Released the new product which mounted the hollow axis Geared Motor which is integrated type of Index and Motor (Inverter control)
- Center distance 45~170mm (7 types of machine)

Specifications of Shaft • Flange HD Series



Overview

INDXIA is the intermittent device of the roller gear cam equipment which has been developed with the theme of “faster, more precise, and easier to use”. This HD Series can be used according to the purpose of use, as it has been made as the integrated form of the straight shaft of the output shaft and the flange surface. The table, arm, sprocket, gear, etc. can be directly connected to the flange surface, and the mounting of the torque safety device which protects the grading device from the overload by utilizing the shaft part can be simply done.

INDXIA has the splendid safety, credibility, and high speed; it can be utilized for driving conveyor, as well as the rotary type automatic device. It is the INDEX which contributes to the cost performance as well as enhances the overall credibility of the total machines, in the current era requiring the manpower saving, and high productivity.

Characteristic

- Standardizing from the small size to the midsize machine (center distance 45~170mm)
- Number of STOPS are available from 2 to 16.
- Output shaft is the integrated type of shaft and flange, which has the enhanced convenience of component mounting
- Attachment posture and attachment direction are flexible so that it can be utilized in many ways.

Basic Motions

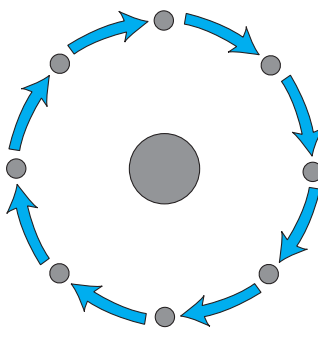
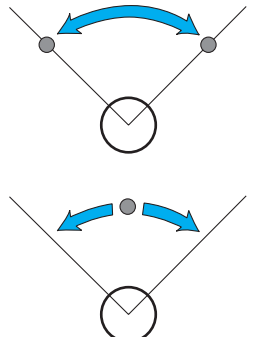
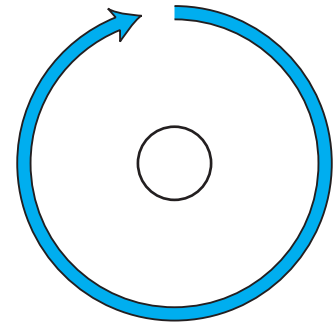
● Indexing Drive  • Stop → Dividing → Stop → Dividing: the intermittent rotation movement is done. • The output shaft divides and stops (once each) for 1 rotation of the input shaft. • It can be used as the core grading device of the rotary type automatic machine which is with the rotation table. • It can be used as the grading device of the in line automatic machine which conducts the intermittent transfer of conveyor. 	● Oscillating Drive  • It is the device with the output shaft doing the reciprocating motion, utilizing the input shaft rotating at the continuous constant velocity. • Simple reciprocating motion and the stopping condition at the intermediate location of the motion can be set, and the stopping angle can also be freely designated. • Oscillating cam can be mounted at the output shaft, and the motion can be changed to a straight line motion by utilizing the roller and guide at the fleet, which enables the use as the carrier device of work. 	● Reducer Type  • Precise reducing TYPE. • It is suitable for the speed reducer of the machine which has the small delivery loss & back lash, and wants the smooth rotation and high torque. • It can be used for dividing table into the multi sections, and also it can be used for randomly dividing table. 
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Table A-1

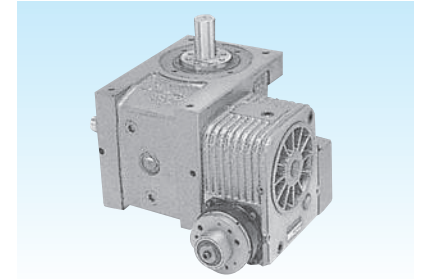
Mounting of Option

(a) Specification of mounting of the reducer <Size of related type HD060~HD170>

This specification which mounted the precise worm reducer, is developed to maximize the characteristics of Indxia. Because this reducer is mounted directly to the body of input axis, it actualized the compact size and eliminated the transfer loss. Moreover, due to the pre-load adjusting tools, it can obtain fine rotation with less backlash. Mounting the clutch and brake are possible.

【R48, R65, R80, R100】

Referring to 24P

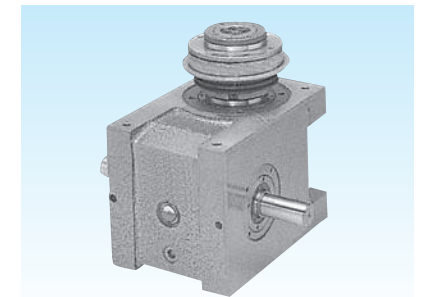


(b) Specification of mounting of the torque shield <Size of related type HD045~HD170>

Big trouble will be generated to the body of Indxia if the load applied to the output axis of Indxia is more than its specification. The torque shield is the safety device to prevent such accident to happen. When excessive torque is applied to the output, it will block corresponding torque and protect the product. There are flange type and coupling types are available therefore, please select the correct type upon your usage.

【TO6F~TI8F, TO6C~TI8C】

Referring to 22 P

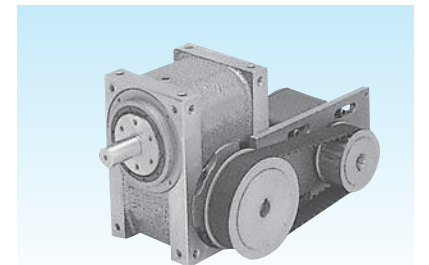


(c) Specification of mounting of the induction motor <Size of related type HD045~HD060>

This is compact unit which integrated the drive source by applying the best suitable timing belt for operation. For the drive source, it has applied the induction motor which as characteristics of high efficiency, high power and less power consumption. It will provide the rotation with characteristics of stable, high rigidity and less backlash.

【60W, 90W】

Referring to 23P

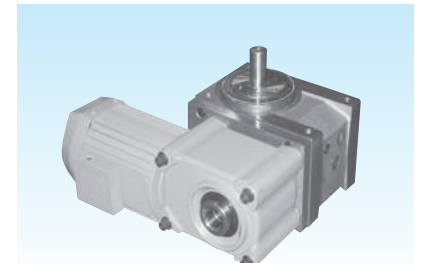


(d) Specification of mounting of the geared motor <Size of related type HD070~HD170>

This is indexing drive which has applied the geared motor as a input drive source. The output of this type will repeat rotate and stop which is known as intermittent dividing operation. This is motor integrated compact product which kept its advantage characteristics such as high speed, high rigidity and high reliability.

【0.2kw, 0.4kw, 0.75kw, 1.5kw, 2.2kw】

Referring to 19P



Example for application

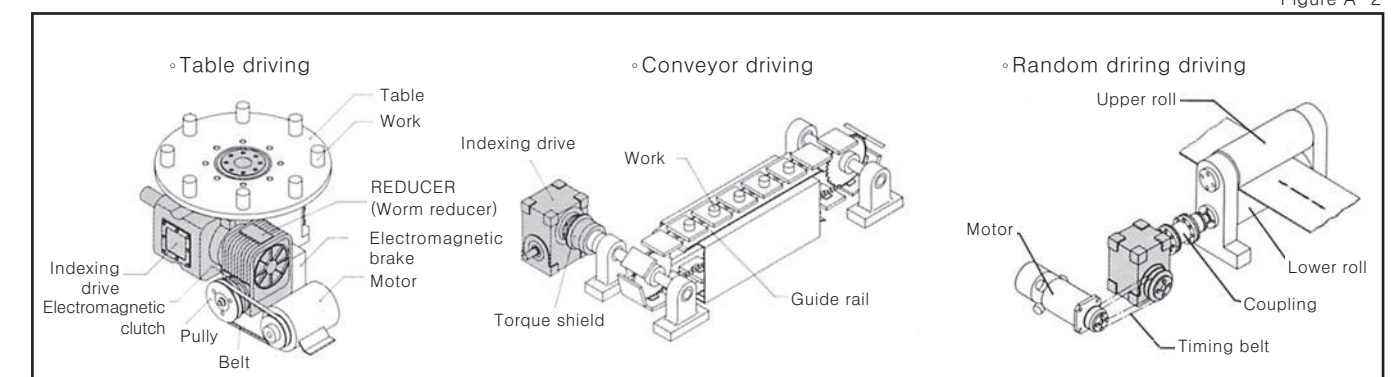


Figure A-2

■ Regarding the selecting the machine type

Purpose and usage of index device are various. The important fact of selecting the model is to clear the usage and purpose first and then sufficiently understand the characteristics and operation of device. Regarding the selecting models, please sufficiently check the constraint conditions.

(1) Maximum Load

It allowed THRUST load and RADIAL load of output shaft of the roller gear cam index device. Maintaining the accuracy will become difficult if the loading capacity exceeds this value.

(2) Bending of output shaft

It shows the moment of allowed bending of the shaft in case of receiving the load of overhang. The shaft tends to be cut from the one part of shaft by the fatigue phenomenon of shaft in case of exceeding this value.

(3) Rigidity of torsion of shaft

It means that the rotation must be constant in case of input shaft and the vibration of torsion is controlled in case of output shaft. It needs especially the rigidity of torsion of shaft.

(4) Degree of dividing

In case of requiring high dividing accuracy, please select 1DWELL CAM. (please refer to the characteristic table)

(5) The distance between shaft distance and table.

Please consider the following values and select the model in case of mounting the table and arm to the flange surface of output as considering the operation and safety. (Below values are based on our experience)

Diameter of table --> 6 times max allowable value of shaft distance

Length of arm --> 5 times max allowable value of shaft distance

(6) Applying RPM

It can apply RPM up to the value of torque written on the torque table.

(7) Environment temperature

The standard surrounding temperature for INDXIA is 0 ~ 40. Please contact us for not using the product under the condition of given temperature.

(8) Static rated output Torque

It displays the allowable limit of torque which can be applied to output axis. (Please refer to the torque table)

(9) Dynamic rated output Torque

This is allowable limit value which calculated the life cycle as 12,000 hours. The torque calculation of model selection is usually based on this value and also life cycle is calculated. (Please refer to the torque table)

■ The driving device and surround device of input/output

In order to constitute an excellent automatic machine, it is very important to selecting the proper model.

Therefore, please sufficiently check about the input drive system from drive source to input axis and the output drive system from output axis to final position. By doing so, it can increase the accuracy, reliability and ability.

(1) Component of input shaft

It requires actions such as selecting the machine without backlash, shortening the power transferring path to the input axis from the motor and etc. Motor, reducer, timing belt, clutch, brake, coupling, locking factors.

(2) Component of output shaft

Static exciting force is being applied to the rotating output when performing stop or dividing, it is important to decrease the output load, eliminate the bending and backlash. Table, conveyor, torque shield

(3) Unit

We have prepared various of surrounding devices in order to maximize our Index drive to perform in 100% condition.

• Sign used at the formula

a_4	: Backlash Factor	No	: Initial RPM(rpm)	Top	: Dynamic rated output torque(N • m)
A_m	: Non-dimensional maximum acceleration	m	: Number of dwells	T_s	: Static rated output torque(N • m)
A_{max}	: Maximum acceleration($\frac{m}{s^2}$)	θ	: Index angle(deg)	T_t	: Output shaft required torque(N • m)
D	: Diameter of rotation(m)	P	: Transfer pitch(m)	T_w	: Work load torque(N • m)
F	: Work load(N)	P_a	: Average Load Motor Power(Kw)	T_x	: Camshaft friction torque(N • m)
J	: moment of inertia($kg \cdot m^2$)	P_s	: Motor power(Kw)	V_e	: Straight line velocity(m/s)
J_b	: Internal moment of inertia($kg \cdot m^2$)	Qm	: Dimensionless Maximum CAM SHAFT torque coefficient	V_m	: Dimensionless Maximum velocity
g	: Acceleration of gravity($\frac{m}{s^2}$)	R	: Radius of rotation pitch(m)	V_{max}	: Maximum velocity(m/s)
K	: Radius of rotation(m)	S	: Number of stop	Ww	: Work load load(N)
Lf	: Life coefficient	T_c	: Camshaft torque(N • m)	β	: Angle of action(deg)
Lh	: Expected life time(hr)	T_d	: Start/Stop torque(N • m)	γ	: Rotating speed ratio($\gamma > 1$)
M	: Mass(kg)	T_f	: Friction torque(N • m)	μ	: Frictional coefficient
N	: Revolutions Per Minute(rpm)	T_i	: Inertial torque(N • m)	φ	: Oscillation angle(deg)
N_a	: Capability Table RPM(rpm)	T_{oi}	: Internal Inertia load torque(N • m)		

Table B-2

	Rotary motion	Linear motion
(A) Moment of inertia J	$J = MK^2 = \frac{1}{4}MD^2$ (kg • m ²)	$J = M \left(\frac{S \cdot P}{2\pi} \right)^2$ (kg • m ²) $J = M \left(\frac{60 \cdot V_e}{2\pi \cdot N} \right)^2$ (kg • m ²)
(B) Inertial torque Ti	$T_i = 226.2Am \frac{J \cdot N^2}{S \cdot (\theta/m)^2}$ (N • m) $= 226.2Am \frac{M \cdot K^2 \cdot N^2}{S \cdot (\theta/m)^2}$ (N • m)	$T_i = 5.73Am \frac{M \cdot S \cdot P^2 \cdot N^2}{(\theta/m)^2}$ (N • m)
(C) Friction torque Tf	$T_f = W \cdot \mu \cdot R \cdot g$ (N • m)	$T_f = \frac{W \cdot \mu \cdot S \cdot P \cdot g}{2\pi}$ (N • m)
(D) Work load torque Tw	$T_w = R \cdot F \cdot \cos\beta$ (N • m)	$T_w = \frac{F \cdot S \cdot P}{2\pi} \cos\beta$ (N • m)
(E) Required torque Tt	$T_t = T_i + T_f + T_w$ (N • m)	
(F) Cam shaft torque Tc, Tce	Real camshaft torque of indexing drive. $T_c = 500Qm \frac{1}{S \cdot \theta} (T_t + T_{oi}) + T_x$ (N • m) Real camshaft torque of oscillating drive. $T_c = 1.389Qm \frac{\varphi}{\theta} (T_t + T_{oi}) + T_x$ (N • m) In case of acting the friction torque Tf or the work load torque TW on the output load. $T_{ce} = 360Vm \frac{1}{S \cdot \theta} (T_f + T_w) + T_x$ (N • m) In case of acting inertial torque Ti on the output load. $T_{ce} = 360Qm \frac{1}{S \cdot \theta} (T_i + T_{oi}) + T_x$ (N • m)	In case of acting the Frictional force by direct motion or work load. $T_{ce} = 57.32Vm \frac{P(W \cdot \mu + W_w)}{\theta}$ (N • m) In case of acting the inertial force only by the direct motion. $T_{ce} = 2063Am \cdot Qm \frac{P^2 \cdot N^2 \cdot M}{(\theta/m)^3}$ (N • m)
(G) Motor power Ps	$P_s = \frac{T_c \cdot N}{9550}$ (Kw) Motor power of average load [In case of $T_i > (T_f + T_w)$] $P_a = \frac{1}{2} P_s$ (Kw)	
(H) Life time Lh	$L_h = 12000L_f^{10/3}$ (hr) $L_f = \frac{T_{op}}{a_i (T_i + T_{oi}) + T_f + T_w}$	

■ Radius of gyration K

Table B-3

K^2	$\frac{r_1^2}{2}$	$\frac{r_1^2 + r_2^2}{2}$	$\frac{a^2 + b^2}{3}$
K^2	$\frac{r_1^2}{2} + R^2$	$\frac{r_1^2 + r_2^2}{2} + R^2$	$\frac{a^2 + b^2}{3} + R^2$

■ Life factor Lf and life hour Lh(hr)

Table B-4

Lh (hr)	Lf	Lh (hr)	Lf	Lh (hr)	Lf
2000	0.584	16000	1.09	50000	1.53
3000	0.660	18000	1.13	55000	1.58
4000	0.719	20000	1.17	60000	1.62
5000	0.769	22000	1.20	65000	1.66
6000	0.812	24000	1.23	40000	1.70
7000	0.851	26000	1.26	75000	1.73
8000	0.885	28000	1.29	80000	1.77
9000	0.917	30000	1.32	90000	1.83
10000	0.947	35000	1.38	100000	1.89
12000	1.00	40000	1.44	110000	1.98
14000	1.05	45000	1.49	120000	2.00

In case of indirect driving	Please calculate as below in case of gaining the indirect rotation from the output shaft or the direct movement.
inertial moment	$J_e = J/\gamma^2$
frictional torque	$T_{fe} = T_f/\gamma$
working load torque	$T_{we} = T_w/\gamma$
inertial torque	$T_{ie} = T_i/\gamma$

Product code

HD series

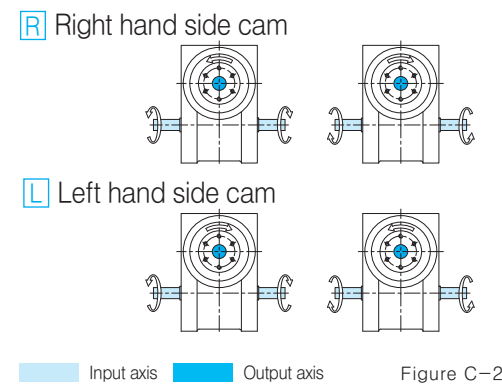
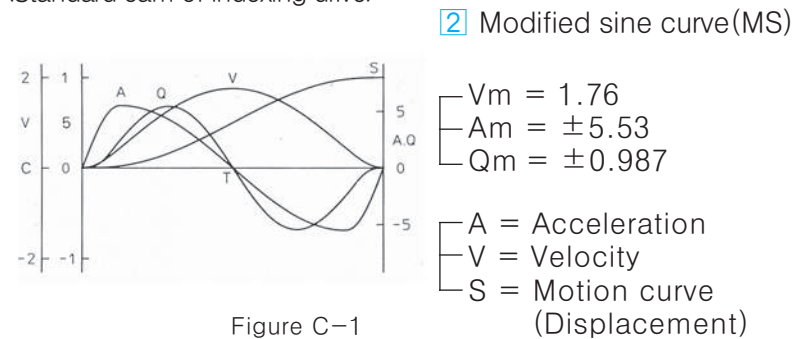
Indexing drive

ex.) **HD 080** — **08 12 2 R** — **S 3 VW 1** / **X**

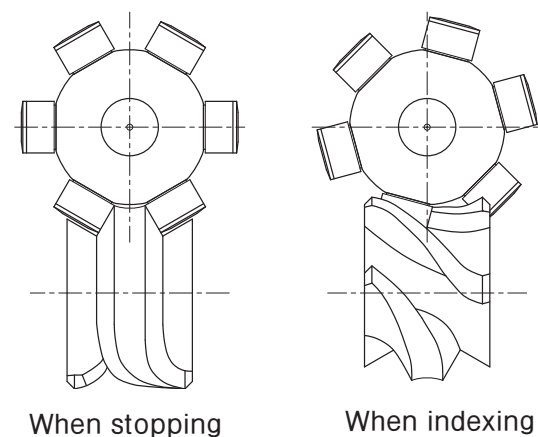
a b c₁ c₂ d e f g h i j

a Model	b Size	c ₁ Number of stop (S)	c ₂ Indexing angle (θ)	d Cam curve	e Rotational direction of input/output axis
HD Model name	080 Center distance 80mm	08 8stop	12 120°	2 MS Curve	R 1 DWELL and right hand side cam
HD Indicating HD Series	Indicating the center distance of input and output axis.	Indicating the number of stops of output axis per 1 rotation of output axis.	Indicating the indexing angle of required input axis for 1 indexing action.	1 Modified trapezoid curve MT 2 Modified sine curve MS 3 Modified equivalent acceleration MCV50 4 SHP-5 9 Order made cam curve Please inquire regarding the other curve.	Indicating the rotational direction of output axis toward the rotational direction of input axis and indicating the number of stops (DWELL) of output axis per 1 rotation of input axis. In case of 2DWELL, output axis will stop 2 times per 1 rotation of input axis. Right hand side cam R R2 R3 R4 Left hand side cam L L2 L3 L4 1DWELL is standard for DL type Please contact us for 2DWELL type or others.

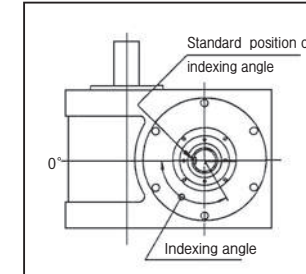
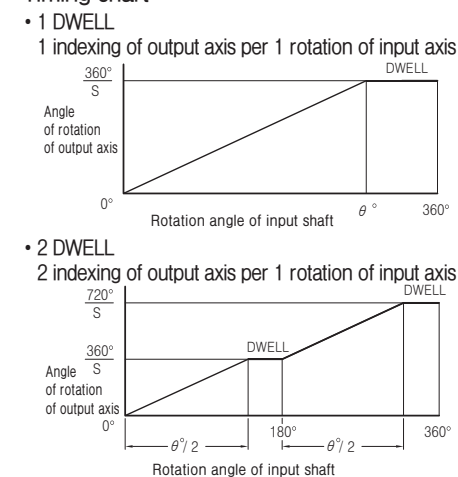
<Standard cam of indexing drive>



Regarding the Indexing and stopping

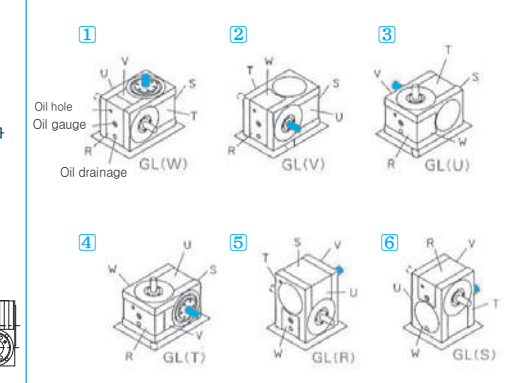
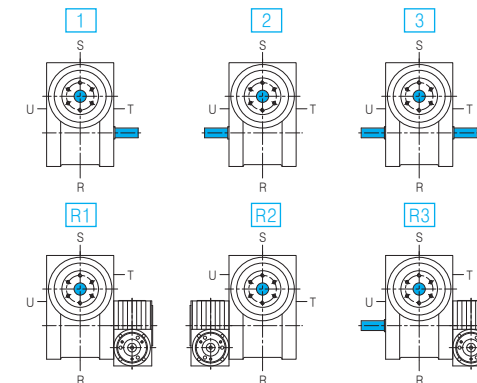


Timing chart



The product code is composed of size, number of stops, indexing angle, cam curve, cam rotational direction, output axis type, input axis type, fabricated side of mounting hole, position and special specification. Therefore, this device is much more complicated compare to the general machine device and the corresponding composition is extensively massive. It is almost impossible to operate the machine if the code is incorrect. Therefore, please make sure to know the using condition and then select the product code. Please provide us the using RPM, required accuracy and etc. Lastly, there are separate products code for reducer, torque shield and induction motor.

f Specification of output shaft	g Specification of input shaft	h Fabricated side of mounting hole	i Mounting position	j Special Instruction
S Standard shaft type	3 Both T and U surface sides input extension	VW V and W side of fabricated mounting tap hole.	1 Mounting position	X Special instruction
S Standard shaft type L Torque shield H Hollow shaft (separate consultation)	1 One side input axis (T side) 2 One side input axis (U side) 3 Double side input axis R1 One side input axis and R mounted (T side) R2 One side input axis and R mounted (U side) R3 Double input axis and R mounted M1 One side input axis and M mounted (T side) M2 One side input axis and M mounted (U side) M3 Double side input axis and M mounted (T side) M4 Double side input axis and M mounted (U side) <R: Reducer M: Motor>	The mounting hole of HD Series is standard which the tap hole fabrication has been done in both side of VW. In case of requiring tap holes on the side of R, S, T, V, please indicate the corresponding side on the code. A is fabrication of all sides.	Position 1 ... W face is GL Position 2 ... V face is GL Position 3 ... U face is GL Position 4 ... T face is GL Position 5 ... R face is GL Position 6 ... S face is GL Caution) GL (Ground Level)	Please mark X in case of special specification besides the standard product. ☐ Standard product (Do not mark anything) ☒ Special specification ☒ Example) 1) Change or indication of size, tolerance and etc 2) Fabrication of mounting holes other than additional fabrication and standard position. 3) Special order of indexing angle 4) Special order of cam curve 5) Special order of indexing accuracy 6) Change or indication of oil, level, drain 7) The other special specifications Cautious) Please provide us further notice for special order.



Code of part (Induction motor)

Code Example) **5IK60GU-AF** — **50** — **1**

a b c

Precautions

The size **4.5** and **6** are only applicable specification for induction motor mounting specification.

a The model of induction motor	b Deceleration ratio of gear head	c Position of motor mounting
Indicating the model of motor ex.) 5IK60GU-AF (60W) M9IC60G4L (60W) <Comments> Please write down the desired model as it is.	Indicating the deceleration ratio of gear head.	Figure C-5

Oscillating drive

ex.) **HD 110E** — **0128 2 R** — **S 3 VW 1** / **X**

a b c d e f g h i j

a Model	b Size	c Organizing number	d Cam curve	e Rotational direction of input/ output axis
HD Model name	110E Center distance 110mm	0128 0128	2 MS curve	R Right hand side cam
HD Indicating HD Series	Indicating the center distance of input and output axis. E : Indicating oscillator drive	The timing of input axis is order made for oscillating drive. Therefore, our company will decide the 4 digits of organizing number.	- Modified trapezoid curve MT - Modified sine curve MS - Modified equivalent acceleration MCV50 - Residual vibration controlling curve SHP-5 - Order made cam curve and also including the reciprocation movement. ● Please contact us for curves other than above curves.	The right hand side cam and left hand side cam is decided by the rotating direction of output axis towards the rotational direction of input axis from the input standard position (input 0 degree) of timing chart. R Right hand side cam L Left hand side cam ⚠ Cautious Code list of f ~ i are same as the HD indexing drive product code.

Reducer TYPE

ex.) **HD 140R** — **12 36 0 R** — **S 3 VW 1** / **X**

a b c₁ c₂ d e f g h i j

a Model	b Size	C ₁ Reduction ratio	C ₂ Indexing angle	d Cam curve	e Direction of rotation of output shaft
HD Model name	140R Center distance 140mm	12 Deceleration ratio 1/12	36 Indexing angle 360°	0 Cam curve for constant rotation	R Right hand side cam
HD Indicating HD series.	Indicating the center distance of input and output axis. R : Indicating reducer type	The required number of rotation of input axis for 1 rotation of output axis.	36 enters all of the reducer types	Cam curve of Constant velocity	Right hand side cam and left hand side cam are decided by the rotational direction of output axis towards the rotational direction of input axis. R Right hand side cam L Left hand side cam ⚠ Cautious Code list of f ~ i are same as the HD indexing drive product code

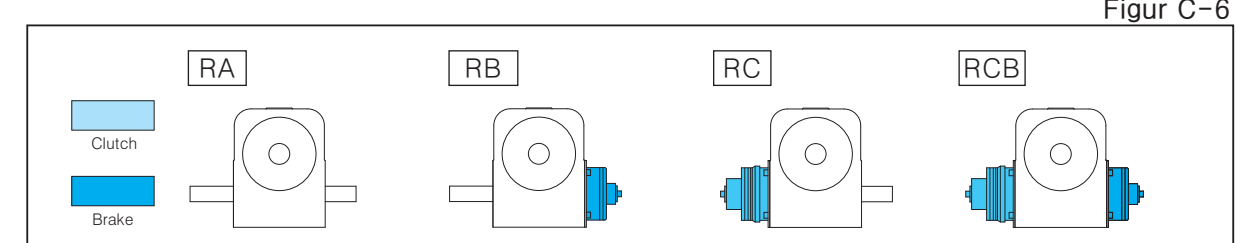
Code of part (Reducer)

Code Example) **R80** — **40** — **R CB** **3** / **1**

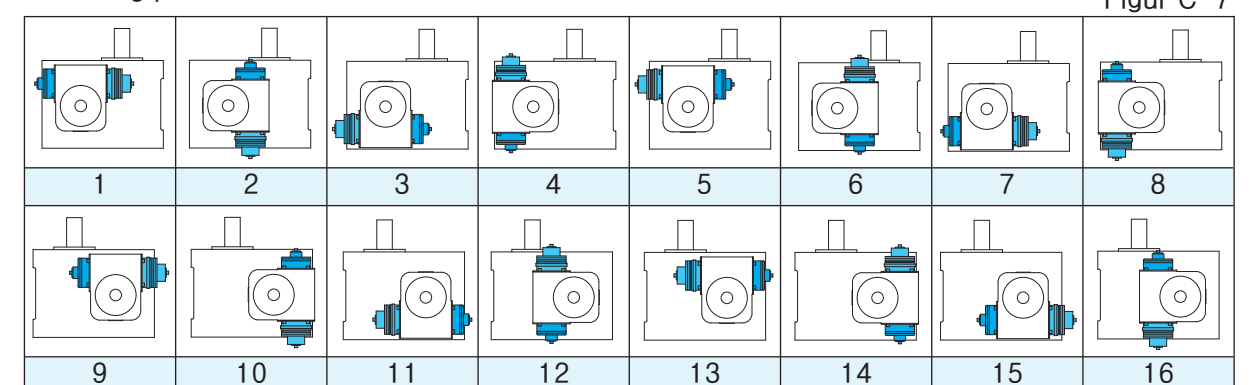
a b c d e f

a Reducer model	b Nominal reduction ratio	c Twisted direction of worm axis.	d Clutch brake specification	e Mounting position of reducer	f Mounting position of indexing device
Ex. R80 Center distance 80mm	Ex. 40 Nominal reduction ratio 40	Ex. R Right side twisted	Ex. CB Specification of clutch/brake	Ex. 3 Mounting Position 3	Ex. 1 Mounting Position 1 (W side is GL)
R indicates the reducer. A number indicates the center distance	Indicating nominal reduction ratio. Nominal reduction ratio iN and actual reduction ratio I are very depends on the model. Thus please carefully check and fill in the sheet.	Indicating the twisted direction of gear set. But, gear set is only available with right side twisted direction.	A Clutch and Brake do not exist. B Attachment the only brake. C Attachment the only Clutch. CB Attachment clutch/ attachment brake. (Refer to figure C-6)	Indicating the reducer mounting position when installing it to input axis of indexing drive.	Indicating the position of body of indexing drive which of the reducer is being mounted.

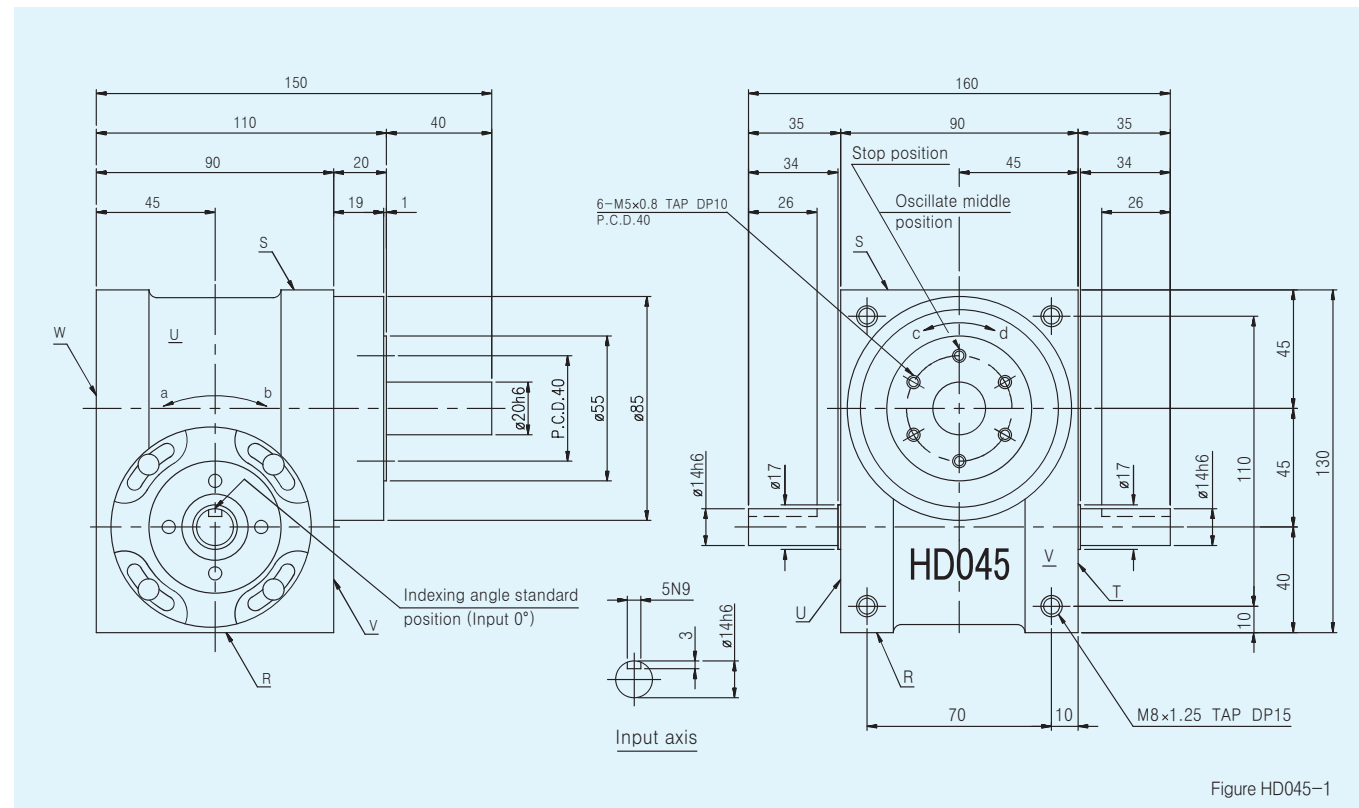
Mounting Position



Mounting posture of reducer

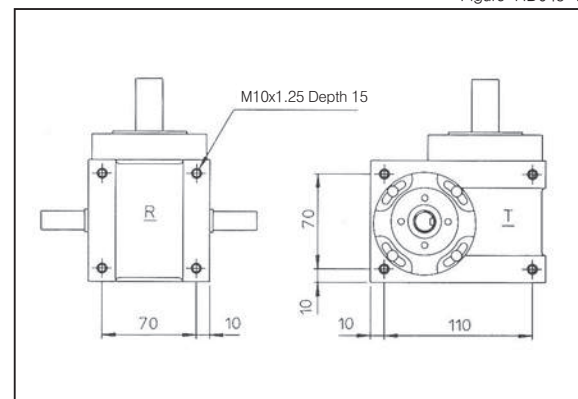


HD045/HD045E/HD045R



• Mounting hole position

Figure HD045-2



Mounting hole diagram of RSTU side

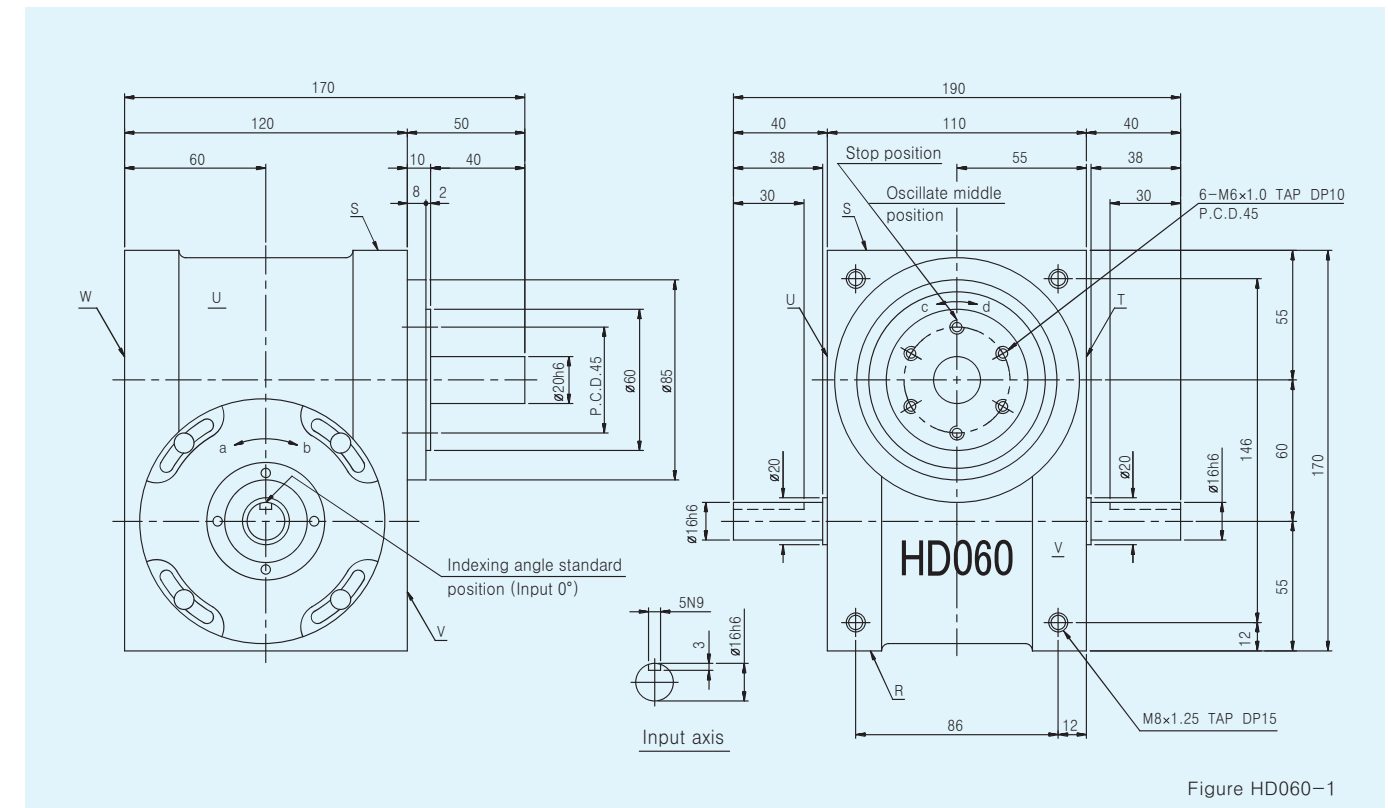
• Specification

Table HD045-1

Item	Symbol	Unit	Value	Item	Symbol	Unit	Value	Item	Unit	Symbol	Value
Allowable THRUST load of output axis	P ₁	N	1275	Allowable THRUST load of input axis	P ₄	N	833	Indexing accuracy 1DWELL	SEC		±60
Allowable THRUST RADIAL load of output axis	P ₂	N	980	Allowable RADIAL load of input axis	P ₅	N	735	Indexing accuracy 2DWELL	SEC		±120
Output static torque	T _s	N · m	Refer to Torque Capacity Table	Maximum repeatable allowed torque of input axis	P ₆	N · m	39	Indexing accuracy 3DWELL	SEC		±180
Output torsional rigidity	K ₁	N · m /rad	16.7 X 10 ³	Input torsional rigidity	K ₂	N · m /rad	2.74 X 10 ³	Indexing accuracy 4DWELL	SEC		±240
Output Inertia	J ₀	kg · m ²	0.36 X 10 ⁻³	Input inertia	J ₁	kg · m ²	0.08 X 10 ⁻³	Repeatability	SEC		30
Allowable bending moment of output axis	P ₃	N · m	34.3					Product weight	Kg		About 6

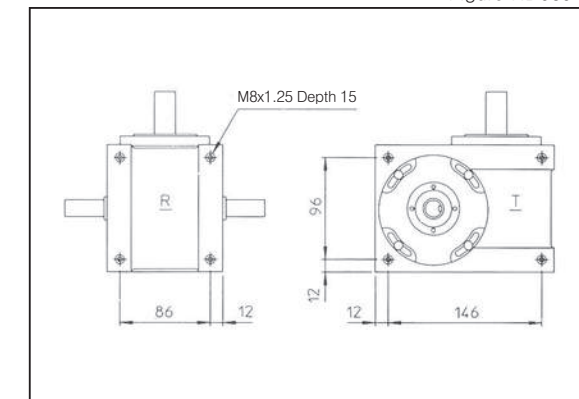
Cautious) J of input shaft is the values in case of the rectification. Please re check it when ordering since the specification and all values can be changed without the notice.
(1N≒0.102kgf · m)

HD060/HD060E/HD060R



• Mounting hole locations

Figure HD060-2



Mounting hole diagram of RSTU side

• Location of oilplug, etc., and oil oillevel

Figure HD060-3

Mounting Position	1	2	3	4	5	6
Location						
Oil level	0.5	0.37	0.35	0.35	0.3	0.3

⚠ Precautions

- The order is PLUG(PT3/8), LEVEL(VA-01) and DRAIN(PT1/4) from the top regard-ing each location according to the position.
- The position responds to the code i of indexing drive.
- The oil level indicated in Figure HD060-3 are given in general figures and will differ according to the profile of cam and the number of cam follower.

Table HD060-1

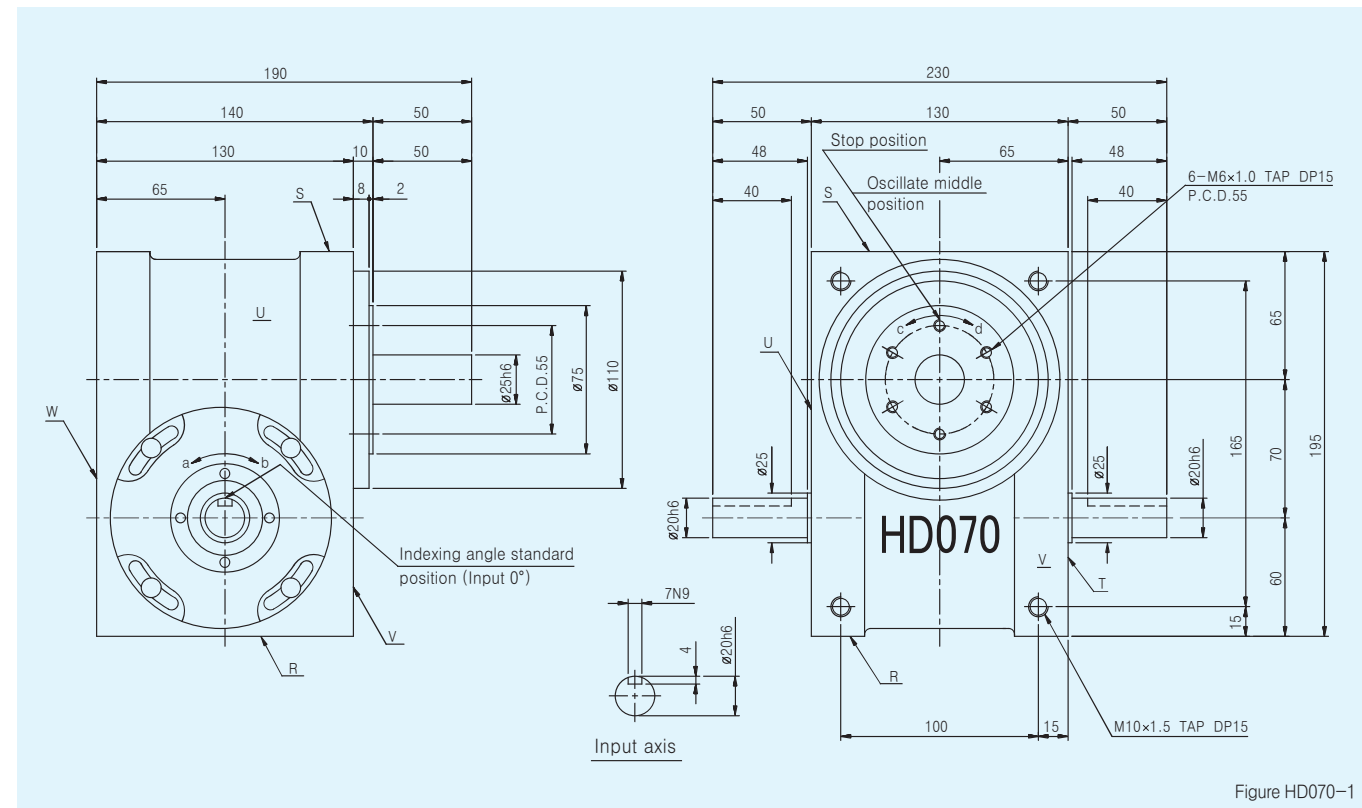
• Specification

Item	Symbol	Unit	Value	Item	Symbol	Unit	Value	Item	Unit	Symbol	Value
Allowable THRUST load of output axis	P ₁	N	1372	Allowable THRUST load of input axis	P ₄	N	980	Indexing accuracy 1DWELL	SEC		±45
Allowable THRUST RADIAL load of output axis	P ₂	N	1372	Allowable RADIAL load of input axis	P ₅	N	931	Indexing accuracy 2DWELL	SEC		±90
Output static torque	T _s	N · m	Refer to Torque Capacity Table	Maximum repeatable allowed torque of input axis	P ₆	N · m	59	Indexing accuracy 3DWELL	SEC		±135
Output torsional rigidity	K ₁	N · m /rad	18.6 X 10 ³	Input torsional rigidity	K ₂	N · m /rad	4.12 X 10 ³	Indexing accuracy 4DWELL	SEC		±180
Output Inertia	J ₀	kg · m ²	0.53 X 10 ⁻³	Input inertia	J ₁	kg · m ²	0.23 X 10 ⁻³	Repeatability	SEC		20
Allowable bending moment of output axis	P ₃	N · m	44.1					Product weight	Kg		About 10

Cautious) J of input shaft is the values in case of the rectification. Please re check it when ordering since the specification and all values can be changed without the notice.
(1N≒0.102kgf · m)

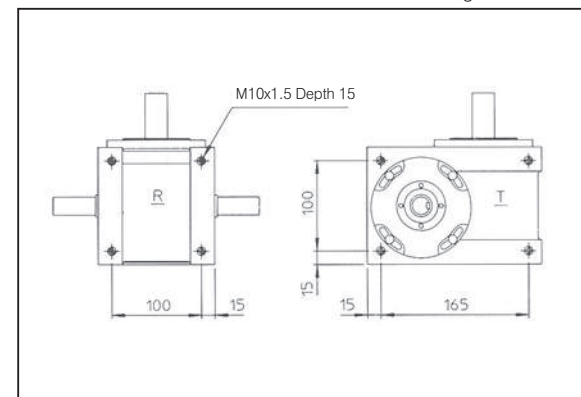
HD070

HD070/HD070E/HD070R



• Mounting hole locations

Figure HD070-2



Mounting hole diagram of RSTU side

• Location of oilplug, etc., and oil oillevel

Figure HD070-3

Mounting Position	1	2	3	4	5	6
Location						
Oil level	0.6	0.6	0.55	0.55	0.4	0.4

⚠ Precautions

- The order is PLUG(PT3/8), LEVEL(VA-01) and DRAIN(PT1/4) from the top regarding each location according to the position.
- The position responds to the code i of indexing drive.
- The oil level indicated in Figure HD070-3 are given in general figures and will differ according to the profile of cam and the number of cam follower.

Table HD070-1

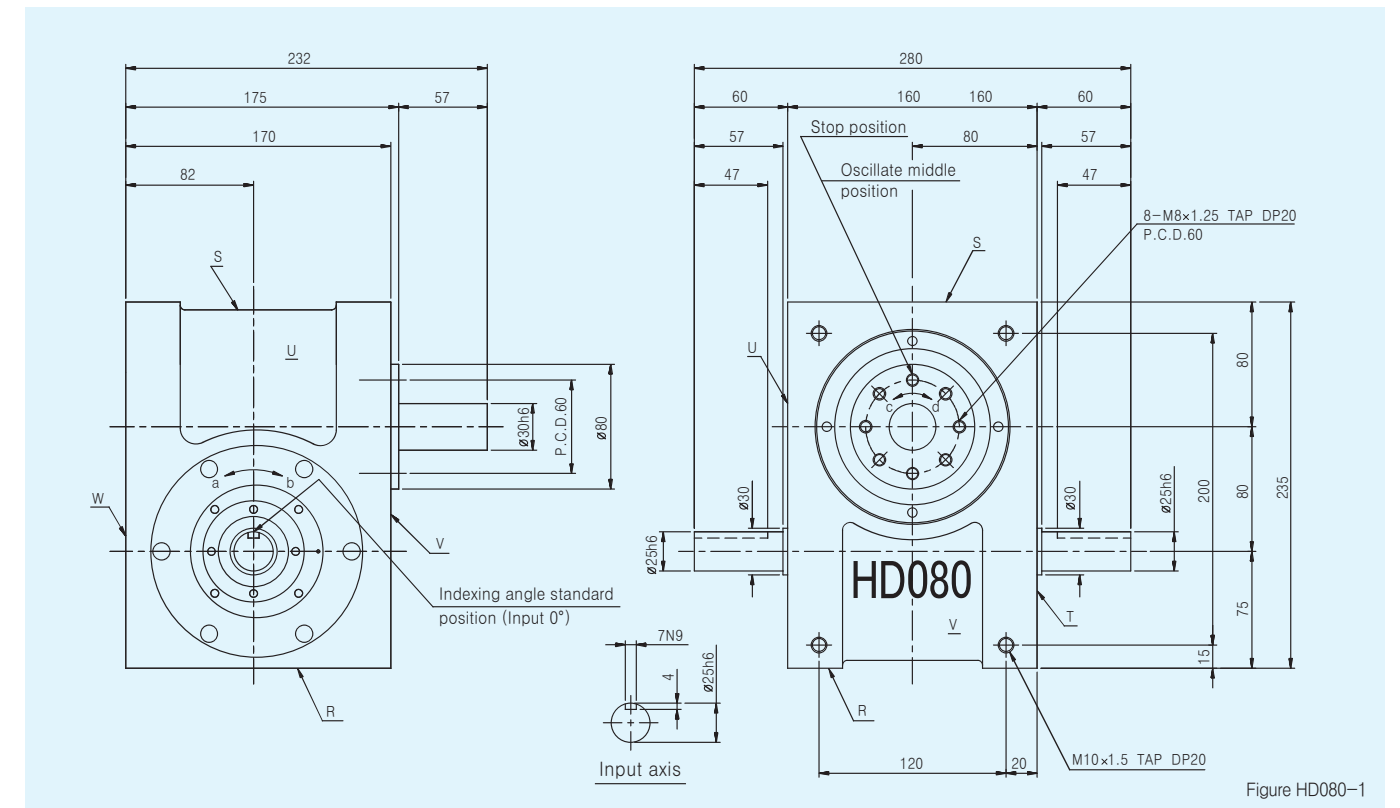
• Specification

Item	Symbol	Unit	Value	Item	Symbol	Unit	Value	Item	Unit	Symbol	Value
Allowable THRUST load of output axis	P ₁	N	2156	Allowable THRUST load of input axis	P ₄	N	1470	Indexing accuracy 1DWELL	SEC		±30
Allowable THRUST RADIAL load of output axis	P ₂	N	2156	Allowable RADIAL load of input axis	P ₅	N	1078	Indexing accuracy 2DWELL	SEC		±60
Output static torque	T _s	N · m	Refer to Torque Capacity Table	Maximum repeatable allowed torque of input axis	P ₆	N · m	93.1	Indexing accuracy 3DWELL	SEC		±90
Output torsional rigidity	K ₁	N · m / rad	32.3 X 10 ³	Input torsional rigidity	K ₂	N · m / rad	8.43 X 10 ³	Indexing accuracy 4DWELL	SEC		±120
Output Inertia	J ₀	kg · m ²	1.72 X 10 ⁻³	Input inertia	J ₁	kg · m ²	1.5 X 10 ⁻³	Repeatability	SEC		15
Allowable bending moment of output axis	P ₃	N · m	69					Product weight	Kg		About 16

Cautious) J of input shaft is the values in case of the rectification. Please re check it when ordering since the specification and all values can be changed without the notice.
(1N≐0.102kgf · m)

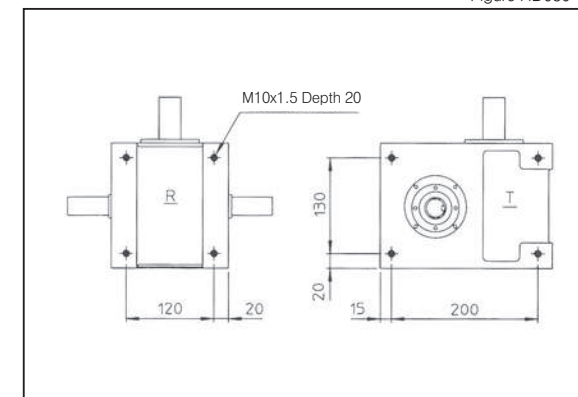
HD080

HD080/HD080E/HD080R



• Mounting hole locations

Figure HD080-2



Mounting hole diagram of RSTU side

• Location of oilplug, etc., and oil oillevel

Figure HD080-3

Mounting Position	1	2	3	4	5	6
Location						
Oil level	1.2	0.8	1.4	1.2	0.7	1.4

⚠ Precautions

- The order is PLUG(PT1/2), LEVEL(VA), DRAIN(PT1/2) from the top regarding each location according to the position.
- The position responds to the code i of indexing drive.
- The oil level indicated in Figure HD080-3 are given in general figures and will differ according to the profile of cam and the number of cam follower.

Table HD080-1

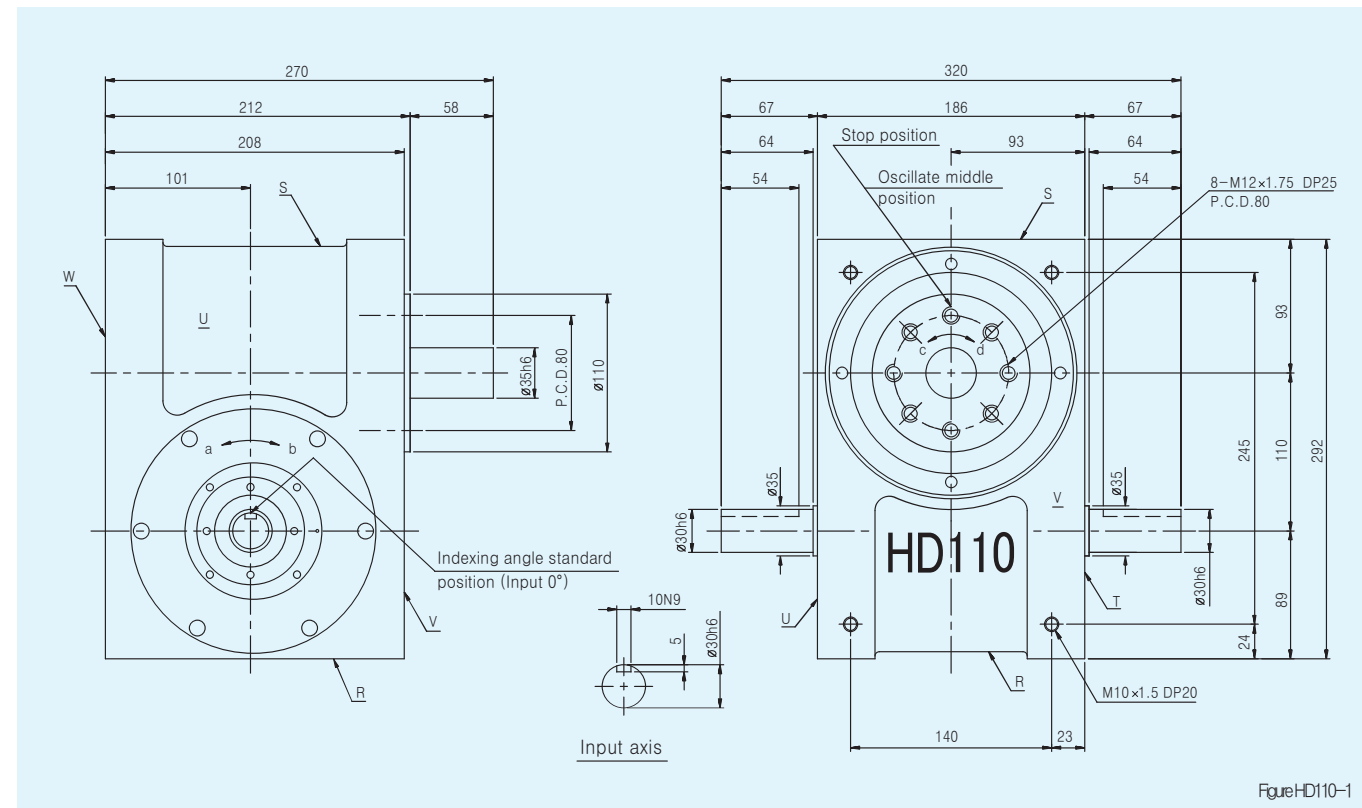
• Specification

Item	Symbol	Unit	Value	Item	Symbol	Unit	Value	Item	Unit	Symbol	Value
Allowable THRUST load of output axis	P ₁	N	3038	Allowable THRUST load of input axis	P ₄	N	2058	Indexing accuracy 1DWELL	SEC		±30
Allowable THRUST RADIAL load of output axis	P ₂	N	2450	Allowable RADIAL load of input axis	P ₅	N	1862	Indexing accuracy 2DWELL	SEC		±60
Output static torque	T _s	N · m	Refer to Torque Capacity Table	Maximum repeatable allowed torque of input axis	P ₆	N · m	181.3	Indexing accuracy 3DWELL	SEC		±90
Output torsional rigidity	K ₁	N · m / rad	98 X 10 ³	Input torsional rigidity	K ₂	N · m / rad	16.7 X 10 ³	Indexing accuracy 4DWELL	SEC		±120
Output Inertia	J ₀	kg · m ²	4.6 X 10 ⁻³	Input inertia	J ₁	kg · m ²	2.3 X 10 ⁻³	Repeatability	SEC		15
Allowable bending moment of output axis	P ₃	N · m	88					Product weight	Kg		About 29

Cautious) J of input shaft is the values in case of the rectification. Please re check it when ordering since the specification and all values can be changed without the notice.
(1N≐0.102kgf · m)

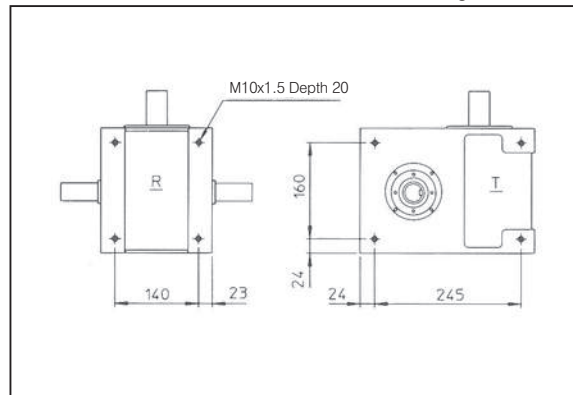
HD 110

■ HD110/HD110E/HD110R



- Mounting hole locations

Figure HD110-2



Mounting hole diagram of RSTU side

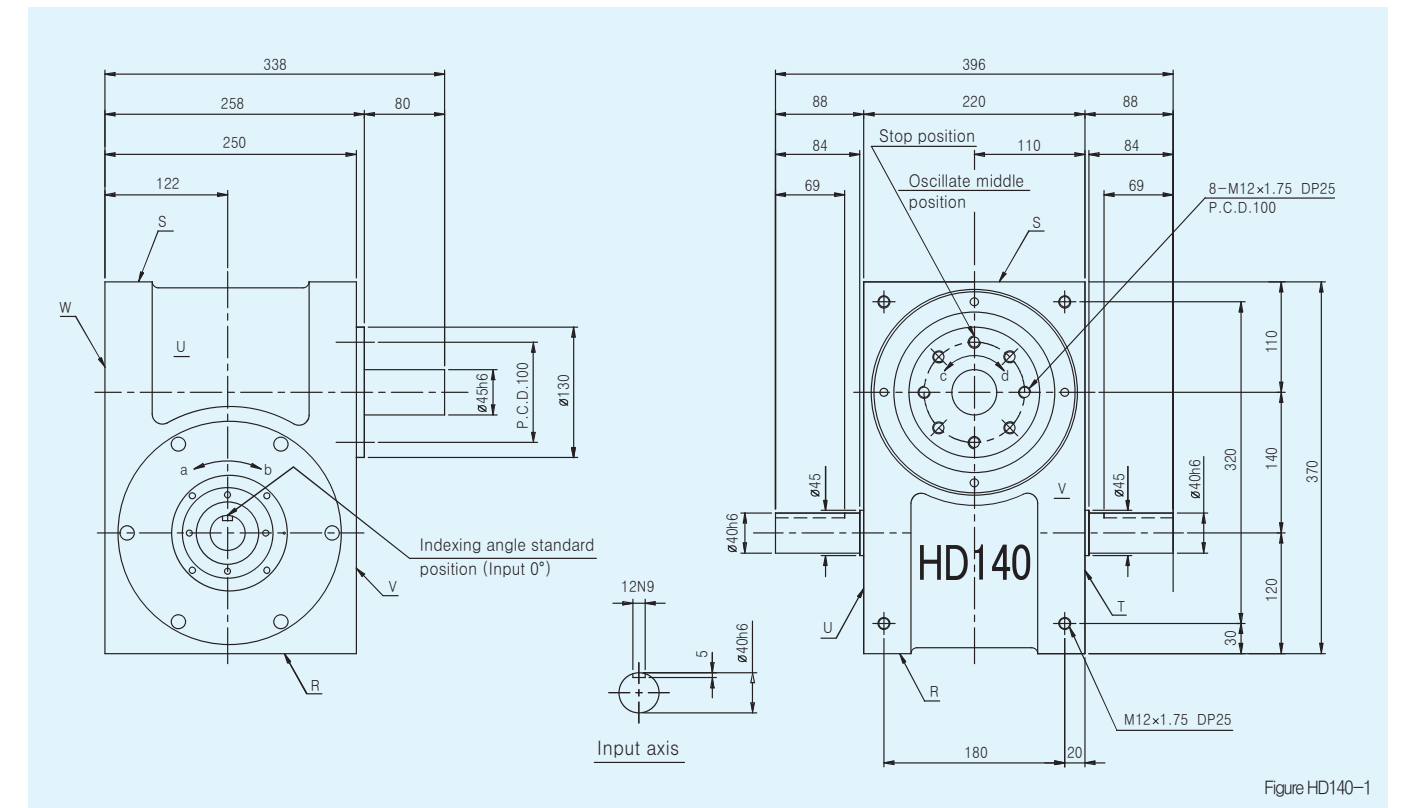
- Specification

Item	Symbol	Unit	Value	Item	Symbol	Unit	Value	Item	Unit	Symbol	Value
Allowable THRUST load of output axis	P ₁	N	3920	Allowable THRUST load of input axis	P ₄	N	3528	Indexing accuracy 1DWELL	SEC		± 30
Allowable THRUST RADIAL load of output axis	P ₂	N	4312	Allowable RADIAL load of input axis	P ₅	N	2842	Indexing accuracy 2DWELL	SEC		± 60
Output static torque	T _S	N • m	Refer to Torque Capacity Table	Maximum repeatable allowed torque of input axis	P ₆	N • m	314	Indexing accuracy 3DWELL	SEC		± 90
Output torsional rigidity	K ₁	N • m /rad	196 X 10 ³	Input torsional rigidity	K ₂	N • m /rad	30.4 X 10 ³	Indexing accuracy 4DWELL	SEC		± 120
Output Inertia	J ₀	kg • m ²	22.6 X 10 ⁻³	Input inertia	J ₁	kg • m ²	7.0 X 10 ⁻³	Repeatability	SEC		15
Allowable bending moment of output axis	P ₃	N • m	137					Product weight	Kg		About 51

Cautious) J of input shaft is the values in case of the rectification. Please re check it when ordering since the specification and all values can be changed without the notice.
(1N≒0.102kgf・m)

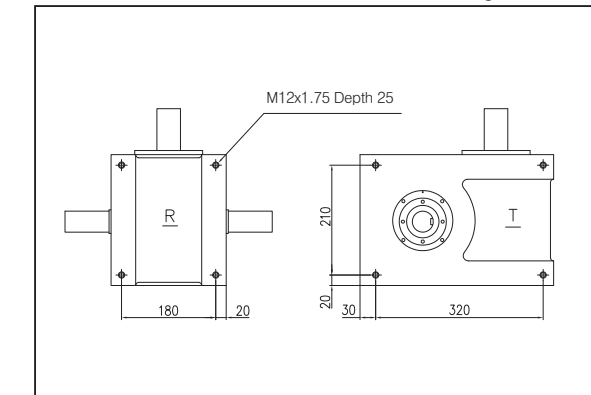
HD140

■ HD140/HD140E/HD140R



- Mounting hole locations

Figure HD140-2



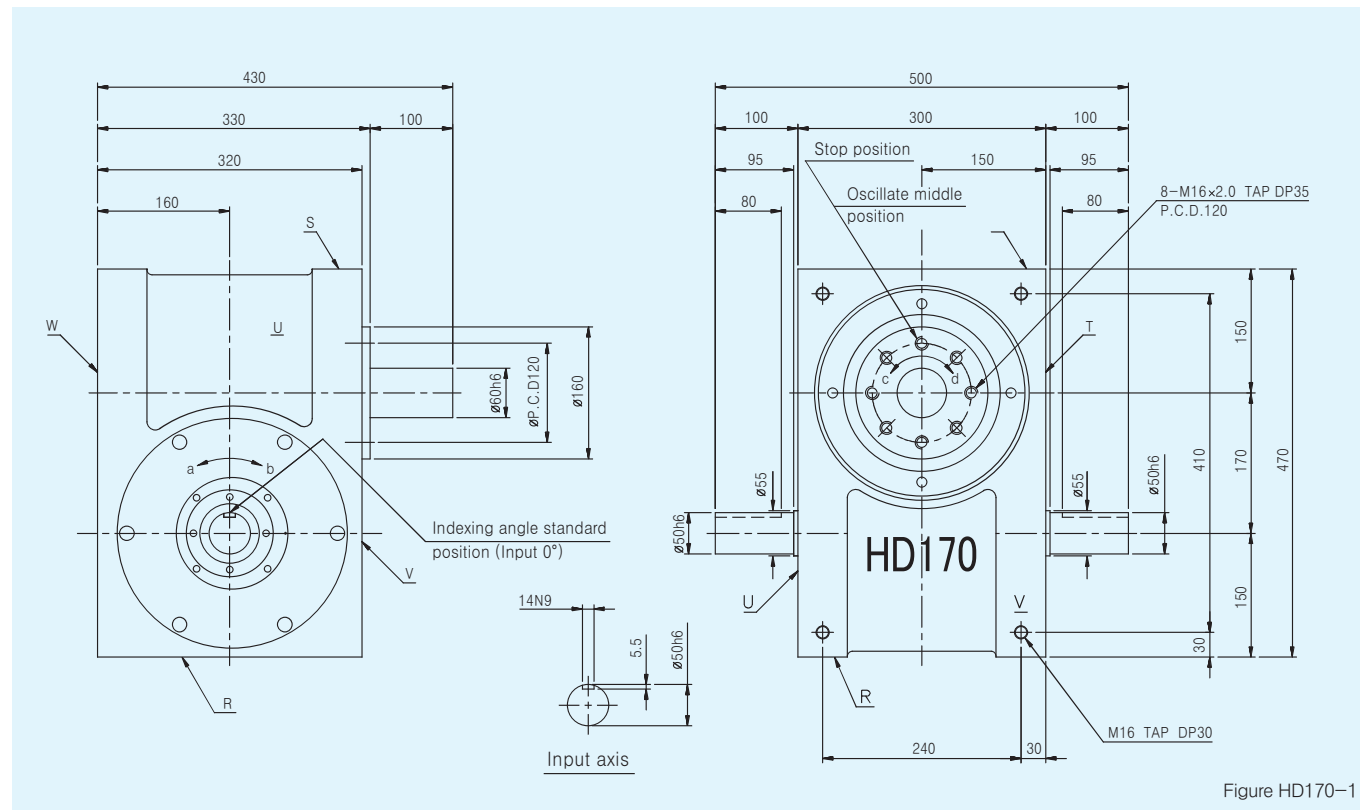
Mounting hole diagram of RSTU side

- Specification

Item	Symbol	Unit	Value	Item	Symbol	Unit	Value	Item	Unit	Symbol	Value
Allowable THRUST load of output axis	P ₁	N	5880	Allowable THRUST load of input axis	P ₄	N	4312	Indexing accuracy 1DWELL	SEC		± 30
Allowable THRUST RADIAL load of output axis	P ₂	N	6860	Allowable RADIAL load of input axis	P ₅	N	5488	Indexing accuracy 2DWELL	SEC		± 60
Output static torque	T _S	N • m	Refer to Torque Capacity Table	Maximum repeatable allowed torque of input axis	P ₆	N • m	735	Indexing accuracy 3DWELL	SEC		± 90
Output torsional rigidity	K ₁	N • m /rad	392 X 10 ³	Input torsional rigidity	K ₂	N • m /rad	78 X 10 ³	Indexing accuracy 4DWELL	SEC		± 120
Output Inertia	J ₀	kg • m ²	49 X 10 ⁻³	Input inertia	J ₁	kg • m ²	27 X 10 ⁻³	Repeatability	SEC		15
Allowable bending moment of output axis	P ₃	N • m	255					Product weight	Kg		About 120

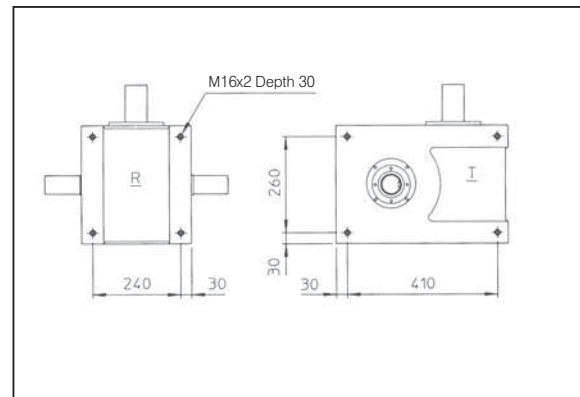
Cautious) J of input shaft is the values in case of the rectification. Please re check it when ordering since the specification and all values can be changed without the notice.
(1N=0.102kgf・m)

HD series



• Mounting hole locations

Figure HD170-2



• Location of oilplug, etc., and oil oillevel

Figure HD170-3

Mouting Position	1	2	3	4	5	6
Location						
Oil level	10	9	9	9	4	7

△ Precautions

- The order is PLUG(PT3/4), LEVEL(VB) and DRAIN(PT3/4) from the top regarding each location according to the position.
- The position responds to the code i of indexing drive.
- The oil level indicated in Figure HD170-3 are given in general figures and will differ according to the profile of cam and the number of cam follower.

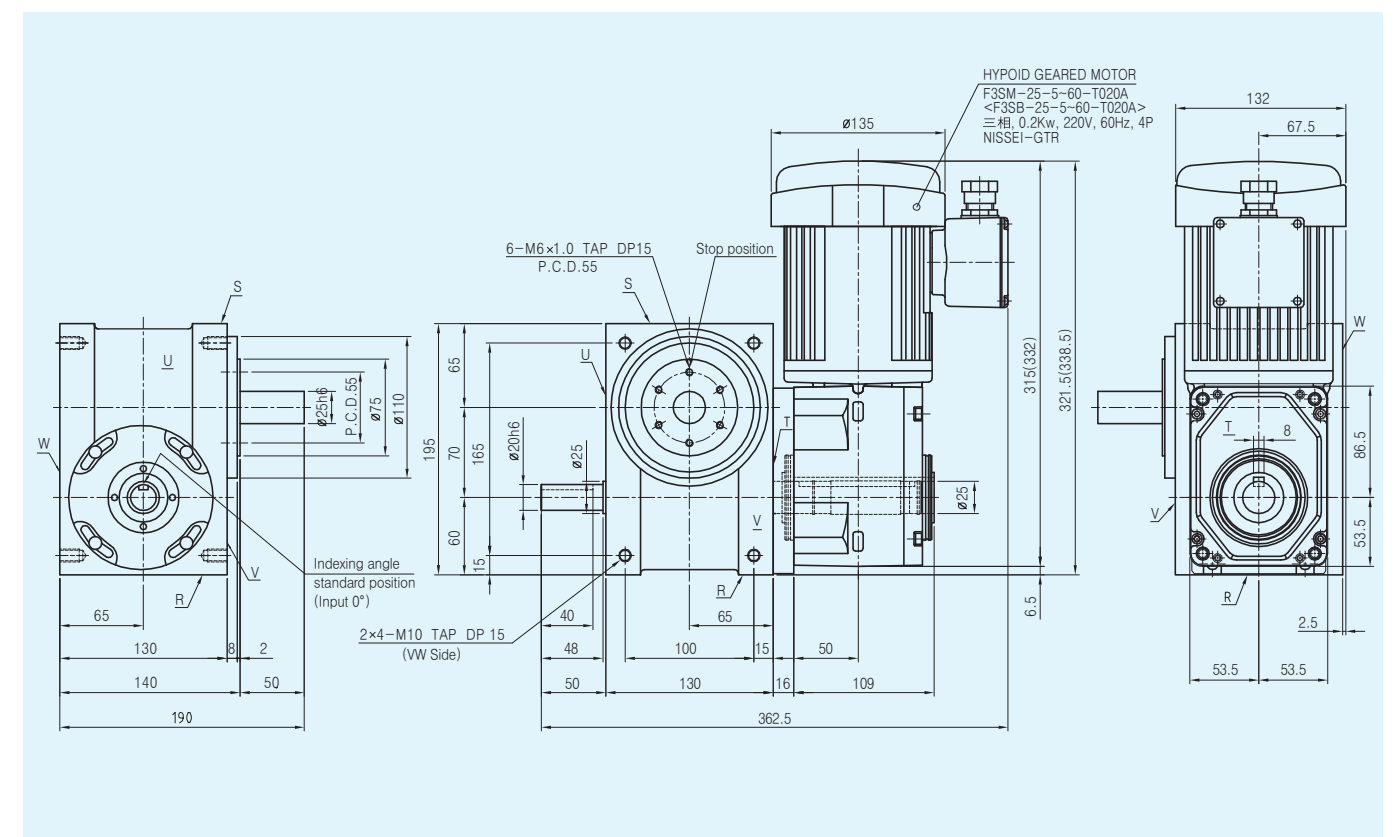
Table HD170-1

• Specification

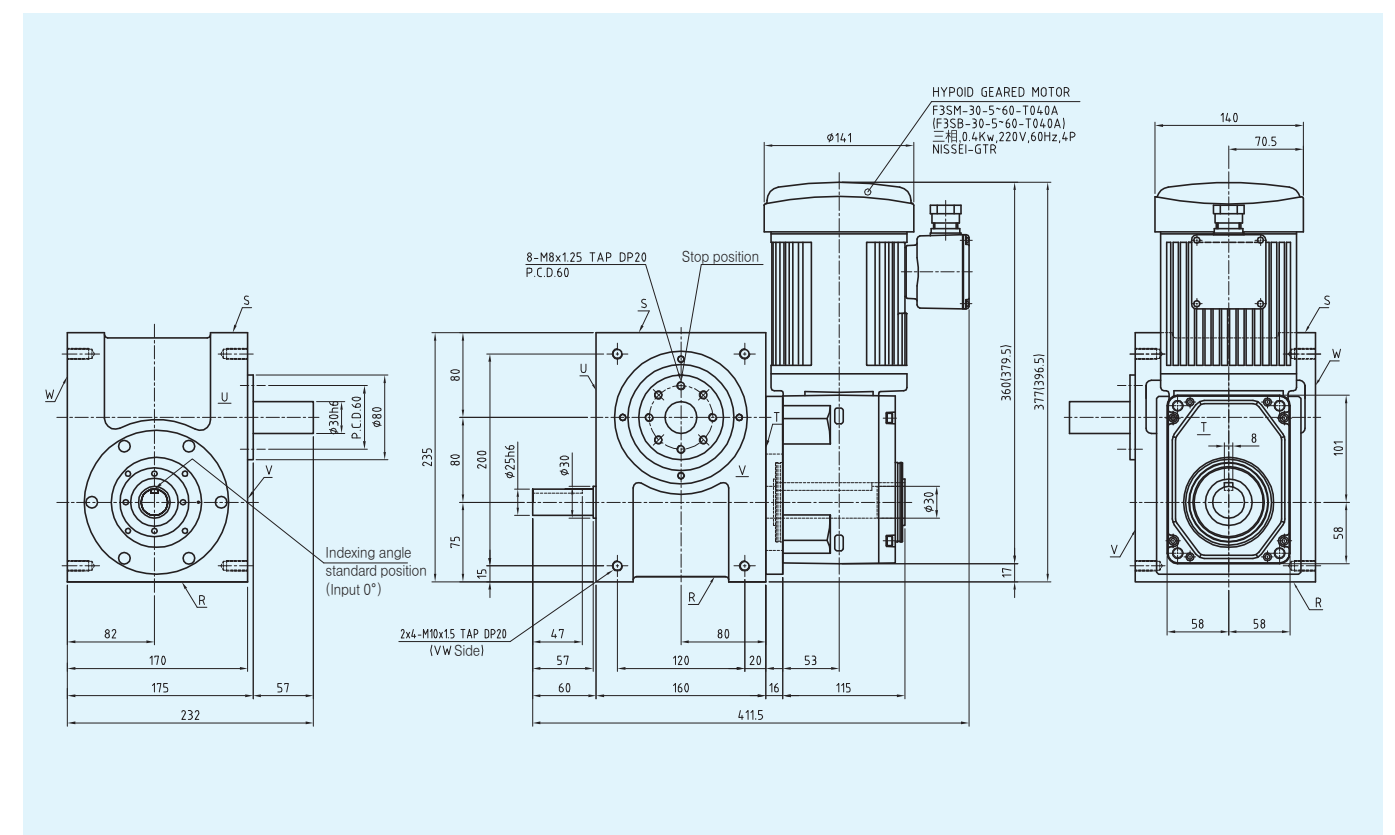
Item	Symbol	Unit	Value	Item	Symbol	Unit	Value	Item	Unit	Symbol	Value
Allowable THRUST load of output axis	P ₁	N	7448	Allowable THRUST load of input axis	P ₄	N	5782	Indexing accuracy 1DWELL	SEC		±30
Allowable THRUST RADIAL load of output axis	P ₂	N	8722	Allowable RADIAL load of input axis	P ₅	N	9800	Indexing accuracy 2DWELL	SEC		±60
Output static torque	T _s	N · m	Refer to Torque Capacity Table	Maximum repeatable allowed torque of input axis	P ₆	N · m	1421	Indexing accuracy 3DWELL	SEC		±90
Output torsional rigidity	K ₁	N · m /rad	0.98 X 10 ⁶	Input torsional rigidity	K ₂	N · m /rad	137 X 10 ³	Indexing accuracy 4DWELL	SEC		±120
Output Inertia	J ₀	kg · m ²	0.19	Input inertia	J ₁	kg · m ²	0.07	Repeatability	SEC		15
Allowable bending moment of output axis	P ₃	N · m	353					Product weight	Kg		About 200

Cautious) J of input shaft is the values in case of the rectification. Please re check it when ordering since the specification and all values can be changed without the notice.
(1N≒0.102kgf · m)

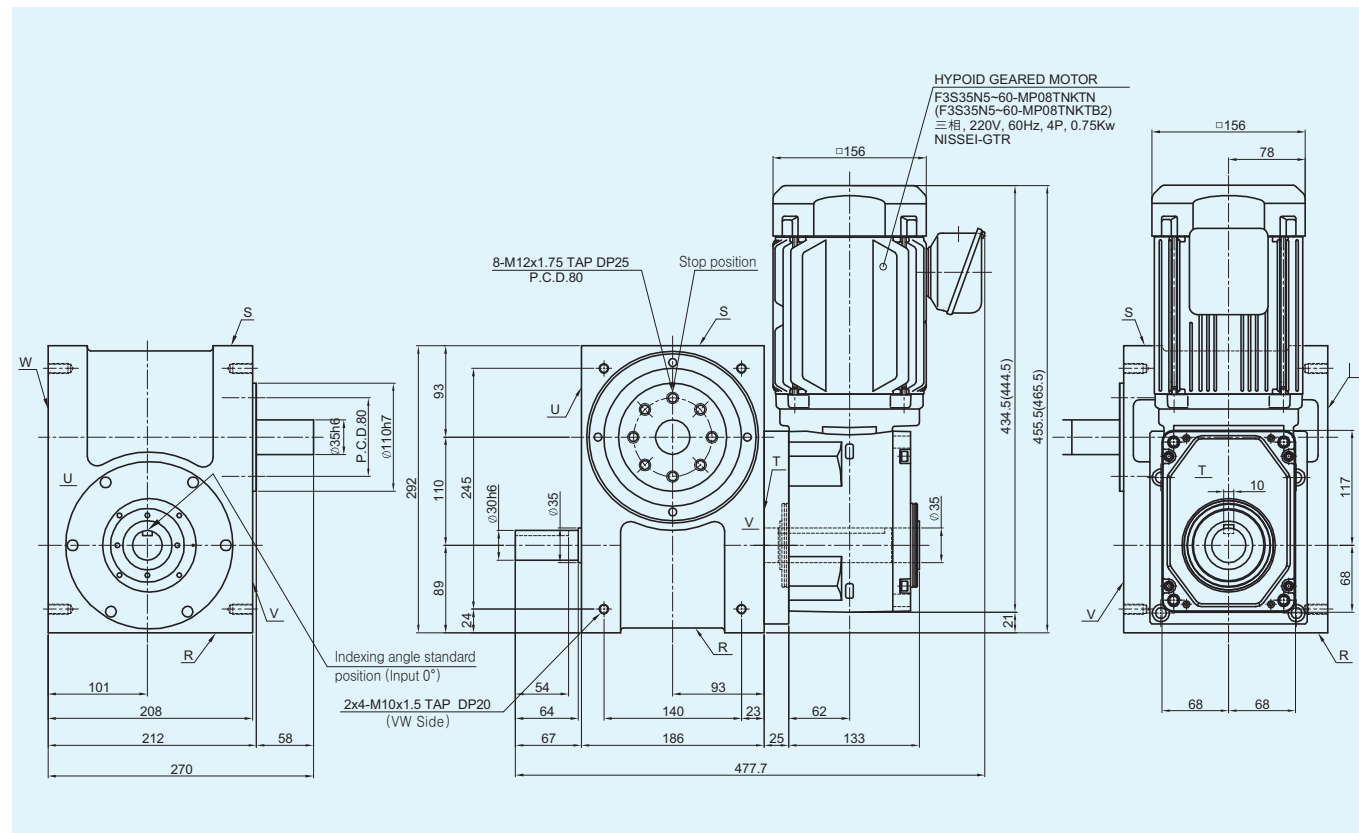
HD070 + Integral type hypoid geared motor (0.2Kw)



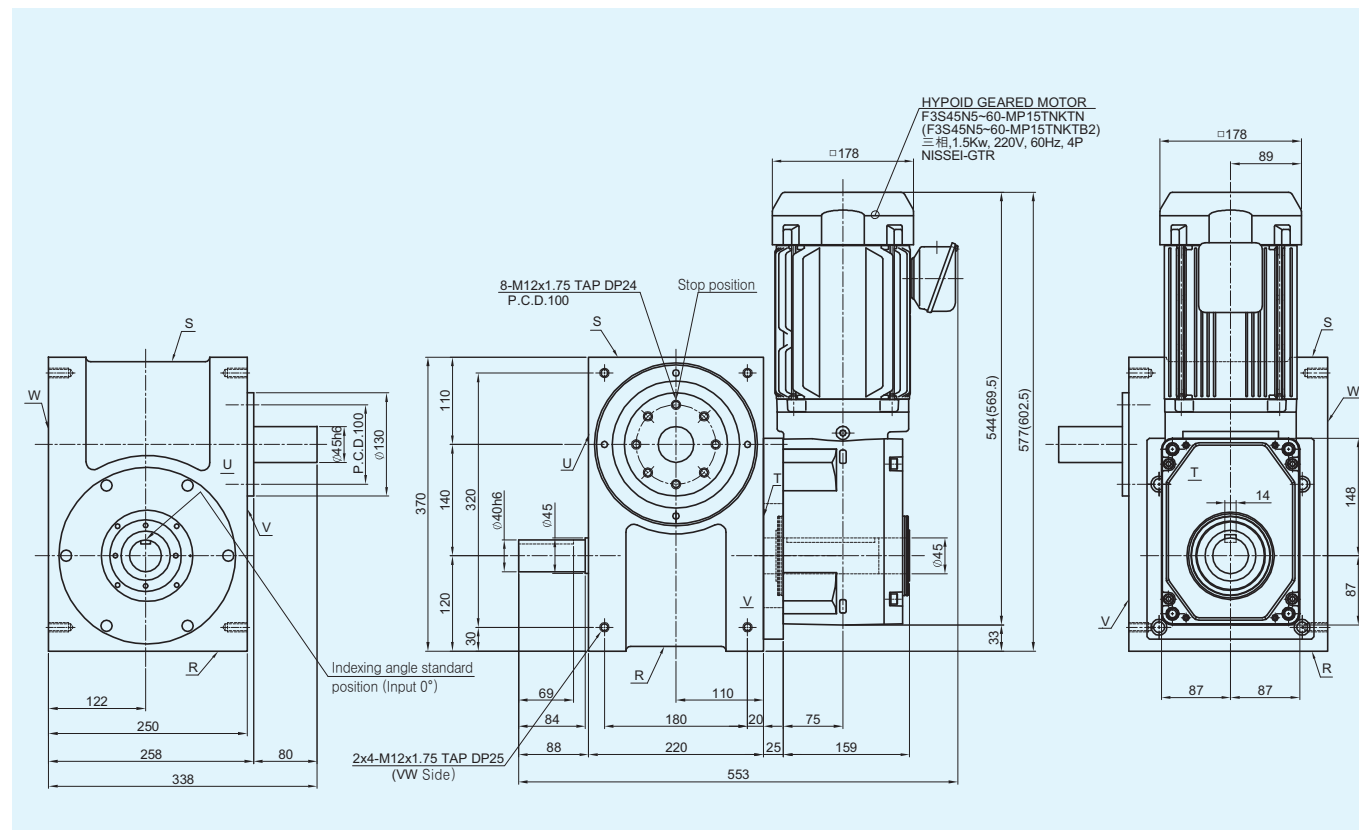
HD080 + Integral type hypoid geared motor (0.4Kw)



HD110 + Integral geared motor of hypoid (0.75Kw)



HD140 + Integral geared motor of hypoid (1.5Kw)



Specification of HD series

Standard specification of indexing drive

Table HD-1

Model	Number of STOP									
	2	3	4	5	6	8	10	12	15	16
HD045	●	●	●		●	●				
HD060	●	●	●	●	●	●	●	●		
HD070	●	●	●	●	●	●	●	●		
HD080	●	●	●	●	●	●	●	●		●
HD110	●	●	●	●	●	●	●	●	●	●
HD140	●	●	●	●	●	●	●	●	●	●
HD170	●	●	●	●	●	●	●	●	●	●

Standard specification of oscillating drive

Table HD-2

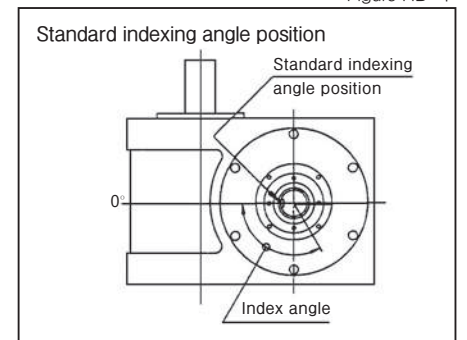
Model	HD045E, HD060E, HD070E, HD080E, HD014E, HD017E
Rocking angle ϕ (deg)	15, 30, 45, 60, 90
Oscillate indexing angle θ (deg)	60, 75, 90, 120, 150, 180

Standard specification of roller drive

Table HD-3

Model	HD045R, HD060R, HD070R, HD080R, HD110R, HD140R, HD170R
Deceleration ratio	3, 4, 5, 6, 8, 10, 12

Figure HD-1



Cautious) Possible to handle specification other than specifications on the above. In such cases, please contact us.

Shaft and section of HD Series

Figure HD-2

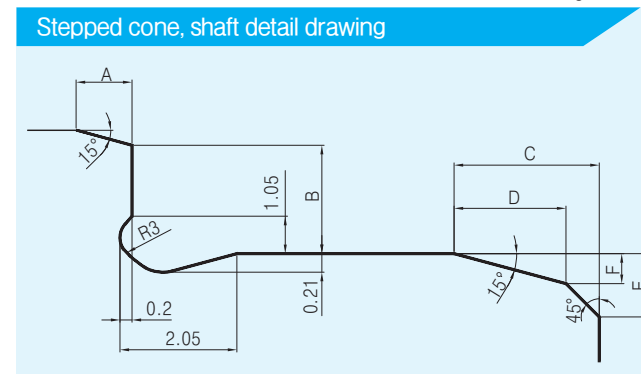


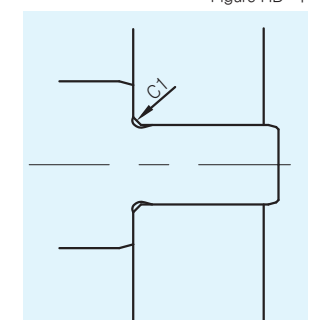
Figure table

Table HD-4

	Model	A	B	C	D	E	F
Input shaft	HD040, HD060	Section r is R0.5					
	HD070~HD170	2.05	1.9	2.24	0.55	1.0	0.45
Output shaft	HD045	Section r is R0.5					
	HD060	—	—	2.24	0.55	1.0	0.45
	HD070	—	—	2.24	0.55	1.0	0.45
	HD080	—	—	2.24	0.55	1.0	0.45
	HD110	—	—	2.24	0.55	1.0	0.45
	HD140	—	—	2.24	0.55	1.0	0.45
	HD170	—	—	3.73	1.37	2.0	0.63

How to chamfer inner section.

Figure HD-4

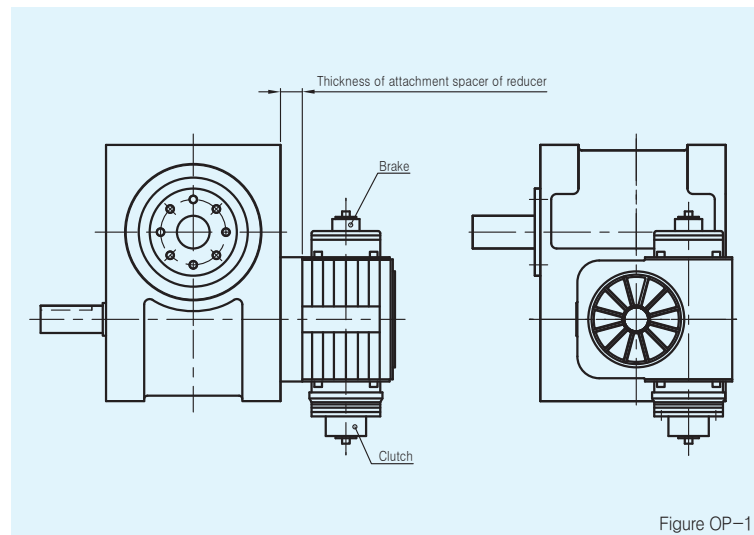


Cautious

Input/output axis and section part of HD series is fabricated as 2 layer R, 2 layer chamfer and etc considering the decrease of fatigue failure and material of mounting state, pressing in oil seal according to the stress concentration. Chamfering of inner section of pulley, table and etc should be fabricated after considering the shape of shaft axis.

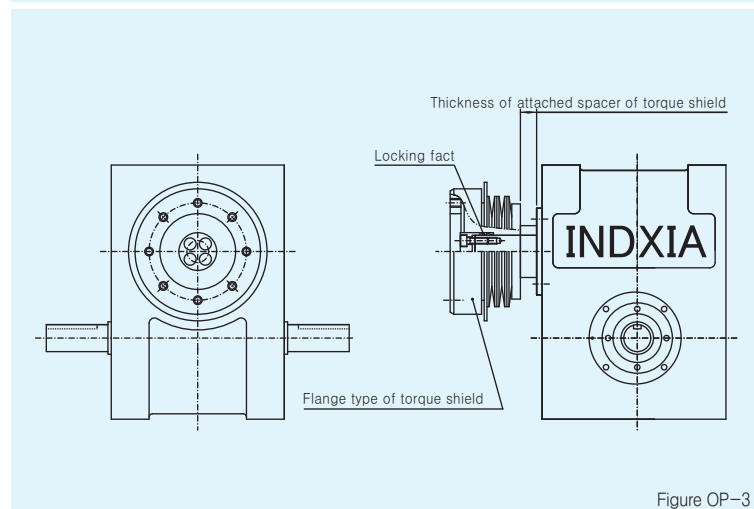
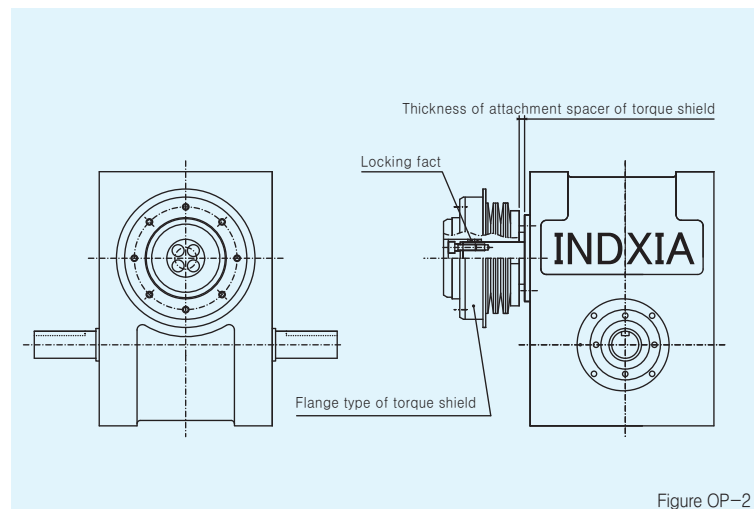
Precautions) Please perform the method of chamfering the internal diameter section of the input shaft of HD045 and HD060 and the output shaft of HD045 as C 0.5.

Reducer mounted type specification



For mounting position values, please refer to the dimensions of each product.

Torque shield mounted type specification



For mounting position values, please refer to the dimensions of each product.

Mounted model

Table OP-1

	HD 045	HD 060	HD 070	HD 080	HD 110	HD 140	HD 170
R48		● (15)	● (15)				
R65			● (15)	● (-)	● (-)	● (25)	
R80					● (-)	● (-)	● (30)
R100						● (-)	● (-)

Precautions

The figure in () is the thickness of spacer to enter the gap between the torque shield and indexing drive. But, with the sign of (-), it does not require spacer.

Mounted model

Table OP-2

	HD 045	HD 060	HD 070	HD 080	HD 110	HD 140	HD 170
T06F	● (5)	● (5)	● (5)				
T07F			● (5)	● (5)	● (5)		
T08F					● (5)	● (14)	
T11F						● (5)	● (21)
T14F							● (20)
T06C	● (8)	● (10)	● (19)				
T07C			● (7)	● (15)	● (17)		
T08C					● (9)	● (34)	
T11C						● (24)	● (46)
T14C							● (20)

Precautions

The figure in () is the thickness of spacer to enter the gap between the torque shield and indexing drive. But, with the sign of (-), it does not require spacer.

Induction motor mounted type specification

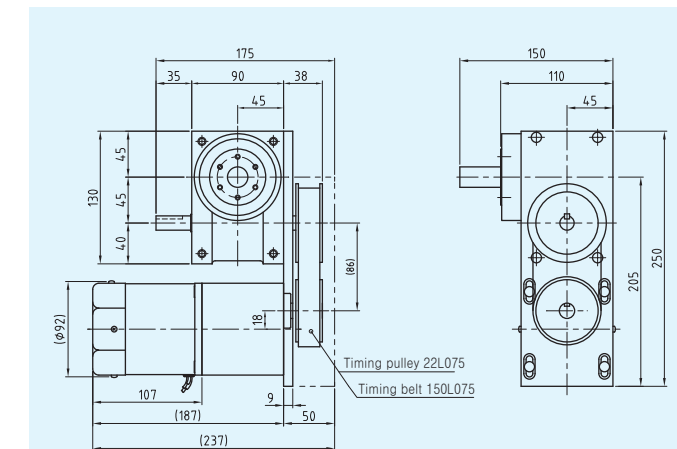


Figure OP-4

Product code Indxing drive **HD045-06122R-SM3VW** 1
Exampel) Motor mounted code **5IK60GU AF-40-1**

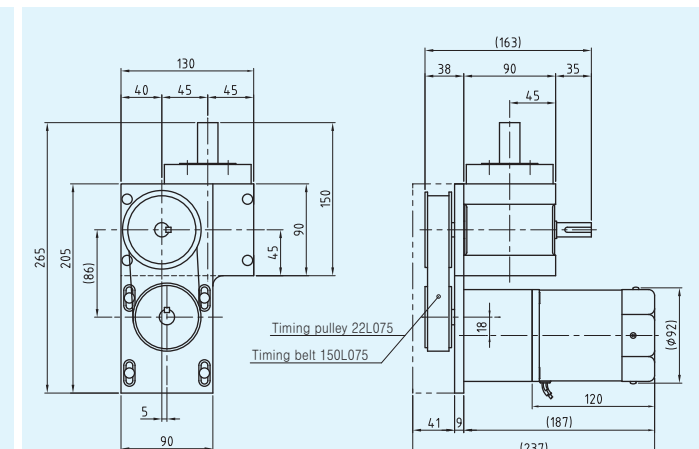


Figure OP-5

Product code Indxing drive **HD045-06122R-SM3RS** 5
Exampel) Motor mounted code **5IK60GU AF-40-2**

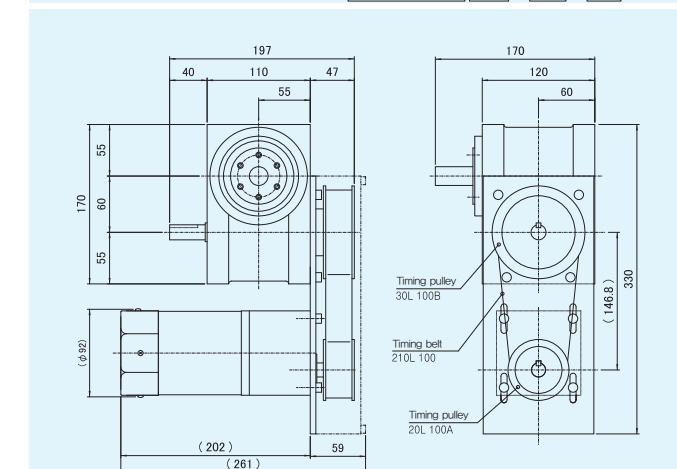


Figure OP-6

Product code Indxing drive **HD060-06122R-SM3VW** 1
Exampel) Motor mounted code **5IK90GU AF-40-1**

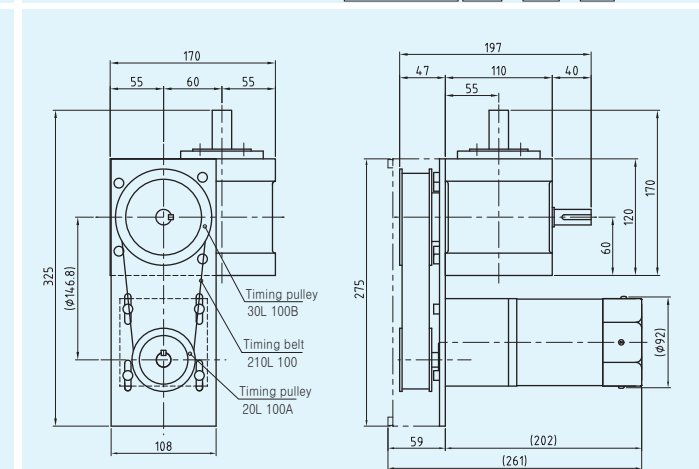


Figure OP-7

Product code Indxing drive **HD060-06122R-SM3RS** 5
Exampel) Motor mounted code **5IK90GU AF-40-2**

Characteristic table of induction motor

Table OP-3

MOTOR	Output (W)	Frequ-ency (Hz)	Voltage (V)	Electric current (A)	Starting torque (N·m)	Continuous torque (N·m)	Number of rotation (rpm)	Condenser capacity (μF)	Gear head
5IK60GU-AF	60	50 60	100	1.4	0.314 0.294	0.441 0.372	1300 1550	15	5GU□KB
5IK90GU-AF	90	50 60	100	2.0	0.441	0.666 0.559	1300 1550	25	5GU□KB
M9IC60G4L	60	50 60	100	1.3 1.2	0.441	0.451 0.363	1275 1575	15	M9GD□B
M9IC90G4L	90	50 60	100	1.6 1.7	0.470	0.637 0.519	1325 1625	25	M9GD□B

Torque in case the gear head is directly connected(N·m)

Table OP-4

Number of rotation(rpm)	200	120	100	60	50	30	20	15	10
Deceleration ratio of 50Hz and 60Hz	7.5 9	12.5 15	15 18	25 30	30 36	50 60	75 90	100 120	150 180
5IK60GU-AF	2.65	4.02	4.80	7.25	8.72	14.50	19.60	19.60	19.60
5IK60GU-AF	4.02	6.08	7.25	10.98	13.13	19.60	19.60	19.60	19.60
M9IC60G4L	2.35	3.92	4.70	7.55	9.11	15.19	19.60	19.60	19.60
M9IC60G4L	3.43	5.68	6.76	10.88	13.03	19.60	19.60	19.60	19.60

Specification of electrically driven timing

Table OP-5

Model	Deceleration ratio of timing pulley	Figure of pulley A	Figure of pulley B	D ₁ Distance between the lead of pulley	Belt type
HD045	1.0	22	22	86	150L 40치
HD060	1.5	20	30	146.8	210L 56치

Cautious) The deceleration ratio of pulley of the mounted HD060 is 1.5. Please be cautious when choosing the deceleration ratio of gear head.

Precautions

- Attach the motor mounting spacer on the T side or U side of Index main body.
- Above figure is an example of T side attachment. It becomes symmetry in case of U side.
- Please inform us reduction ratio besides the code number when ordering.
- It is possible to apply other motors other than model provided in this catalog so please let us know your desired motor model.

RGB Dimension

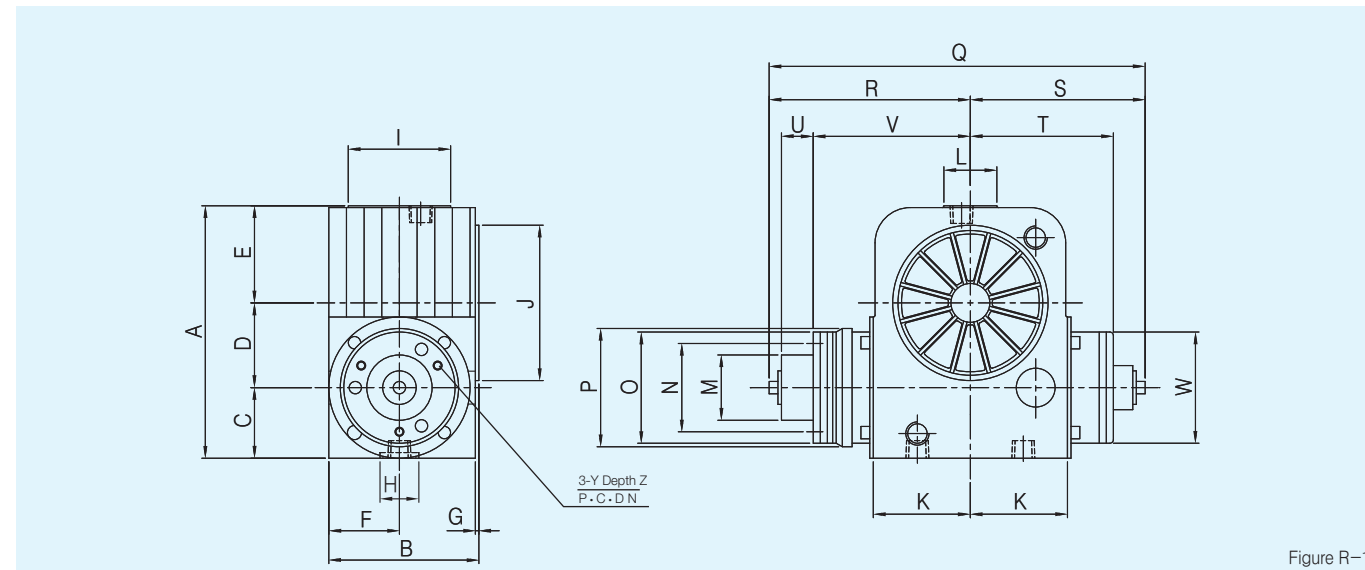


Figure R-1

• Dimensions table

Table R-1

Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	Y	Z
R48	143	85	40	48	55	40	2	22	58	88	55	30	37h7	50	63	67	213	114	99	81	18	89	64	M5	6
R65	180	95	45	65	70	45	2	30	62	120	75	40	45h7	60	80	85	275	143	127	103.8	20	114	81	M6	8
R80	224	117	54	80	90	55	2	30	80	150	90	60	60h7	76	100	106	327	171	151	122.9	24	136	101	M6	8
R100	278	142	68	100	110	70	2	33	93	180	110	80	70h7	95	125	133	387	202	180	147.3	25	163	126	M8	12.5

※ Please compare the figure R-1 and figure R-2 with the RC type of clutch and RB type of brake.

△ **Precautions** Please check the length of bolt when locking the pulley. (Please refer to Y and Z in the dimension table.)

RA Dimension

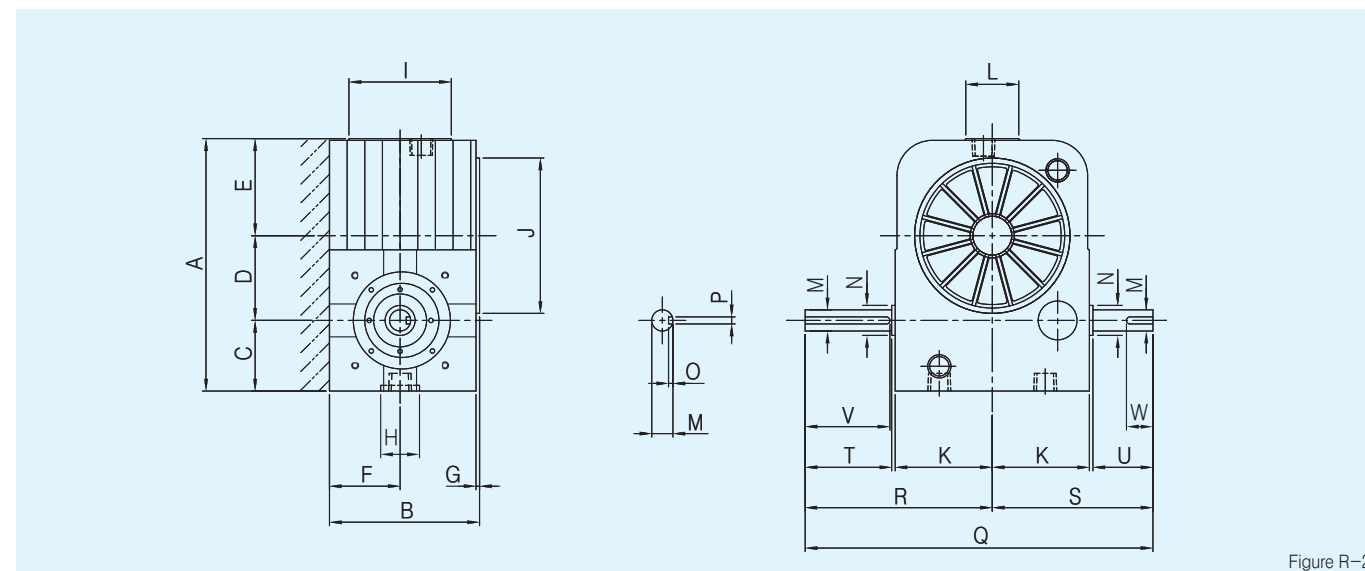


Figure R-2

• Dimensions table

Table R-2

Type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
R48	143	85	40	48	55	40	2	22	58	88	55	30	12h7	17	2.5	4N9	197	106	91	49	34	48	15
R65	180	95	45	65	70	45	2	30	62	120	75	40	17h7	20	3	5N9	252	133	119	55.5	41.5	52	18
R80	224	117	54	80	90	55	2	30	80	150	90	60	25h7	30	4	7N9	301	159	142	66	49	62	22
R100	278	142	68	100	110	70	2	33	93	180	110	80	30h7	35	4	7N9	357	187	170	73.5	56.5	70	25

※ Specification and values can be changed without prior notice. Therefore, please double check before ordering.

Table R-3

Contents	Unit	Symbol	R48	R65	R80	R100
Maximum speed	rpm	Nw	1800	1800	1800	1800
Moment of inertia of worm shaft	kg • m ²	C ²	1.81 X 10 ⁻³	8.01 X 10 ⁻³	0.023	0.077
Moment of inertia of worm gear	kg • m ²	C ³	0.22 X 10 ⁻³	0.53 X 10 ⁻³	0.123 X 10 ⁻²	0.325X 10 ⁻²
Backlash on wheel shaft	degree	b	(0.26)	(0.22)	(0.1)	(0.16)
Friction torque of worm shaft	N • m	T _{xw}	(0.441)	(0.588)	(0.98)	(1.47)
Product weight	Kg		3	10	18	30
Clutch specification			101-06 Type	101-08 Type	101-10 Type	101-12 Type
Static friction torque	N • m	T _{sc}	5.39	10.8	21.6	44.1
Dynamic friction torque	N • m	T _{dc}	4.9	9.8	19.6	39.2
Stator • rotor weight	kg	W _{sc}	0.4	0.725	1.26	2.3
Armature weight	kg	W _{ac}	0.06	0.1	0.24	0.46
Rotor inertial weight	kg • m ²	C ⁴	0.074 X 10 ⁻³	0.224 X 10 ⁻³	0.68 X 10 ⁻³	2.14 X 10 ⁻³
Armature inertial weight	kg • m ²	C ⁵	0.042 X 10 ⁻³	0.118 X 10 ⁻³	0.48 x 10 ⁻³	1.31 X 10 ⁻³
Rated voltage	V		DC24	DC24	DC24	DC24
Minimum power	W		11	15	20	25
Brake specification			111-06 Type	111-08 Type	111-10 Type	111-12 Type
Static friction torque	N • m	T _{sb}	5.39	10.8	21.6	44.1
Dynamic friction torque	N • m	T _{db}	4.9	9.8	19.6	39.2
Stator • rotor weight	kg	W _{sb}	0.22	0.4	0.67	1.22
Armature weight	kg	W _{ab}	0.06	0.1	0.24	0.46
Armature inertial weight	kg • m ²	C ⁶	0.042 X 10 ⁻³	0.118 X 10 ⁻³	0.48 X 10 ⁻³	1.31 X 10 ⁻³
Rated voltage	V		DC24	DC24	DC24	DC24
Minimum power	W		11	15	20	25

1N • ≒ 0.102kgf • m

△ Precautions

1. T_{dc} and T_{db} (Dynamic friction torque) at the specification table is the value in case the relative velocity is 100rpm.

2. Equivalent Moment of inertia: $J_2 = \frac{C_1 + C_2}{i^2} + C_3 + C_4 + C_6$
 i Real deceleration ratio
 C_1 Moment of inertia of input shaft (Cam shaft)

Location of Oil plug, oil gauge and oil drain

Table R-4

Mout	Worm shaft is on top	Worm shaft positioned up right	Worm shaft on the bottom
Location			
Oil level ℓ	Attachment is impossible.	0.23	0.30
	Attaching pen is possible.	0.41	0.59
		0.71	0.87
		1.34	1.73

How to handling indexing drive?

Roller gear cam mechanisms has very high degree of precisin Make sure you thoroughly understand the knowledge of its mechanisms.

This will enable you to practice proper handling procedures and there fare prevent major accidents from occur-ring.

(1) Installation

Please remove to use the emulsion in case the crack, impurity and stamp, etc remain.

Please install the equipment after applying the grease and mineral oil for preventing the rust of mounting face after cleaning up. Please attach on the stable bottom stably since the load of large fluctuation is acted at the device.

(2) Environment

The use environment of grading device makes largely the performance of device. Taking the measures is necessary to examine and research for the environment of the location to install it.

a) The environment temperature to use the grading device of standard specification is 0°C ~ 40°C.

b) Producing the rust is easy in case of using at the environment containing lots of water.

Please perform the treatment to prevent the rust carefully.

c) The input output shaft is sealed by the oil seal. Please examine the protective cover since it causes the wear of seal side and the leak of oil

according to the amount and type of impurity.

d) Please perform the insulation thor-oughly since the electric current causes the degradation of device.

(3) Operation

The problem generates in case of driving rightly after terminating the attachment of parts since the auto-matic machine to use the grading device is complicatedly made by the many parts. Please check if the obstacle is generated to operate by using the hand whenever the major parts are attached to think that the input shaft can be operated by the hand. Please check if it operates rightly to perform the operation at low speed or to act it by hand.

(4) Handling of input shaft

It becomes the standard location of the index angle when the main line of the gap of key of input shaft exits on the direction of turret. The origin is the opening location to be dividing in case of indexing drive and is the timing chart in case of oscillating. The key is used for deciding the location and for completely sending the impulsive load. Please choose the other sending method in case of normal operation while depending on the sending key.

(5) Handling of output shaft

Please install it to increase the tor-sional rigidity to install the attachment flange to move closely to the one side of shaft as possible regarding the location of attachment when attaching

the table. Please decrease the over-hang load after the acting point for sending the power moves closely to the one side of shaft in case of per-forming the indirect driving to use the gear etc.

(6) Lubrication

There is the important role such as the decrease of frictional heat of each part of electricity body, the removal of frictional heat and the preventing the rust on electricity side etc. in case of lubrication.

However, it causes the extent decline and lifetime decline in case the correct lubricating oil is not selected. Thus, please decide it to consider of use condition. We recommend the quality thing including the additive material of extreme pressure in case of lubricat-ing oil. But, please do not mix the oil of the other company's oil. Please select the proper things at below table since the viscosity is different according to the number of rotation.

(7) Repair • maintenance

a) The size of backlash of input output type increases as the year changes. Please perform the regular check and adjustment.

b) Please keep the adequate amount since it causes the abnormal tem-perature rise and the flowing oil in case of having a lot of flux of lubri-cating oil.

c) Please exchange the lubricating oil once per year and 3,000 time per operation even though the operation time is short.

Table I-1

RPM of input shaft of grading device (rpm)	Viscosity cSt/40°C	Lubricating oil			Viscosity cSt/40°C (For use of reducer)
		KOREA SHELL	KOREA MOBIL	Japan Oil	
0~20	>680	Shell omala 680	Mobil gear 636	M680	>300
20~100	680~460	Shell omala 460	Mobil gear 634	M460	270~230
100~200	460~320	Shell omala 320	Mobil gear 632	M320	190~150
200~400	320~220	Shell omala 220	Mobil gear 630	M220	—
Excess 400	220~150	Shell omala 150	Mobil gear 629	M150	—
—	150~68	Shell omala 68	Mobil gear 626	M68	—

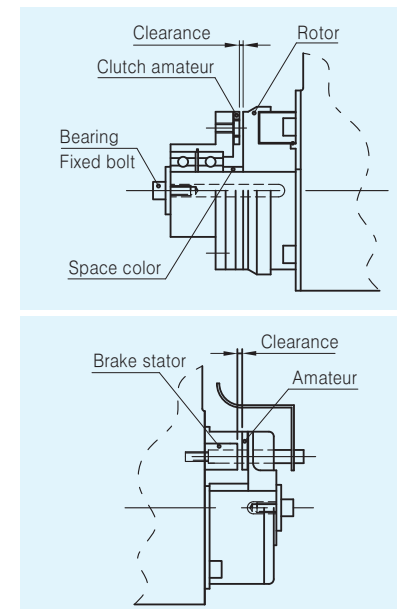
Precautions Please select the highest viscosity (the biggest number) in case the number of rotation of input shaft is the edge point.

Handling of reducer

(1) The clearance of the adjusting clear-ance of clutch/brake is the GAP of the lining and the amateur. It is adjusted as the proper value when shipping. However, the GAP is expanded to wear the friction surface of lining slowly according to the operation. Please adjust it in order that this clearance can be the proper value of the next table in case the error is generated by the clearance.

(2) Exchange of bearing

The deep ball bearing of 2ea are used at the clutch part. Please exchange the bearing when adjusting the clearance.



• Proper clearance

Table I-2

	Proper clearance	Bearing
R48	0.15~0.25 (0.4)	6202LLU
R65	0.15~0.25 (0.4)	6203LLU
R80	0.15~0.25 (0.5)	6205LLU
R100	0.2~0.35 (0.6)	6206LLU

() is possible when adjusting the gap

(3) Lubrication

The grading device follows the lubrication. The exchange is once after 1,000 hourst wice per 3,000 hours Just, even though the peration time is shortplease exchange it once per 1year.

Viscosity of lubricating oil

Table I-3

Form		In case the worm is soaked in oil					In case the worm is not soaked in oil				
Type	Normal deceleration ratio	Number of rotation of worm shaft (rpm)					Number of rotation of worm shaft (rpm)				
		1800~1500	1500~1000	1000~750	750~500	Below 500	1800~1500	1500~1000	1000~750	750~500	Below 500
R48	10										
	20										
	30 • 50										
R65	5										
	10 • 31.5										
	20 • 40										
R80	50										
	5										
	10 • 31.5										
R100	20 • 40										
	50										
	5										
R100	10 • 31.5										
	20 • 40										
	50										

Viscosity over 300이상

Viscosity 270~230

Viscosity 190~150

Unit: cSt/50°C

Handling of TORQUE SHIELD

(1) Adjustment of FLANGE TYPE

Please pay attention to the eccentric of table of the table about the main rota-tion of output in case of attaching the table etc. to the flange part.

RADIAL concentricity: 0.02mm T.I.R

(2) Adjustment of COUPLING TYPE

The coupling type is made of the

structure to be able to absorb the mis-alignment such as the angular mis-alignment, the clearance error and the parallel fault to be generated in case of the attachment between 2 shaftes.

(3) Repair • Inspection Please

Please follow the proper method even though it is the maintenance free. Please be careful that the impurity, acid, alkali, and the water etc are

stained. The grease is used for the lubrication. Please supply it per 1,000~2,000 hours since it can be simply used as the nut of adjusting torque is unloosed. Please use the grease of lithium type (Illumination 2) in case of grease.

Recommended grease

SHELL-ALVANIA EP2

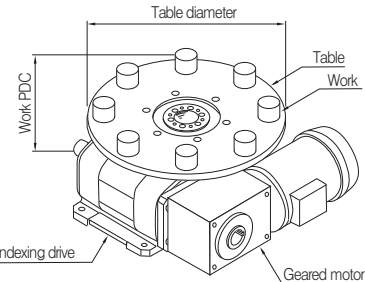
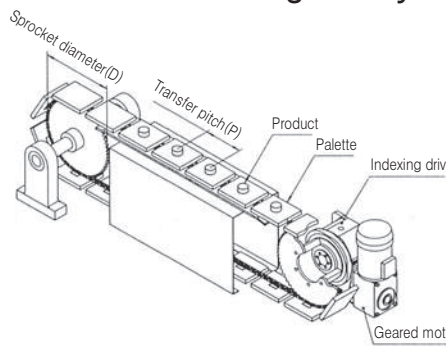
MOBIL-MOBILUX EP2

Dear Sir(Sirs)

Selected data of INDXIA-HD type

Company name			
Department name			
Name of person in charge			
Phone number	(Extension number)	Fax number	

- Selecting the HD series is required to choose the proper type on the use condition.
- We are selecting the type by the torque calculation as the service to the customers.
- Pleases send it to use after writing the use condition to this fax sheet.

• Number of stop S			
• Dividing time t ₁ sec			
• Stopping time t ₂ sec			
In case of driving the data		• Table diameter D mm	
		• Table mass W ₁ kg	
		• Jig : P.C.D D ₂ mm	
		• Jig mass per 1ea W ₂ kg	
		• Quantity of jig n ₂	
		• Work P.C.D D ₃ mm	
		• Work mass per 1ea W ₃ kg	
		• Quantity of work n ₃	
• Transfer pitch P mm		In case of driving conveyor	
• Chain and attachment mass W ₁ kg			
• Jig mass g W ₂ kg			
• Work mass W ₃ kg			
• Sprocket diameter D mm			
• Sprocket mass per 1ea W ₄ kg			
• Quantity of sprocket n ₄			
• Fact of friction μ			
Geared motor	Whether it exists • not	Inverter	Whether it exists • not
Torque shield	Whether it exists • not	Timing cam	(Whether it exists: set) • not
Note			

INDXIA

Index device of roller gear cam type

Indexing drive of integrally fix shaft time with is compact and simple installation

HAseries

- INDEXING DRIVE • TORQUE SHIELD
- GEARED MOTOR • TIMING CAM

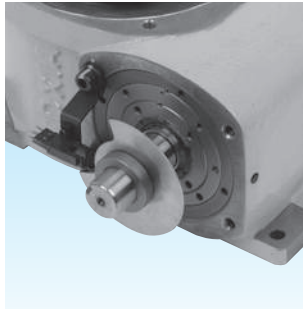


Option specification

▼ Mounting torque shield



▼ Timing cam & sensor

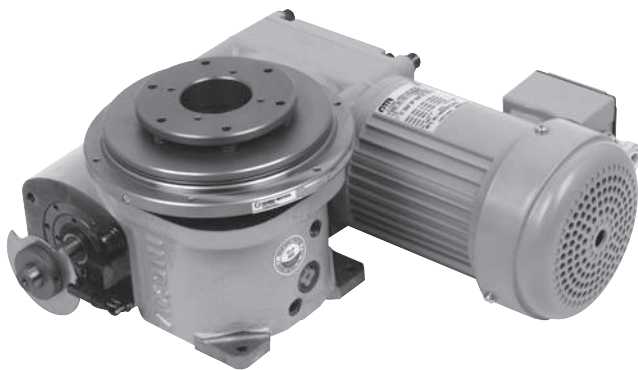


Characteristic of HA series

- Distance between the shaft 70, 90, 110, 150, 190, 230, 330mm Standardization of 7 types
- The number of stop is widely responded from 2 to 32 stop.
- The output part is made of Hollow flange form that the torsion is high.
- Design of compact as housing of thin film
- Standard installation of fixed hollow shaft on the center of flange of output.
- Mounting the timing cam and sensor is possible on the input shaft.
- Mounting the torque shield is possible to the output shaft.
- Specification of inverter control to install the geared motor of the hollow shaft type by the standard
- CAD drawing of all types (Referring to Homepage)

Activating the resources saving while promoting the efficiency according to the guide line that the international standard presents becomes the essential theme as all over the world signizes the ISO14000 at the time that the global environmental problems is closed up. We develop 「INDXIA HA SERIES」 and sell it after we examine the specification of 「HANNZ MOTROL CO.,LTD.」 used widely now at the view point of ECONOMY TYPE about the grading device of high reliability to meet the requirement (demand) such as the soft movement, completed movement and the movement of high reliability etc. like this.

This product is presented after examining efficiently in order that the treating such as the output of the hollow flange form to be able to attach directly the table etc. and the standard installation of inverter control not to need the exchange of part of the clutch/brake etc. is easily performed to focus on the improvement of cost such as choosing the geared motor of cost performance to come in to the market and the housing of thin film to minimized the machined surface. We are very pleased to introduce the 「INDXIA-HA SERIES」 as the best product to let adapt to the times in the real world to increase the expectation gradually about the index device to take the charge of the backbone of the automatic device of the high reliability in the industrial world.



Product outline

It is the INDEX UNIT of integral driving part being compact that the geared motor of shaft mount type of the excellent cost performance is installed at the housing of thin film. It is index device to be easy to handle after examining newly from the internal structure of merit in itself of the device of roller gear cam of the HANNZ MOTROL CO.,LTD. to have the abundant production results. In addition, the maintenance free of the machine part is actualized in order that the movement/stopping by the inverter control are performed without the clutch/brake and the cost down is done.

Characteristic

- Distance between the shaft from 70mm to 450mm
Standardization of 8 types
- The number of stop is widely responded from 2 to 32 stop.
- The output part is made of Hollow flange form that the torsion is high.
- Design of compact as housing of thin film
- Standard installation of fixed hollow shaft on the center of flange of output.
- Mounting the timing cam and sensor is possible on the input shaft.
- Mounting the torque shield is possible to the output shaft.
- Specification of inverter control to install the geared motor of the hollow shaft type by the standard

Attention on unit

The catalog uses the SI unit. Please check the figure and the unit in case of referring to the characteristic table of each product specification and the Torque delivery ability chart . In addition, please pay attention sufficiently in case of selecting the type since it is shown as the 1/4 figure about the J of gravitational system of units regarding the moment of inertia.

contents

54 Product outline, Characteristic

53 Standard specification

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72 Torque delivery ability chart

86 Selecting type

88 Selecting inverter

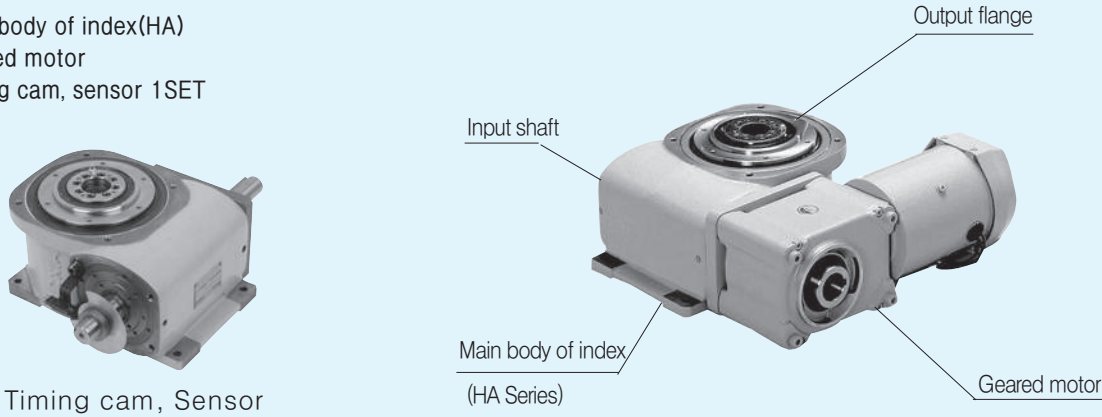
91 Torque shield

92 Handling

93 Data of selecting type

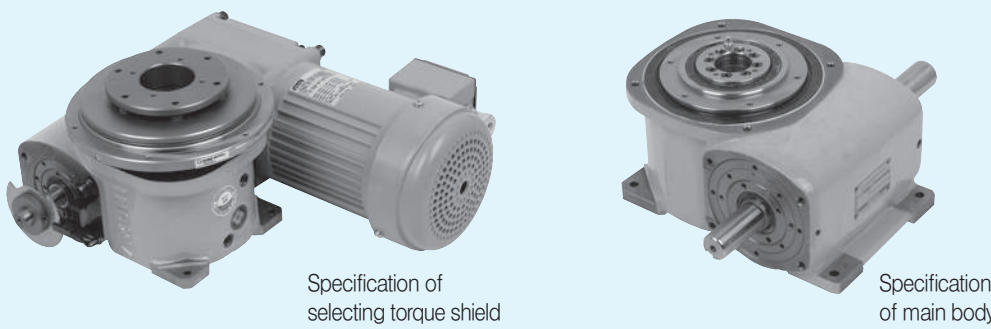
Standard PACKAGE

- Main body of index(HA)
- Geared motor
- Timing cam, sensor 1SET



Option

- Torque shield



Product specification of HA series

1DWELL(HA070~HA450)

S	120°	150°	180°	210°	240°	270°	300°	330°
2								△
3						△	△	
4					△	△		
5				△	△	○		
6			△	△	○	○		
8		△	△	○	○	○		
10	△	△	○	○	○	○		
12	△	△	○	○	○	○		
15	△	△	○	○	○	○		
16	△	△	○	○	○	○		

2DWELL(HA070~HA450)

S	120°	150°	180°	210°	240°	270°	300°	330°
16				○	○	○		
20			○	○	○	○		
24			○	○	○	○		
32			○	○	○	○		

S : Number of STOP,
θ : Index angle
△ SMS curve, Standardization of
SMCV curve figure
○ SMS 3 curve , △ SMCV 3 curve

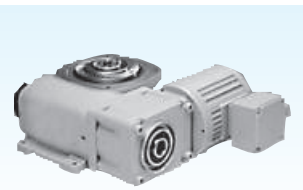
- It is impossible to produce as the alpha.
- Please consult us since the part can respond to the special specification.

The rotation of one times at the input shaft and grading and stopping of two times at the same cycle are performed in case of 2DWELL. The index angle is the total index angle of input shaft of the rotation of one time.

Index	HA070	HA090	HA110	HA150	HA190	HA230
Geared motor capacity (Kw)	0.1/0.2	0.2/0.4	0.4/0.75	0.75/1.5 (2.2)	1.5/2.2	2.2/3.7 (5.5)
Timing cam + sensor	Installing up to 3 sets on the input shaft of specification of both shafts is possible.					
Option	Torque shield	T07B	T09B	T11B	T15B	T19B T23B
	Inverter	We select it according to the requirement.				

The geared motor of capacity of () is the special specification.

HA070

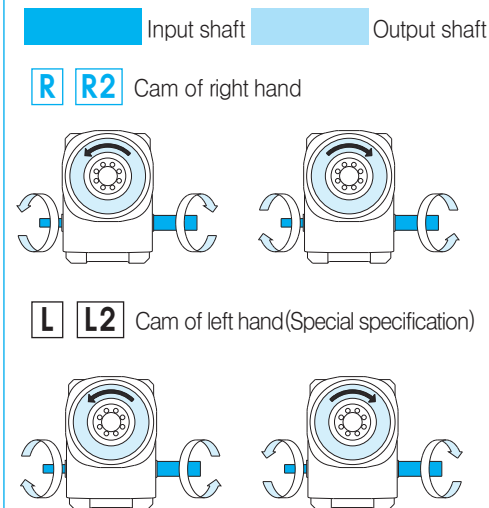
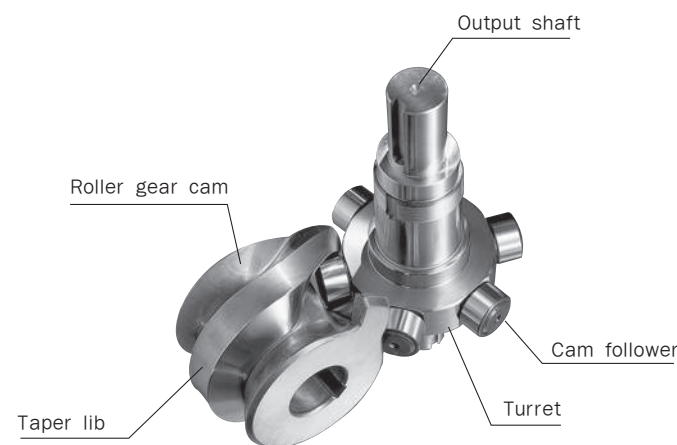


Please re-check it when ordering since the specification and values are changed without the notice.

ex.) **HA** **090** — **08** **18** **7** **R** — **S** **M3** **VW** **1** **X**

a b c₁ c₂ d e f g h i j

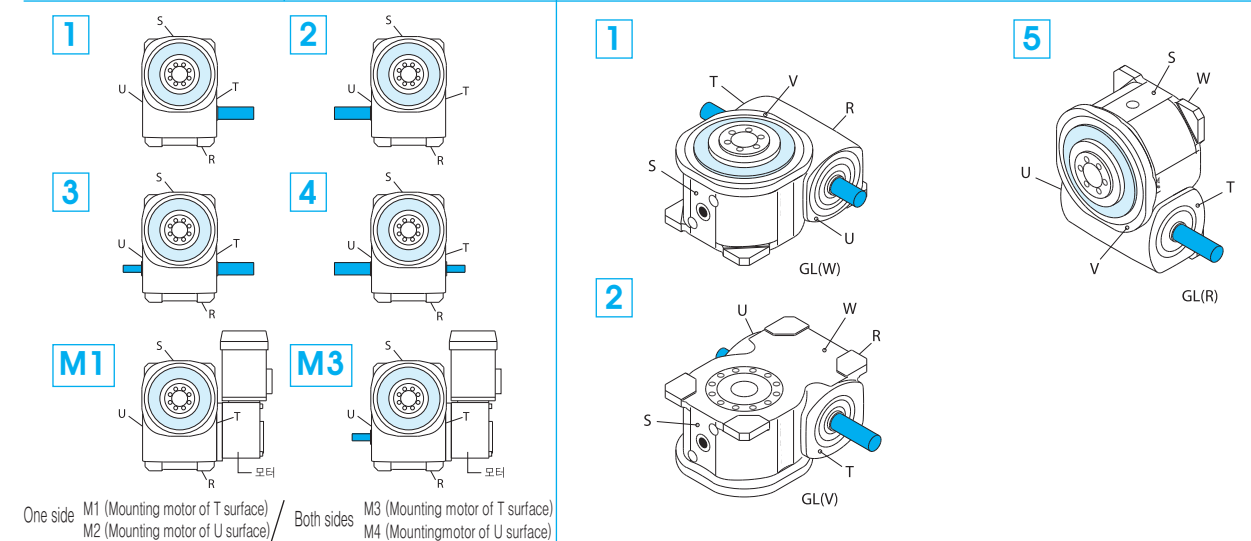
a Model	b Size	c ₁ Number of stop (S)	c ₂ Index angle (θ)	d Cam curve	e Direction of rotation of input-output shaft
HA Model name	090 Center distance 90mm	08 8 stop	18 180°	7 SMS-3 curve	R 1Dwell and Cam of right hand
HA It shows the HA series.	It shows the distance between the shaft of input-output.	It is the number of stop of output shaft per one rotation of the output shaft.	It is the angle of rotation of the input shaft required when dividing one time. Angle of rotation of 2 times in case of 2DWELL.	7 SMS-3 curve 8 SMCV-3 curve 9 Cam curve except above thing (Special specification)	It shows the direction of rotation of output shaft about the direction of rotation of input shaft and the number of stop(DWELL) of output shaft per one rotation of input shaft. 1DWELL 2DWELL Cam of right hand R R2 Cam of left hand L L2



About the decision of product

The scope of combination is large since the product code of HA series is made of the combination of the number and the sign. Please decide the correct product code after selecting the type and define the use condition clearly since the right use of product if the number of product is wrong. In addition, please pay attention to it to be the same to the index since the geared motor and torque shield have the product code. Just, there is the condition to be able to respond to the stamp of appointed color except the content of written code, the deceleration ratio except the characteristic table, the attachment of motor from the other voltage and the attachment of terminal of half space etc. in case of the characteristic specification. Please consult us after checking the price to hope, the number of product and the time limit for delivery date etc. at the required specification.

f Specification of output shaft	g Specification of input shaft	h Processing side of attachment hole	i Position of attachment	j Special Instruction
S Standard shaft type	M3 Input shaft of both sides	VW Processing of attachment hole of V surface and W surface	1 Position of attached part (W face is GL)	X (Option) – Gear motor – Limiter
S Standard shaft type L Mounting torque	The one side type 1 2 and both sides type 3 4 M3 M4 exist. (Referring to below figure) Note) The one shaft is the special specification in case of HA070~HA230.	The hole of penetration on V face and W face are processed as the attachment hole is the standard specification	Position 1 W face is GL Position 2 V face is GL Position 3 U face is GL Position 4 T face is GL Position 5 R face is GL. Note) GL(Ground Level)	Please add the X in case the special specification exists. Standard specification X Special specification Note) Please attach the specification separately regarding the contents of special specification.



Geared Motor

Product code Example)

a Form	b Amount of motor	c Reduction ratio	d Use voltage	e Specification	f Mounting type
GM Geared motor	It shows the output of motor. Example) 0.2 0.2Kw 0.75 0.75Kw 3.7 3.7Kw 11 11Kw	It shows the deceleration ratio. Example) 1010 2020 20.3720.37	It shows the use voltage. A 200/220V B 230V C Other voltage	S Standard	Size of main body of index to install the geared motor

Attention of geared motor

- Please pay attention sufficiently to selecting it since the geared motor installed to HA series is different from the form and maker according to the size. Please tell the sign of product code of characteristic table of geared motor of each product specification when ordering.
- Please discuss separately the other specification as the geared motor is the standard of the 200/220V on the 3 types for common use and the 50/60 HZ specifications.
- Please discuss separately when mounting the brake.

Timing cam, sensor

a Form	b EA	c Model
TC Timing cam + sensor	1 1 SET 2 2 SET 3 3 SET	Please write the type of main body of HA series to install the timing cam.

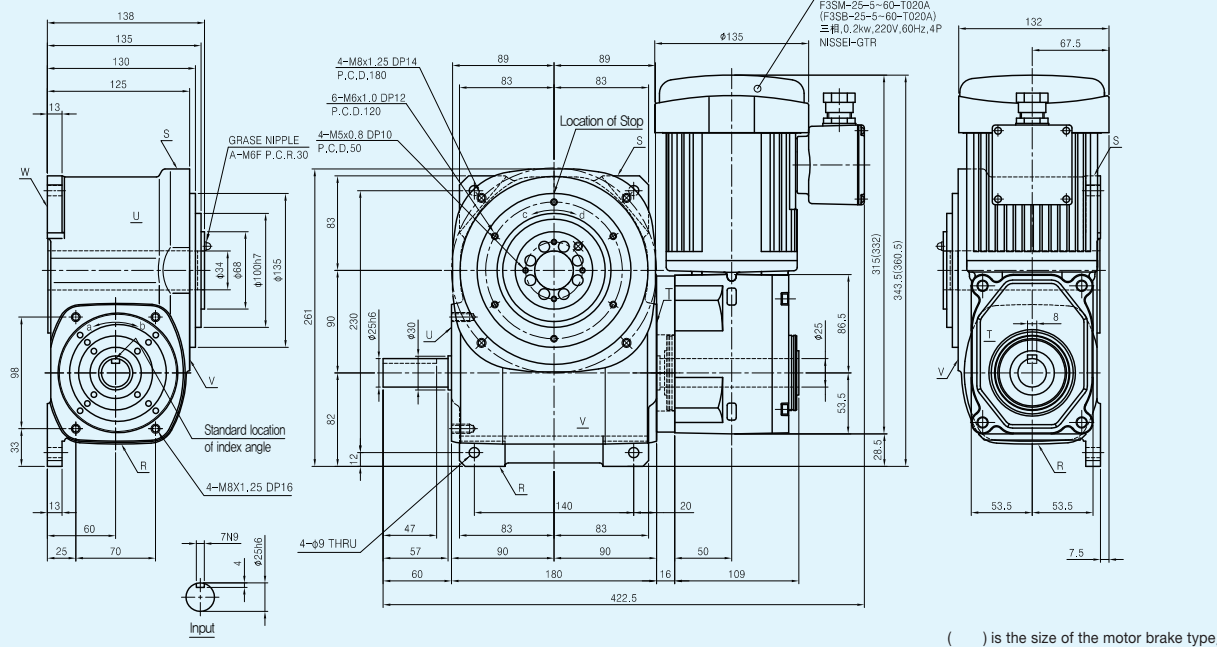
Torque shield (Option)

a Size	b Form	c Maximum blocked torque	d Type of spring
It shows the size of torque shield. 7 , 9 , 11 , 15 , 19 , 23 Please select it that is the same size to the main body of HA series.	It shows the form of torque shield. Use for HA series.	It shows the maximum blocked torqued (Tmax). Example) 20 Tmax=200N・m	There is 2 types of the spring. L Coil spring for use for light load H Coil spring for use for heavy load

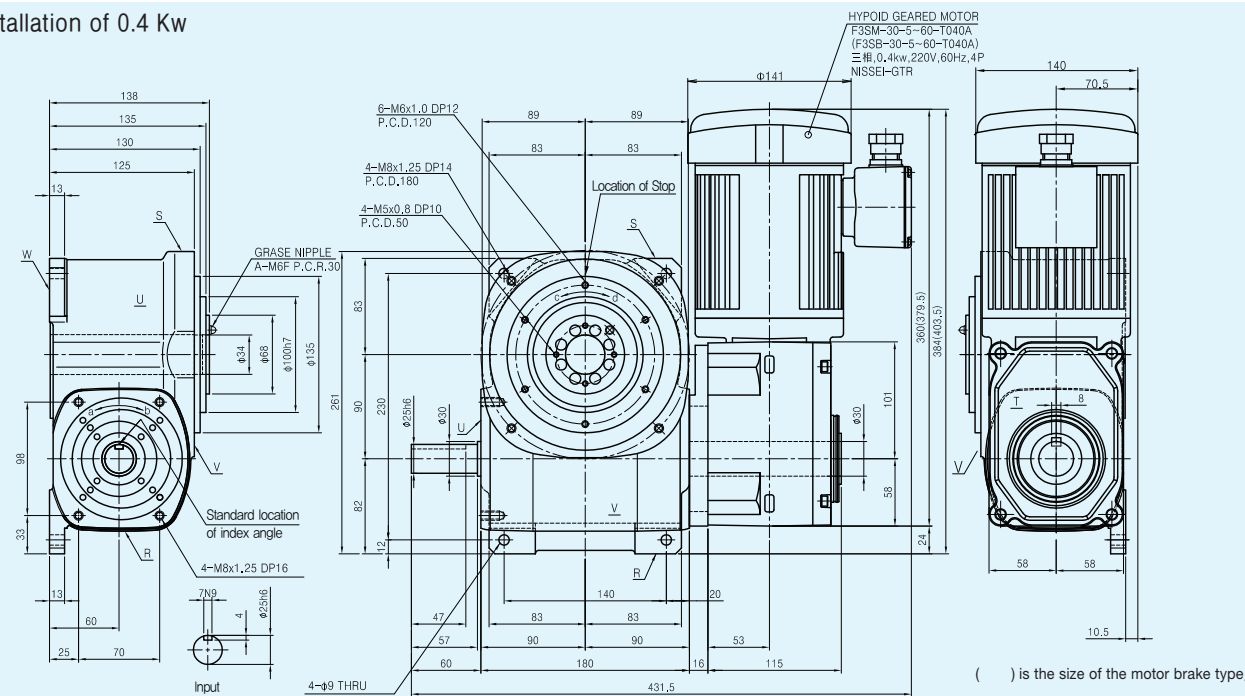
HA 090 Dimension

[Unit:mm]

(a) Installation of 0.2Kw



(b) Installation of 0.4 Kw



• Characteristic table of index

Table 9AD-1

Characteristics items	Sign	Unit	Values	Characteristics items	Sign	Unit	Values	Characteristics items	Sign	Unit	Values
Load of allowable THRUST of output shaft	P ₁	N	4900	Load of allowable THRUST of input shaft	P ₄	N	2500	Dividing extent of 1DWEL		sec	±30
Load of allowable RADIAL of output shaft	P ₂	N	2100	Allowed TORQUE of maximum repeating at maximum of input shaft	P ₅	N	2500	Dividing extent of 2DWEL		sec	±60
Allowable TORQUE of output shaft	T _s	N · m	Referring to ability chart of torque	TORQUE of allowed repeating at maximum of input shaft	P ₆	N · m	245	Repeating extent		sec	30
Rigidity of torsion of output shaft	K ₁	N · m / rad	2.64X10 ⁵	Rigidity of torsion of input shaft	K ₂	N · m / rad	3.36X10 ⁴	Product mass (Main body of index)		kg	24
Moment of inertia of output shaft	J ₀	kg · m ²	1.11X10 ⁻²	Moment of inertia of input shaft	J _c	kg · m ²	2.5X10 ⁻³	Stamp color of housing			Ivory
Allowable moment of bending of output shaft	P ₃	N · m	98								

Note1) The moment of inertia J of input shaft is the values in case of the rectification.

1N · m ≈ 0.102kgf · m

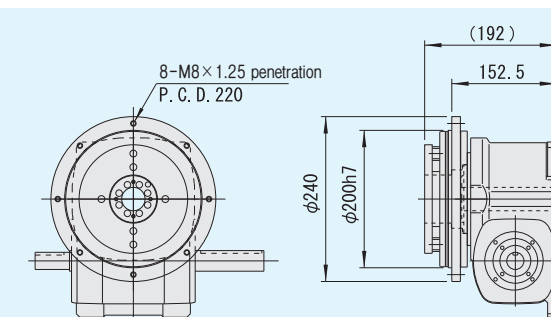
• Characteristic table of geared motor [GM0.2/0.4]

Table HA 090-2

Product code		Motor output (Kw)	Real reduction ratio (i)	RPM of output shaft Nm(rpm)		Allowed output torque Tr(N · m)		Moment of inertia of motor Jm(kg · m ²)	Mass (kg)
200/220V specification	230V 사양 specification			50Hz	60Hz	50Hz	60Hz		
GM 0.2 - 20AS	GM 0.2 - 20BS-US	0.2	20	75	90	23	19	0.81 × 10 ⁻³	9.8
GM 0.2 - 25AS	GM 0.2 - 25BS-US		25	60	72	27	24		
GM 0.2 - 30AS	GM 0.2 - 30BS-US		30	50	60	33	27		
GM 0.2 - 40AS	GM 0.2 - 40BS-US		40	37.5	45	44	37		
GM 0.2 - 50AS	GM 0.2 - 50BS-US		50	30	36	55	46		
GM 0.4 - 10AS	GM 0.4 - 10BS-US	0.4	10	150	180	23	19	0.98 × 10 ⁻³	10.2
GM 0.4 - 15AS	GM 0.4 - 15BS-US		15	100	120	33	27		
GM 0.4 - 20AS	GM 0.4 - 20BS-US		20	75	90	44	37		
GM 0.4 - 25AS	GM 0.4 - 25BS-US		25	60	72	55	46		
GM 0.4 - 30AS	GM 0.4 - 30BS-US		30	50	60	67	55		
GM 0.4 - 40AS	GM 0.4 - 40BS-US		40	37.5	45	88	74		
GM 0.4 - 50AS	GM 0.4 - 50BS-US		50	30	36	111	92		

Installation of torque shield (Option)

Figure HA090-3

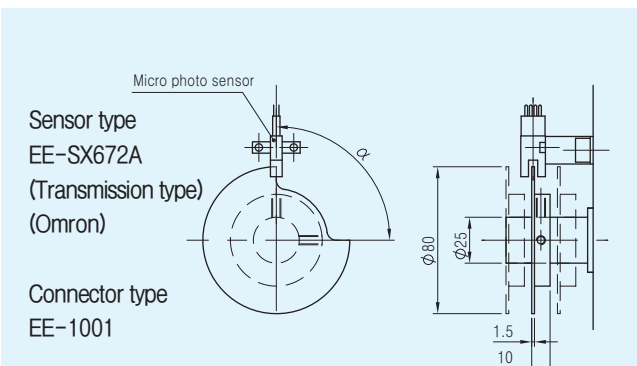


Example of product code

Indexing drive HA090 - 02338R - L3VW 1
Torque shield T09 B - 20 L

Installation of Timing cam-Photo sensor

Figure HA090-4



Example of product code

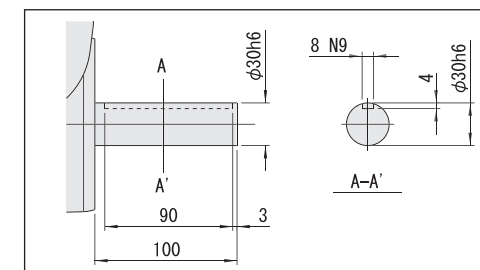
Timing cam and sensor TC - 1 - HA090

Attention

- Attachment posture of geared motor is the standard specification that it is written at the Dimension diagram (Drawing HA090 1, Drawing HA090 2)
- In case of HA090, mounting the motor of 0.2Kw and 0.4Kw is possible. Please pay attention since the part of motor protrudes from the flange face of index in case of the installation of 0.2Kw and 0.4Kw.
- In case of HA090, mounting the T09B of torque shield is possible.
- Mounting the timing cam and sensor is possible to 3 set according to the requirement in case of the input of both sides.

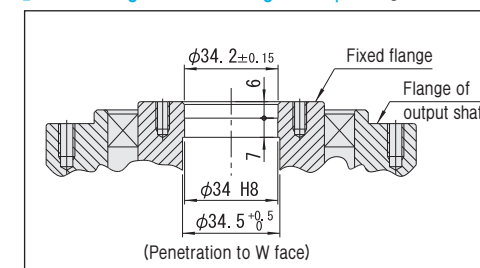
Input shaft of standard specification of main body (Side of T surface)

Figure HA090-5



Detailed degree of fixed flange of output

Figure HA090-6



Location of oil-hole, oil gauge and oil drain part according to position and flow

Figure HA090-7

Position	1	2	5
Location			
Oil level (ℓ)	0.5	0.9	1.0

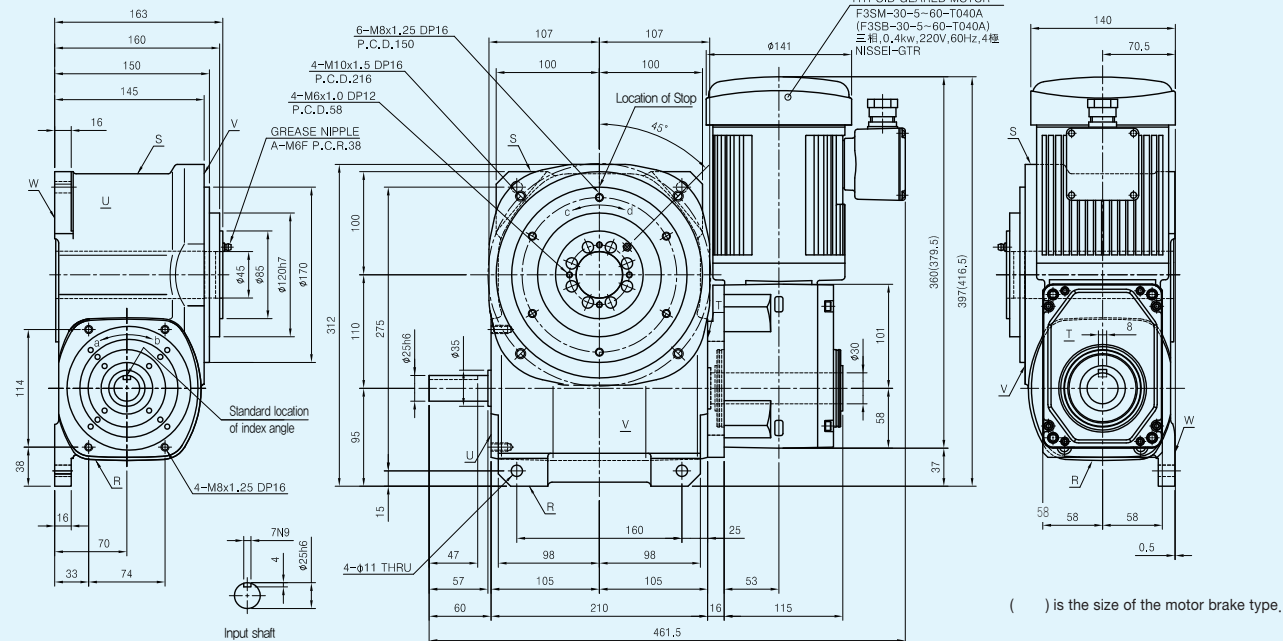
Attention

- The order is the location of PLUG(PT 3/8), LEVEL(VA 01) and DRAIN(PT1/4) from the top regarding each location according to the position.(Drawing HA 090 7).
- The position responds to the code I of indexing drive.
- The rough value is written since an flow changes according to the cam type and the number of cam follower.

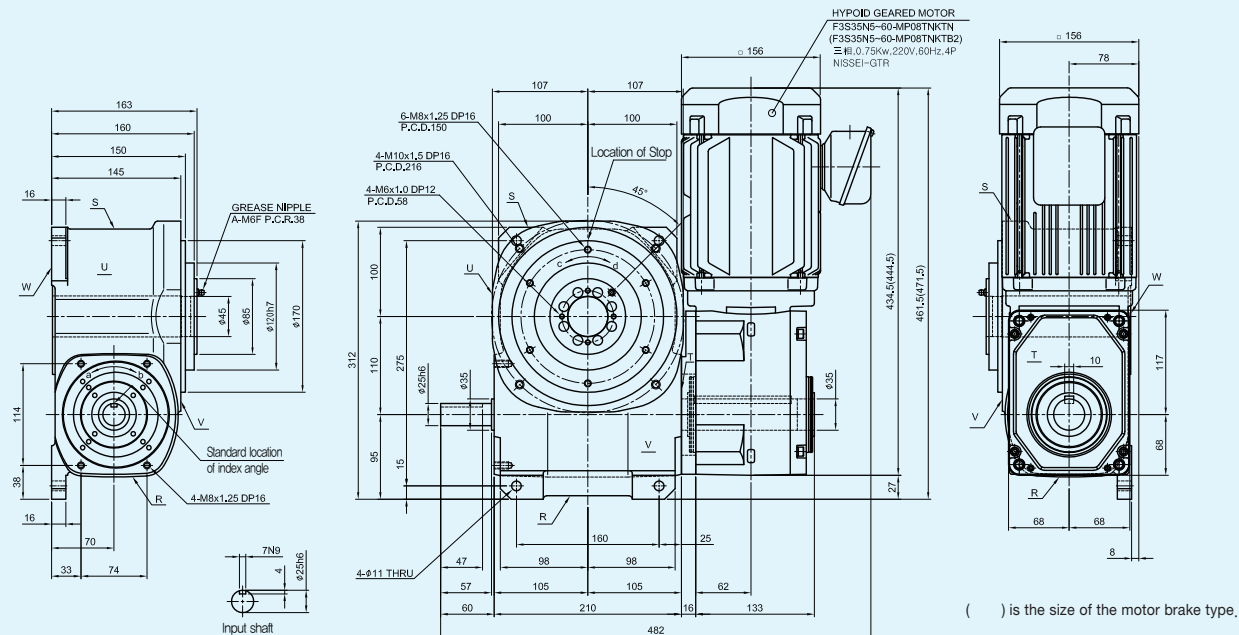
HA 110 Dimension

[Unit:mm]

(a) Mounted motor 0.4Kw



(b) Mounted motor 0.75Kw



• Characteristic table of index

Characteristics items	Sign	Unit	Number	Characteristics items	Sign	Unit	Number	Characteristics items	Sign	Unit	Number
Load of allowable THRUST of output shaft	P ₁	N	6800	Load of allowable THRUST of input shaft	P ₄	N	3000	Dividing extent of 1DWELL		sec	± 30
Load of allowable RADIAL of output shaft	P ₂	N	3400	Allowed TORQUE of maximum repeating at maximum of input shaft	P ₅	N	3500	Dividing extent of 2DWELL		sec	± 60
Allowable TORQUE of output shaft	T _s	N · m	Referring to ability chart of torque	TORQUE of allowed repeating at maximum of input shaft	P ₆	N · m	294	Repeating extent		sec	30
Rigidity of torsion of output shaft	K ₁	N · m / rad	4.43X10 ⁵	Rigidity of torsion of input shaft	K ₂	N · m / rad	3.98X10 ⁴	Product mass (Main body of index)		kg	42
Moment of inertia of output shaft	J ₀	kg · m ²	3.47X10 ⁻²	Moment of inertia of input shaft	J _c	kg · m ²	6.0X10 ⁻³	Stamp color of housing		Ivory	
Allowable moment of bending of output shaft	P ₃	N · m	147								

Note1) The moment of inertia J of input shaft is the values in case of the rectification.

1N · m ≈ 0.102kgf · m

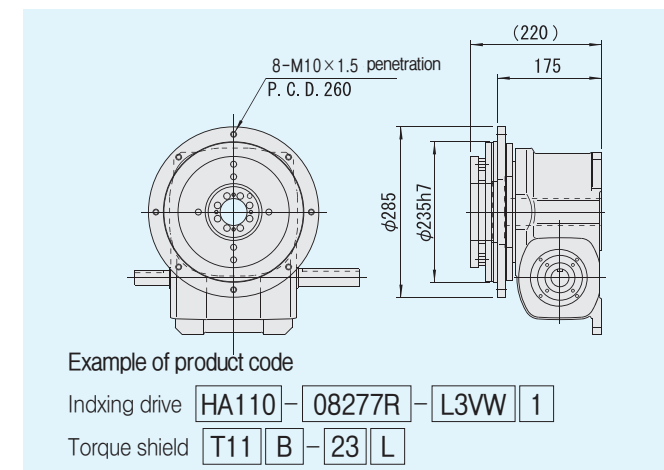
• Characteristic table of geared motor [GM0.4/0.75]

Table HA110-2

Product code		Motor output (Kw)	Real reduction ratio (i)	RPM of output shaft Nm(rpm)		Allowed output torque Tr(N · m)		Moment of inertia of motor Jm(kg · m ²)	Mass (kg)
200/220V specification	230V specification			50Hz	60Hz	50Hz	60Hz		
GM 0.4-20AS	GM 0.4-20BS-US	0.4	20	75	90	44	37	0.98 × 10 ⁻³	10.2
GM 0.4-25AS	GM 0.4-25BS-US		25	60	72	55	46		
GM 0.4-30AS	GM 0.4-30BS-US		30	50	60	67	55		
GM 0.4-40AS	GM 0.4-40BS-US		40	37.5	45	88	74		
GM 0.4-50AS	GM 0.4-50BS-US	0.75	50	30	36	111	92	1.43 × 10 ⁻³	19
GM 0.75-10AS	GM 0.75-10BS-US		10	150	180	41	34		
GM 0.75-15AS	GM 0.75-15BS-US		15	100	120	63	52		
GM 0.75-20AS	GM 0.75-20BS-US		20	75	90	83	70		
GM 0.75-25AS	GM 0.75-25BS-US		25	60	72	104	86		
GM 0.75-30AS	GM 0.75-30BS-US		30	50	60	124	104		
GM 0.75-40AS	GM 0.75-40BS-US		40	37.5	45	166	138		
GM 0.75-50AS	GM 0.75-50BS-US		50	30	36	208	173		

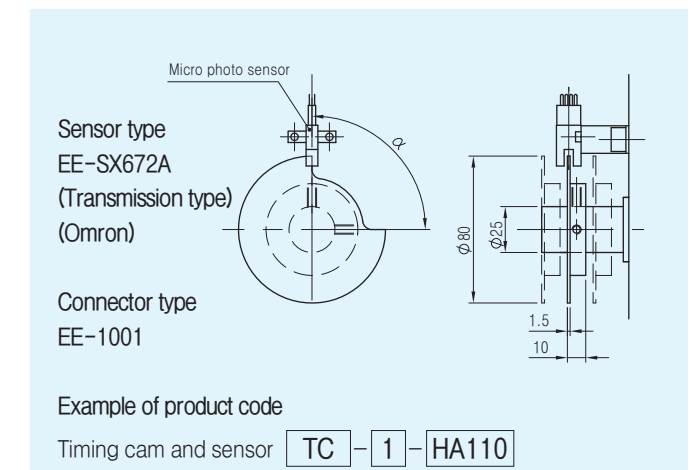
■ Installation of torque shield (Option)

Figure HA110-3



■ Installation of Timing cam-Photo sensor

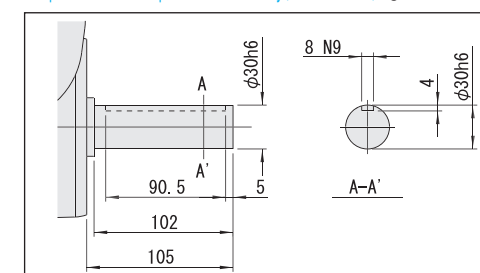
Figure HA110-4



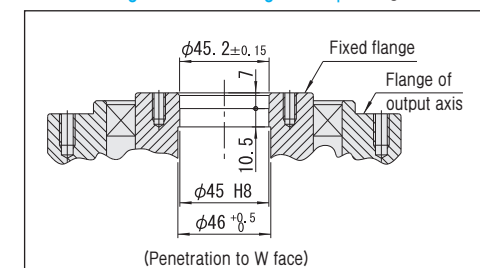
△ Attention

- Attachment posture of geared motor is the standard specification that it is written at the dimension diagram (Drawing HA110 1, Drawing HA110 2)
- In case of HA110, mounting the motor of 0.4Kw and 0.75Kw is possible. Just, the exchange is impossible after buying since the hollow hole of attached hollow hole of geared motor by an amount of condenser.
- Please pay attention since the part of motor protrudes from the flange face of index in case of the installation of motor 0.75Kw. In addition, please design the base face of geared motor because of the casting surface to consider not being interference to the base etc. when mounting it.
- In case of HA110, mounting the T11B of torque shield is possible.
- Mounting the timing cam and sensor is possible to 3 sets according to the requirement in case of the input of both sides.

■ Input shaft of standard specification of main body (Side of T surface) Figure HA110-5



■ Detailed degree of fixed flange of output Figure HA110-6



■ Location of Oil-hole, oil gauge and oil drain part according to position and flow Figure HA110-7

Position	1	2	5
Location			
Oil level (ℓ)	0.8	1.4	1.6

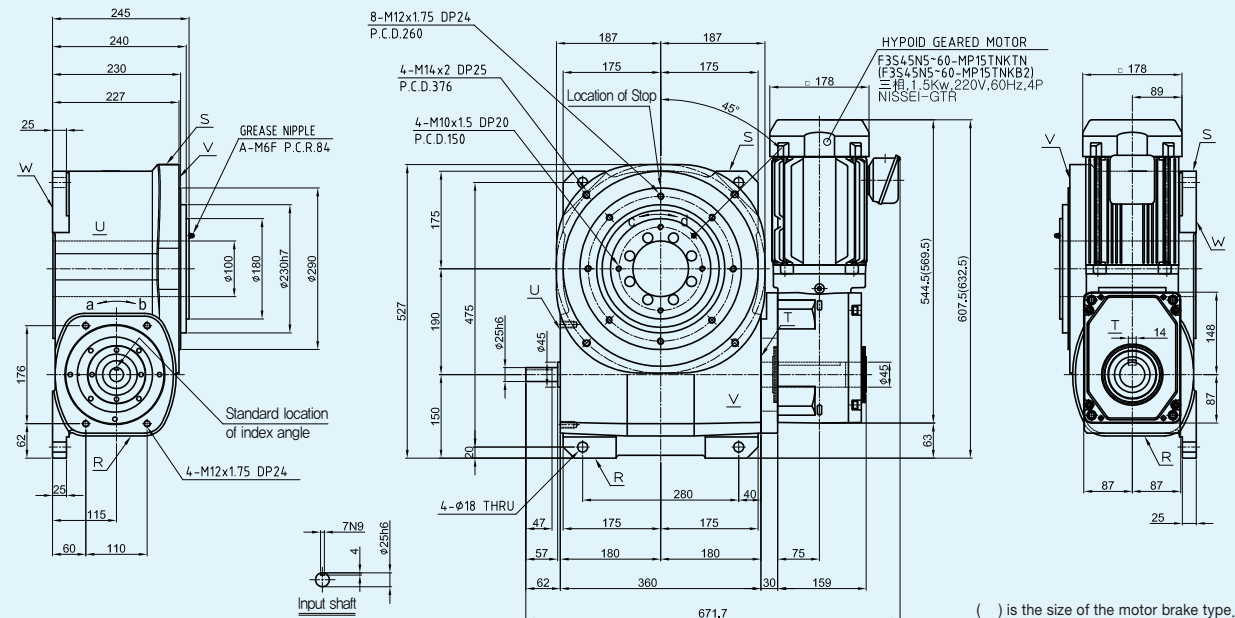
△ Attention

- The order is the location of Oil hole (PT 1/2), oil gauge (VA) and oil drain part (PT 1/2) from the top regarding each location according to the position. (Drawing HA 110 7).
- The position responds to the code I of indexing drive.
- The rough value is written since a flow changes according to the cam type and the number of cam follower.

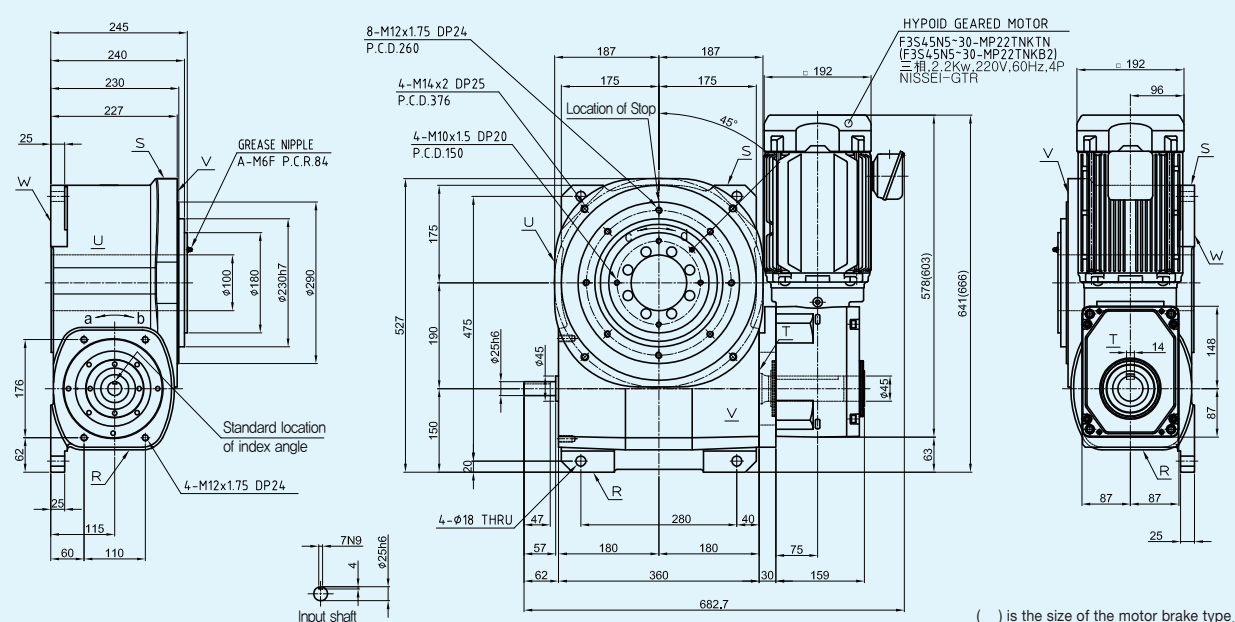
HA 190 Dimension

[Unit:mm]

(a) Mounted motor 1.5Kw



(b) Mounted motor 2.2 Kw



• Characteristic table of index

Table HA190-1

Characteristics items	Sign	Unit	Values	Characteristics items	Sign	Unit	Values	Characteristics items	Sign	Unit	Values
Load of allowable THRUST of output shaft	P ₁	N	18000	Load of allowable THRUST of input shaft	P ₄	N	5000	Dividing extent of 1DWELL		sec	±30
Load of allowable RADIAL of output shaft	P ₂	N	9000	Allowed TORQUE of maximum repeating at maximum of input shaft	P ₅	N	5000	Dividing extent of 2DWELL		sec	±60
Allowable TORQUE of output shaft	T _s	N · m	Referring to ability chart of torque	TORQUE of allowed repeating at maximum of input shaft	P ₆	N · m	600	Repeating extent		sec	30
Rigidity of torsion of output shaft	K ₁	N · m / rad	3.5X10 ⁶	Rigidity of torsion of input shaft	K ₂	N · m / rad	8.4X10 ⁴	Product mass (Main body of index)		kg	180
Moment of inertia of output shaft	J ₀	kg · m ²	0.549	Moment of inertia of input shaft	J _c	kg · m ²	0.105	Stamp color of housing		Ivory	
Allowable moment of bending of output shaft	P ₃	N · m	600								

Note1) The moment of inertia J of input shaft is the values in case of the rectification.

1N · m ≈ 0.102kgf · m

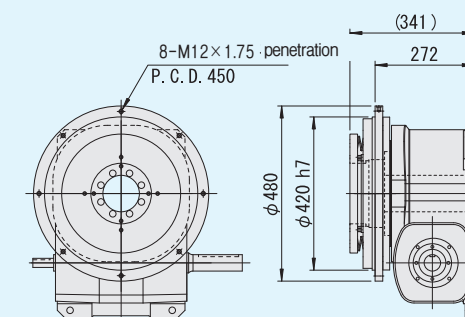
• Characteristic table of geared motor [GM 1.5/2.2]

Table HA190-2

Product code		Motor output (Kw)	Real reduction ratio (i)	RPM of output shaft Nm(rpm)		Allowed output torque Tr(N · m)		Moment of inertia of motor Jm(kg · m ²)	Mass (kg)
200/220V specification	230V specification			50Hz	60Hz	50Hz	60Hz		
GM 1.5 - 20AS	GM 1.5 - 20BS-US	1.5	20	75	90	166	138	3.41×10^{-3}	29
GM 1.5 - 25AS	GM 1.5 - 25BS-US		25	60	72	208	173		
GM 1.5 - 30AS	GM 1.5 - 30BS-US		30	50	60	249	208		
GM 1.5 - 40AS	GM 1.5 - 40BS-US		40	37.5	45	332	276		
GM 1.5 - 50AS	GM 1.5 - 50BS-US		50	30	36	416	345		
GM 2.2 - 10AS	GM 2.2 - 10BS-US	2.2	10	150	180	122	102	4.79×10^{-3}	34
GM 2.2 - 15AS	GM 2.2 - 15BS-US		15	100	120	182	152		
GM 2.2 - 20AS	GM 2.2 - 20BS-US		20	75	90	244	203		
GM 2.2 - 25AS	GM 2.2 - 25BS-US		25	60	72	305	254		
GM 2.2 - 30AS	GM 2.2 - 30BS-US		30	50	60	366	305		
GM 2.2 - 40AS	GM 2.2 - 40BS-US		40	37.5	45	487	406		
GM 2.2 - 50AS	GM 2.2 - 50BS-US		50	30	36	609	508		

■ Installation of torque shield(Optional)

Figure HA190-3

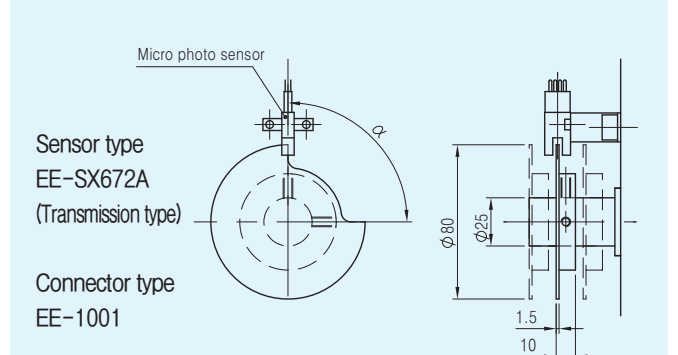


Example of product code

Indxing drive **HA190** - **08217R** - **L3VW** **1**
Torque shield **T19** **B** - **200** **L**

■ Installation of Timing cam-Photo sensor

Figure HA190-4



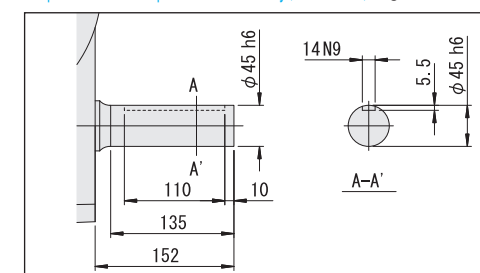
Example of product code

Timing cam and sensor **TC** - **1** - **HA190**

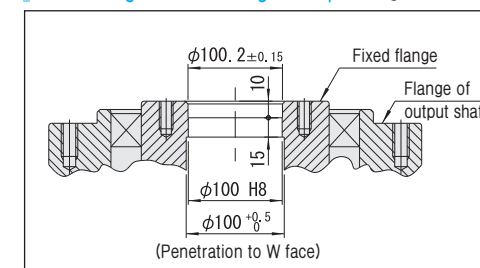
△ Attention

- Attachment position of geared motor is the standard specification that it is written at the size figure (Figure HA190 1, Figure HA190 2).
- In case of HA190, installing the motor of 1.5Kw and 2.2Kw is possible. Just, the exchange is impossible after buying since the hollow hole of attached hollow hole of geared motor by an amount of condenser. In addition, please inquiry since installing motor of 2.2Kw as the special specification is possible.
- Please pay attention since the part of motor protrudes from the flange face of index in case of the installation of motor 3.7 Kw. In addition, please design the base face of geared motor because of the casting surface to consider not being interference to the base etc. when installing it.
- In case of HA190, installing the T19B of torque shield is possible.
- Installing the timing cam and sensor is possible to 3 sets according to the requirement in case of the input of both sides.

■ Input axis of standard specification of main body (Side of T face) Figure HA190-5



■ Detailed degree of fixed flange of output Figure HA190-6



■ Location of refueling part, oil gauge and oil drain part according to position and amount of oil Figure HA190-7

Position	1	2	5
Location			
Oil level (ℓ)	5	6	6.5

△ Attention

- The order is the location of refueling part(PT 1/2), oil gauge(VA) and oil drain part (PT1/2) from the top regarding each location according to the position.(Figure HA 190 7).
- The position responds to the code I of indxing drive.
- The rough value is written since an amount of oil changes according to the cam type and the number of cam follower.

Regarding the selecting model

Please be cautious when selecting the mode. If users select the wrong model, the performance of the product will not be fully activated and also it may become the reason for early breakage. The input and output conditions are the main factors for selection therefore please make all the condition clear before selecting. Also, there are special calculation, symbols and etc for indexing drive so please do not hesitate to contact us for any further questions. We are providing the model selection by calculating the torque as for service so if you fill out the "Fax Sheet" and give us fax, we will take care of it.

Steps for model selection

<Order>

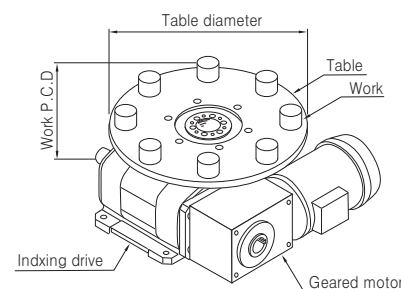
- (1) Decision of the number of stop(s)
Select the proper number of stop on the use condition according the list of "Standard specification".
- (2) Decision of the index angle (θ)
Select the closest index angle from the list of "Standard specification" in order to calculate the index angle (θ) according to the stopping time and the ratio of dividing time.
 $t_1 : t_2 = (360^\circ - \theta) : \theta$
Select $240^\circ \sim 270^\circ$ in case of activating and stopping the camshaft by the inverter control and brake motor.
- (3) Calculation of number of rotation of input shaft(N)
$$N = \frac{60}{t_2} \cdot \frac{\theta}{360 \times m}$$
- (4) Calculation of moment of inertia (J) [Formula (A)]
Calculate the moment of inertia (J) of the table, jig work and etc.
- (5) Calculation of required torque (T_i) [Formula (B, C, D, E)]
Calculate the required necessary torque (T_i) after calculating the inertial torque (T_i), friction torque (T_f), and working load torque (T_w).
- (6) Selecting model
Select the size where the dynamic rated output torque T_{op} (refer to torque chart) exceeds the required torque (T_i) considering the selected number of stops, indexing angle, cam curve and RPM.
- (7) Calculation of camshaft torque (T_c) [Formula (F)]
- (8) Selecting motor [Formula (G)]
Select the motor after calculating the necessary motor power (P_s).
- (9) Calculation (a_4) of backlash factor (Backlash factor)
1. Decide the backlash of input machine (Backlash factor), torsion, and total amount of bending

Used sign at selecting the model

a_4 : Backlash factor	L_h : Expected life time (hr)	S : Number of stop	T_s : Static rated output torque (N·m)
A_m : Dimensionless Maximum Acceleration	m : Number of Dwell	t_1 : Stopping time (sec)	T_i : Output shaft necessary torque (N·m)
B_a : Backlash of converting the output shaft	M : Mass (kg)	t_2 : Grading time (sec)	T_w : Working load torque (N·m)
E : Braking efficiency of regenerative inverter	N : Number of rotation of input shaft (rpm)	t_d : Breaking time of starting + stoping (sec)	T_x : Camshaft friction torque (N·m)
F : Work load (N)	N_D : Number of rotation of maximum output (rpm)	t_D : Dwell time	V_m : Non-dimensional maximum velocity
i : Deceleration ratio ($i > 1$)	N_M : Number of rotation of motor (rpm)	T_c : Camshaft torque (N·m)	W : Weight (N)
J : Total moment of inertia of output load (kg·m ²)	N_R : Number of rotation of output of geared motor (rpm)	T_d : Start/stop torque (N·m)	β : Working angle (deg)
J_c : Moment of inertia of input shaft (kg·m ²)	P : Transfer pitch (m)	T_f : Frictional torque (N·m)	γ : Rotating speed ratio $\gamma > 1$
J_M : Moment of inertia of motor (kg·m ²)	P_{NV} : Amount of inverter (Kw)	T_i : Inertial torque (N·m)	θ : Index angle (deg)
J_{MC} : Moment of inertia of converting the motor shaft (kg·m ²)	P_s : Motor power (Kw)	T_{ai} : Internal inertia torque (N·m)	θ_i : Braking angle of input shaft
K : Radius of rotation (m)	Q_m : Non-dimensional maximum camshaft fact	T_{op} : Dynamic rated output torque (N·m)	μ : Frictional coefficient
L_f : life coefficient	R : Rotation pitch cycle radius (m)	T_R : Allowed torque of output of geared motor (N·m)	ϵ : Inertia load rate

Figure 88-1

In case of table driving



Needed data

- ① Number of stop
- ② (t_2) Stopping time (t_1) and Dividing time (t_2)
- ③ Mass of Table, external diameter
- ④ Number and mass of Jig, Attachment P.C.D
- ⑤ Number and mass of work, Attachment P.C.D
- ⑥ Whether the option is installed or not
- ⑦ Expected life time

- In case of mounting the hypoid gear reducer $B_i = 0.6$
- In case of mounting the worm gear reducer $B_i = 0.4$

2. Calculation of backlash (B_a) of converting the output shaft

$$B_a = \frac{B_i \times V_m \times 360}{S \cdot \theta}$$

3. Calculation of inertia revival rate (ϵ)

$$B_a = \frac{T_i + T_{oi} - T_f}{T_s} \times 100$$

4. Decision of backlash factor (a_4)

Calculate the backlash factor to refer to the table 89-5 from the backlash of converting the output shaft calculated and the inertia load rate.

(10) Checking the desired life time (L_h) [Formula (H)]

Calculate the L_h after calculating the life coefficient (L_f)

Calculate the summary value on the table 89-4.

(11) Selecting geared motor

1. Check if the motor selected at the (8) of the selected index can be installed at the characteristic table of geared motor. Please check the attention of characteristic table since the big geared motor of one size is installed as the special specification according to the type.
2. Select the rpm of input shaft(N) and the deceleration ratio (i) from the characteristic table.
Please select the deceleration ratio to be the fixed number of rotation at the frequency (40~60HZ) of setting inverter in case of successive rotation when controlling the inverter.
3. Check if the torque of allowed output of geared motor (T_R) exceeds the torque of camshaft (T_c).

Formula

Table 89-1

	In case of rotation movement	In case of direct movement
(A) J Moment of inertia	$J = MK^2$ (kg·m ²)	$J = M \left(\frac{S \cdot P}{2\pi} \right)^2$ (kg·m ²)
(B) T_i Inertial torque	$T_i = 226.2 A_m \frac{J \cdot N^2}{S \cdot (\theta/m)^2}$ (N·m)	$T_i = 5.73 A_m \frac{M \cdot S \cdot P^2 \cdot N^2}{(\theta/m)^2}$ (N·m)
(C) T_f Friction torque	$T_f = W \cdot \mu \cdot R$ (N·m)	$T_f = \frac{W \cdot \mu \cdot S \cdot P}{2\pi}$ (N·m)
(D) T_w Working load torque	$T_w = R \cdot F \cdot \cos \beta$ (N·m)	$T_w = \frac{F \cdot S \cdot P}{2\pi} \cos \beta$ (N·m)
(E) T_t Necessary torque	$T_t = T_i + T_f + T_w$ (N·m)	
(F) T_c Camshaft torque	$T_c = 500 Q_m \frac{1}{S \cdot \theta}$ ($T_t + T_{oi}$) + T_x (N·m)	
(G) P_s Motor power	$P_s = \frac{T_c \cdot N}{9550}$ (Kw)	
(H) L_h Expected life time	$L_h = 8000 L_f^{1/3}$ (hr)	단, $L_f = \frac{T_{op}}{a_4 (T_i + T_{oi}) + T_f + T_w}$
(I) P_{INV} Capacity of inverter	$P_{INV} = \frac{a_4 \times T_c \times N}{9550 \times E}$ (Kw)	
In case of indirect movement	Please calculate as below in case of gaining the indirect rotation from the output shaft or the direct movement.	
	Equivalent inertial moment $J_e = J/\gamma^2$	Equivalent frictional torque $T_{fe} = T_f/\gamma$
	Equivalent working load torque $T_{we} = T_w/\gamma$	Equivalent inertial torque $T_{ie} = T_i/\gamma$

Radius of rotation K

Table 89-2

K^2	$\frac{r_1^2}{2}$	$\frac{r_1^2 + r_2^2}{2}$	$\frac{a^2 + b^2}{3}$
K^2	$\frac{r_1^2}{2} + R^2$	$\frac{r_1^2 + r_2^2}{2} + R^2$	$\frac{a^2 + b^2}{3} + R^2$

Characteristic table of cam curve (A_m, V_m, Q_m)

Table 89-3

Cam curve	Cam curve	Maximum speed V_m	Maximum acceleration A_m	Torque coefficient of maximum camshaft Q_m
SMS-3	7	1.818	± 4.848	± 1.178
SMCV-3	8	1.290	± 6.882	± 0.836

Life factor L_f and life hour L_h (hr)

Table 89-4

L_h (hr)	L_f	L_h (hr)	L_f	L_h (hr)	L_f
2000	0.659	10000	1.06	26000	1.42
3000	0.745	12000	1.12	28000	1.45
4000	0.812	14000	1.18	30000	1.48
5000	0.868	16000	1.23	35000	1.55
6000	0.917	18000	1.27	40000	1.62
7000	0.960	20000	1.31	45000	1.67
8000	1.00	22000	1.35	50000	1.73
9000	1.03	24000	1.39	55000	1.78

Backlash factor a_4

Table 89-5

B_a	ϵ	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
0.05	1.00	1.05	1.07	1.09	1.10	1.12	1.12	1.13	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.19	1.20	1.21
0.1	1.02	1.11	1.15	1.18	1.21	1.24	1.26	1.27	1.27	1.29	1.31	1.33	1.35	1.37	1.39	1.41	1.43	1.44
0.2	1.06	1.21	1.30	1.36	1.42	1.48	1.51	1.54	1.57	1.60	1.63	1.66	1.69	1.72	1.75	1.78	1.81	
0.3	1.08	1.28	1.40	1.48	1.56	1.64	1.68	1.72	1.76	1.80	1.84	1.88	1.92	1.96	2.00	2.04	2.08	
0.4	1.10	1.35	1.50	1.60	1.70	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	
0.5	1.12	1.42	1.60	1.72	1.84	1.96	2.02	2.08	2.14	2.20	2.26	2.32	2.38	2.44	2.50	2.56	2.62	

ϵ : Inertia load rate, B_a : backlash of converting the output shaft

In case of selecting inverter

Please check the capacity according to below order to choose it after referring to the catalog about the maker of basically sufficient capacity and the type since selecting the proper inverter on the use condition is necessary in case the ON and OFF of HA series is controlled by the inverter.

Order of selecting inverter

<Order>

Calculate and select the capacity of the inverter (PINV1) to activate and stop the motor at the location of the DWELL to consider the capacity of the inverter (PINV1) needed for the driving index to perform the successive rotation of the input shaft (Cam shaft) of HA series in case of the inverter type and the moment of inertia of geared motor etc.

△ An amount of the inverter means the amount of named inverter(Amount of motor of standard application) not the rated capacity.

<Capacity in case of performing the continuous rotation on the input shaft: PINV1>

(1) Decision of efficiency on regenerative braking torque (E)

Please refer to the catalog of inverter to use since the regenerative braking torque (E) is different according to whether the maker of the inverter, the type, the capacity and the external braking resistance are used. That is, the value of E is 150% ... 1.5, 100% ... 1.0, 50% ... 0.5, 20% ... 0.2.

(2) Calculation of capacity of inverter(PINV1) [Formula (1)]

Select the type exceeding the amount of motor of selecting motor (8) in case of calculating the amount of inverter.

<Required capacity for activating and stopping of motor: PINV2>

(1) Calculation of DWELL time(t_D)

Calculate the DWELL time (Stopping time) in case the cam shaft (input shaft) of alpha series is rotated successively as the number of using rotation

$$t_D = \frac{60}{N} \times \frac{360 - \theta}{360}$$

(2) Calculation of moment of inertia converting motor shaft(J_{MC})

1. Check the moment of inertia (J_C) of input shaft of index at the characteristic table.
2. Check the moment of inertia of motor of geared motor (J_M) at the characteristic table.
3. Calculate the moment of inertia of converting motor shaft (J_{MC}) excluding the load of the index output.

$$J_{MC} = \frac{J_C}{i^2} + J_M$$

Controlling block diagram

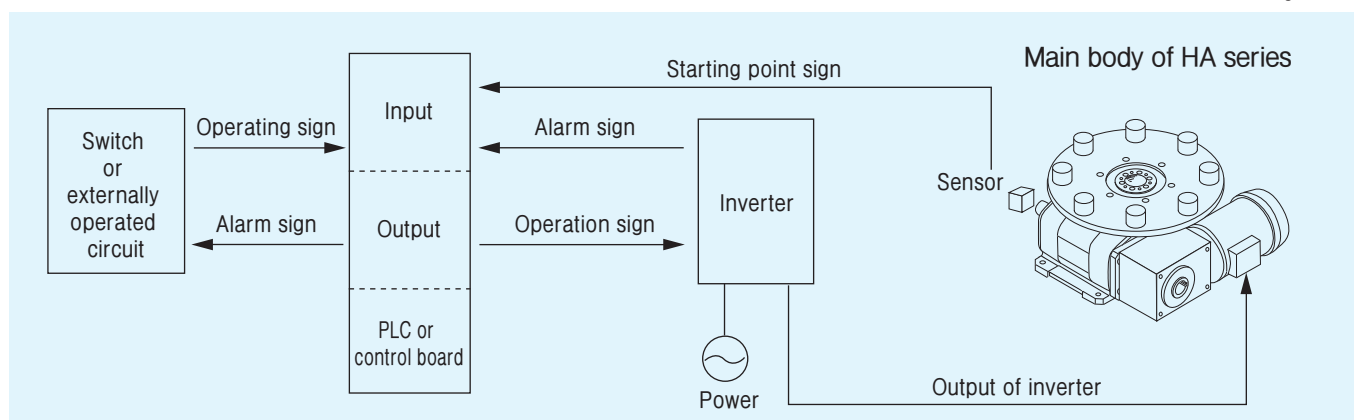


Figure 90-1

(3) Decision of inverter capacity (P_{INV})

1. Check of rpm of mounted motor (N_M)
50Hz ... 1500rpm, 60Hz ... 1800rpm
2. Calculation of inverter capacity (P_{INV2})

$$P_{INV2} = \frac{J_{MC} \times N_M^2}{91406 \times t_D}$$

(3) Decision of amount of inverter necessary on the driving HA series (P_{INV})

Decide the product to meet the below condition finally in case of the amount of inverter necessary on the driving HA series.

$$P_{INV} \geq P_{INV1}, P_{INV2}$$

(4) Calculation of breaking time of starting • stopping (t_d)

Calculate the breaking time necessary to activate or stop the index of inverter.

$$t_d = \frac{J_{MC} \times N_M^2}{91406 \times P_{INV}}$$

△ There is an case of that the minimum setting ability of breaking time is 0.1 seconds in case of the type of inverter. In this case, please set as 0.1 seconds. In addition, please refer to the catalog of inverter to use since the make, the acceleration according to the type and the setting scope of reduction time is decided.

(5) Braking angle of camshaft (θ_a)

Calculate the braking angle necessary to acquire the sign of sensor by the timing cam etc. on the cam shaft of index.

$$\theta_a = 3 \times N \times t_d$$

The angle of 2θ_d is needed as the θ_d is the angle when activating and starting in case of adjusting the timing cam.

(6) Reduction of braking angle of camshaft

The change of inverter is needed according to the below order in case the braking angle of camshaft is required less. (θ_a)

1. Check if the inverter to be able to adjust exists even though the minimum setting of braking time is below 0.1 seconds.
2. Check the braking angle demanded. (θ_d)
3. Calculate the braking time demanded. (t_R)

$$t_R = \frac{\theta_R}{3 \times N}$$

4. Re check the inverter capacity (P_{INVR})

$$t_R = \frac{J_{MC} \times N_M^2}{91406 \times t_R}$$

Select the inverter of the larger capacity in case of exceeding the capacity of inverter (P_{INV}) selected at the procedure (3) in case of the figure calculated according to above contents.

Dimension diagram

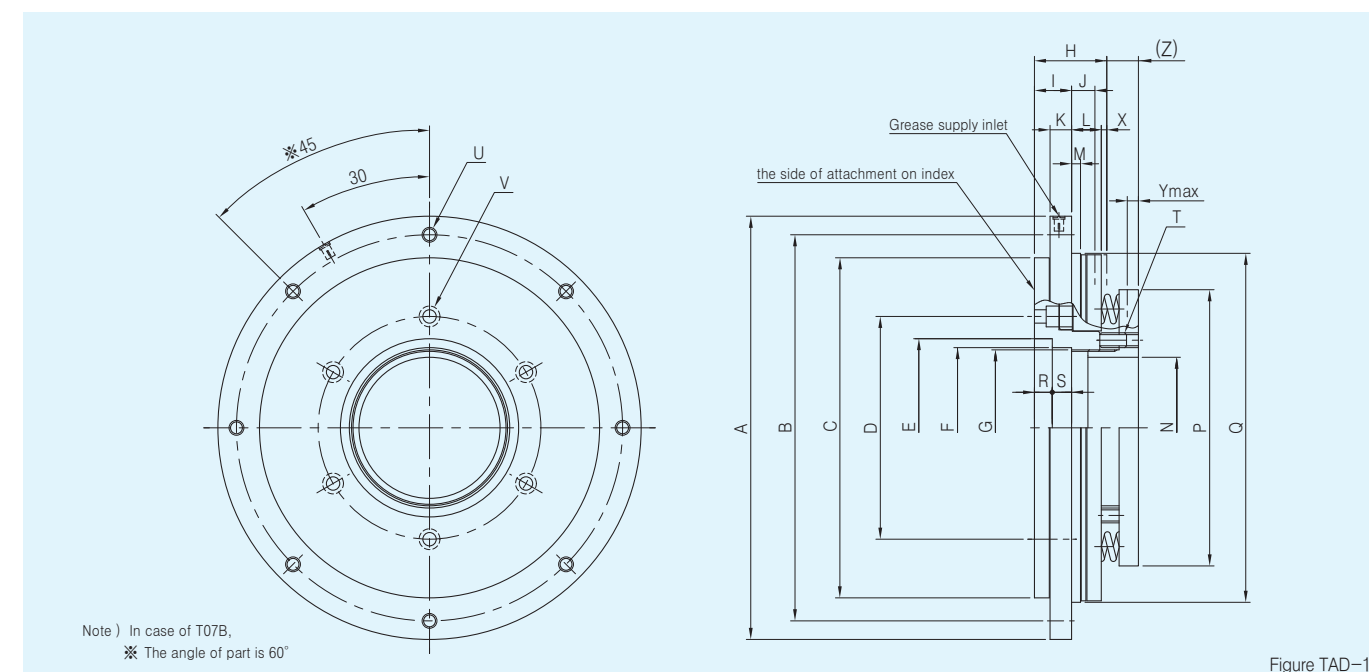


Figure TAD-1

Value table

Table TAD-1

Form	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U	V	X	Y _{max}	Z
T07B	Ø180	Ø168	Ø152	Ø85	Ø70 H7	Ø60	M55 -2	33	19	14	10.5	14	5	Ø47	Ø107	Ø155 h7	7	10	(4) M5	(6)M5 -0.8	(6) 6.6DR.	3	5	16.5
T09B	Ø240	Ø220	Ø198	Ø120	Ø100 H7	Ø85	M80 -2	39	22.5	16.5	12.5	17.5	5	Ø70	Ø158	Ø200 h7	7	16	(4) M10	(8)M8 -1.25	(6) 6.6DR.	3.5	7	23
T11B	Ø285	Ø260	Ø229	Ø150	Ø120 H7	Ø108	M105 -2	44	25	19	14.5	20	6	Ø95	Ø186	Ø235 h7	12	13	(4) M10	(8)M10 -1.5	(6) 9DR.	3.7	7.5	26
T15B	Ø395	Ø365	Ø328	Ø210	Ø172 H7	Ø155	M145 -2	64	37	27	20	27	6	Ø130	Ø256	Ø335 h7	12	33	(4) M10	(8)M12 -1.75	(6) 11DR.	5.5	7	26
T19B	Ø480	Ø450	Ø419	Ø260	Ø230 H7	Ø186	M180 -2	80	42	38	21	33	8	Ø166	Ø326	Ø420 h7	16	43	(4) M10	(8)M12 -1.75	(8) 14DR.	5.6	7	31
T23B	Ø555	Ø525	Ø494	Ø336	Ø275 H7	Ø262	M260 -2	82	47	35	25	35	9	Ø246	Ø402	Ø495 h7	7	44	(4) M10	(8)M14 -2	(8) 14DR.	6.5	8	36

[Unit:mm]

Characteristic table

Table TAD-2

	Code	Range of adjustment of blocked torque (N • m)	Screw pitch of nut adjusting torque (mm)	Maximum load of allowed RADIAL (N)	Maximum load of allowed THRUST (N)	Maximum bending moment allowed (N • m)	Maximum number of allowed rotation (r.p.m)	Moment of inertia (kg • m ²)	Mass (kg)
T07B	15L	40~150	2	2450	2950	45	200	0.02	4.5
	25H	100~250							
T09B	20L	60~200	2	5200	5000	100	200	0.07	9.6
	45H	140~450							
T11B	23L	90~230	2	7300	7000	180	200	0.15	15
	60H	150~600							
T15B	100L	300~1000	2	11800	12000	430	140	0.8	43
	220H	650~2200							
T19B	200L	500~2000	2	16800	17000	750	120	2.1	74
	450H	1500~4500							
T23B	350L	1200~3500	2	24800	35000	1950	100	4.5	110
	550H	2000~5500							

Attention

1. Please tighten the bolt set correctly after adjusting the torque.
2. Please re check it when ordering since the specification and figure is changed without the notification.

- X : The panel of overload detection moves to Xmm if the overload is performed. Please control the driving after using the detection of SWITCH to use this movement.
- (Z) : This figure is the amount of protrusion of the nut adjusting torque when the spring is the free height. Please refer to this Z figure in case the blocked torque generates.
- Ymax : This figure is the amount of clamping of the adjusting torque nut in case of maximum blocked torque. Please pay attention since the movement is impossible in case of it is clamped over this values.

■ Handling of HA series

Since the accuracy of roller gear cam type index drive has high accuracy, it may cause early breakage or may decrease the performance of mounted automatic machine in case of faulty usage. Therefore, please fully understand the product and use it correctly.

(1) Installation

Please remove to use the emulsion in case the crack, impurity and stamp, etc remain. Please install the equipment after applying the grease and mineral oil for preventing the rust of installed face after cleaning up. Please attach on the stable bottom stably since the load of large fluctuation is acted at the device.

(2) Environment

- The environment does critically affect the performance of device. The installation place should be carefully examined and researched and find the solution for any trouble.
- a) The proper temperature is 0 ~ 40.
 - b) Humid environment condition may generate the rust easily. Please perform rust-proof treatment carefully.
 - c) Input/Output axis are sealed by oil seal. However, it still may generate the leakage of oil or surface abrasion depending on the amount of dust, type of dust and etc. Therefore please consider to use the protection cover.

(3) Operation

The problem generates in case of driving rightly after terminating the attachment of parts since the automatic machine to use the grading device is complicatedly made by the many parts. Please check if the obstacle is generated by performing the rotation at low speed or by rotating by the hand whenever the major part is attached. Please check if it operates rightly to perform the operation at low speed or to act it by hand. After that, please check that the power driving is acted, abnormal sound or abnormal vibration, change of temperature and the oil leak etc.

(4) Handling of input axis

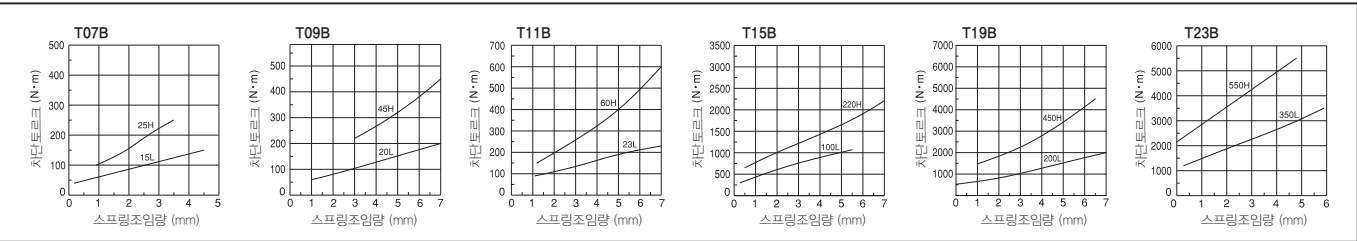
It becomes the standard location of the index angle when the main line of the gap of key of input shaft exits on the direction of turret. The opening location to be dividing in case of indexing drive and the decision of location and the safely sending impulsive load in case of key are used. Please examine the other sending method not to depend on the sending key in case of acquiring the safe operation.

(5) Handling of output

- a) The output part of index device needs the strongly torsional rigidity since the inertial torque of statics load at activating and stopping to be accompanied is acted when attaching. In addition, the motion is not permitted in case of the rotation to keep the extent of decision of location. The output part of HA type is made to be able to perform the attachment simply and to have the high extent of table etc since the flange part to support the table is largely designed

	Attachment bolt		(Recommendation) LOCK PIN HOLE	
	Size	Locked torque	Location of processing	Depth of processing
HA070	6-M6	13.5N・m	P.C.D.85	12mm
HA090	6-M6	13.5N・m	P.C.D.120	12mm
HA110	6-M8	34N・m	P.C.D.150	16mm
HA150	6-M10	67.5N・m	P.C.D.210	20mm
HA190	8-M12	84N・m	P.C.D.260	24mm
HA230	8-M12	84N・m	P.C.D.336	24mm

■ 토크특성표



- b) Please lock the lock pin according to the requirement, lock the bolt and meet the concentricity while the table is moved toward the axial gradient and the rotation after processing largely the extent of 0.1~0.2mm in case of the hole diameter of focal table. The locking torque of bolt that we recommend at the flange of index is as below.
- c) The strongly fixed flange of the penetration hole is set by the standard at the main of output part. The fixed table is possible to attach to this fixed flange directly. In addition, this can be used very conveniently in case of piping and wiring the since the attachment base is performed as the hole processing at the main location of output part.

(6) Lubrication

There is the important role such as the decrease of frictional heat of each part of electricity body, the removal of frictional heat and the preventing the rust on electricity side etc. in case of lubrication. However, it causes the extent decline and lifetime decline in case the correct lubricating oil is not selected. Thus, please decide it to consider of use condition. We recommend the quality thing including the additive material of extreme pressure in case of lubricating oil. But, please do not mix the oil of the other company's oil. Please select the proper things at below table since the viscosity is different according to the number of rotation.

(7) Repair・maintenance

- a) The size of backlash of input output type increases as the year changes. Please perform the regular check and adjustment.
- b) Please keep the adequate amount since it causes the abnormal temperature rise and the flowing oil in case of having a lot of flux of lubricating oil.
- c) Please exchange the lubricating oil once per year and 3,000 time per operation even though the operation time is short.

(8) Lubrication of geared motor

- In case of geared motor
The grease lubrication method is chosen in case of lubrication.
The exchange of grease and supply is not required mainly.
- In case of geared motor of helical worm
Please perform the one-to-one exchange once per 2years even though the operation time is short or once after operating 10,000 times.

Lubricating oil	Product name	Viscosity grade of ISO
Mineral oil	Mobil gear 636	VG 680

The amount of supply is changed according to the position of attachment.

	GM 2.2	GM 5.5/7.5	GM 11/15
In case of the main body of index is installed on the position of 1.2	1ℓ	3.8ℓ	7ℓ
In case of the main body of index is installed on the position of 5.	2.9ℓ	11.2ℓ	21ℓ

■ Viscosity of lubrication oil(Unit : cSt/40℃)

Rotation of input shaft of grading device (rpm)	Viscosity cSt/40℃	KOREA SHELL	KOREA MOBIL	Japan Oil
0~20	>680	Shell omala 680	Mobil gear 636	M680
20~100	680~460	Shell omala 460	Mobil gear 634~633	M460
100~200	460~320	Shell omala 320	Mobil gear 632	M320

△ Please select the highest viscosity (the biggest number) in case the number of rotation of input shaft is the edge point. (1cSt=1mm/s)

HANNZ MOTROL CO.,LTD.

Dear Sir(Sirs)

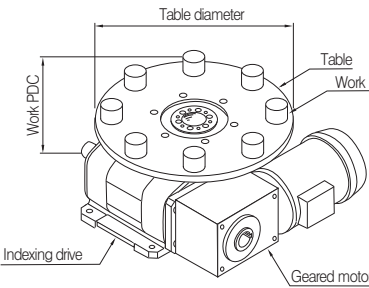
Selected data of INDXIA-HD type

Company name			
Department name			
Name of person in charge			
Phone number	(Extension number)	Fax number	

- Selecting the HD series is required to choose the proper type on the use condition.
- We are selecting the type by the torque calculation as the service to the customers.
- Pleases send it to use after writing the use condition to this fax sheet.

• Number of stop	S	
• Dividing time	t1	sec
• Stopping time	t2	sec

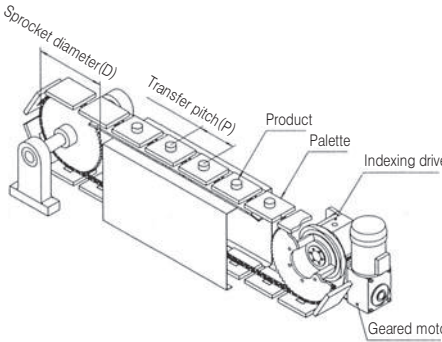
In case of driving the data



- Table diameter D
- Table mass W1
- Jig : P.C.D D2
- Jig mass per 1ea W2
- Quantity of jig n2
- Work P.C.D D3
- Work mass per 1ea W3
- Quantity of work n3

- Transfer pitch P
- Chain and attachment mass W1
- Jig mass g W2
- Work mass W3
- Sprocket diameter D
- Sprocket mass per 1ea W4
- Quantity of sprocket n4
- Fact of friction μ

In case of driving conveyor



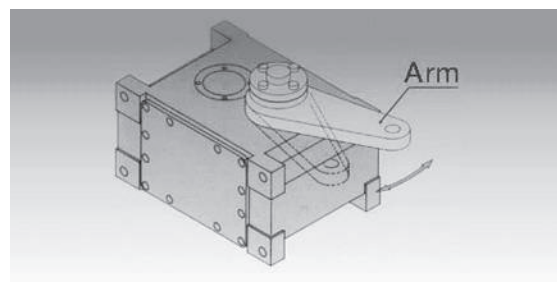
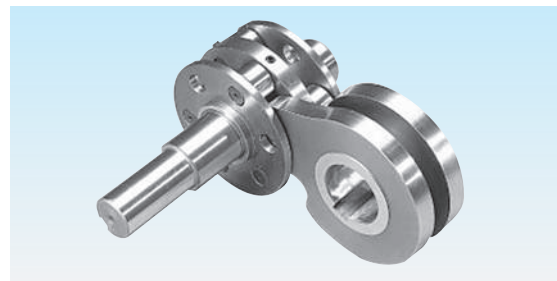
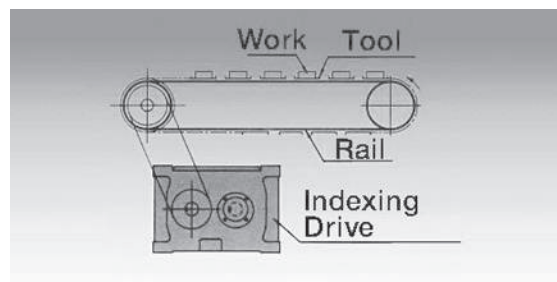
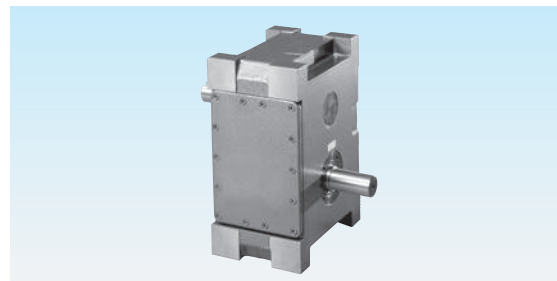
Geared motor	Whether it exists • not	Inverter	Whether it exists • not
Torque shield	Whether it exists • not	Timing cam	(Whether it exists: set) • not

Note

INDXIA

Index device of parallel cam type

HP series



Characteristic of HP series

- The PARALLEL INDEX is the indexing device which using the parallel cam mechanism. The roller gear cam mechanism which developed by Hannz Motrol is suitable for heavy load machine since the axis of input and output are being perpendicular. In addition, this PARALLEL cam mechanism is made of the input and output shaft in parallel structure and very suitable device of ideal flat surface cam is on the direct transfer of conveyor to require the small partition such as 1, 2 and 3 partitions especially.
- Parallel index is the intermittent grading device of flat cam device having 2 plate cams fixed in parallel on the input shaft, the spider installed on the output shaft related in parallel to the input shaft, and the cam follower to

contact 2 plate cams to this spider.

- The output shaft to have inserted the cam follower rotates intermittently if the 2 plate cams of input shaft. The quality of the dynamic characteristic, the extent and the feature of load etc. is superb when dividing even though the input and output shaft are compared with the Geneva device of the parallel ration.
- The condition of impossible production in the past becomes possible since the characteristic of lead and the dividing extent become better by cancelling the constraint condition on the design to use the parallel cam of HANNZ MOTROL CO.,LTD.

HP series

Product code

For the product code selection, please make sure to clearly understand the required specification and then refer to the below code. In case of wrong product code, you will not be able to use the product. Therefore, please contact us for unclear specification.

ex.)

HP200	01	27	2	A	S	1	2	VW	1	X
a	b	c	d	e	f	g	h	i	j	k

a Housing size	b Number of stop	c Index angle (θ)	d Cam curve	e Direction of rotation of input-output shaft	f Form of output shaft	g Direction of output shaft	h Direction of input shaft	i Processing side of hole of attached part	j Attached part and location of Oil-hole	k Special specification
HP200 200mm	01 1 Stop	27 270°	2 MS (Modified Sine)	A Counterclockwise direction	S Direction of output shaft	1 Output shaft of T surface	2 Only U surface side	VW Processing of attachment hole of V face and W surface	1 Position of attached part (The W surface becomes GL)	X Special specification
200: It shows the distance between the axes.	It is the number of stop per one rotation of the output shaft. The method of 2DWELL exists under 1,2,3,4,6,7,8 stop and 6,8 stop.	It is the angle of rotation of the input shaft required when grading one time.	It shows the number of cam curve. ② MS (Modified Sine) ③ MCV (Modified Constant Velocity 50) ⑤ MCV (Modified Constant Velocity 25)	It shows the direction of rotation of output shaft about the direction of rotation of input shaft.	It shows the form of output shaft. S Standard L Installation of torque shield of output shaft	It shows the protruded side of output shaft. ① T surface side ② U surface side	It shows the relation of assembling location of input shaft. ① Only T surface side ② Only U surface side ③ Both T and U surface sides input extension (In case of mounting the reducer) R1 Only T surface side R2 Only U surface side R3 R3 Both T and U surface sides input extension	Install after processing the side of attachment required. The standard is that the 2 sides of VW are processed by the hole of penetration.	Please select the attachment posture since the location of Oil hole, oil gauge and oil drain part according to the attachment posture is changed. In case of high speed, please discuss it since the form of Oil hole etc. is changed. 1, 3, 4, 5, 6(5types)	Please write the X in case the special specification exists except the standard product. Standard specification Special specification Note) Please attach separately the specification in case of the contents of special specification.

Figure g. h

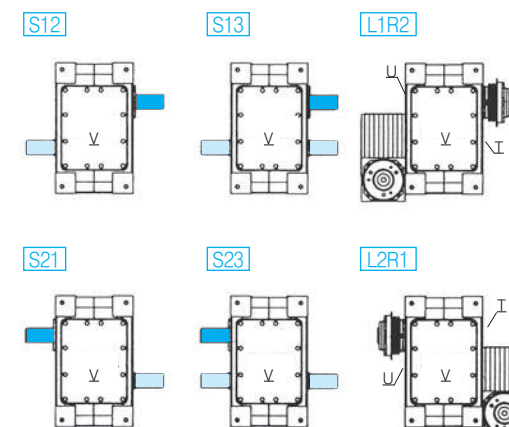


Figure i

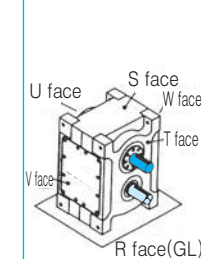
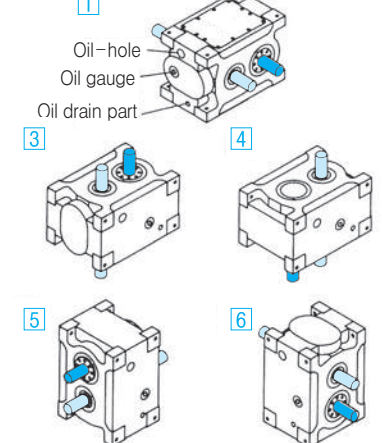
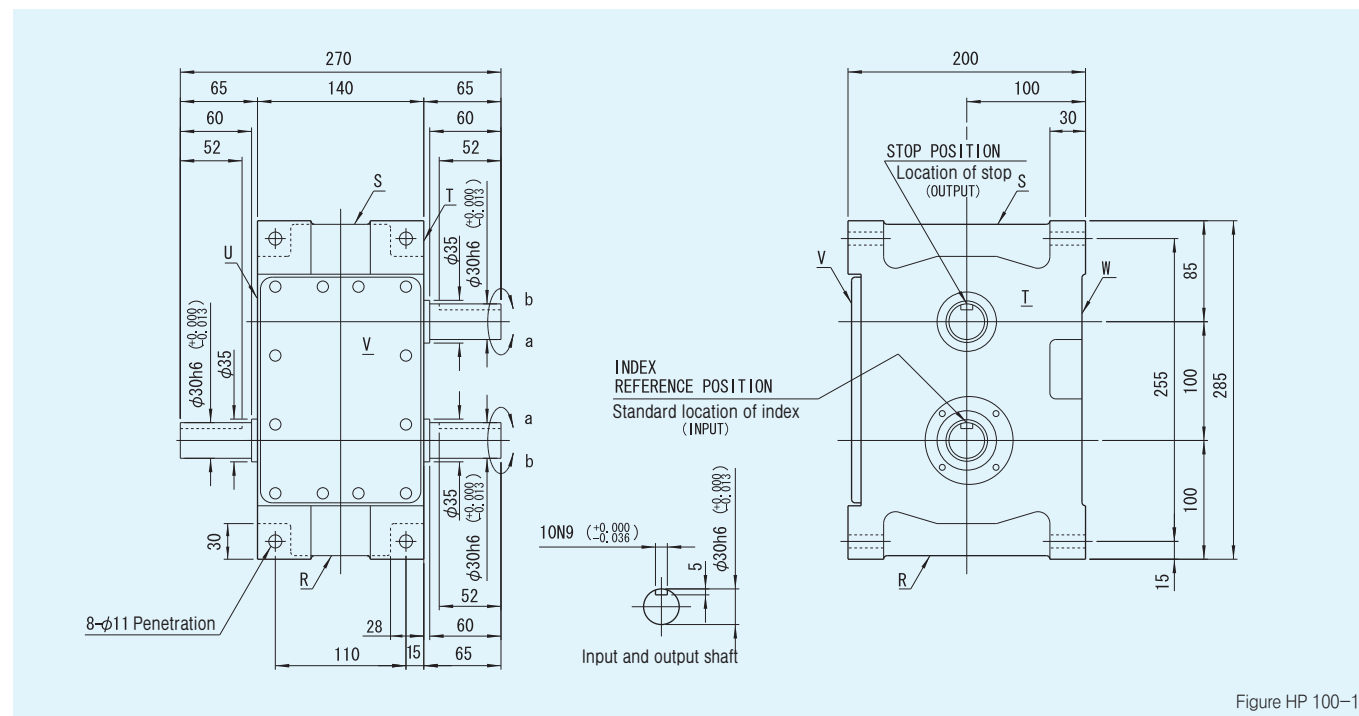


Figure j

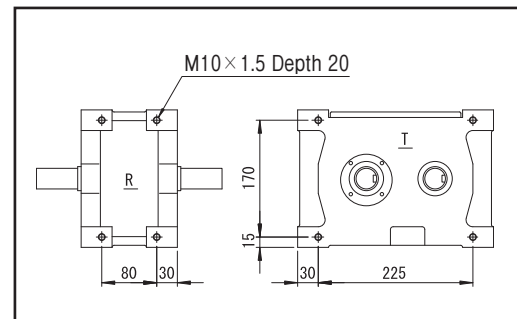


Dimension of HP100



Location of attachment hole

Figure HP 100-2



Dimension diagram of attachment hole of RSTU surface

Location of Oil hole of oil according to the position and flow

Figure HP 100 -3

Position	1	3	4	5	6
Location					
Oil level (L)	1.5	1.5	1.5	1.5	1.5

Attention

- The order is the location of Oil hole (PT 3/8), oil gauge (PF3/8) and oil drain part (PT3/8) from the top regarding each location according to the position.
- The position responds to the code J of indexing drive.
- The rough value is written since a flow changes according to the cam type and the number of cam follower.

Characteristic table

Table HP 100-1

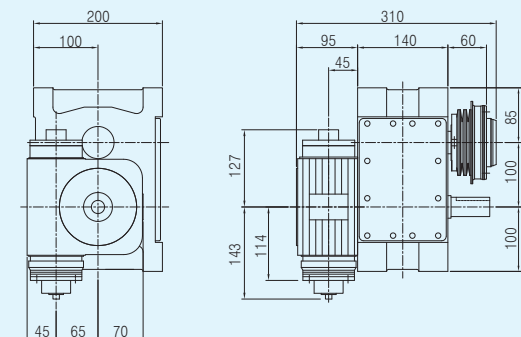
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Load of allowed THRUST of output shaft	P ₁	N	4704	Load of allowed THRUST of input shaft	P ₄	N	4704	Dividing extent of 1DWELL		sec	±60
Load of allowed RADIAL of output shaft	P ₂	N	3920	Load of allowed RADIAL of input shaft	P ₅	N	3920	Dividing extent of 2DWELL		sec	±120
Allowed TORQUE of output shaft	T _s	N·m	Referring to table of sending torque	Allowed TORQUE of maximum repetition of input shaft	P ₆	N·m	392	Repeating extent		sec	60
Rigidity of torsion of output shaft	K ₁	N·m/rad	3.19X10 ⁴	Torsional rigidity of input shaft	K ₂	N·m/rad	3.19X10 ⁴	Product mass (Main body of index)		kg	About 36
Moment of inertia of output shaft	J ₀	kg·m ²	Referring to table of sending torque	Moment of inertia of input shaft	J ₁	kg·m ²	6.0X10 ⁻³				

Note) J of input shaft is the value in case of the rectification.

1N·m ≈ 0.102kgf·m

Mounted Option

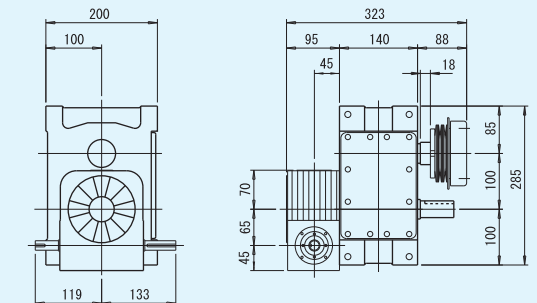
HP100 (a)



Product Example)

Indexing drive HP100 - 01302A - L1R3VW 1
 Reducer R65 - 10 RCB 15 / 1
 Torque shield T07F - 12L

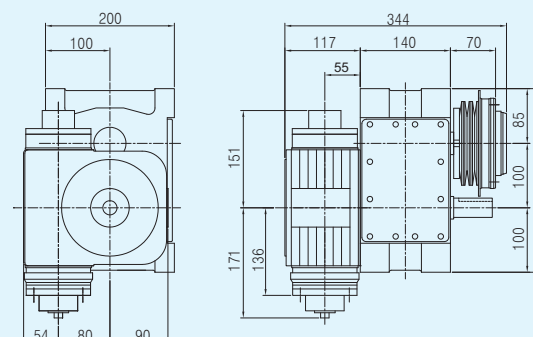
HP100 (b)



Product Example)

Indexing drive HP100 - 01302A - L1R3VW 1
 Reducer R65 - 10 RA 14 / 1
 Torque shield T07C - 20L

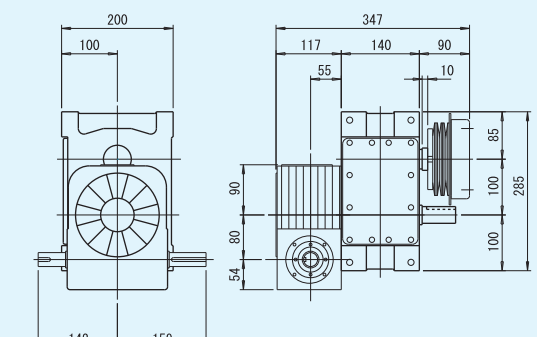
HP100 (c)



Product Example)

Indexing drive HP100 - 01302A - L1R3VW 1
 Reducer R80 - 10 RCB 15 / 1
 Torque shield T08F - 20L

HP100 (d)



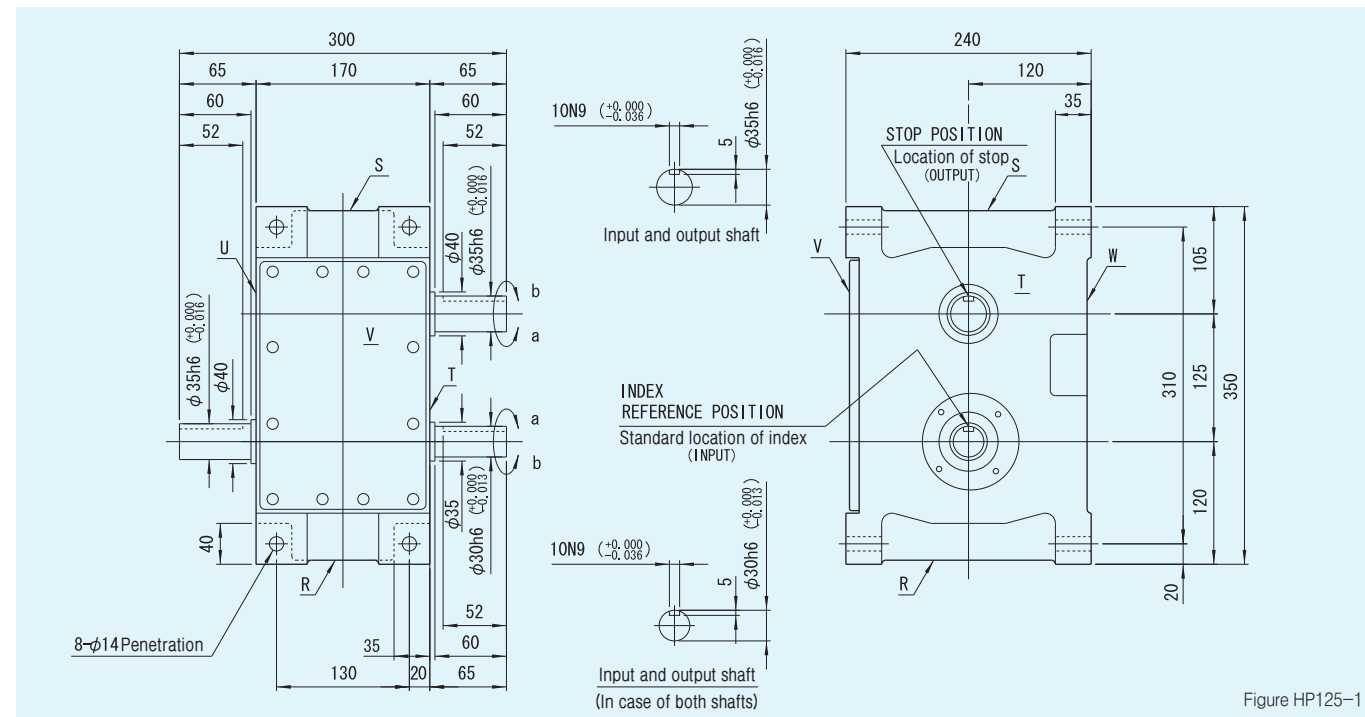
Product Example)

Indexing drive HP100 - 01302A - L1R3VW 1
 Reducer R80 - 10 RA 14 / 1
 Torque shield T08C - 15L

Attention

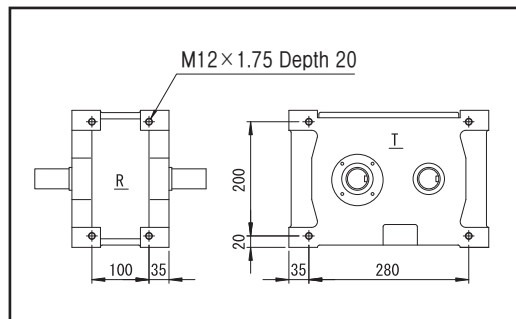
- Attaching reducer R65 and R80 is possible at HP 100.
- The attachment posture of reducer is standardized as the 16 types such as written part on P11.
- The installation of torque shield T07F, T07C, T08F, T08C is possible at HP100.
- The spacer is required in case of mounting the torque shield.

Dimension of HP125



Location of attachment hole

Figure HP125-2



Location of Oil hole of oil according to the position and flow

Figure HP125-3

Position	1	3	4	5	6
Location					
Oil level (L)	3.2	3.2	3.2	3.2	3.2

Attention

- The order is the location of Oil hole (PT 3/8), oil gauge (PF3/8) and oil drain part (PT3/8) from the top regarding each location according to the position.
- The position responds to the code J of indexing drive.
- The rough value is written since an flow changes according to the cam type and the number of cam follower.

Characteristic table

Table HP125-1

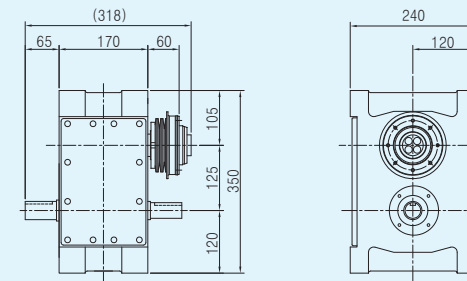
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Load of allowed THRUST of output shaft	P ₁	N	5096	Load of allowed THRUST of input shaft	P ₄	N	5096	Dividing extent of 1DWELL		sec	±60
Load of allowed RADIAL of output shaft	P ₂	N	6174	Load of allowed RADIAL of input shaft	P ₅	N	6174	Dividing extent of 2DWELL		sec	±120
Allowed TORQUE of output shaft	T _s	N·m	Referring to table of sending torque	Allowed TORQUE of maximum repetition of input shaft	P ₆	N·m	637	Repeating extent		sec	60
Rigidity of torsion of output shaft	K ₁	N·m/rad	4.93X10 ⁴	Torsional rigidity of input shaft	K ₂	N·m/rad	4.93X10 ⁴	Product mass (Main body of index)		kg	About 65
Moment of inertia of output shaft	J ₀	kg·m ²	Referring to table of sending torque	Moment of inertia of input shaft	J ₁	kg·m ²	1.63X10 ⁻²				

Note) J of input shaft is the value in case of the rectification.

1N·m ≈ 0.102kgf·m

Mounted Option

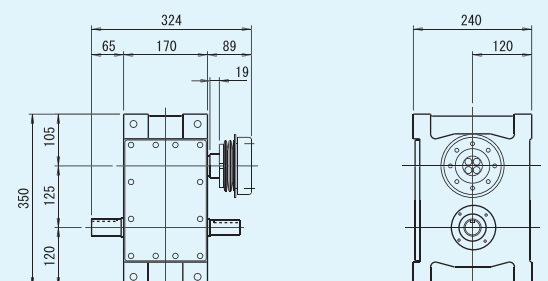
HP125 (a)



Product Example)

Indexing drive **HP125 - 01302A - L1R3VW 1**
Torque shield **T07F - 40L**

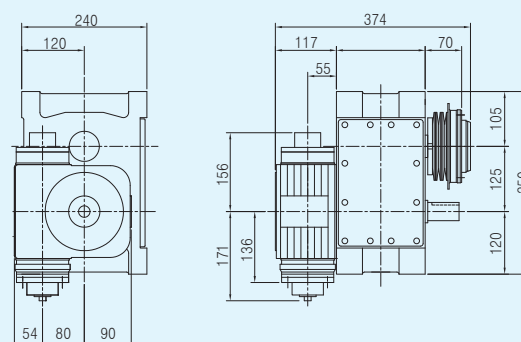
HP125 (b)



Product Example)

Indexing drive **HP125 - 01302A - L1R3VW 1**
Torque shield **T07C - 35L**

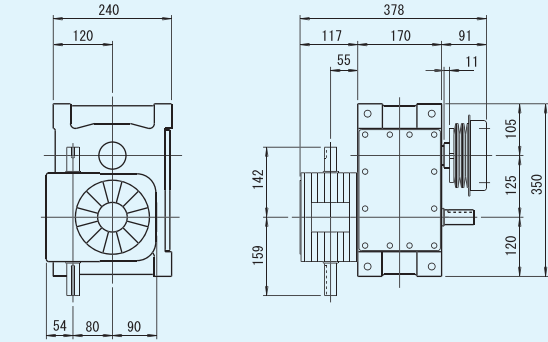
HP125 (c)



Product Example)

Indexing drive **HP125 - 01302A - L1R3VW 1**
Reducer **R80 - 10 RCB 15 / 1**
Torque shield **T08F - 40L**

HP125 (d)



Product Example)

Indexing drive **HP125 - 01302A - L1R3VW 1**
Reducer **R80 - 10 RA 15 / 1**
Torque shield **T08C - 45L**

Attention

- Attaching reducer R80 is possible at HP 125.
- The attachment posture of reducer is standardized as the 16 types such as written part on P11.
- The installation of torque shield T07F, T07C, T08F, T08C is possible at HP125.
- The spacer is required in case of mounting the torque shield.

Dimension of HP150

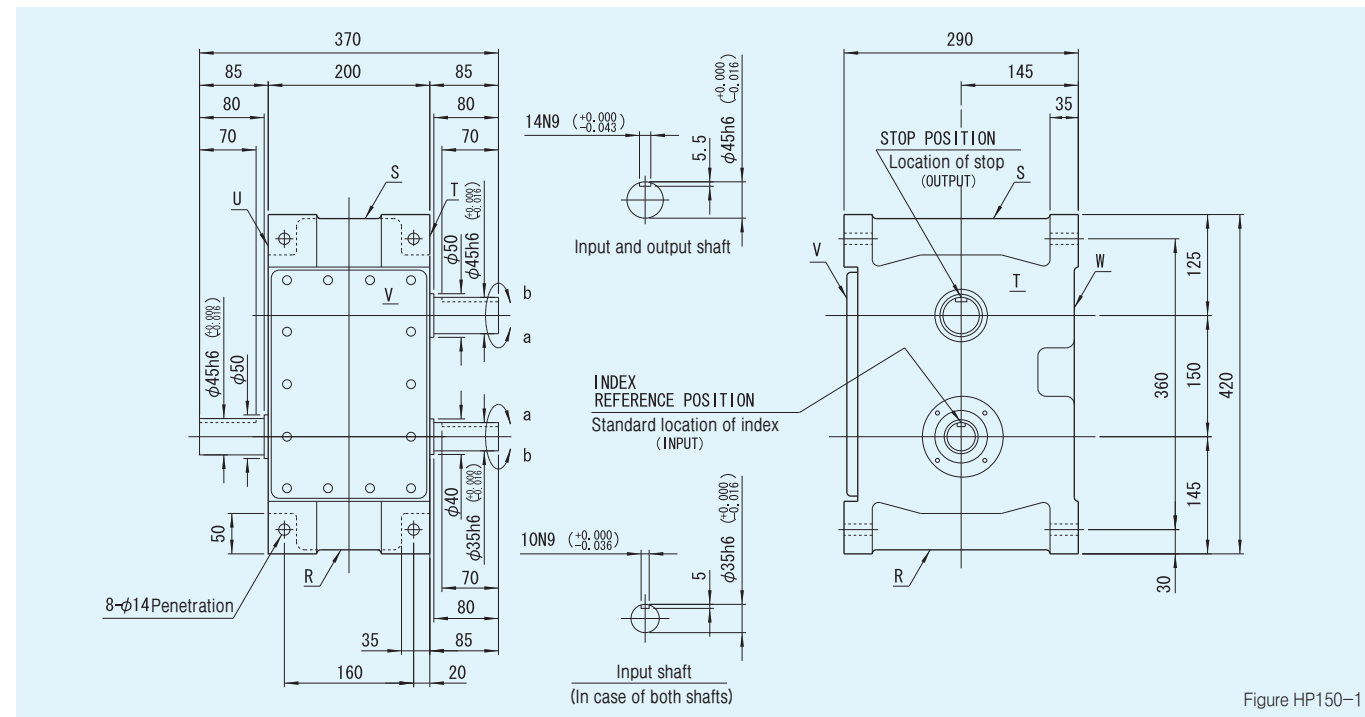
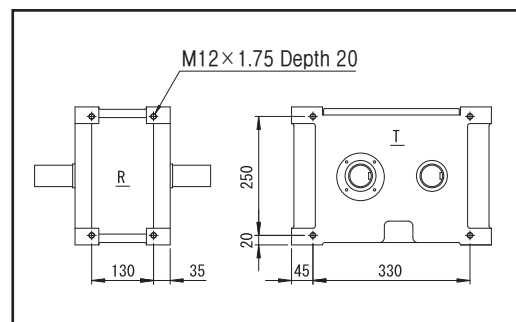


Figure HP150-1

Location of attachment hole

Figure HP150-2



Dimension diagram of attachment hole of RSTU surface

Location of Oil hole of oil according to the position and flow

Figure HP150-3

Position	1	3	4	5	6
Location					
Oil level (L)	5.5	5.5	5.5	5.5	5.5

△ Attention

- The order is the location of Oil hole (PT 1/2), oil gauge (PF1/2) and oil drain part (PT1/2) from the top regarding each location according to the position.
- The position responds to the code J of indexing drive.
- The rough value is written since an flow changes according to the cam type and the number of cam follower.

Characteristic table

Table HP150-1

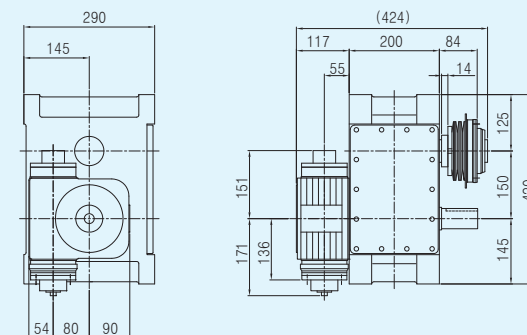
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Load of allowed THRUST of output shaft	P ₁	N	5096	Load of allowed THRUST of input shaft	P ₄	N	5096	Dividing extent of 1DWELL		sec	±60
Load of allowed RADIAL of output shaft	P ₂	N	6174	Load of allowed RADIAL of input shaft	P ₅	N	6174	Dividing extent of 2DWELL		sec	±120
Allowed TORQUE of output shaft	T _s	N·m	Referring to table of sending torque	Allowed TORQUE of maximum repetition of input shaft	P ₆	N·m	637	Repeating extent		sec	60
Rigidity of torsion of output shaft	K ₁	N·m/rad	4.93X10 ⁴	Torsional rigidity of input shaft	K ₂	N·m/rad	4.93X10 ⁴	Product mass (Main body of index)		kg	About 100
Moment of inertia of output shaft	J ₀	kg·m ²	Referring to table of sending torque	Moment of inertia of input shaft	J ₁	kg·m ²	1.63X10 ⁻²				

Note) J of input shaft is the value in case of the rectification.

1N·m ≈ 0.102kgf·m

Mounted Option

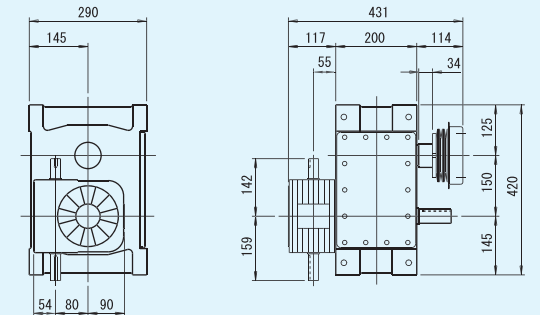
HP150 (a)



Product Example)

Indexing drive	HP150 - 01302A - L1R3VW 1
Reducer	R80 - 10 RCB 15 / 1
Torque shield	T08F - 60L

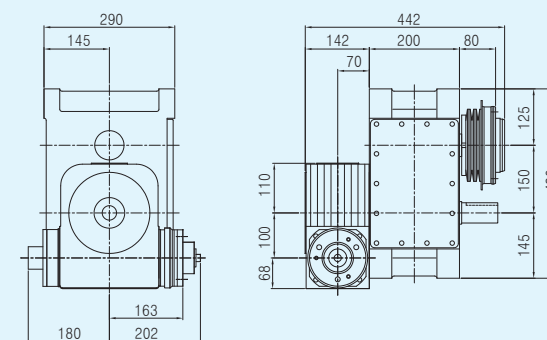
HP150 (b)



Product Example)

Indexing drive	HP150 - 01302A - L1R3VW 1
Reducer	R80 - 10 RA 15 / 1
Torque shield	T08C - 45L

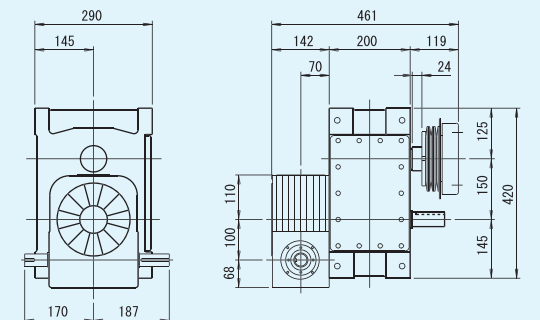
HP150 (c)



Product Example)

Indexing drive	HP150 - 01302A - L1R3VW 1
Reducer	R100 - 10 RCB 14 / 1
Torque shield	T11F - 35L

HP150 (d)



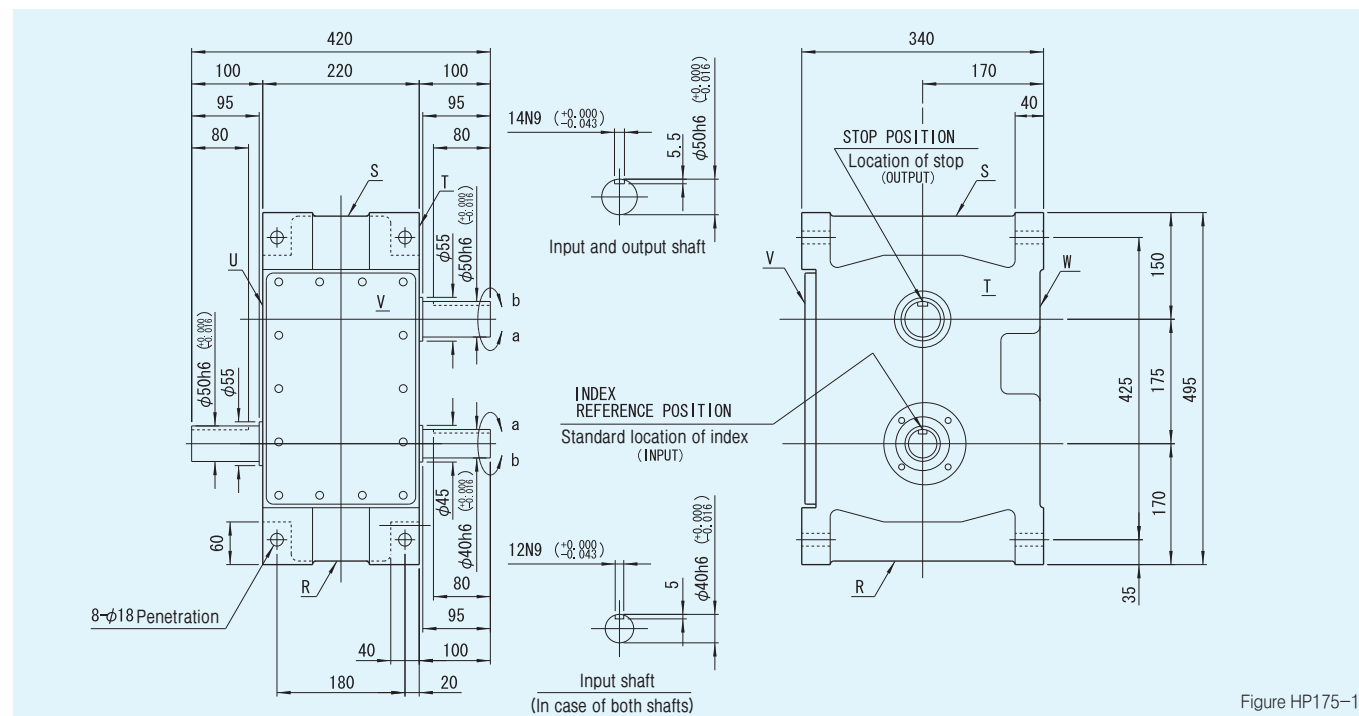
Product Example)

Indexing drive	HP150 - 01302A - L1R3VW 1
Reducer	R100 - 10 RA 14 / 1
Torque shield	T11C - 65L

△ Attention

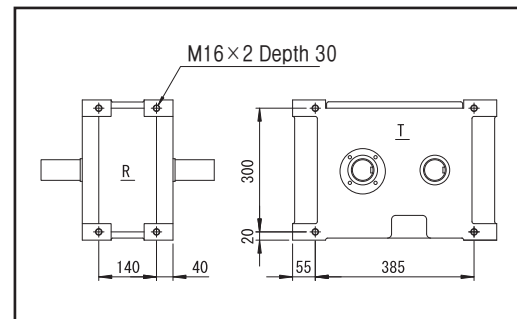
- Attaching reducer R80 and R100 is possible at HP 150.
- The attachment posture of reducer is standardized as the 16 types such as written part on P11.
- The installation of torque shield T08F, T08C, T11F, T11C is possible at HP150.
- The spacer is required in case of mounting the torque shield.

Dimension of HP175



Location of attachment hole

Figure HP175-2



Dimension diagram of attachment hole of RSTU surface

Location of Oil hole of oil according to the position and flow

Figure HP175-3

Position	1	3	4	5	6
Location					
Oil level (L)	8	8	8	8	8

Attention

- The order is the location of Oil hole (PT 1/2), oil gauge (PF 3/4) and oil drain part (PT1/2) from the top regarding each location according to the position.
- The position responds to the code J of indexing drive.
- The rough value is written since a flow changes according to the cam type and the number of cam follower.

Characteristic table

Table HP175-1

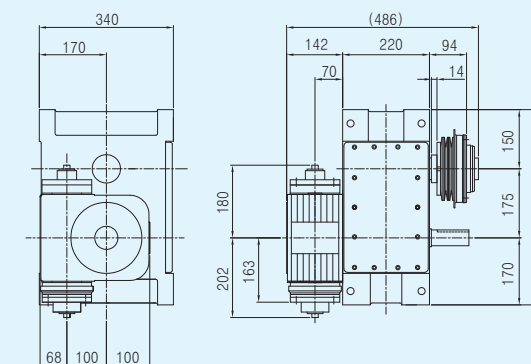
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Load of allowed THRUST of output shaft	P ₁	N	9016	Load of allowed THRUST of input shaft	P ₄	N	9016	Dividing extent of 1DWELL		sec	±60
Load of allowed RADIAL of output shaft	P ₂	N	9800	Load of allowed RADIAL of input shaft	P ₅	N	9800	Dividing extent of 2DWELL		sec	±120
Allowed TORQUE of output shaft	T _s	N·m	Referring to table of sending torque	Allowed TORQUE of maximum repetition of input shaft	P ₆	N·m	1813	Repeating extent		sec	60
Rigidity of torsion of output shaft	K ₁	N·m/rad	1.65X10 ⁴	Torsional rigidity of input shaft	K ₂	N·m/rad	1.65X10 ⁵	Product mass (Main body of index)		kg	About 160
Moment of inertia of output shaft	J ₀	kg·m ²	Referring to table of sending torque	Moment of inertia of input shaft	J ₁	kg·m ²	7.5X10 ⁻²				

(Note) J of input shaft is the value in case of the rectification.

1N·m ≈ 0.102kgf·m

Mounted Option

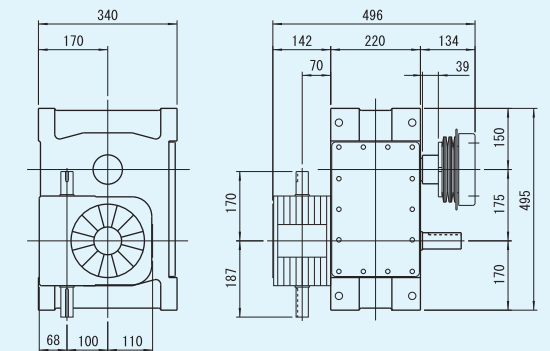
HP175 (a)



Product Example)

Indexing drive **HP175 - 01302A - L1R3VW 1**
 Reducer **R100 - 10 RCB 15 / 1**
 토크실드 **T11F - 25L**

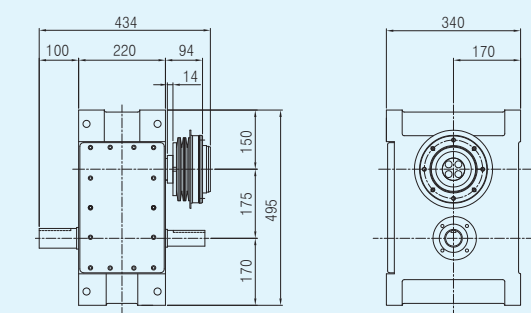
HP175 (b)



Product Example)

Indexing drive **HP175 - 01302A - L1R3VW 1**
 Reducer **R100 - 10 RA 15 / 1**
 토크실드 **T11C - 35L**

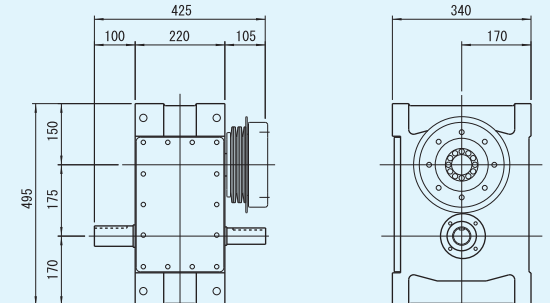
HP175 (c)



Product Example)

Indexing drive **HP175 - 01302A - L1R3VW 1**
 Torque shield **T14F - 45L**

HP175 (d)



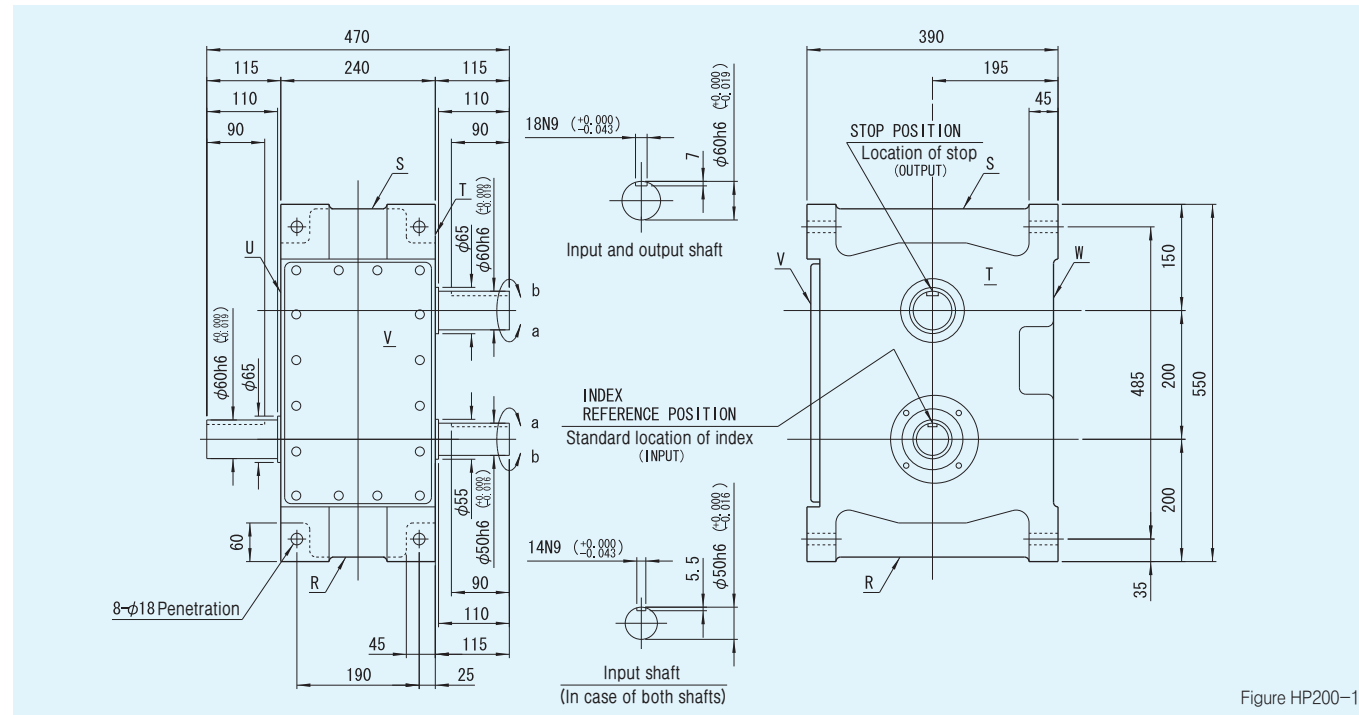
Product Example)

Indexing drive **HP175 - 01302A - L1R3VW 1**
 Torque shield **T14C - 45L**

Attention

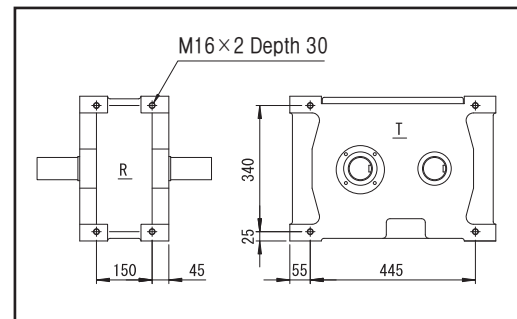
- Attaching reducer R100 is possible at HP 175.
- The attachment posture of reducer is standardized as the 16 types such as written part on P11.
- The installation of torque shield T11F, T11C, T14F, T14C is possible at HP175.
- The spacer is required in case of mounting the torque shield.

Dimension of HP200



Location of attachment hole

Figure HP200-2



Dimension diagram of attachment hole of RSTU surface

Location of Oil hole of oil according to the position and flow

Figure HP200-3

Position	1	3	4	5	6
Location					
Oil level (L)	12	12	12	12	12

△ Attention

- The order is the location of Oil hole (PT 1/2), oil gauge (PF 3/4) and oil drain part (PT1/2) from the top regarding each location according to the position.
- The position responds to the code J of indexing drive.
- The rough value is written since a flow changes according to the cam type and the number of cam follower.

Characteristic table

Table HP200-1

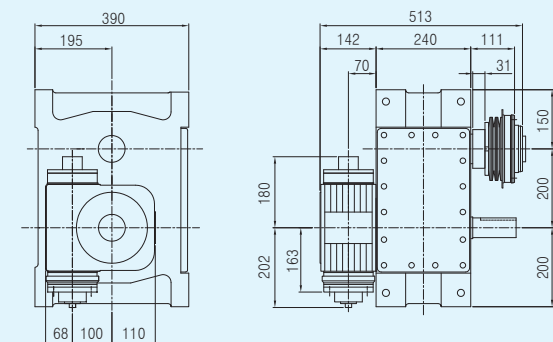
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Load of allowed THRUST of output shaft	P ₁	N	12936	Load of allowed THRUST of input shaft	P ₄	N	12936	Dividing extent of 1DWELL		sec	±60
Load of allowed RADIAL of output shaft	P ₂	N	13524	Load of allowed RADIAL of input shaft	P ₅	N	18620	Dividing extent of 2DWELL		sec	±120
Allowed TORQUE of output shaft	T _s	N·m	Referring to table of sending torque	Allowed TORQUE of maximum repetition of input shaft	P ₆	N·m	3136	Repeating extent		sec	60
Rigidity of torsion of output shaft	K ₁	N·m/rad	3.19X10 ⁵	Torsional rigidity of input shaft	K ₂	N·m/rad	3.19X10 ⁵	Product mass (Main body of index)		kg	About 220
Moment of inertia of output shaft	J ₀	kg·m ²	Referring to table of sending torque	Moment of inertia of input shaft	J ₁	kg·m ²	0.148				

Note) J of input shaft is the value in case of the rectification.

1N·m ≈ 0.102kgf·m

Mounted Option

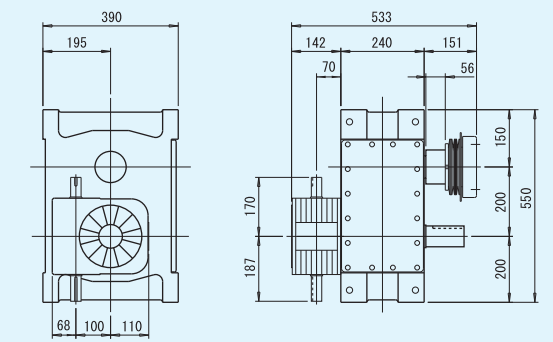
HP200 (a)



Product Example)

Indexing drive HP200 - 01302A - L1R3VW 1
 Reducer R100 - 10 RCB 15 / 1
 Torque shield T11F - 12X

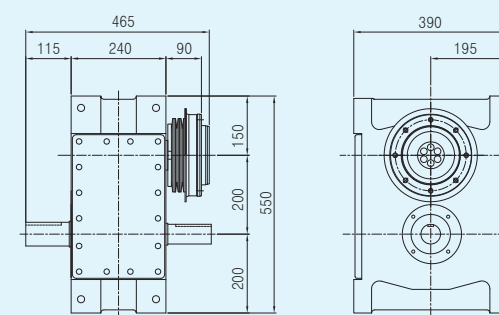
HP200 (b)



Product Example)

Indexing drive HP200 - 01302A - L1R3VW 1
 Reducer R100 - 10 RA 15 / 1
 Torque shield T11C - 10X

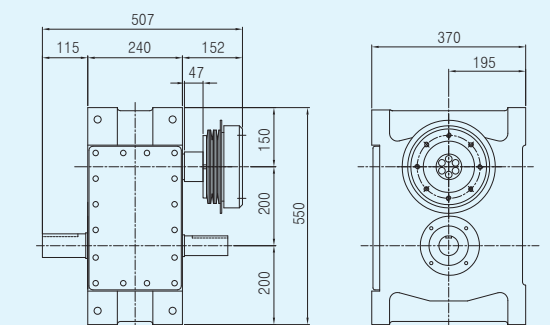
HP200 (c)



Product Example)

Indexing drive HP200 - 01302A - L1R3VW 1
 Torque shield T14F - 12X

HP200 (d)



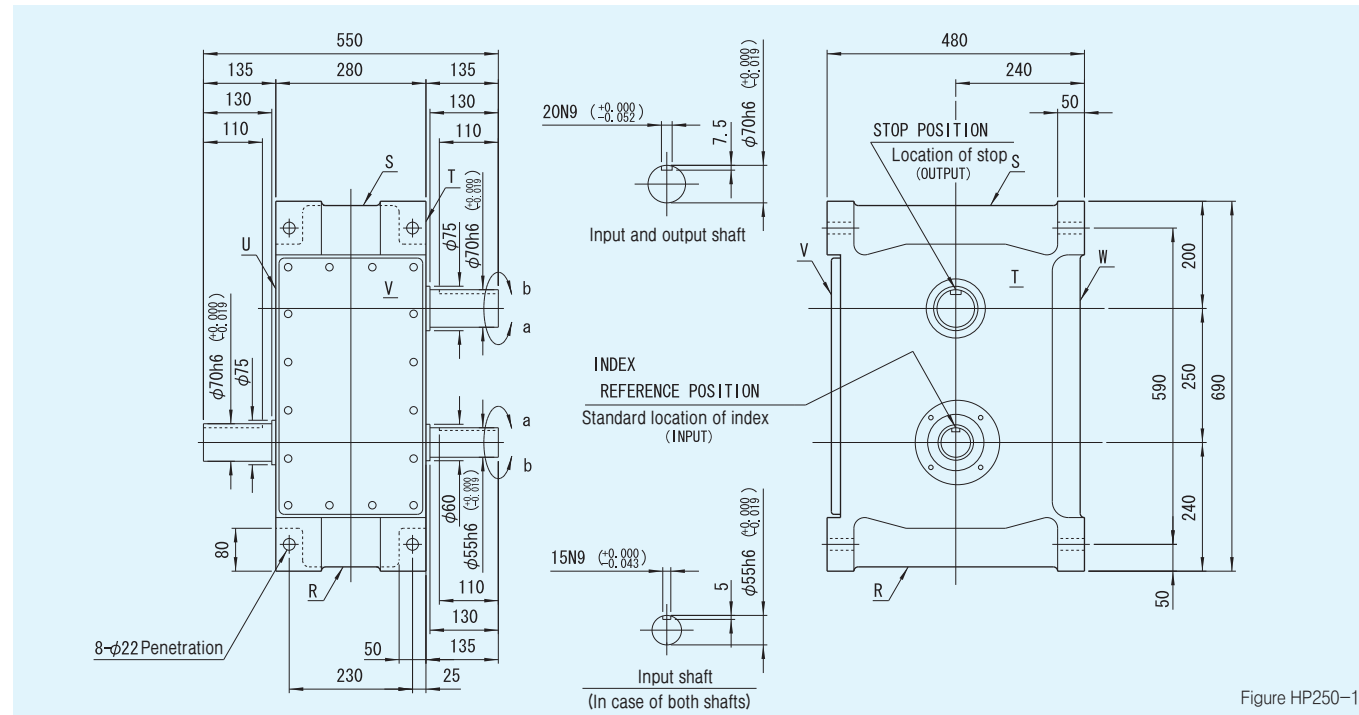
Product Example)

Indexing drive HP200 - 01302A - L1R3VW 1
 Torque shield T14C - 13X

△ Attention

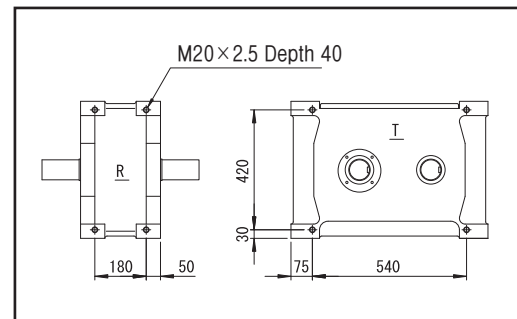
- Attaching reducer R100 and R125 is possible at HP 200.
- The attachment posture of reducer is standardized as the 16 types such as written part on P11.
- The installation of torque T11F, T11C, T14F, T14C is possible at HP200.
- The spacer is required in case of mounting the torque shield.

Dimension of HP250



Location of attachment hole

Figure HP250-2



Dimension diagram of attachment hole of RSTU surface

Location of Oil hole of oil according to the position and flow

Figure HP250-3

Position	1	3	4	5	6
Location					
Oil level (L)	20	20	20	20	20

Attention

- The order is the location of Oil hole (PT 1/2), oil gauge (PF3/4) and oil drain part (PT1/2) from the top regarding each location according to the position.
- The position responds to the code J of indexing drive.
- The rough value is written since an flow changes according to the cam type and the number of cam follower.

Characteristic table

Table HP250-1

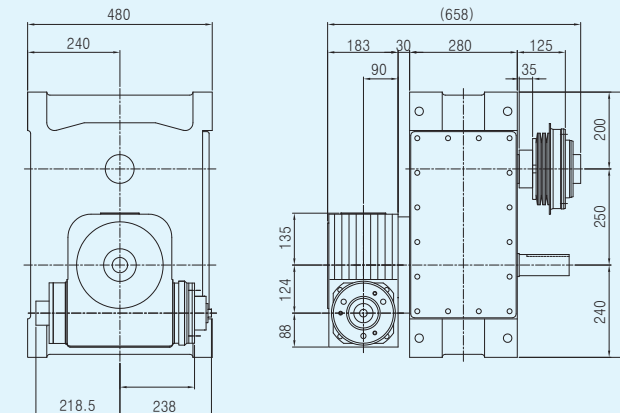
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Load of allowed THRUST of output shaft	P ₁	N	15190	Load of allowed THRUST of input shaft	P ₄	N	15190	Dividing extent of 1DWELL		sec	±60
Load of allowed RADIAL of output shaft	P ₂	N	15288	Load of allowed RADIAL of input shaft	P ₅	N	23520	Dividing extent of 2DWELL		sec	±120
Allowed TORQUE of output shaft	T _s	N·m	Referring to table of sending torque	Allowed TORQUE of maximum repetition of input shaft	P ₆	N·m	4900	Repeating extent		sec	60
Rigidity of torsion of output shaft	K ₁	N·m/rad	5.26X10 ⁵	Torsional rigidity of input shaft	K ₂	N·m/rad	5.26X10 ⁵	Product mass (Main body of index)		kg	About 350
Moment of inertia of output shaft	J ₀	kg·m ²	Referring to table of sending torque	Moment of inertia of input shaft	J ₁	kg·m ²	0.495				

Note) J of input shaft is the value in case of the rectification.

1N·m ≈ 0.102kgf·m

Mounted Option

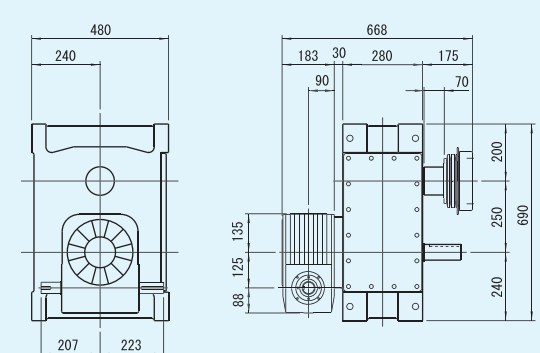
HP250 (a)



Product Example)

Indexing drive **HP250 - 01302A - L1R3VW 1**
 Reducer **R125 - 10 RCB 14 / 1**
 Torque shield **T14F - 18X**

HP250 (b)



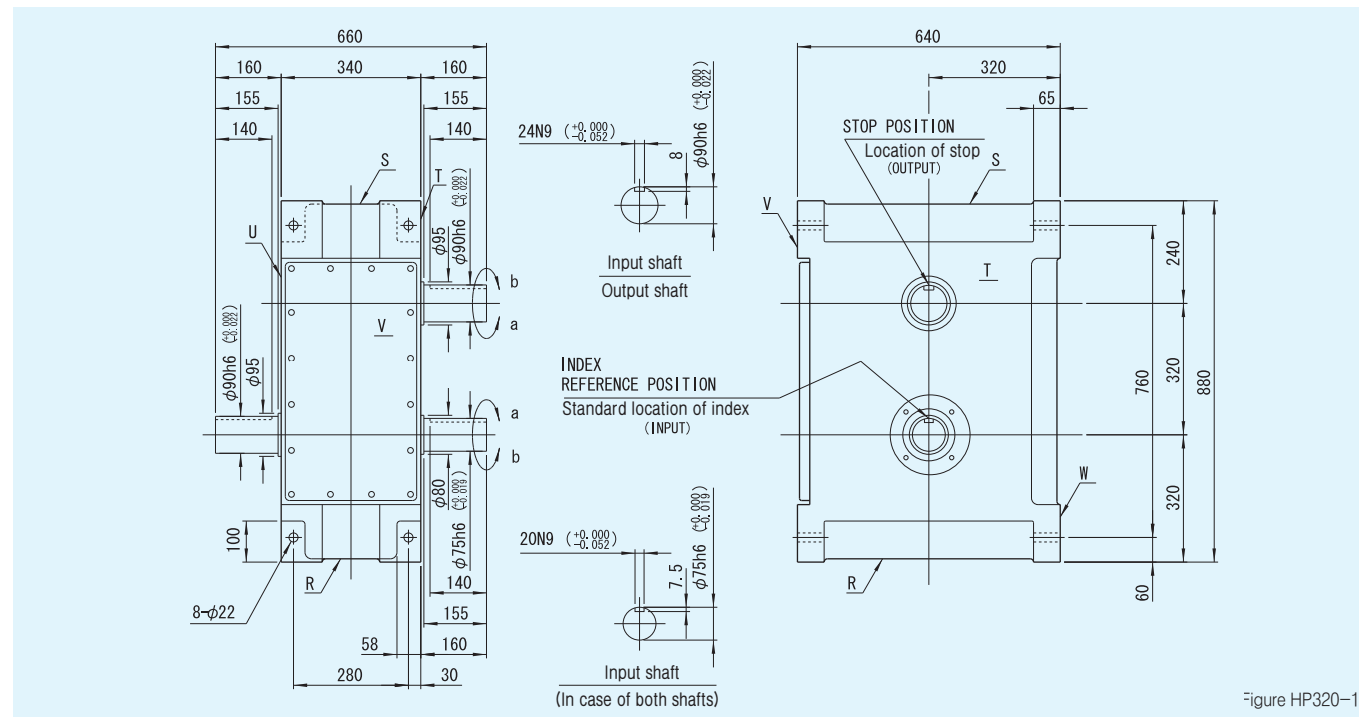
Product Example)

Indexing drive **HP250 - 01302A - L1R3VW 1**
 Reducer **R125 - 10 RA 14 / 1**
 Torque shield **T14C - 13X**

Attention

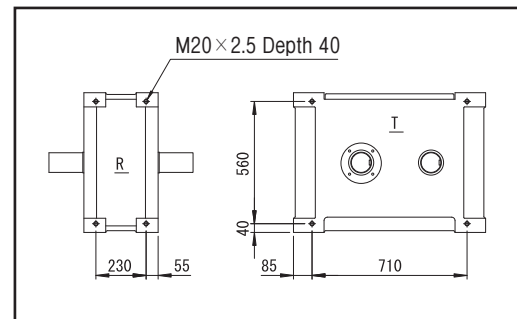
- Attaching reducer R125 is possible at HP 250.
- The attachment posture of reducer is standardized as the 16 types such as written part on P11.
- The installation of torque shield T14F, T18C, T18F, T18Cis possible at HP 250.
- The spacer is required in case of mounting the torque shield.

Dimension of HP320



Location of attachment hole

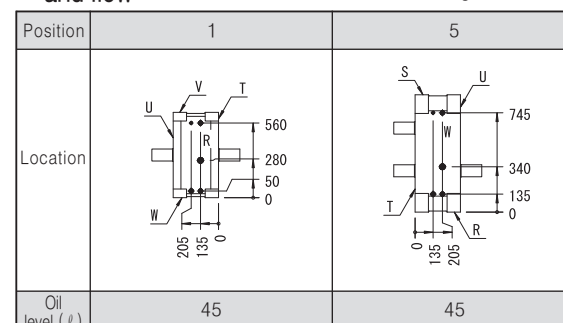
Figure HP320 -2



Dimension diagram of attachment hole of RSTU surface

Location of Oil hole of oil according to the position and flow

Figure HP320 -3



Attention

- The order is the location of Oil hole(PT 3/8), oil gauge(PF3/8) and oil drain part (PT3/8) from the top regarding each location according to the position.
- The position responds to the code J of indexing drive.
- The rough value is written since an flow changes according to the cam type and the number of cam follower.

Characteristic table

Table HP320-1

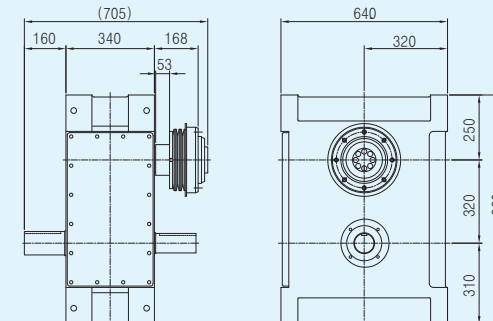
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Load of allowed THRUST of output shaft	P ₁	N	22540	Load of allowed THRUST of input shaft	P ₄	N	22540	Dividing extent of 1DWELL		sec	±60
Load of allowed RADIAL of output shaft	P ₂	N	23520	Load of allowed RADIAL of input shaft	P ₅	N	41160	Dividing extent of 2DWELL		sec	±120
Allowed TORQUE of output shaft	T _s	N·m	Referring to table of sending torque	Allowed TORQUE of maximum repetition of input shaft	P ₆	N·m	10780	Repeating extent		sec	60
Rigidity of torsion of output shaft	K ₁	N·m/rad	1.08×10 ⁶	Torsional rigidity of input shaft	K ₂	N·m/rad	1.08×10 ⁶	Product mass (Main body of index)		kg	About 750
Moment of inertia of output shaft	J ₀	kg·m ²	Referring to table of sending torque	Moment of inertia of input shaft	J ₁	kg·m ²	1.7				

Note) J of input shaft is the value in case of the rectification.

1N·m ≈ 0.102kgf·m

Mounted Option

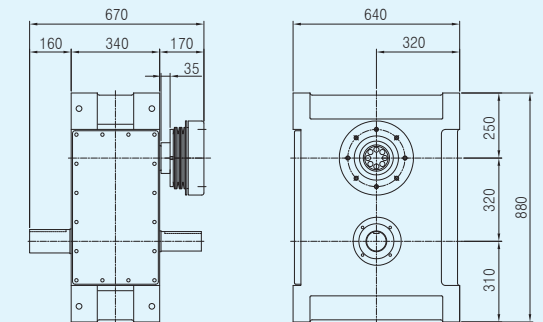
HP320 (a)



Product Example)

Indexing drive HP320 - 01302A - L1R3VW 1
Torque shield T18F - 13X

HP320 (b)



Product Example)

Indexing drive HP320 - 01302A - L1R3VW 1
Torque shield T18C - 16X

Attention

- The attachment position of reducer is standardized as the 16 types such as written part on P11.
- The installation of torque shield T18F, T18C is possible at HP320.
- The spacer is required in case of installing the torque shield.

Dear Sir(Sirs)

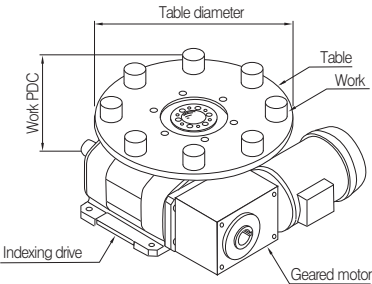
Selected data of INDXIA HD type

Company name			
Department name			
Name of person in charge			
Phone number	(Extension number)	Fax number	

• Selecting the HD series is required to choose the proper model on the use condition.
• We are selecting the type by the torque calculation as the service to the customers.
• Pleases send it to use after writing the use condition to this fax sheet.

● Number of stop S	
● Dividing time t1 sec	
● Stopping time t2 sec	

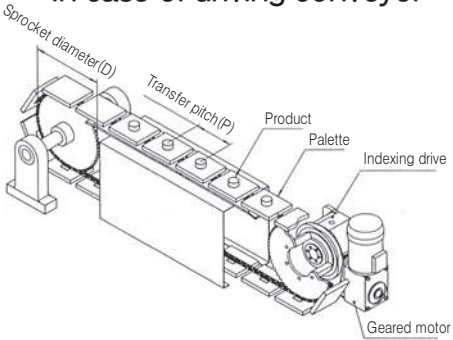
In case of driving the data



● Table diameter D mm
● Table mass W1 kg
● Jig : P.C.D D2 mm
● Jig mass per 1ea W2 kg
● Quantity of jig n2
● Work P.C.D D3 mm
● Work mass per 1ea W3 kg
● Quantity of work n3

● Transfer pitch..... P mm
● Chain and attachment mass..... W1 kg
● Jig mass g W2 kg
● Work mass W3 kg
● Sprocket diameter..... D mm
● Sprocket mass per 1ea W4 kg
● Quantity of sprocket..... n4
● Coefficient of friction..... μ

In case of driving conveyor

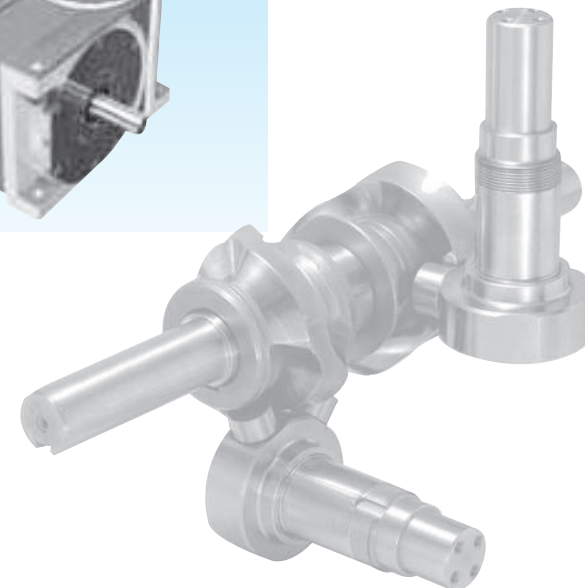
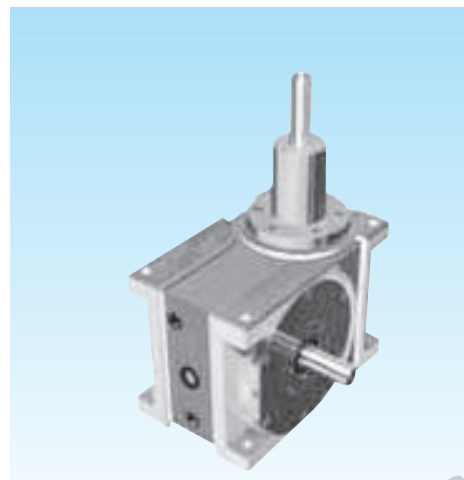
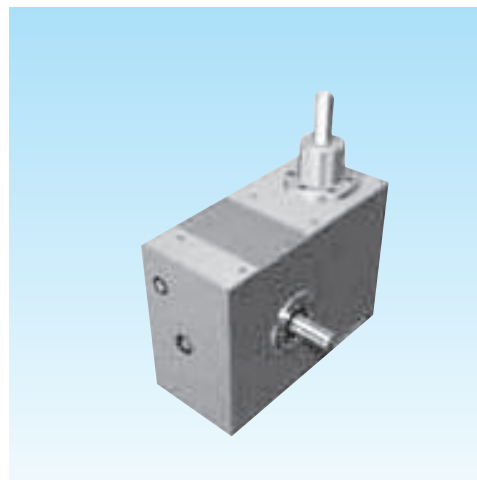


Geared motor	Whether it exists • not	Inverter	Whether it exists • not
Torque shield	Whether it exists • not	Timing cam	(Whether it exists: set) • not

MEMO

INDXIA

Pick&Place Unit



Characteristics of HN, HL Series

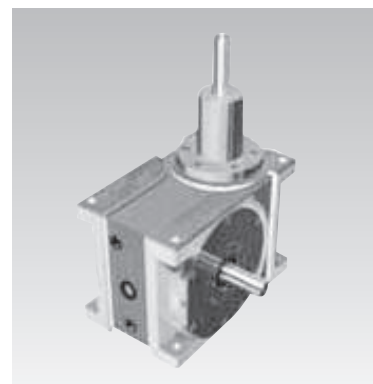
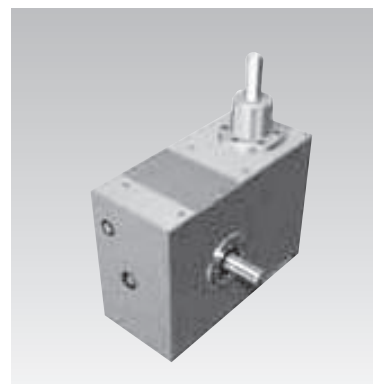
- Pick & Place Unit adopted with roller gear cam and grooved cam
- Excellent in high speed because all movements are consisted of cams
- Unit with a high reliability for long period with its simple structure
- HL type is a Universal Type with big oscillation angle

With increasing numbers of handle works requiring precise high productivity such as Microelectronic field, Pick & Place Unit with high speed and precise timing is in the spotlight.

Hannz Motrol Co., Ltd. manufactures a number of different types—compact drive of special cam mechanism, high accuracy type resulting rotary motion and rectilinear motion using roller gear cam mechanism, general purpose type using 1pc of roller gear cam and grooved cam to deal with extensive demands.

Characteristics

- Return of precise position
- High speed performance and excellent durability
- Available for synchronized operation of other equipments.



Product Code

Ex.)

HN	110
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6317	2	R
------	---	---

S	3	VW
---	---	----

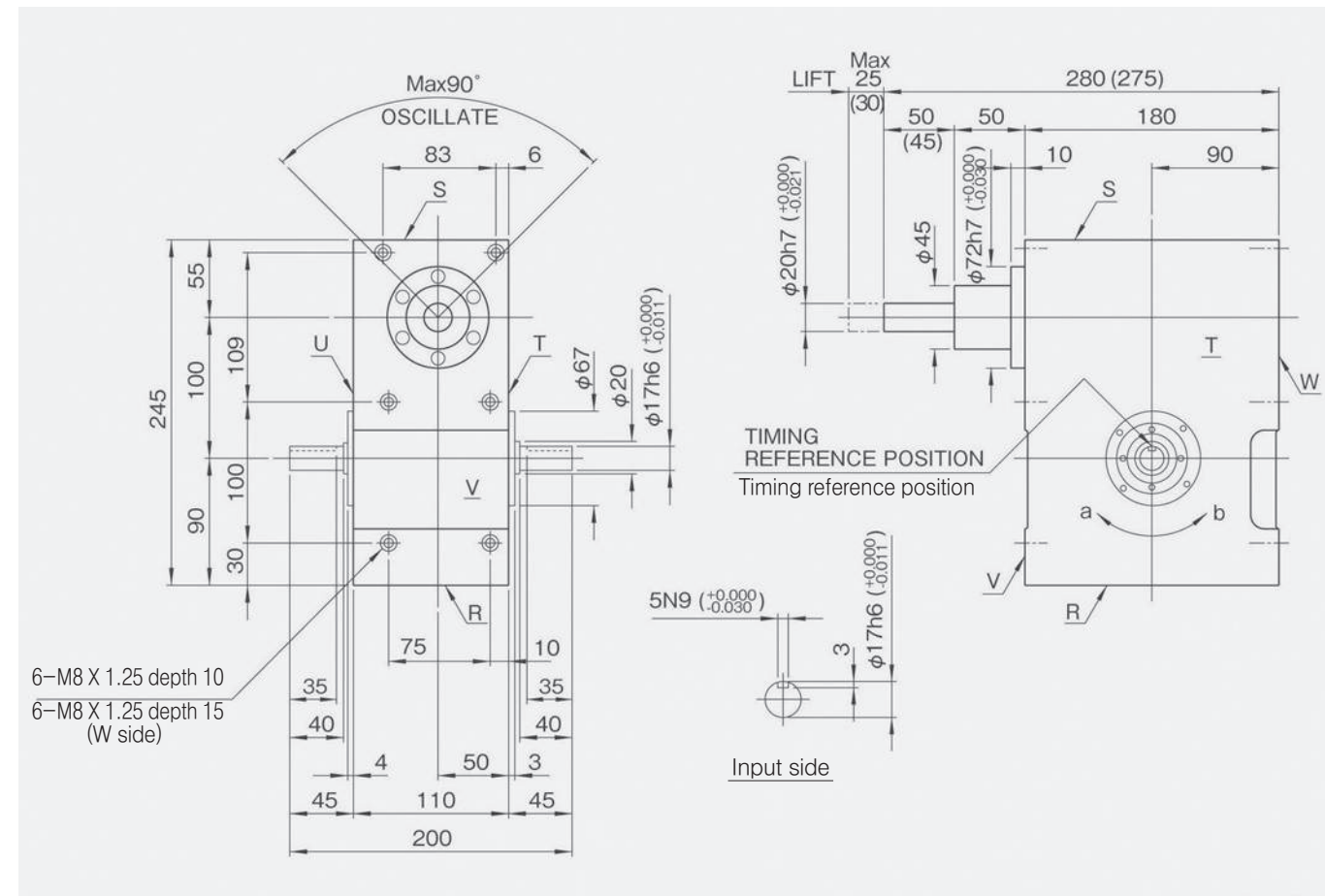
1	X
---	---

a b c d e f g h i j

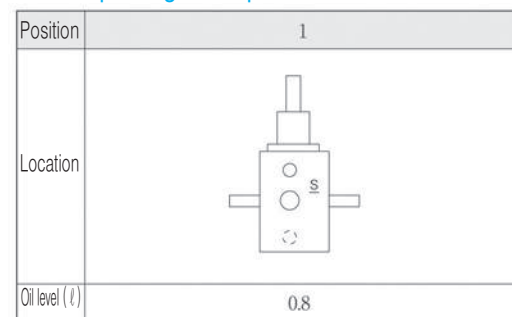
a Form	b Size	c Reference number	d Cam curve	e Rotation direction
HN Oscillating handler HN series	110 Axial distance 110mm	6317 Reference number of Hannz Motrol	2 MS Curve	R Right hand cam
HN HN series HL HL series	It shows the axial distance between input shaft and output shaft.	All oscillating handler is produced by order. Therefore Hannz Motrol decides a 4 digit reference number.	1: Modified trapezoid curve (MT) 2: Modified sine curve (MS) 3: Modified constant velocity (MCV50) 4: SHP 5 Special order curve 9: Custom cam curve Cam curve satisfying customers requests	Decided according to the input shaft rotation direction and output shaft rotation direction Ⓡ Right hand cam Ⓛ Left hand cam

f Specification of output shaft	g Specification of input shaft	h Processing surface of mounting hole	i Mounting Position	j Special Instruction
S Standard shaft type	3 Both T and U surface sides input nsion	VW Processing of tapped mounting holes of V surface and W surface	1 Mounting position (The W surface becomes GL)	X Special instruction
S Standard specification	1. Only T surface side 2. Only U surface side 3. Both T and U surface sides input extension R1 T surface side input extension and reducer mounted R2 U surface side input extension one reducer mounted R3 Only one surface side input extension one reducer mounted Note) If reducer is equipped for both sides input side, the code is the same for both T and U sides.	Please enter the code additionally to the surface to the code in case the tapped hole is required at the R,S,T, U Surface. Processing of all surface is A. Depending on the types, there are sides where the attachment hole processing is impossible. (Refer to the page of each type.)	It is available to use in position that all sides become GL. Position1. W side becomes GL Position 2. V side becomes GL Position 3. U side becomes GL Position 4. T side becomes GL Position 5. R side becomes GL Position 6. S side becomes GL	If there is a special specification apart from the standard product (Catalog expression), enter (X). () Standard product(Blank) (X) Special order product (X) Expression example 1) Determine the changes in figure and tolerance.
The shaft is a standard for output shaft specification. ••S Torque limiter mounted is a special specification. Input shaft specifications are ① Only T surface side R Mounted Reducer ② Only U surface side M Mounted Motor ③ Both T and U surface sides input extension S1 S2 S3				

HN100 dimension



The location of oil hole, flow meter and drain and flow depending on the position



Attention

- Position is in order of oil hole, oil gage and oil drainage from the top.
- Flow changes depending on the form of cam, the number of cam followers, etc.

Characteristic table of index

Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Allowed load of output shaft	W ₀	N	Refer to the loading capacity table	Allowed THRUST load of input shaft	P ₃	N	980	GD2 of oscillate part of output part	J ₀	kg · m ²	1.2 × 10 ⁻³
Allowed THRUST load of output shaft	P ₁	N	245	Maximum repeated bending force of input shaft	P ₄	N	1078	Inner load of lift part of output part	W _{a1}	N	19.6
Allowed RADIAL load of output shaft	P ₂	N	98	Maximum allowed repeated torque of input shaft	P ₅	N · m	68.6	Product weight		kg	27
Allowed torque of output shaft	T _s	N · m	Refer to the torque transmission table	Twisting stiffness of input shaft	K ₂	N · m / rad	6664				
Twisting stiffness of output shaft	K ₁	N · m / rad	5096	GD2 of input shaft	J ₁	kg · m ²	1.5 × 10 ⁻²				

1N=0.102kgf

An example of option being mounted (Small motor equipped specification)

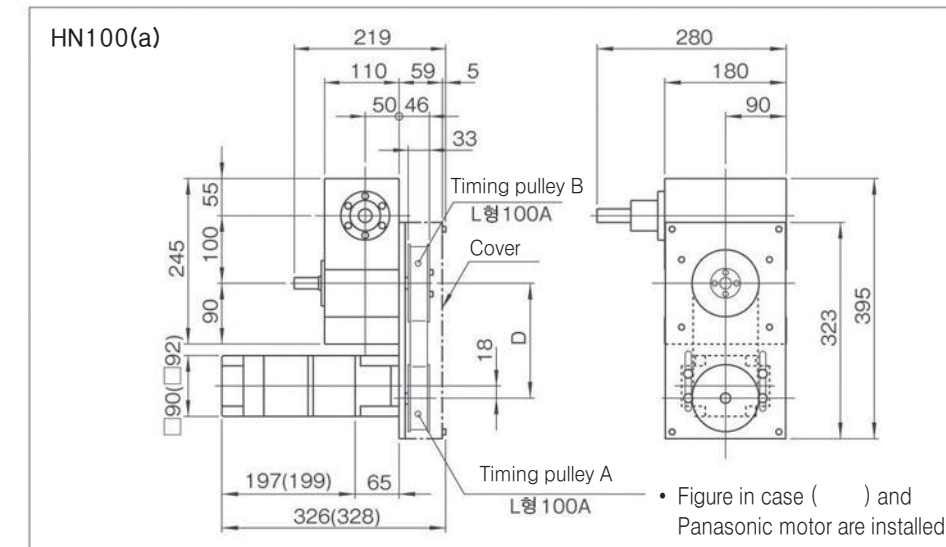


Figure in case () and Panasonic motor are installed.

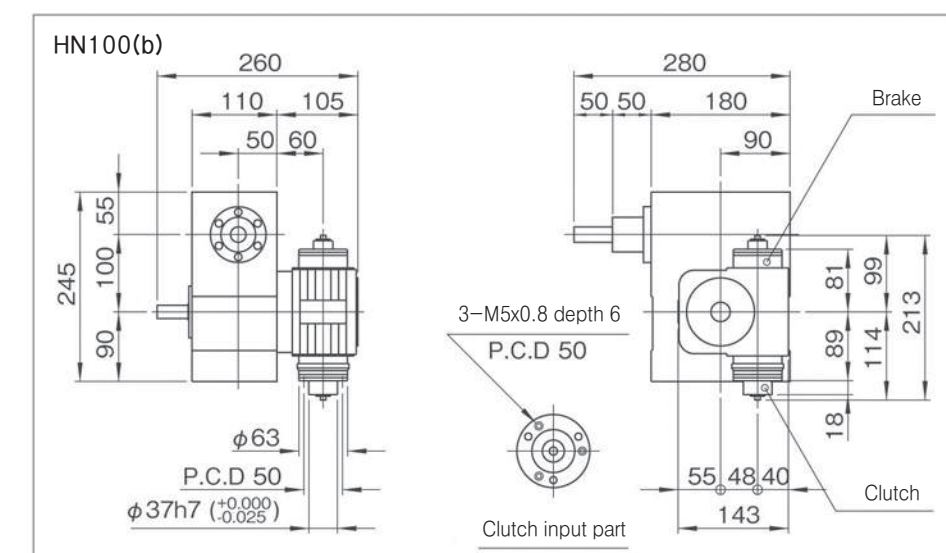
Induction motor continuous rating

Motor type		Output (W)	Frequency (Hz)	Voltage (V)	Current (A)	Starting torque (gcm)	Torque (gcm)	Revolutions Per Minute (rpm)	Capacitance (μF)	Gear head type	
Oriental motor	No C · B	51K90GU-AF	90	50	100	2.0	0.45	0.68	1300	25.0	5GU□KB
	With C · B	CBI 590-801	90	60	100	2.0	0.57	1550	25.0		5GCH□KB
Panasonic	No C · B	M91C90G4L	90	50	100	1.6	0.470	0.637	1325	25.0	M9GD□B
	With C · B	M9CBIC90G4L	90	60	100	1.7	0.519	1625	25.0		M9GE□B-CB

※ □ 에는 감속비가 들어갑니다.

Revolutions Per Minute (rpm)		200	120	100	60	50	30	20	15	10
50Hz deceleration ratio		7.5	12.5	15	25	30	50	75	100	150
60Hz deceleration ratio		9	15	18	30	36	60	90	120	180
Allowed torque	51K90GU-AF	4.1	6.2	7.4	11.2	13.5	20	20	20	20
	M91A90G4L	3.43	5.68	6.76	10.88	13.03	19.6	19.6	19.6	19.6

An example of option being mounted (Reducer R48 mounting specification)



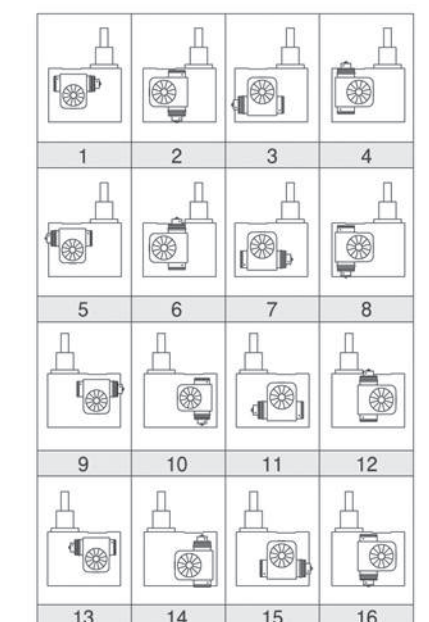
Timing motor specification

Timing pulley reducer	Pulley A size	Pulley B size	D	Separate form
1.4	30	42	170	270L 72ㄱ
1.5	28	42	175	270L 72ㄱ
1.62	26	42	179	270L 72ㄱ

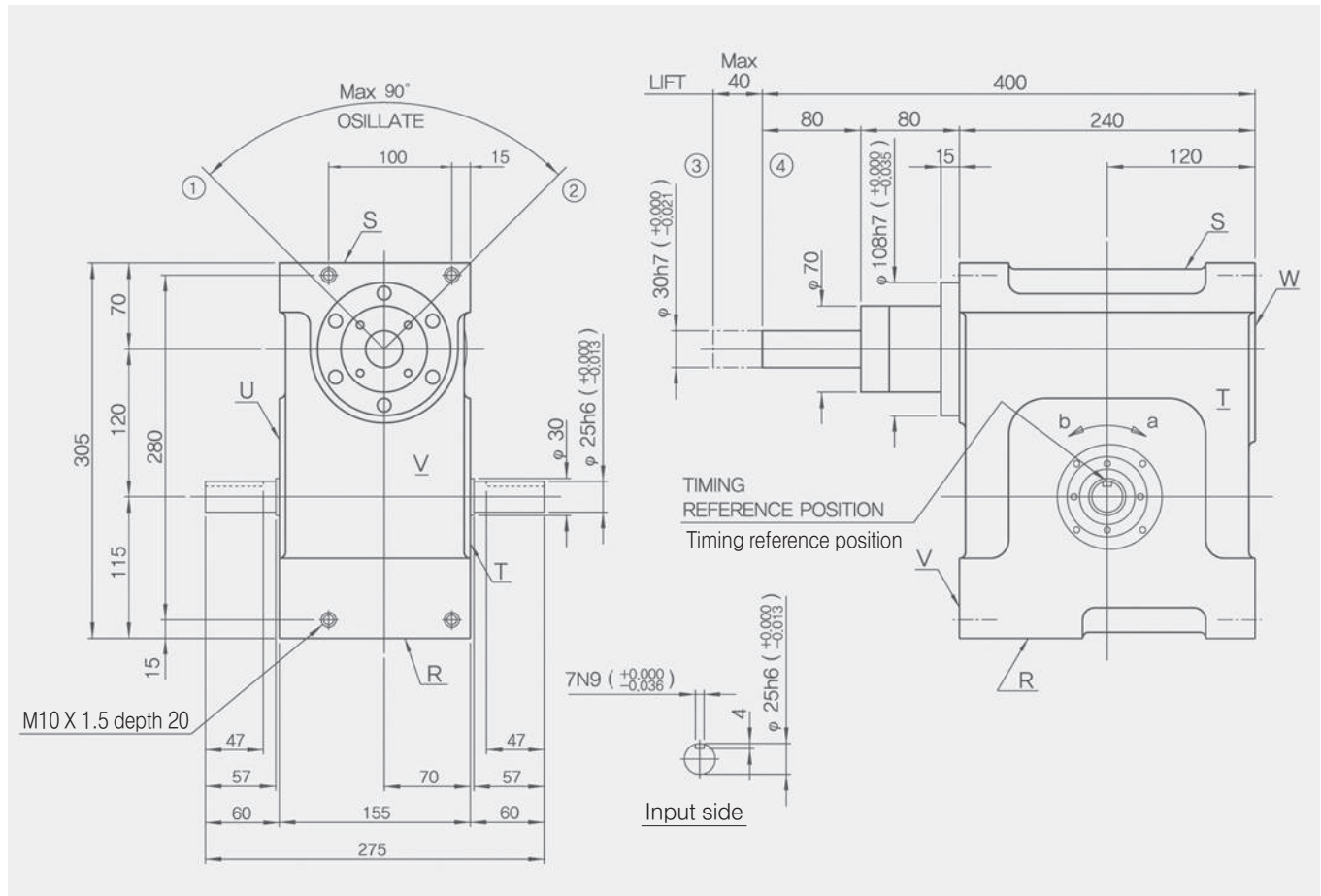
Clutch / Brake part specification

Item	Motor output 90W	
	Clutch	Brake
Statical friction torque	1.5 N · m	
Dynamic friction torque	1.0 N · m	
Rated voltage	DC24V	
Capacity	7W	5W
Amateur attraction time	15msec	
Amateur diminishing time	25msec	
Torque starting time	20msec	
Operation rate	Max. 100 times/ min	
Total amount of working	15 × 10 ⁷ J	
Allowed amount of working per session	1.47J	

Reducer attached position



HN120 dimension



The location of oil hole, flow meter and drain and flow depending on the position

Position	1
Location	
Oil level (l)	1.4

Attention

- Position is in order of oil hole, oil gage and oil drainage from the top.
- Flow changes depending on the form of cam, the number of cam followers, etc.

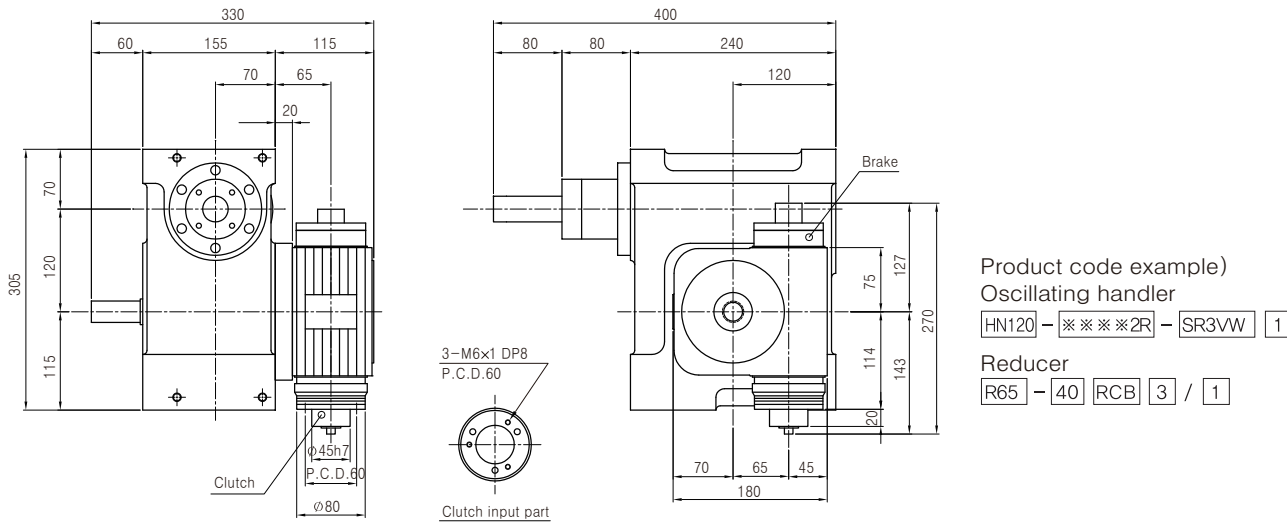
Characteristic table of index

Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Allowed load of output shaft	W0	N	Refer to the loading capacity table	Allowed THRUST load of input shaft	P3	N	1470	GD2 of oscillate part of output part	J0	kg · m ²	0.0033
Allowed THRUST load of output shaft	P1	N	280	Maximum repeated bending force of input shaft	P4	N	2300	Inner load of lift part of output part	Wa1	N	25.5
Allowed RADIAL load of output shaft	P2	N	200	Maximum allowed repeated torque of input shaft	P5	N · m	220	Product weight		kg	about 70
Allowed torque of output shaft	Ts	N · m	Refer to the torque transmission table	Twisting stiffness of input shaft	K2	N · m / rad	1.66 × 10 ⁴				
Twisting stiffness of output shaft	K1	N · m / rad	5096	GD2 of input shaft	J1	kg · m ²	6.3 × 10 ⁻²				

1N=0.102kgf

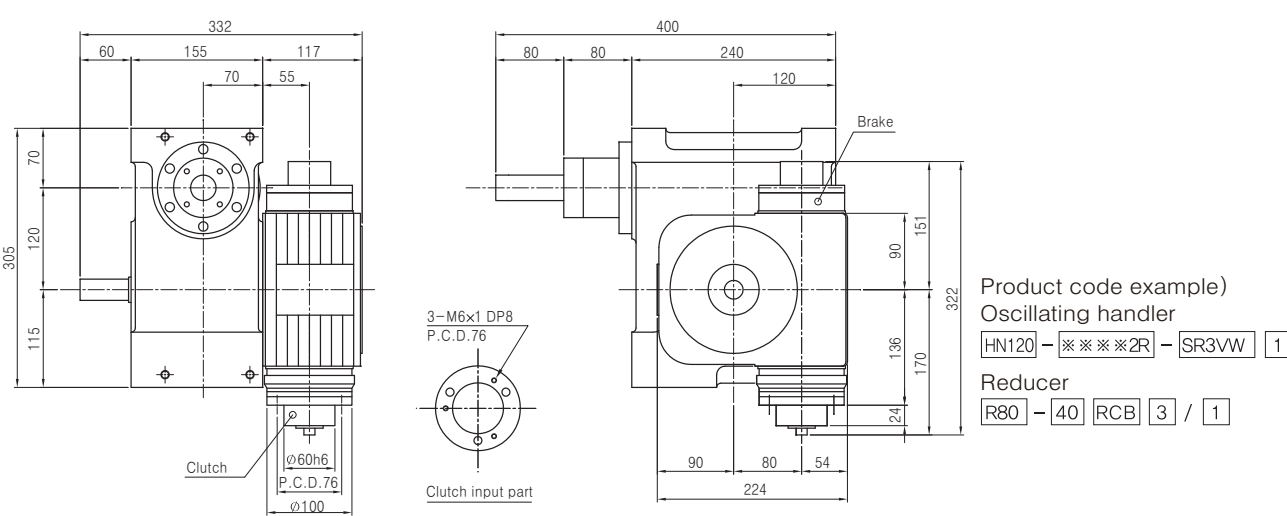
An example of option being mounted

HN120(a)



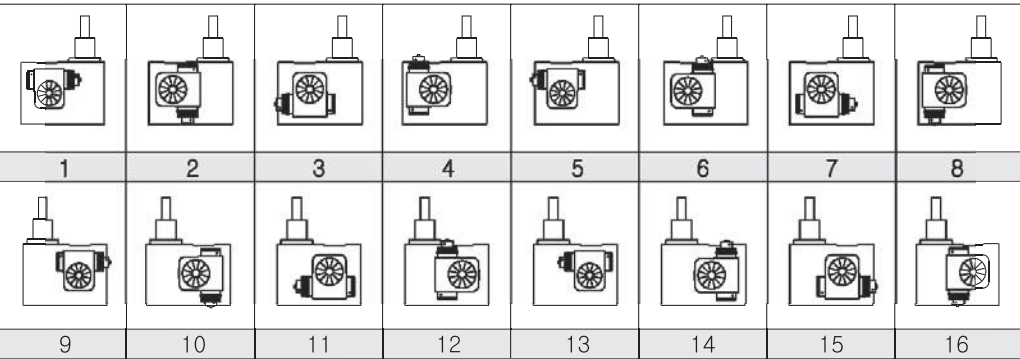
Product code example)
Oscillating handler
HN120 - ※※※2R - SR3VW 1
Reducer
R65 - 40 RCB 3 / 1

HN120(b)

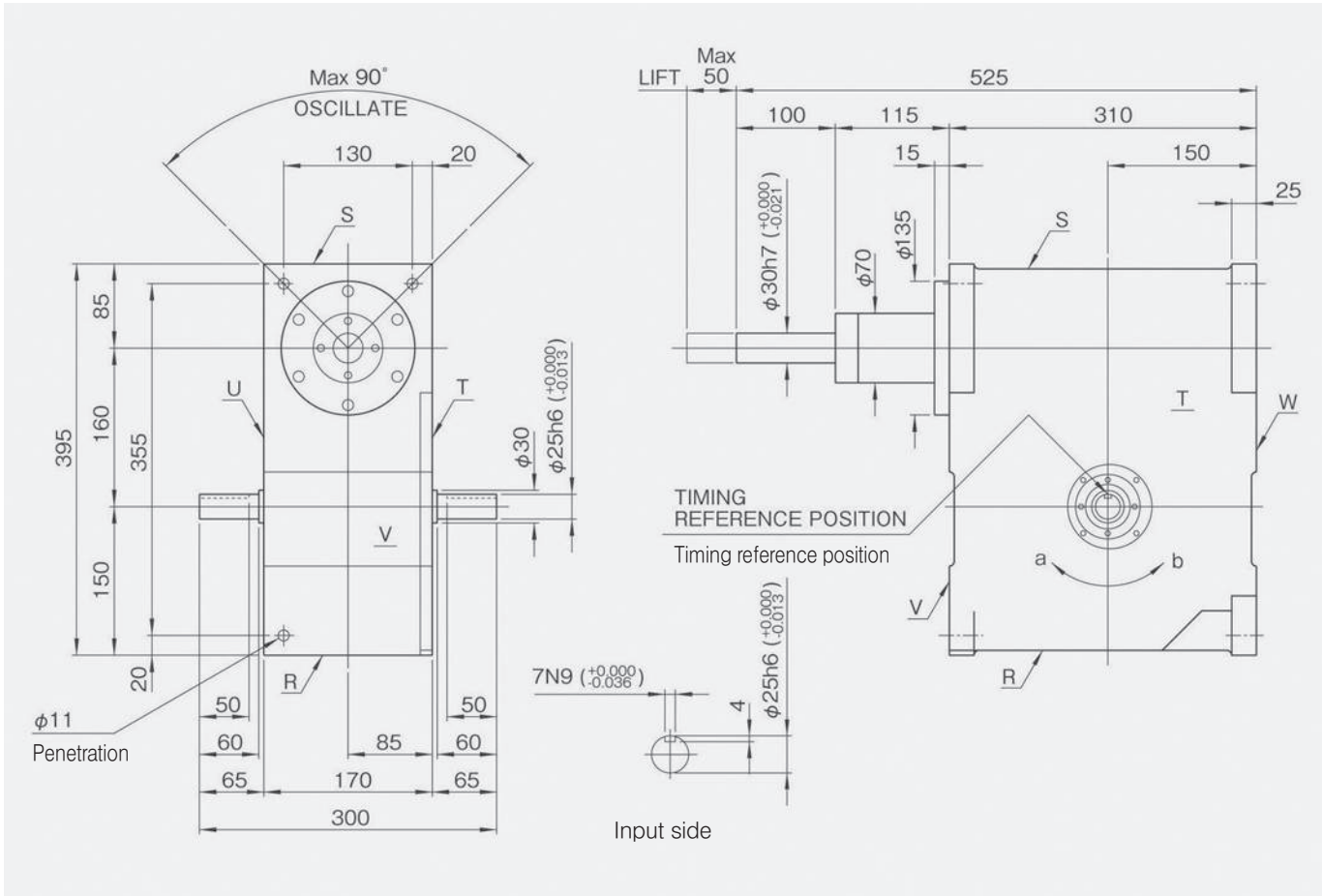


Product code example)
Oscillating handler
HN120 - ※※※2R - SR3VW 1
Reducer
R80 - 40 RCB 3 / 1

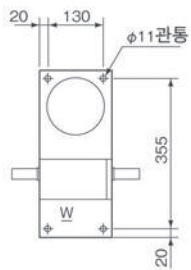
Reducer attached position



HN160 dimension



Location of attachment hole



Dimension diagram of attachment hole of W surface

The location of oil hole, flow meter and drain and flow depending on the position

Position	1
Location	
Oil level (l)	2.5

Attention

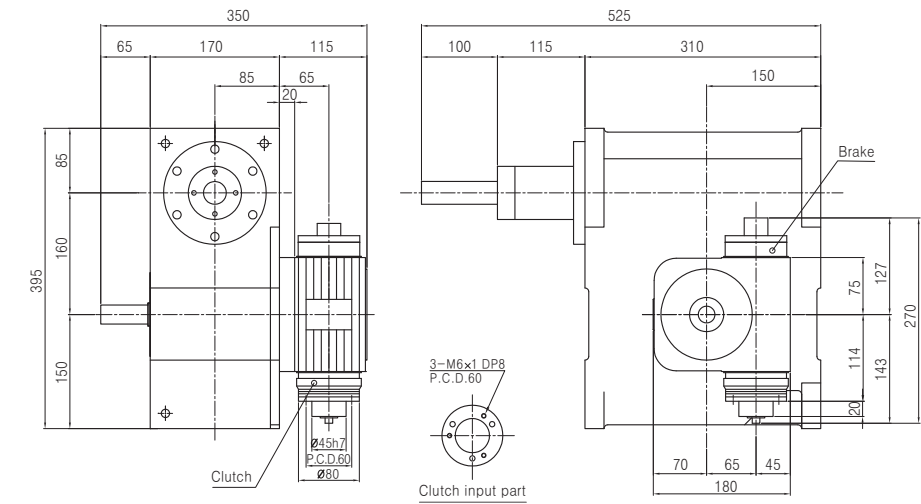
- Position is in order of oil hole, oil gage and oil drainage from the top.
- Flow changes depending on the form of cam, the number of cam followers, etc.

Characteristic table of index

Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Allowed load of output shaft	W0	N	Refer to the loading capacity table	Allowed THRUST load of input shaft	P3	N	1470	GD2 of oscillate part of output part	J0	kg · m ²	6.25 × 10 ⁻³
Allowed THRUST load of output shaft	P1	N	490	Maximum repeated bending force of input shaft	P4	N	2352	Inner load of lift part of output part	Wa1	N	56.8
Allowed RADIAL load of output shaft	P2	N	274.4	Maximum allowed repeated torque of input shaft	P5	N · m	225.4	Product weight		kg	110
Allowed torque of output shaft	Ts	N · m	264.6	Twisting stiffness of input shaft	K2	N · m / rad	2.058 × 10 ⁴				
Twisting stiffness of output shaft	K1	N · m / rad	264.6 × 10 ⁴	GD2 of input shaft	J1	kg · m ²	0.1875				

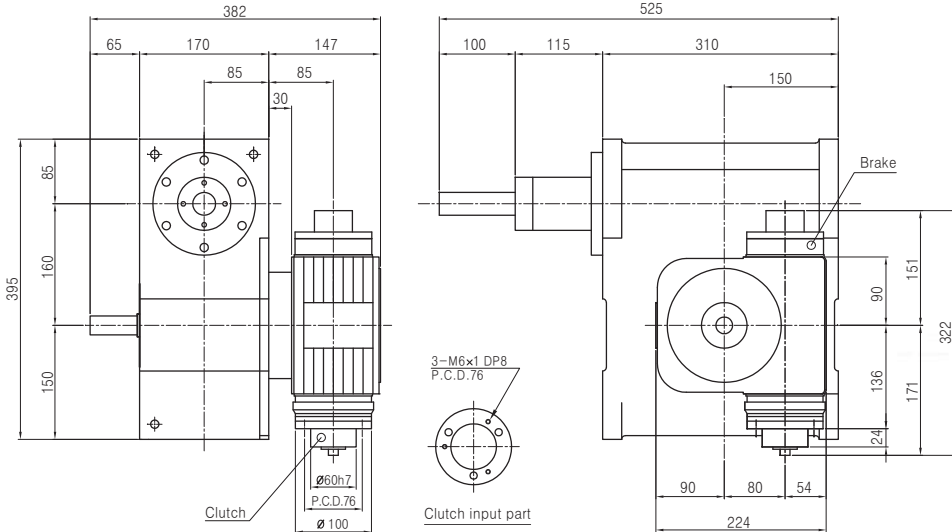
1N=0.102kgf

HN160(a)



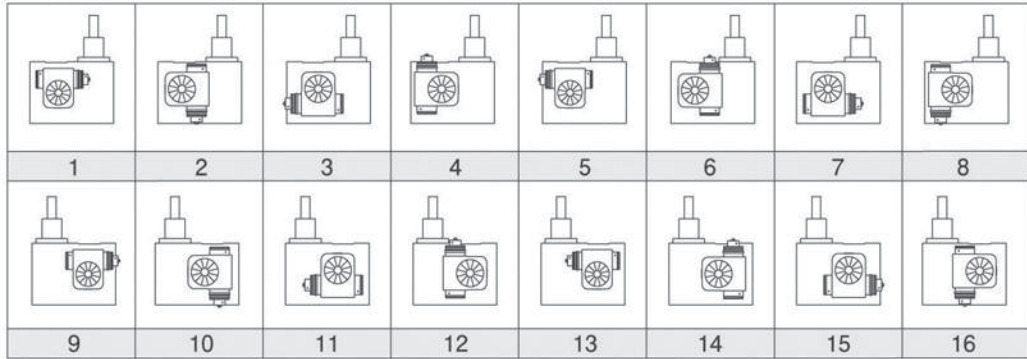
Product code example)
Oscillating handler
HN160-***2R-SR3VW 1
Reducer
R65-40 RCB 3 / 1

HN160(b)

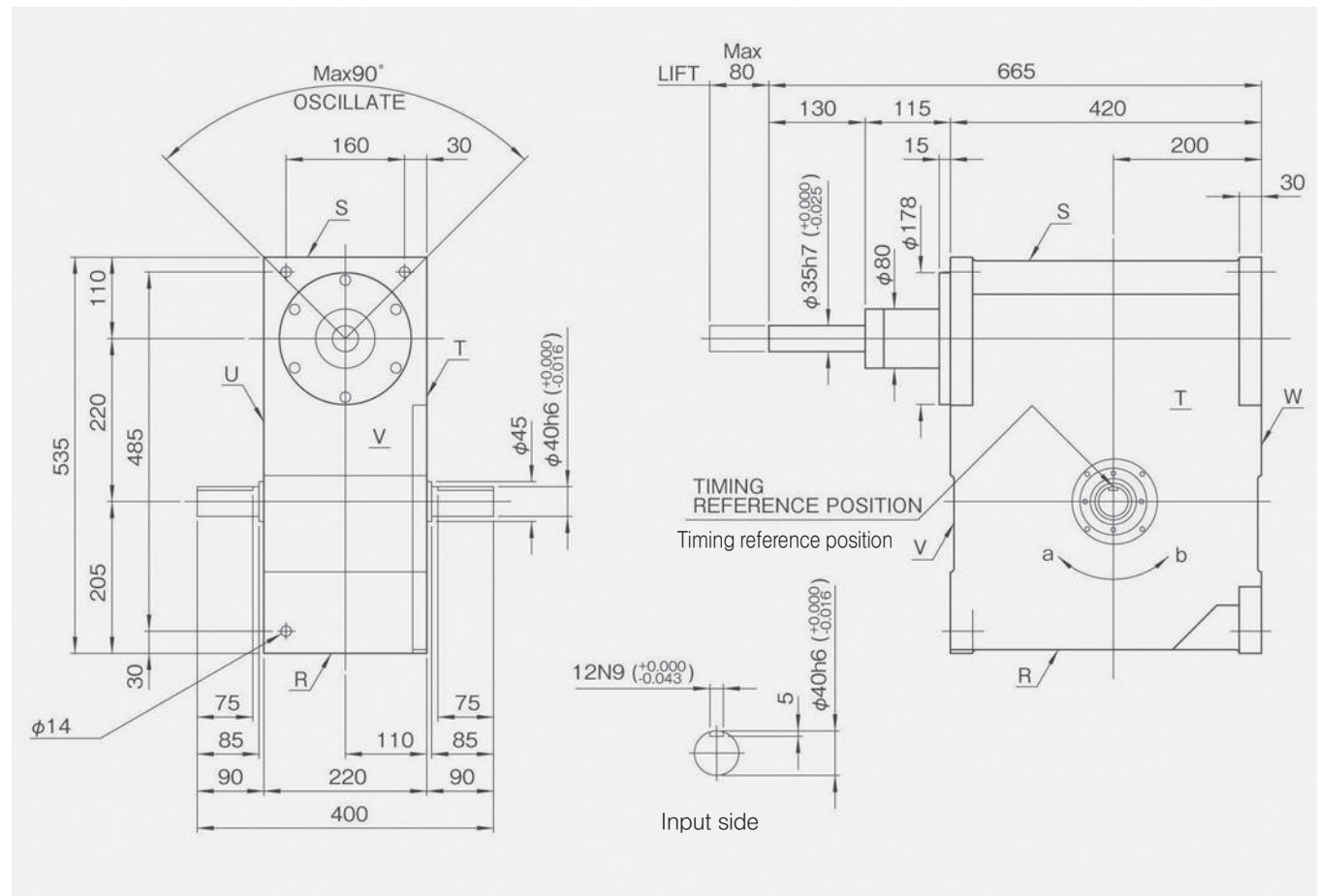


Product code example)
Oscillating handler
HN160-***2R-SR3VW 1
Reducer
R80-40 RCB 3 / 1

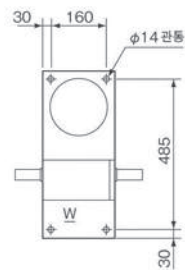
Reducer attached position



HN220 dimension



Location of attachment hole



Dimension diagram of attachment hole of W surface

The location of oil hole, flow meter and drain and flow depending on the position

Position	1
Location	
Oil level (t)	7

Attention

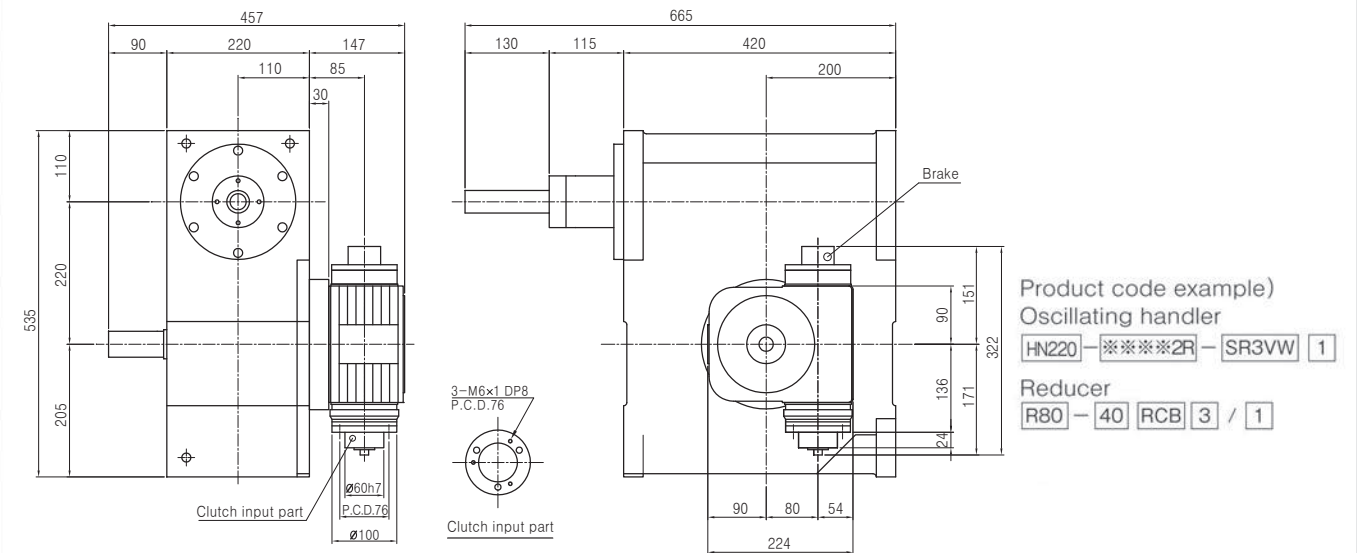
- Position is in order of oil hole, oil gage and oil drainage from the top.
- Flow changes depending on the form of cam, the number of cam followers, etc.

Characteristic table of index

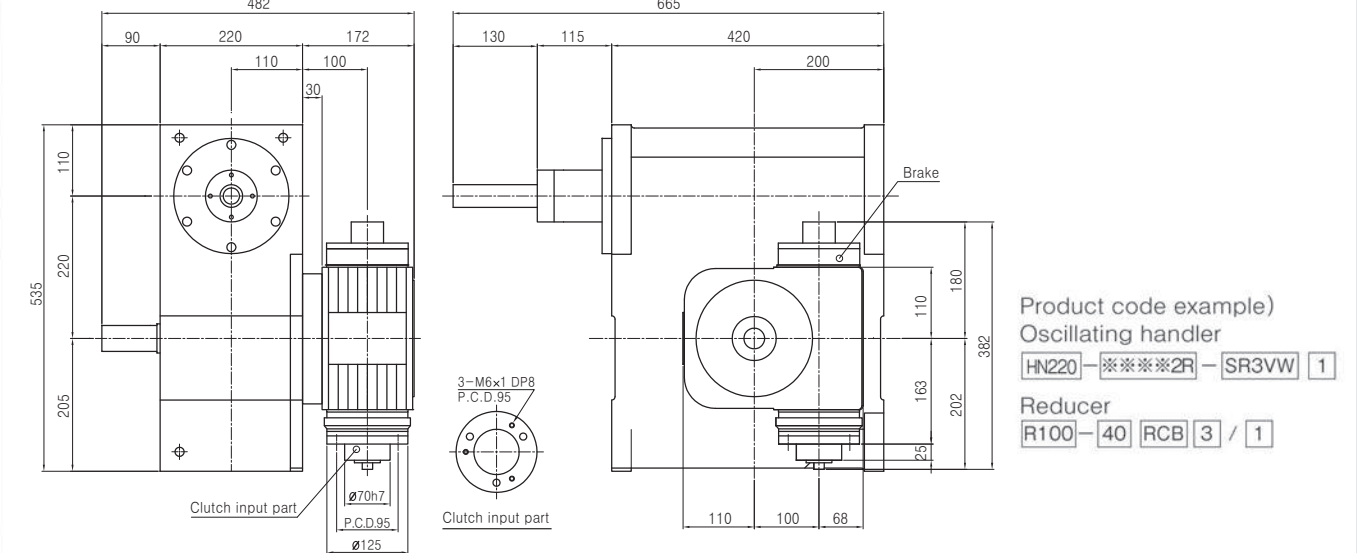
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Allowed load of output shaft	W ₀	N	Refer to the loading capacity table	Allowed THRUST load of input shaft	P ₃	N	2940	GD2 of oscillate part of output part	J ₀	kg · m ²	2.875 × 10 ⁻²
Allowed THRUST load of output shaft	P ₁	N	705.6	Maximum repeated bending force of input shaft	P ₄	N	6860	Inner load of lift part of output part	W _{a1}	N	151.9
Allowed RADIAL load of output shaft	P ₂	N	392	Maximum allowed repeated torque of input shaft	P ₅	N · m	921.2	Product weight		kg	240
Allowed torque of output shaft	T _s	N · m	656.6	Twisting stiffness of input shaft	K ₂	N · m / rad	9.8 × 10 ⁴				
Twisting stiffness of output shaft	K ₁	N · m / rad	3.332 × 10 ⁴	GD2 of input shaft	J ₁	kg · m ²	0.975				

1N=0.102kgf

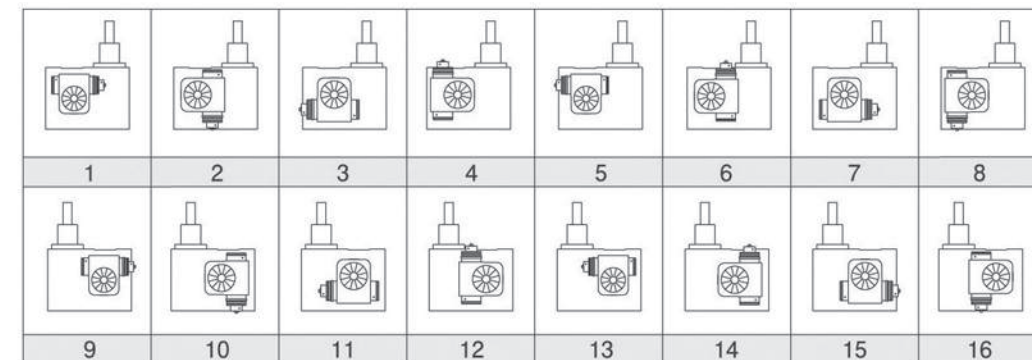
HN220(a)



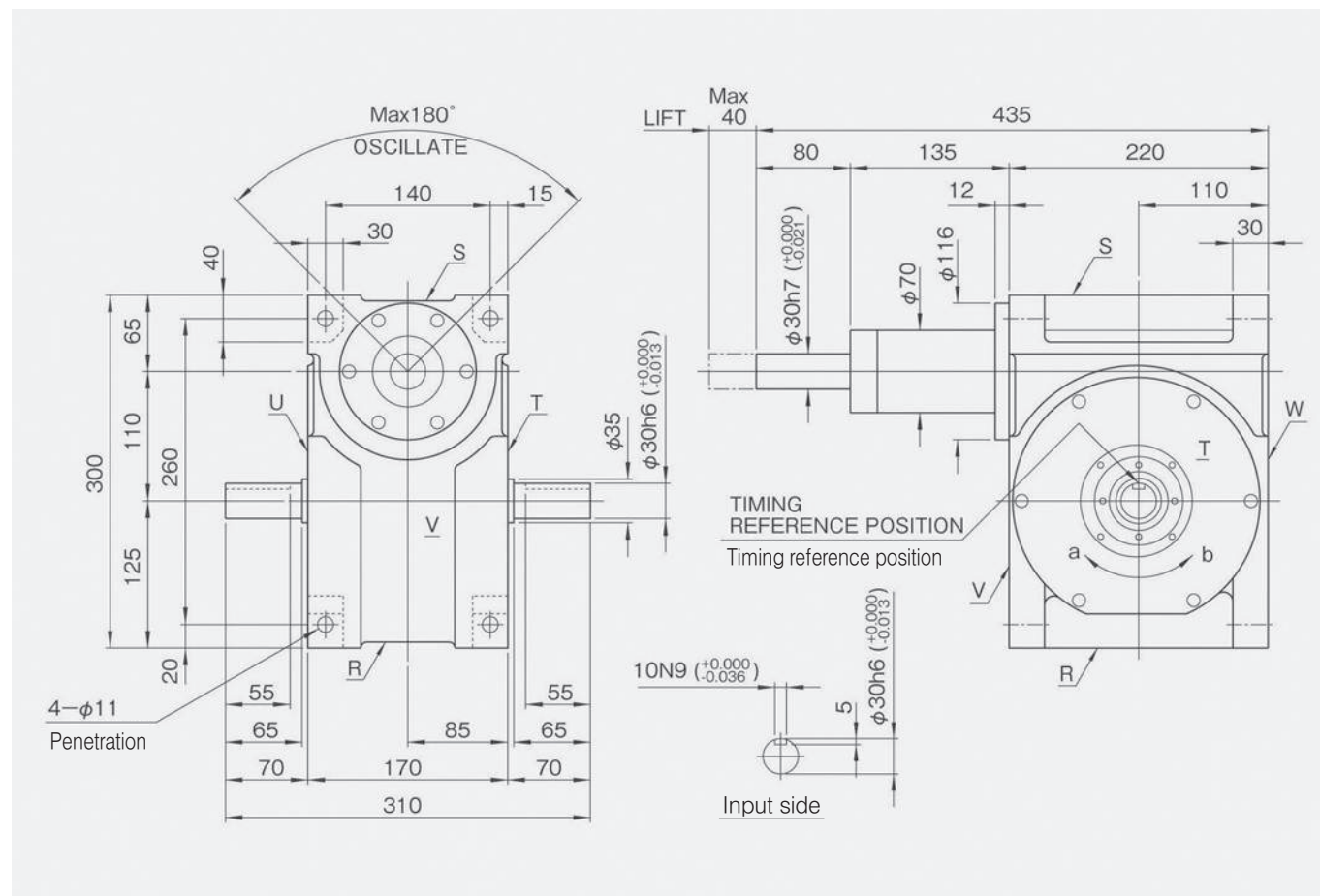
HN220(b)



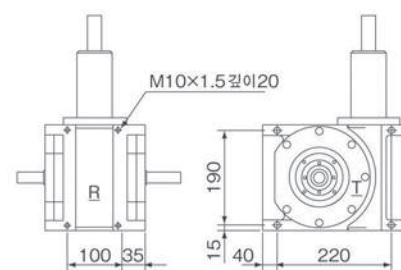
Reducer attached position



HL110 dimension



Location of attachment hole



Dimension diagram of attachment hole of R,S,T,U surface

The location of oil hole, flow meter and drain and flow depending on the position

Position	1
Location	
Oil level (t)	2.0

Attention

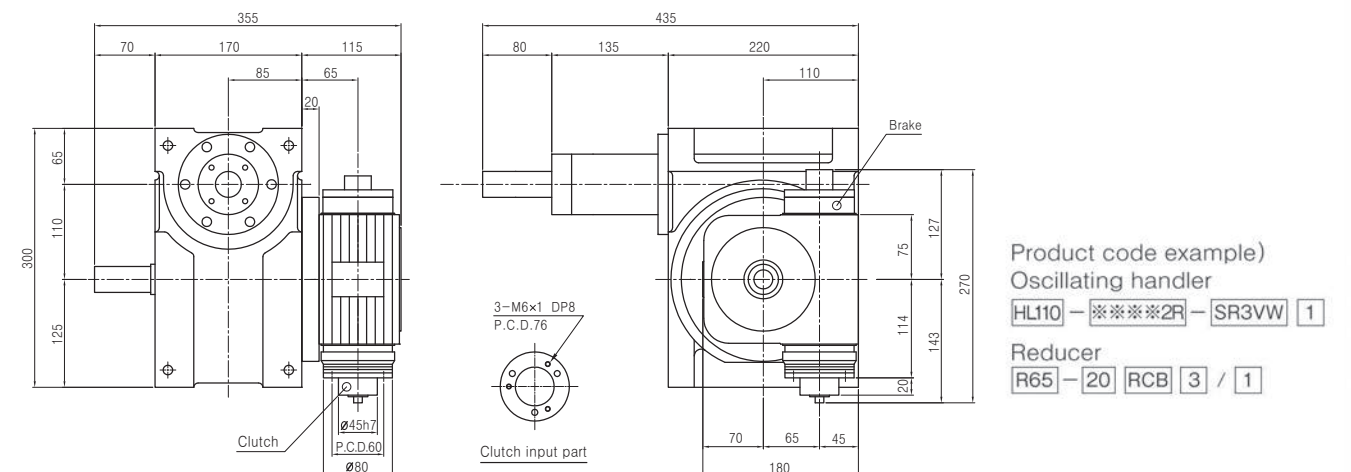
- Position is in order of oil hole, oil gage and oil drainage from the top.
- Flow changes depending on the form of cam, the number of cam followers, etc.

Characteristic table of index

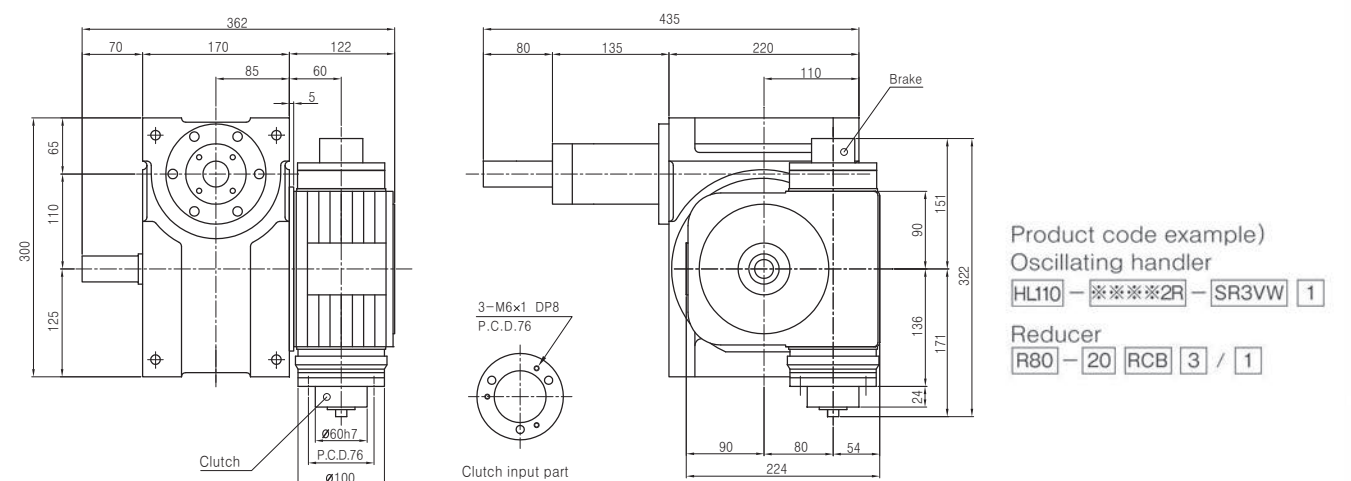
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Allowed load of output shaft	W ₀	N	Refer to the loading capacity table	Allowed THRUST load of input shaft	P ₃	N	2940	GD2 of oscillate part of output part	J ₀	kg · m ²	1.6 × 10 ⁻³
Allowed THRUST load of output shaft	P ₁	N	245	Maximum repeated bending force of input shaft	P ₄	N	2548	Inner load of lift part of output part	W _{a1}	N	34.3
Allowed RADIAL load of output shaft	P ₂	N	176.4	Maximum allowed repeated torque of input shaft	P ₅	N · m	392	Product weight		kg	75
Allowed torque of output shaft	T _s	N · m	Refer to the torque transmission table	Twisting stiffness of input shaft	K ₂	N · m / rad	2.548 × 10 ⁴				
Twisting stiffness of output shaft	K ₁	N · m / rad	1.764 × 10 ⁴	GD2 of input shaft	J ₁	kg · m ²	3.0 × 10 ⁻²				

1N=0.102kgf

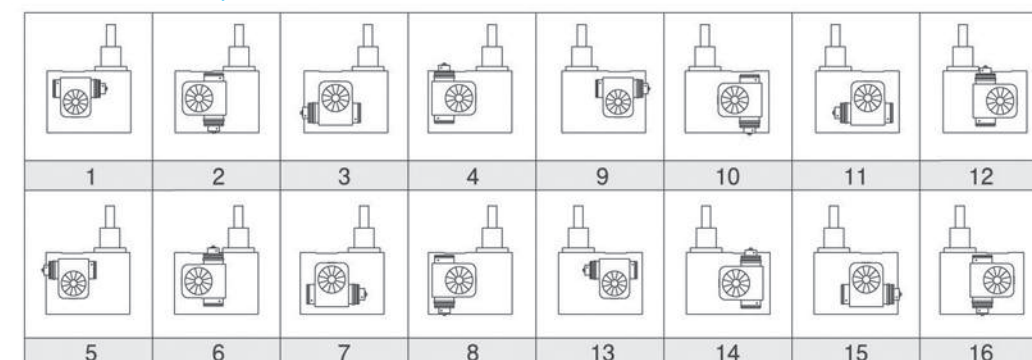
HL110(a)



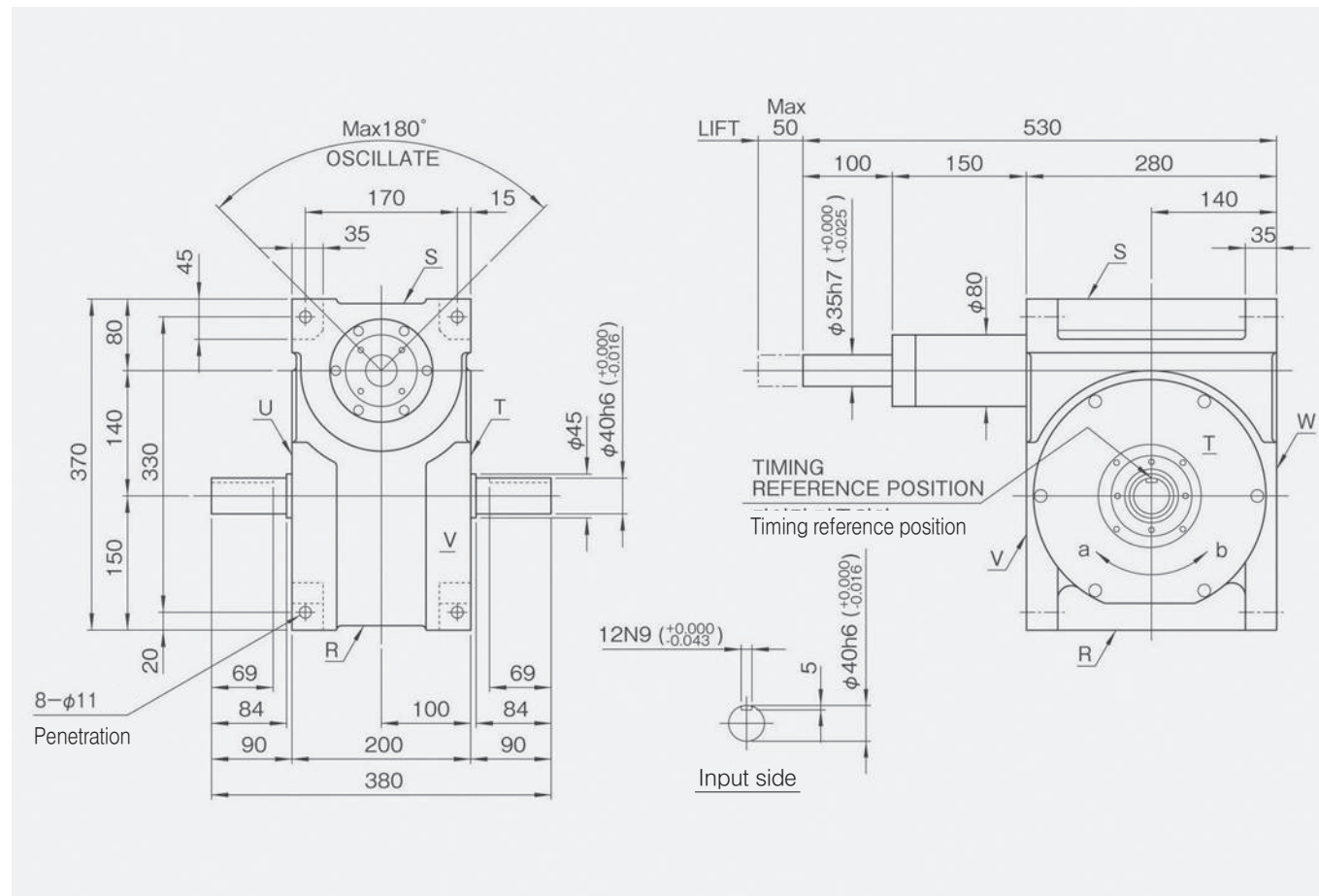
HL110(b)



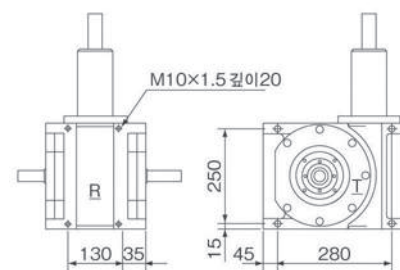
Reducer attached position



HL140 dimension



Location of attachment hole



Dimension diagram of attachment hole of R,S,T,U surface

The location of oil hole, flow meter and drain and flow depending on the position

Position	1
Location	
Oil level (t)	3.5

Attention

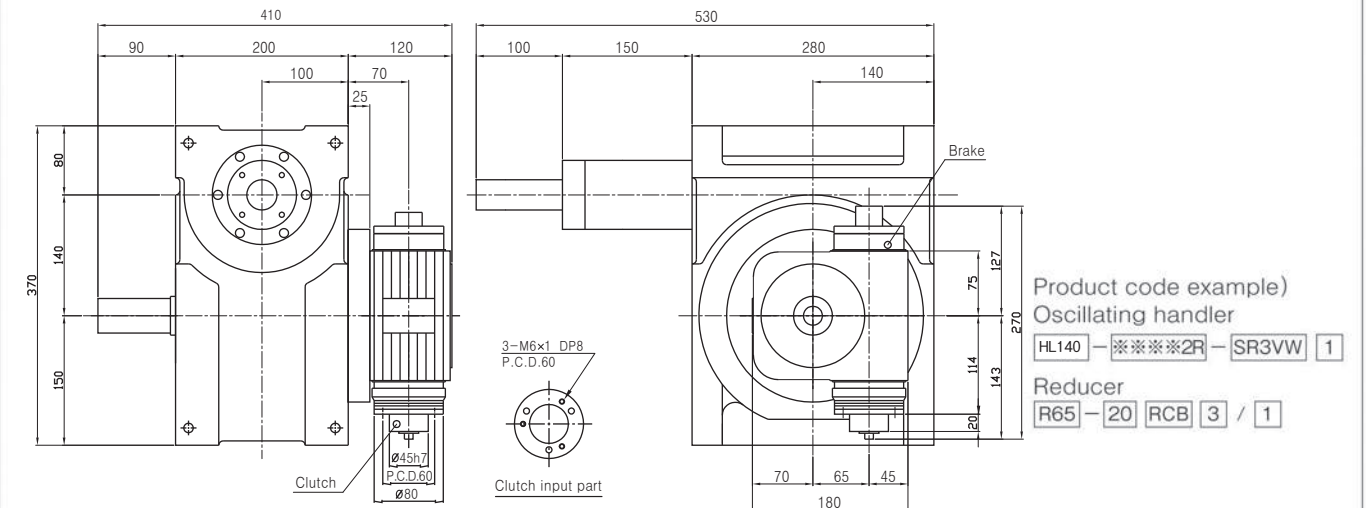
- Position is in order of oil hole, oil gage and oil drainage from the top.
- Flow changes depending on the form of cam, the number of cam followers, etc.

Characteristic table of index

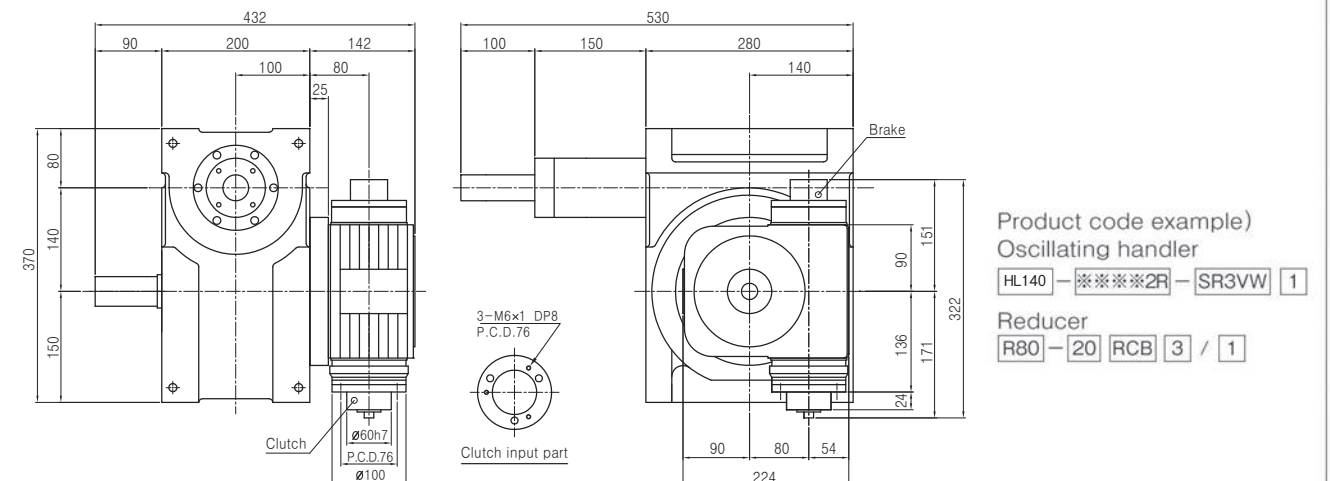
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Allowed load of output shaft	W ₀	N	Refer to the loading capacity table	Allowed THRUST load of input shaft	P ₃	N	3136	GD2 of oscillate part of output part	J ₀	kg · m ²	5.0 × 10 ⁻³
Allowed THRUST load of output shaft	P ₁	N	372.4	Maximum repeated bending force of input shaft	P ₄	N	3822	Inner load of lift part of output part	W _{a1}	N	58.8
Allowed RADIAL load of output shaft	P ₂	N	294	Maximum allowed repeated torque of input shaft	P ₅	N · m	735	Product weight		kg	135
Allowed torque of output shaft	T _s	N · m	Refer to the torque transmission table	Twisting stiffness of input shaft	K ₂	N · m / rad	1.078 × 10 ⁵				
Twisting stiffness of output shaft	K ₁	N · m / rad	2.646 × 10 ⁴	GD2 of input shaft	J ₁	kg · m ²	0.1075				

1N=0.102kgf

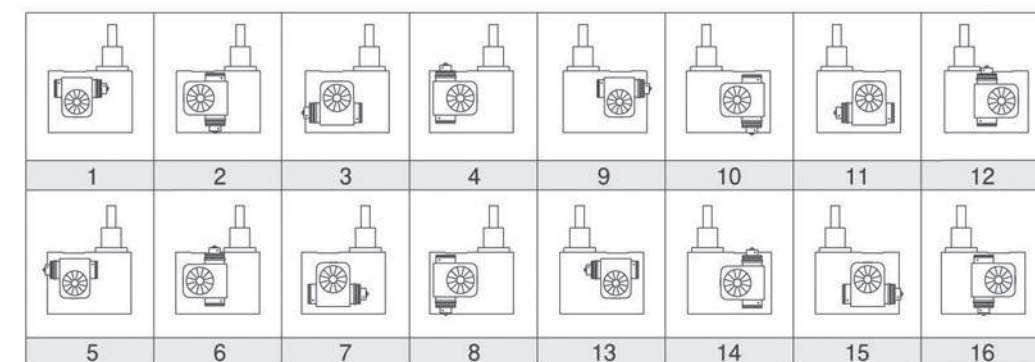
HL140(a)



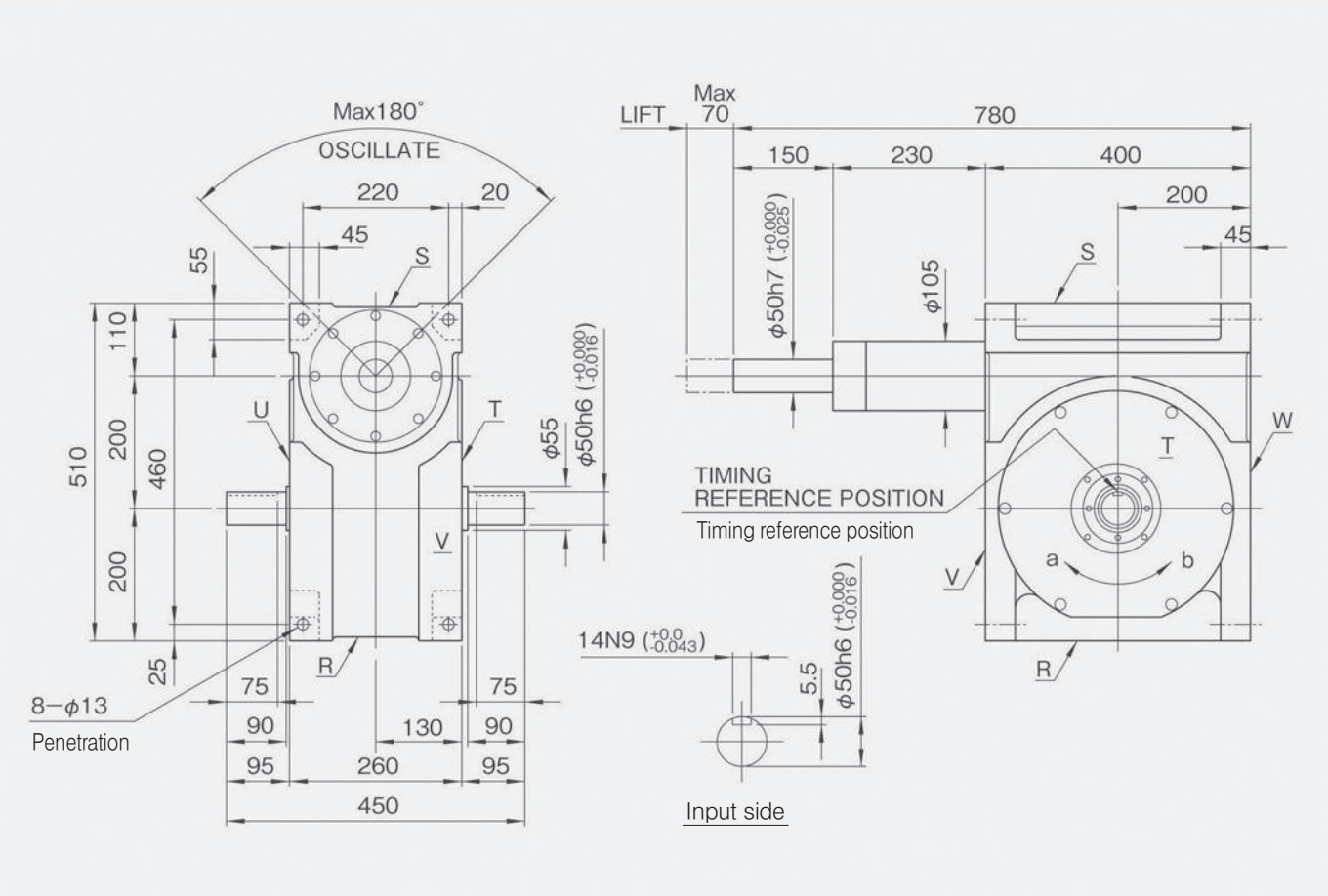
HL140(b)



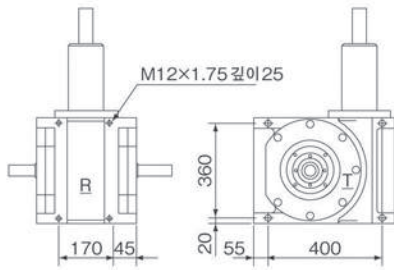
Reducer attached position



HL200 dimension



Location of attachment hole



Dimension diagram of attachment hole of R,S,T,U surface

The location of oil hole, flow meter and drain and flow depending on the position

Position	1
Location	
Oil level (t)	9

Attention

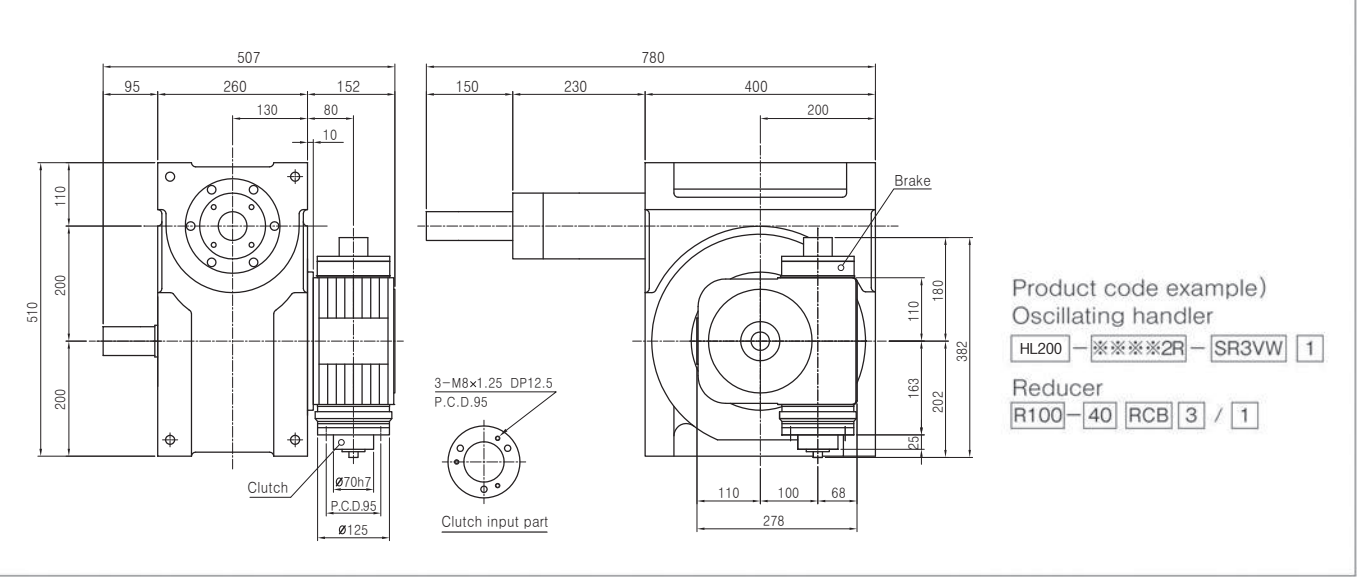
- Position is in order of oil hole, oil gage and oil drainage from the top.
- Flow changes depending on the form of cam, the number of cam followers, etc.

Characteristic table of index

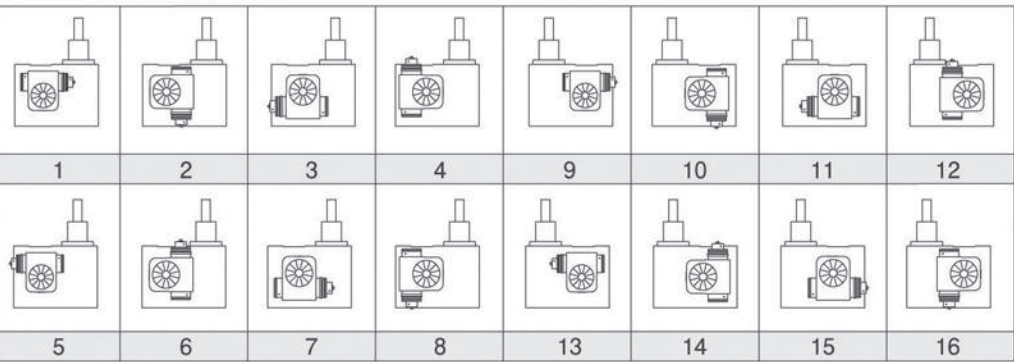
Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values	Characteristics items	Symbol	Unit	Values
Allowed load of output shaft	W ₀	N	Refer to the loading capacity table	Allowed THRUST load of input shaft	P ₃	N	4900	GD2 of oscillate part of output part	J ₀	kg · m ²	3.5 × 10 ⁻²
Allowed THRUST load of output shaft	P ₁	N	735	Maximum repeated bending force of input shaft	P ₄	N	6860	Inner load of lift part of output part	W _{a1}	N	157.8
Allowed RADIAL load of output shaft	P ₂	N	352.8	Maximum allowed repeated torque of input shaft	P ₅	N · m	1372	Product weight		kg	330
Allowed torque of output shaft	T _s	N · m	Refer to the torque transmission table	Twisting stiffness of input shaft	K ₂	N · m / rad	2.646 × 10 ⁵				
Twisting stiffness of output shaft	K ₁	N · m / rad	7.644 × 10 ⁴	GD2 of input shaft	J ₁	kg · m ²	0.365				

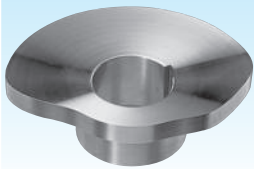
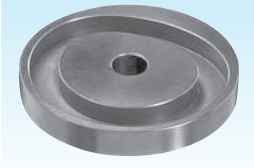
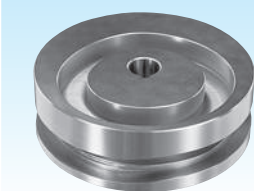
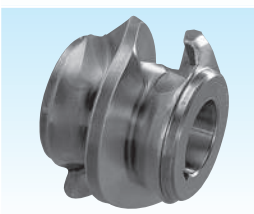
1N=0.102kgf

HL200(a)



Reducer attached position



Flat cam	This is more generally used as the representative of the plate cam. It has no problems in using it for the low speed. However, the spring is needed to prevent it since the jumping phenomenon arises to detach the cam follower from the cam surface in case of high speed driving.	
Grooved cam	Jumping is prevented since the both sides of cam groove trammels the cam follower. However, the cam follower cannot work the groove smoothly in case some available space does not exist. For this, the backlash cannot be avoided. In addition, the cam increases to compare with the flat cam.	
Cylinder grooved cam & Cylinder lib cam	The cylinder grooved cam is the cubic cam to process the cam groove at the surface side of cylinder. The jumping phenomenon doesn't arise since it is the cam of trammed type as well as the grooved cam. However, the backlash cannot be avoided. In case of the cylinder lib cam to trammel to the both surfaces of live to do two cam followers as it improve this point, the backlash is removed according to the pre-load controlling instrument and it is able to use for the weight lightening and high-speed.	
Roller gear cam	This is the best degree of cam. The backlash doesn't exist, the rigidity is high, and it is proper in the speed driving since the structure of the taper lib and cam follower is made of the structure of pre-load controlling instrument to add in the trammed type.	

⚠ Instructions of using cam

- The simple movement is made if possible.
- The most simply turret (link) is made.
- Attention on jumping of turret is required and omitting device to prevent is good.
- Rigidity of rotation increases after external diameter of cam minimizes and the shaft of cam maximizes.
- Desorption of contact material is possible
- It causes the bad effect to the output part in case of the abnormal rotation at the driving part of cam shaft.
- The cover is absolutely necessary at the rotation part for the workability and the stability.
- The contact of the contact material (C/F) set the goal of 30~60%.
- Caution on the lubrication of contact material.
- The rigidity of turret increases and the mass decreases.
- The maximum utilizing of allowed value in case of the diameter of contact material.

Custom Cam

HANNZ MOTROL CO.,LTD.

Dear Sir(Sirs)

Checking sheet on Requirement of customer for CUSTOM CAM

Name of company		Department • Person in charge	
TEL		FAX	

NO.	Checking contents	Requirement for customer and sales
1	Materialsetc	S45C, SCM440, SKA11 and etc.
2	Heat treatment	High frequency, vacuum, cementation and etc.
3	Hardness (HrC)	Hoping hardness.
4	Treatment of surface	SCHP, coloring black, plating and etc.
5	Cam curve	MT, MS, MCV50, SHP-5, MCV25, SMS-3 and etc.
6	Timing line	Please fill in the accompanying paper about the unspecified thing of drawing of customer.
7	Whether the link drawing exists or not	Direct acting turret, oscillation turret.
8	Location of timing °0	Please specify it on the drawing of customer clearly.
9	Standard of stroke	Please specify it on the drawing of customer clearly.
10	External diameter of cam follower	Please specify it on the drawing of customer clearly.
11	Direction of rotation on cam and cam follower	Please specify it on the drawing of customer clearly.
12	Whether the polishing cam is performed or not	Whether it exists or not (Please the check the process in case of processing surface.)
13	Carving, location of carving	Please carve the drawing number of HANNZ MOTROL CO.,LTD. in case of no instruction.
14	Key, tap processing	Please specify the relation of location about the cam and the timing clearly.
15	Tolerance, geometric tolerance	Please specify it on the drawing of customer clearly.
16	ETC	Please specify the special requirement and unusual case separately.



BMTRADA

CERTIFICATE OF REGISTRATION

This is to certify that

HANNZ MOTROL CO., LTD.
(Silhwa Industrial Complex 1 Na 304, Jeongwang-dong),
241, Hyeonmyeok-ro,
Siheung-si,
Gyeonggi-do,
Korea

has been audited and found to meet the requirements of standard
ISO 9001:2008 Quality Management System

Scope of certification
Manufacture and Servicing of Gear Index

Certificate number: 017431

Issue number: 2014-01

Certificate start date: 17 February 2014

Certificate expiry date: 16 February 2017

Date of initial certification: 18 February 2005

Tom Johnston

Signed on behalf of Tom Johnston
Chief Operating Officer
Central Certification Services

제 2007 - 113 호

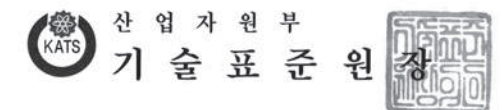
부품 · 소재 신뢰성 인증서

품 목 명 : 인텍스 테이블
 - 종류 또는 용도 : 톨러 기어 캠형 인텍스 드라이브(08DL)
 - 등급 : 신뢰수준 60%, B₁₀ 수명 1.2×10⁴시간
 [12,000시간 사용 후, 제품의 90%는 이상 없음(신뢰수준 60%)]

업 체 명 : (주)한즈모트롤
 대 표 자 : 한 형 수
 소재지(공장) : 경기도 시흥시 정왕동 1242-4
 평 가 기 준 : RS B 0115

부품 · 소재전문기업등의육성에관한특별조치법
 제25조제1항 및 동법시행규칙 제17조제3항의
 규정에 의하여 위와 같이 신뢰성 인증서를 교부
 합니다.

2007년 10월 18일





제 140601 - 00435 호

기술혁신형 중소기업(INNO-BIZ) 확인서

업 체 명 : (주)한즈 모트롤
 대 표 자 : 한형수
 주 소 : 경기 시흥시 협록로 241 (정왕동, 시화공단1나 304)
 등 급 : A
 유효기간 : 2014. 4. 21 ~ 2017. 4. 20

위 업체는 기술혁신형 중소기업 발굴 육성사업에
 의해 선정된 기술혁신형 중소기업(INNO-BIZ)임을
 확인합니다.

※ '14.06.24 : 업체명 변경에 의한 재 교부.



2014년 6월 24일

중 소 기 업 청 장

[공식번호: YxmK-FxWA-Tmoq-gagK]

[발급일자: 2014년 07월 08일]

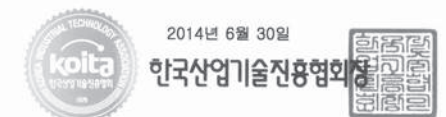
제 2014110703 호

기업부설연구소 인정서

- 연구 소 명 : (주)한즈 모트롤 기술연구소
[소속기업명: (주)한즈 모트롤]
- 소 재 지 : 경기도 시흥시 협록로 241
(정왕동, 시화공단 1나 304) 사무동 2층
- 신고 연월일: 2014년 6월 24일
(최초인정일: 2014년 2월 19일)
※ 변경내역: 상호 및 연구소명 변경

미래창조과학부

「기초연구진흥 및 기술개발지원에 관한 법률」 제14조,
 같은 법 시행령 제16조제1항 및 제27조제1항에 따라 위와
 같이 기업부설연구소로 인정합니다.



※ 한국산업기술진흥법 제45조 제1항에 따라 "http://www.rnd.or.kr"에서 "연구부설"을 입력하면 본인인증 및 위변조 여부를 확인할 수 있습니다.

It is impossible to exclude “MOTION CONTROL” for modern machinery. excellent features such as high accuracy, high speed, and high productivity can be acquired by deducting the optimized motion for each system. One of the valid ways to realize splendid motion control is to conduct guide control according to the exercise curve idealized by the method of theory of mechanics.

HANNZ MOTROL Co., Ltd. has developed its own technology, as the world renowned maker using this cam technology. “INDIXIA” is the indexing drive of the roller gear cam for which our company’s own cam technology was grafted. It has been supplied to various industries to raise the operation ratio of production line, and promote productivity realization, manpower saving.



This type was manufactured by Mr. Larry Johnson (USA), based on the sketch of Leonardo da Vinci (1452~1519), the Italian artist. This is made as a wooden type.

Note regarding safety

- Read the [instruction manual] carefullybefore using; use precisely.
 - Do not use by applying the specifications and conditions which are not described in the catalogue, instruction manual, etc.
 - You must not decompose, retype the product. Such trials may make the product stop working or cause accident.
 - All of the listed products have been thoroughly managed in terms of quality and manufactured, however, when using facilities which is expected to harm human body due to the trouble or disorder of products, and cause damages, please install safety device, protective device, etc. to prevent the occurrence of critical accident.
 - Please contact us if there’s anything uncertain regarding product selection, item to be confirmed during planning, and handling of the product, etc.
- ☞ The details written in the catalogue can be changed without any notice before making orders, so please check them again before ordering any product.

Regarding the implementation of the SI unit

- The catalogue of HANNZ MOTROL Co., Ltd. has implemented the SI unit.
- The units of kgf which were used in the catalogue before have been changed to the SI unit; part of the units were excluded and N(Newton), etc. have been used.
- The calculation formula for selecting the product type is also conversed with the SI unit, from the calculation of capacity of product specification, so that please check once again before selecting the product type.

Le Systeme International d'Unites SI

1) Basic Unit

量	Designation	Sign
Length	Meter	m
Mass	Kilogram	kg
Time	Second	s
Current	Ampere	A

2) Supplementary Unit

量	Designation	Sign
Plain angle	Radian	rad
Solid angle	Steradian	sr

3) Example of assembly unit deducted from the basic unit

量	Designation	Sign
Area	Square meters	m ²
Volume	Cubic meters	m ³
Velocity	Meter/Second	m/s
Acceleration	Meter/Second(2)	m/s ²
Wave		m ⁻¹
Density	Kg/Cubic meters	kg/m ³

4) Change to the SI unit

	N	dyn	kgf
	1	1 × 10 ⁵	1.019 72 × 10 ⁻¹
	1 × 10 ⁻⁵	1	1.019 72 × 10 ⁻⁶
Power	9.806 65	9.806 65 × 10 ⁵	1



304, 1 Na 241, Hyupryeok ro, Siheung si, Gyeonggi do, Republic of Korea (Jeongwang dong, Sihwa Industrial Complex)
PHONE:82-31-499-4054 • FAX:82-31-499-4056
E-MAIL:hannzmotrol@hannzmotrol.com
Homepage:http://www.hannzmotrol.com



Subsidiary

- Company Name: Hanshin Co., Ltd. www.hanshin-fa.co.kr
- Head office • Factory: 712 3 Da, Beonan gil 3, 260, Gongdan 1 dae ro, Siheung si, Gyeonggi do (Jeongwang dong, Sihwa Industrial Complex)

TEL: (031)499-9720~5
FAX: (031)499-9726(Manufacturing),
(031)497-2944(Supporting team)
- Company Name: Hansan Co., Ltd. www.hansan-pf.co.kr
- Head office • Factory: 816 3 Ra, Mayoo ro 118st street, Siheung si, Gyeonggi do (Jeongwang dong, Sihwa Industrial Complex)

TEL: (031)499-2929
FAX: (031)499-2933

- Company Name: Hanshin Busan Co., Ltd. www.hanshinfeeder.co.kr
- Head office • Factory: 341 23, Daejeo 2 dong, Gangseo gu, Busan

TEL: (051)973-6084
FAX: (051)973-6086
- Company Name: HANSHIN BFC CHINA CO.,LTD
- Address: NO.1155 Jin Yu RD, Song Jiang Area, Shanghai, China

TEL: 021-57781302
FAX: 021-57782216