“전기안전, 고객의 안전을 성호가 책임지겠습니다.”

대한민국 최초

모든 스위치 단자부에 안전커버를 부착한 안전스위치입니다.

(당사는 환경을 위하여 볼트 및 프레스류는 3가도금으로 처리 하였습니다.)

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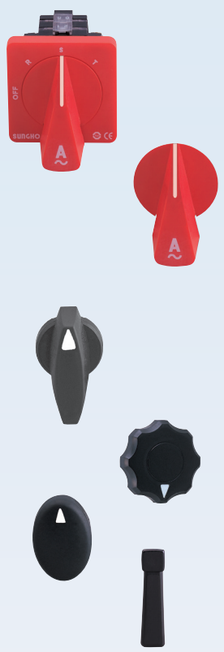
GENERAL CONTENTS

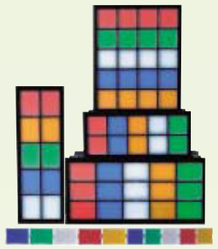
스위치 Switches

6 캠스위치 CAM Switches



조작 및 신호 Control and Signaling

42 집합표시등 Square Light



47 ϕ22-25겸용 PG Serise
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- 눌름버튼스위치
- 표시등
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- 비상정지눌름버튼 스위치

58 ϕ25-30용 PR Serise
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69
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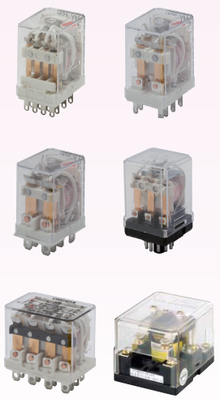
78 제어용릴레이 Industrial Relays



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100 아날로그타이머 Analogue Timers
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112 수위조절기 Floatless Level Switches

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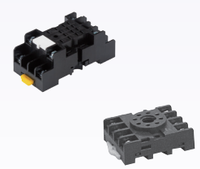
기타 장치 Others

172 단자대 Terminal Blocks

207 휴즈홀더 Fuse Holders

210 소켓 Socket



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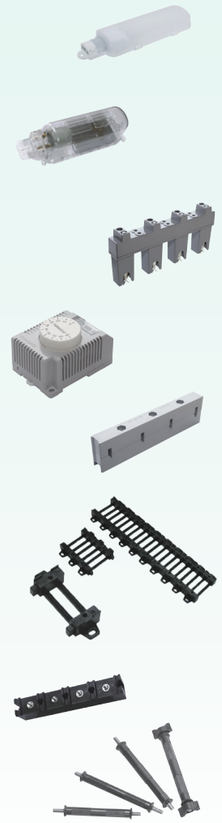
215
- LED 램프
- 직부등
- MCC 1st Connector
- 스페이스히터용 온도조절기
- BUS bar Supporting Insulator
- ELB 지지대
- 부스바 지지대
- P-cover Bolt



Rotary Cam Switches

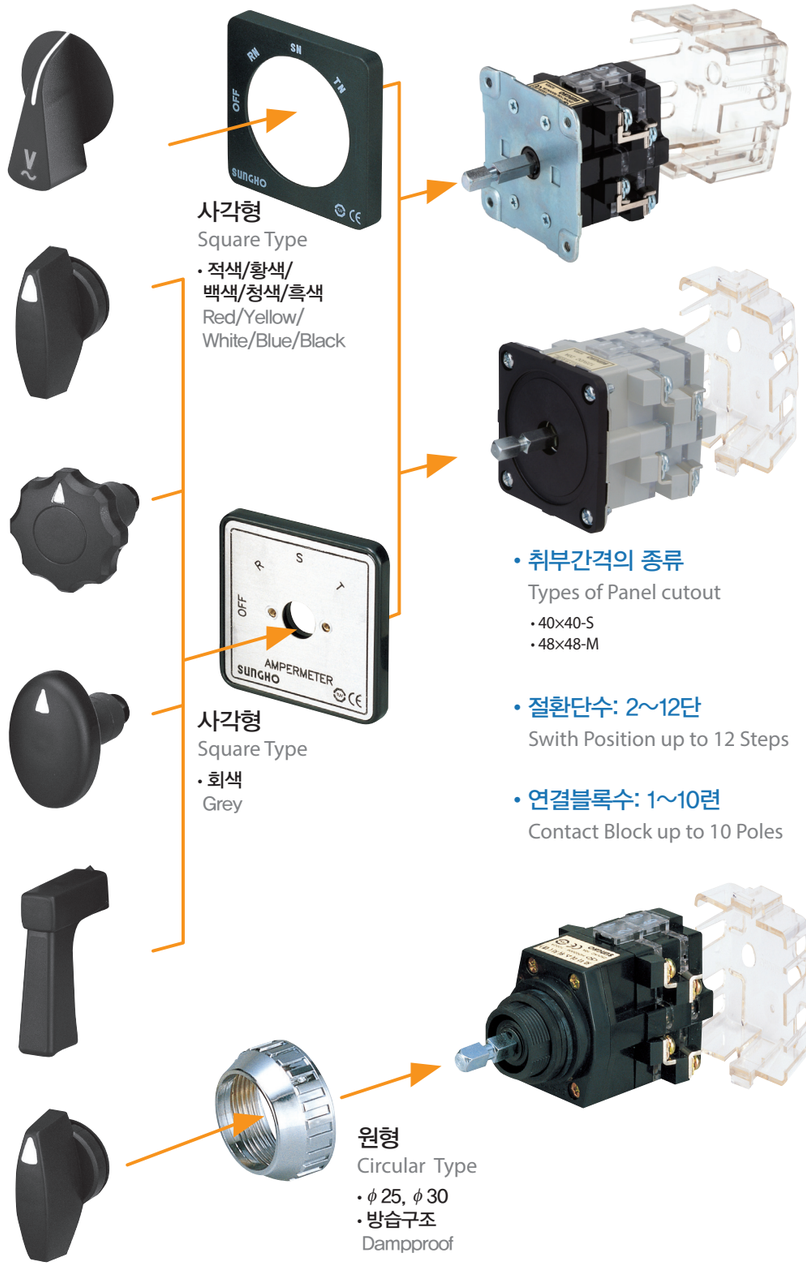
캠 스위치

캠 스위치 ROTARY CAM SWITCHES

한국전기연구원 개발 시험합격

- 단자보호카바 장착형으로 안전합니다.
- 전면조각은 소비자가 원하는 사양대로 가능합니다.

핸들의 종류 Type of Handles	표시판의 종류 Types of Front Plates	접점블록 Base/Contact Block
유럽형 ET Type • 적색/백색/흑색 Red/White/Black		
지침형 Compass Type • 흑색 Black		
국화형 Chrysanthemum Type • 흑색 Black		
계란형 Egg Type • 흑색 Black		
지팡이형 Pistol Type • 흑색 Black		
방습형 Damp proof Type • 흑색 Black		



유럽형
SHCS-ET Type

주문형식 Catalog No. structure
(Ordering information)

S	H	C	S	E	T	R	R	9	M	M	—	A	3	3	2	—	

- SungHo
- 캠스위치 CAM Switch
- 유럽형 European style
- 핸들색상 Handle color
- 표시판색상 Front plate
- 절환각도 Transfer angle: 3 : 30˚, 4 : 45˚, 6 : 60˚, 9 : 90˚
- 취부간격 Panel Cutout
- 핸들복귀방식 Handle return method: M : 수동식, A : 자동식, R : 당겨서 돌리고 자동으로 복귀
- 접점블록종류 Base/contact block
- 없음, 20 : DC150V 20A, 30 : AC220V 30A
- • 전면구조 Type of head

핸들종류 Operating head	핸들색상 Color handle	표시판색상 Front plate	형식 Type of head
유럽형 표준핸들 (수동복귀식) Compass with square plate stay-put	적색 Red	적색 Red	SHCS–ETR
	황색 Yellow	황색 Yellow	SHCS–ETY
	백색 White	백색 White	SHCS–ETW
	청색 Navy blue	청색 Navy blue	SHCS–ETN
	흑색 Black	흑색 Black	SHCS–ETB
유럽형 지팡이 핸들 (자동복귀식) Stick with square plate spring return	흑색 Black	흑색 Black SHCS–ETB SHCS–ETR	2단 중앙복귀식 Spring return to center

Code	Panel Cutout
S	40×40
M	48×48

Code	Description
A332	3φ 3W 2CT
A333	3φ 3W 3CT
A343	3φ 4W 3CT
V332	3φ 3W 2PT
V333	3φ 3W 3PT
V343	3φ 4W 3PT
24FR2	단상4극 정역스위치
40IS	운전선택형산업기계용
40FR	4극 정역스위치
40S	ON/OFF스위치
24FR	단상4극 정역스위치
48S	4P/8P극 전환스위치

표준회로의 예는 위와 같으며
상세회로도는 18 page부터 참조.
See page 18 for selection

SHCS–ETB–M–CS 기본형	
SHCS–ETB–M–CSP 당긴 후 조작 Pull to swing	

접점블록, Base/contact block

절환단수: 2~12단
Switch position up to 12 steps

핸들절환각도
Switching angle of the handle for each step

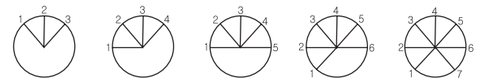
2~7단: 45도
45 degrees up to 7 step-switch

8~12단: 30도
30 degrees from 8 to 12 step-switch

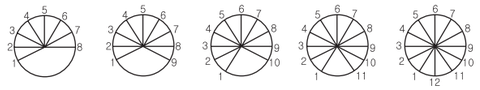
연결블록수: 1~10련
Contact block up to 10 poles

복귀방법: 수동복귀식
Stay-put operation as standard

• 45˚



• 30˚



복귀방법 및 핸들절환 각도는 주문에 따라 변경이 가능합니다. (17page참조)
Switches with spring return and other angles are avlaibale on request. See 17 pages

기본형
SHCS-SH Type

주문형식 Catalog No. structure
(Ordering information)

H	S C S	S H	B	—	M	—	A 3 3 2	—	■
SungHo	캠스위치 CAM Switch	핸들종류 Handle type	핸들색상 Handle color		취부간격 Panel Cutout		접점블록종류 Base/contact block		20 : DC150V 20A 30 : AC220V 30A

• 전면구조
Type of head

핸들종류 Operating head	핸들색상 Color handle	표시판색상 Front plate	형식 Type of head
지침형 Compass with square plate	흑색 Black	회색 Grey	SHCS–SHB
국화형 Chrysanthemum with square plate	흑색 Black	회색 Grey	SHCS–SRB
계란형 Egg with square plate	흑색 Black	회색 Grey	SHCS–SEB

Code	Panel Cutout
S	40×40
M	48×48

Code	Description
A332	3ϕ 3W 2CT
A333	3ϕ 3W 3CT
A343	3ϕ 4W 3CT
V332	3ϕ 3W 2PT
V333	3ϕ 3W 3PT
V343	3ϕ 4W 3PT
24FR2	단상4극 정역스위치
40IS	운전선택형산업기계용
40FR	4극 정역스위치
40S	ON/OFF스위치
24FR	단상4극 정역스위치
48S	4P/8P극 전환스위치

표준회로의 예는 아래와 같으며 상세회로도는 18 page부터 참조 바랍니다.
See page 18 for selection

지팡이형 (자동복귀식)	흑색 Black	회색 Grey	2단중앙복귀식 Spring return to center	SHCS–SHB–M–CS 기본형
Stick with square plate spring return		SHCS–SPB SHCS–CSP		SHCS–SHB–M–CSP 당긴후조작 Pull to swing

접점블록, Base/contact block

절환단수: 2~12단
Switch position up to 12 steps

핸들절환각도
Switching angle of the handle for each step

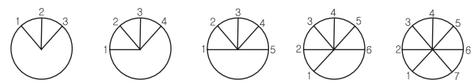
2~7단: 45도
45 degrees up to 7 step-switch

8~12단: 30도
30 degrees from 8 to 12 step-switch

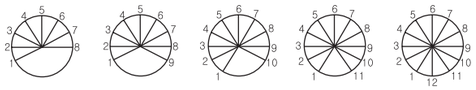
연결블록수: 1~10련
Contact block up to 10 poles

복귀방법: 수동복귀식
Stay-put operation as standard

• 45˚



• 30˚



복귀방법 및 핸들절환 각도는 주문에 따라 변경이 가능합니다. (17 page참조)
Switches with spring return and other angles are avlaibale on request. See 17 pages

방습형
Dampproof

주문형식 Catalog No. structure
(Ordering information)

S H	C S	2 H	B	—	2 1 0 1	—	■
SungHo	캠스위치 CAM Switch	외형치수 Shape dimension	핸들색상 Handle color		접점블록종류 Base/contact block		20 : DC150V 20A 30 : AC220V 30A

핸들
head

• 전면구조
Type of head

핸들종류 Operating head	핸들색상 Color handle	표시판색상 Front plate	형식 Type of head
방습형구조 지침형핸들 Dampproof type with compass handle	흑색 Black	ϕ 25mm Black	SHCS–2HB
		ϕ 30mm	SHCS–3HB

접점블록종류
Base/contact block

상세회로도는 19 page 참조바랍니다.
See page 19 for selection

접점블록, Base/contact block

절환단수: 2~12단
Switch position up to 12 steps

핸들절환각도
Switching angle of the handle for each step

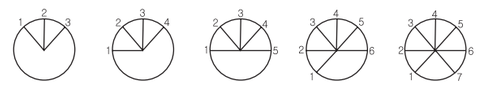
2~7단: 45도
45 degrees up to 7 step-switch

8~12단: 30도
30 degrees from 8 to 12 step-switch

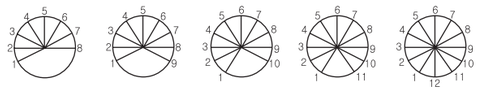
연결블록수: 1~10련
Contact block up to 10 poles

복귀방법: 수동복귀식
Stay-put operation as standard

• 45˚



• 30˚



복귀방법 및 핸들절환각도는 주문에 따라 변경이 가능합니다. (17 page참조)
Switches with spring return and other angles are avlaibale on request. See 17 pages

정격 및 성능 Characteristics

특징
Features

- 엄격한 실험을 통하여 획득한 한국전기연구원 개발시험 합격 및 CE, 안전인증으로 우수성이 인정되었습니다
- 회로의 다양화로 산업용 개폐장치의 용도에 맞게 설계되었습니다.
- 자동개폐기 조작과 각종 전기회로의 절환장치로 사용하기 편리합니다.
- 전류 및 전압등 계기류에 사용되는 제품은 기본품으로 공급하고 있습니다.
- 표준화된 회로에 따라 엄격한 실험과 철저한 품질관리로 제품품질을 향상시켰습니다.
- 사용자의 용도에 맞게 접점 Unit의 단수와 조작용 핸들을 선택 주문 하실 수 있습니다.
- 사각형(40×40, 48×48)과 원형(ϕ25, ϕ30)으로 Panel 부착형입니다.
- 유럽형 핸들은 고정주문시 색상을 자유롭게 선택할수 있습니다.
- 접점 정격이 기본형은 10A이며 250VAC 20A/30A, 125VDC 20A인 캠스위치는 주문에 의하여 제작합니다
- 접점수명은 사용빈도수와 부하조건에 따라 변할 수 있습니다.
- Approved the excellence by qualified CE, TUV standards through rigid test.
- With various circuit formation, designed for industrial switchgear use.
- Convenientusing for transfer of each electrical circuit for autoon-off control machines.
- Support the basis productusing in dustrial instruments like a voltage, current.
- Improved production quality according to rigid-managemen to fquality system and strictttesting by standardization circuit.
- Usercan select stage-number of contactunit, and operating handle of user's choice.
- It is sticked panel form of square and circle(ϕ25, ϕ30).
- User can selectany color of europe-type handle in case of regular order.

접점용량
Contact ratings

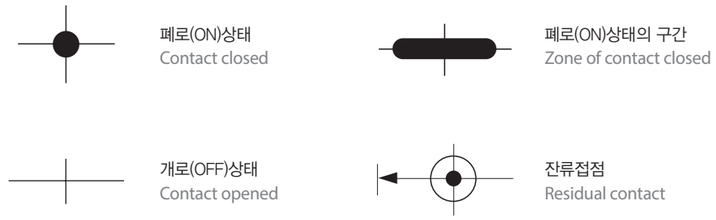
접점통전전류 (일반형) *Rated thermal current*						
10A	AC	정격전압 *Rated voltage*		250V	440V
		정격전류 *Rated current*	저항부하 *Rated load*	10A	6A
			유도부하 *Inductive load*	3A	1.5A
	DC	정격전압 *Rated voltage*		125V	250V
		정격전류 *Rated current*	저항부하 *Rated load*	4.4A	2.5A
			유도부하 *Inductive load*	0.75A	0.5A
20A	AC	정격전압 *Rated voltage*		250V	440V
		정격전류 Rated current	저항부하 *Rated load*	20A	12A
			유도부하 *Inductive load*	6A	3A
	DC	정격전압 *Rated voltage*		125V	250V
		정격전류 *Rated current*	저항부하 *Rated load*	8.5A	5A
			유도부하 *Inductive load*	1.5A	1A
30A	AC	정격전압 *Rated voltage*		250V	440V
			저항부하 *Rated load*	30A	15A
			유도부하 *Inductive load*	10A	5A
	DC	정격전압 *Rated voltage*		125V	250V
			저항부하 *Rated load*	8.8A	5A
			유도부하 *Inductive load*	2.1A	1.2A
20A	DC	정격전압 *Rated voltage*		125V	220V
		정격전류 *Rated current*	저항부하 *Rated load*	20A	10A
			유도부하 *Inductive load*	3.5A	2A

기타특성
Other characteristics

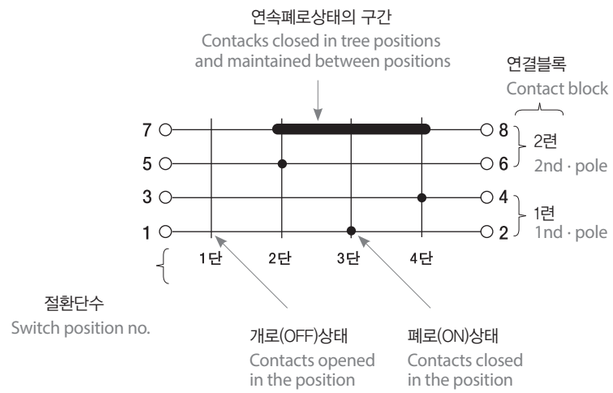
수명	전기적 *Electrical*	10만회 이상 *0.1mil. operations*
	기계적 *Mechanical*	50만회 이상 *0.5mil. operations*
접촉저항 *Contact resistance*		20mΩ(초기치) *Max. 20mΩ*
절연저항 *Insulation resistance*		100mΩ 이상(DC500V MΩ 절연저항계) *Min.100mΩ at DC500V*
내전압 *Dielectric strength*		AC 1,500V 50/60Hz 1Min
내진동 *Vibration protection*		10~55Hz 복진폭 1.5mm
내충격 *Mechanicalshook protection*		30m/S(약 30G)
사용주위온도 *Ambient temperature*		−20℃~+70℃
작동에 필요한 힘 *Handle operating force*		약 600g *About 0.6kgf*

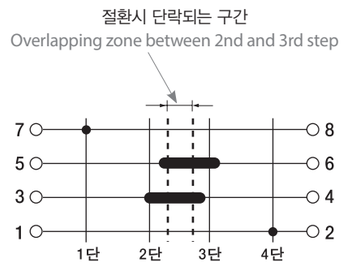
접점기호 및 동작설명 Symbols in switching programs

접점기호
Contact symbols

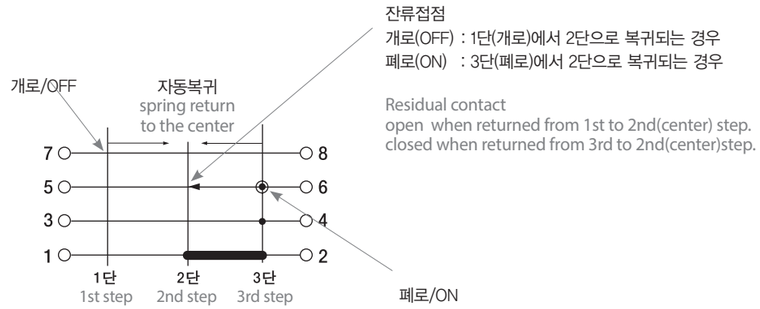


동작설명(예)
Examples of switching programs





2단과 3단간 핸들 절환시 폐로(ON)가 중복되는 구간을 갖는 구조의 회로입니다. 즉, 3~4번 단자와 5~6번 단자는 2단과 3단 사이에 순간적으로 동시에 폐로(ON) 상태가 됩니다.

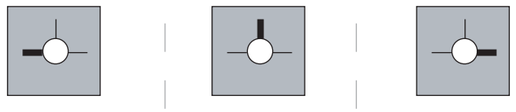


핸들위치와 구조설명 Example of operation

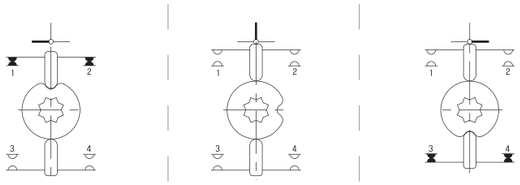
90도 3단의 예
Switching angle 90°
Switch position 3 steps

회로전개도
Switching program

핸들위치
Handle position



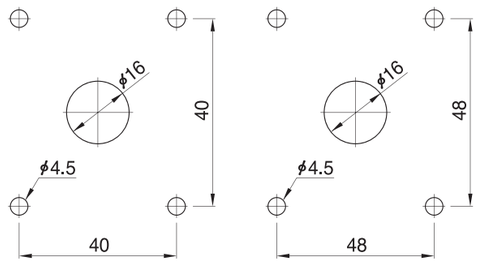
접점과 캠의 동작
Contact block operation



판넬가공치수 Panel cutout

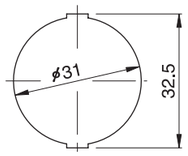
유럽형 및 기본형
SHCS-ETB-S type
SHCS-SHB-S type

SHCS-ETB-M type
SHCS-SHB-M type



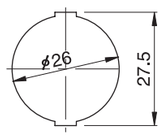
방습형
Dampproof type

SHCS–3HB



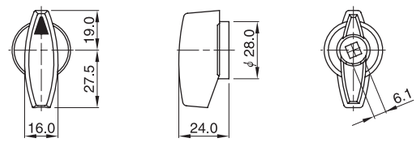
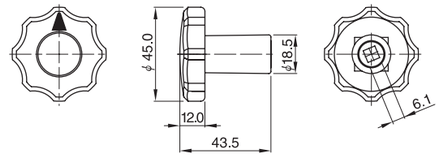
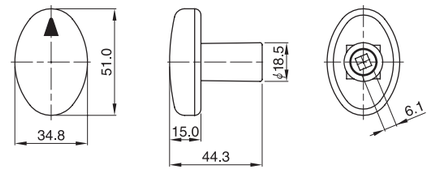
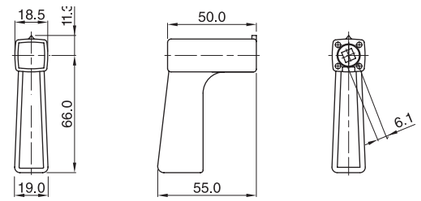
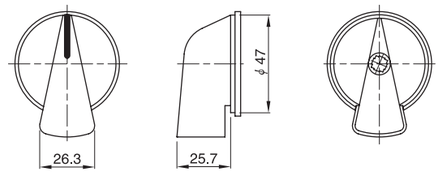
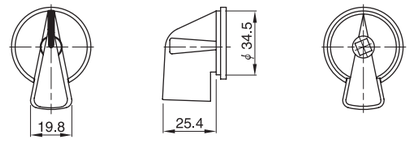
ϕ30

SHCS–2HB



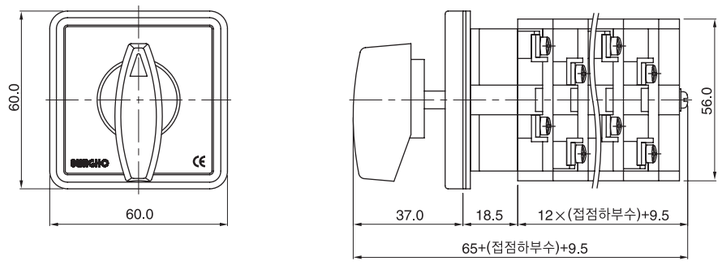
ϕ25

핸들치수 Handle dimensions

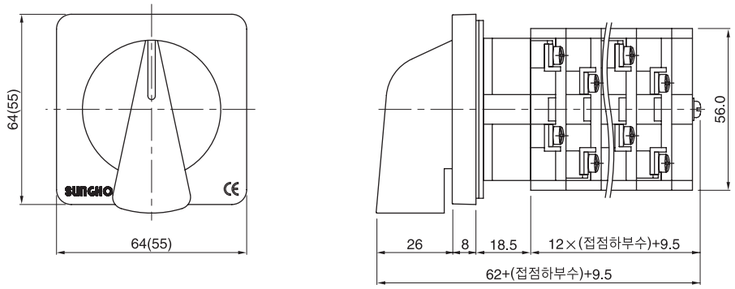
핸들종류 Handle Type		외형치수 Dimension
지침형 Compass type		
국화형 Chrysanthemum type		
계란형 Egg type		
지팡이형 Pistol type		
유럽형 48×48 European style Et 48×48 type		
유럽형 40×40 European style Et 40×40 type		

외형치수 Dimensions

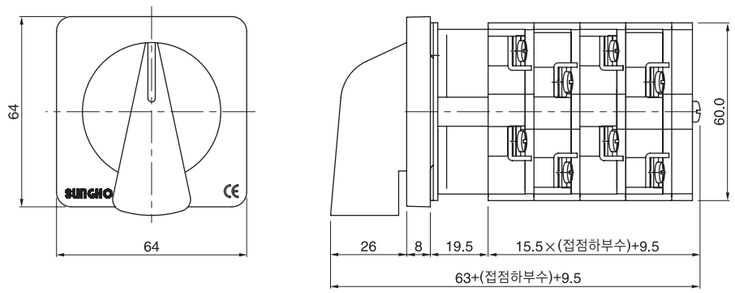
기본형(Standard type)
(600VAC 3A, 600VAC 6A)
SHCS-S type



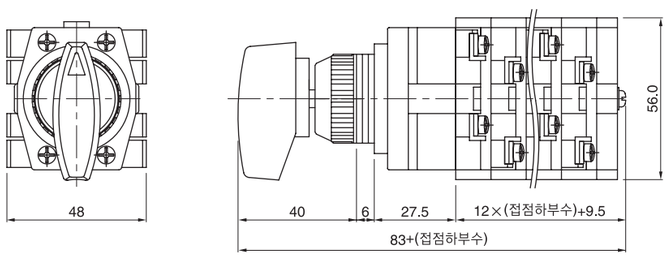
유럽형(European type)
(600VAC 3A, 600VAC 6A)
SHCS-ET type



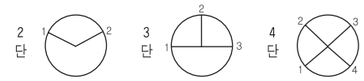
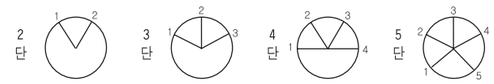
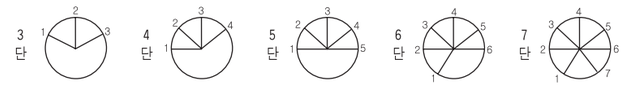
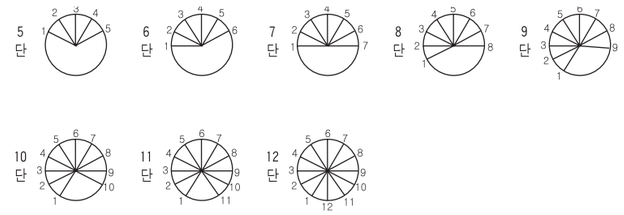
유럽형(European type)
(600VAC 10A, 125VDC 20A)
(220VAC 30A)
SHCS-ET type



방습형(Damp proof type)
(600VAC 3A, 600VAC 6A)
SHCS-S type



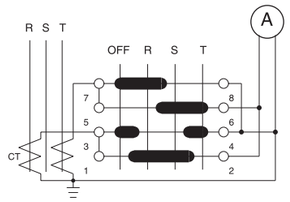
핸들절환각도의 종류 Switching angle of the handle

수동복귀식 90˚ Manual return	90˚	
	60˚	
	45˚	
	30˚	
자동복귀식 Spring return	45˚	1, 2단에서 중앙으로 자동복귀 Spring return to center
		중앙에서 당긴 후 1, 2단으로 조작 1, 2단에서는 중앙으로 자동복귀 Pull to swing to step 1 or 2 from center Spring return to center
혼합복귀식 Mixecl return		1단에서 2단 : 자동복귀 3단에서 2단 : 수동복귀 Spring return from 1st to 2nd only
		1단에서 2단 : 수동복귀 3단에서 2단 : 자동복귀 Spring return from 3rd to 2nd only
		1단에서 2단 : 자동복귀 기타는 수동복귀 Spring return from 1st to 2nd only
		4단에서 3단 : 자동복귀 기타는 수동복귀 Spring return from 4th to 3rd only

접점블록회로도 Base/contact block

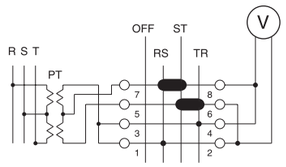
Code : A332

3ϕ 3W 2CT



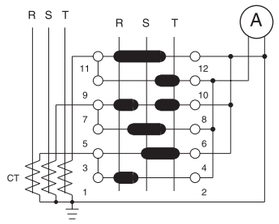
Code : V332

3ϕ 3W 2PT



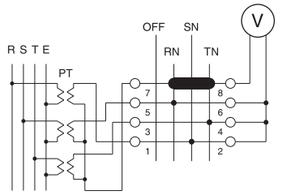
Code : A333

3ϕ 3W 3CT



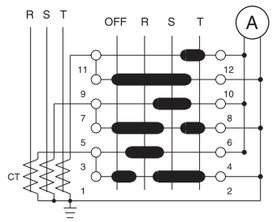
Code : V333

3ϕ 3W 3PT



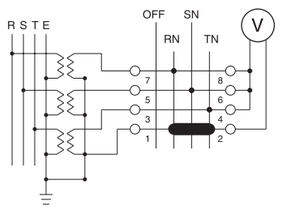
Code : A343

3ϕ 4W 3CT



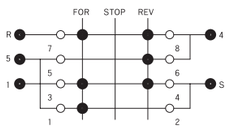
Code : V343

3ϕ 4W 3PT



Code : 24FR2

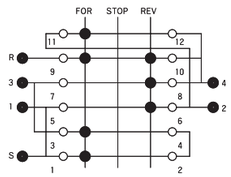
단상 4P 정역스위치



• 용도 : 단상전동기 220V 정역에서만 사용

Code : 24FR

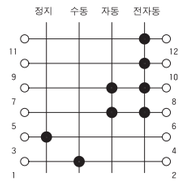
단상 4P 정역스위치



• 용도 : 단상전동기 110/220V 겸용

운전선택형 산업기계용 Code : 40IS

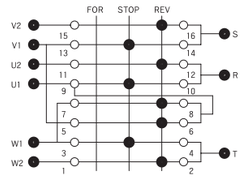
단상 4P 정역스위치



• 용도 : 산업기계, 사출기

Code : 48S

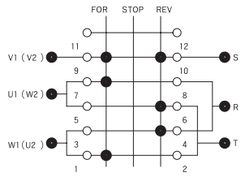
4P, 8P 극전환스위치



• 용도 : 삼상전동기 극전환 및 좌우회전용

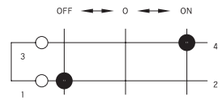
Code : 40FR

4P 정역스위치



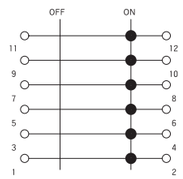
• 용도 : 삼상전동기 극전환 및 좌우회전용

Code : CS



Code : 40S

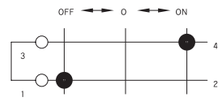
단상 4P 정역스위치



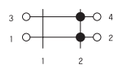
• 용도 : 단상, 삼상 ON, OFF용

Code : CSP

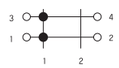
핸들걸림식



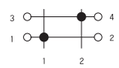
Code : 2101



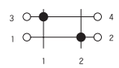
Code : 2102



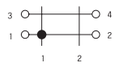
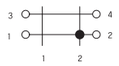
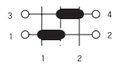
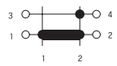
Code : 2103



Code : 2104



접점블록회로도 Base/contact block

Code : 2105	Code : 2106	Code : 2107	Code : 2108
			

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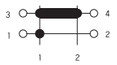	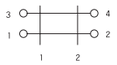	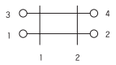	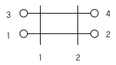

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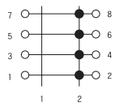	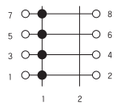	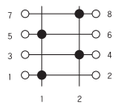	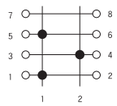

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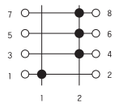
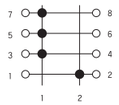
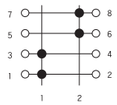
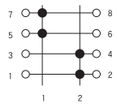
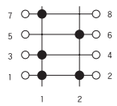
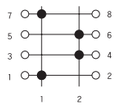
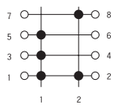
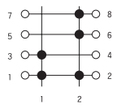
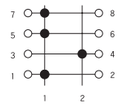
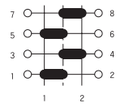
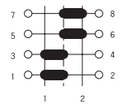
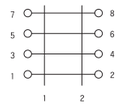
			

Code : 2209	Code : 2210	Code : 2211	Code : 2212
			

Code : 2213	Code : 2214	Code : 2215	
			

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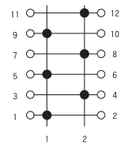	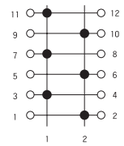	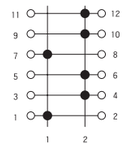	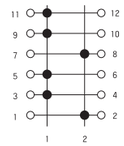

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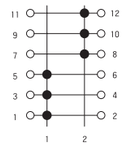
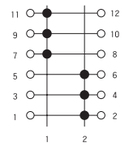
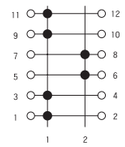
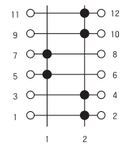
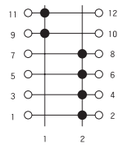
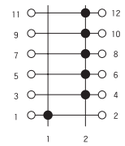
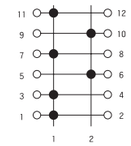
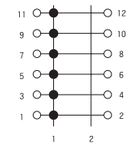
			

Code : 2309	Code : 2310	Code : 2311	Code : 2312
			

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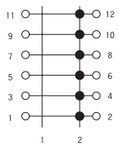
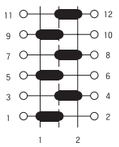
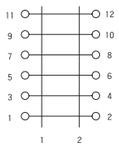
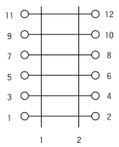
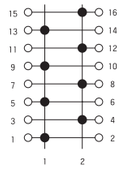
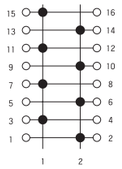
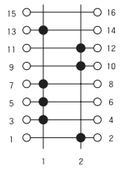
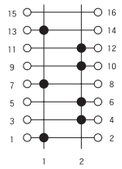
			

접점블록회로도 Base/contact block

Code : 2401	Code : 2402	Code : 2403	Code : 2404
			

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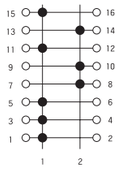
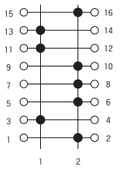
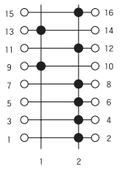
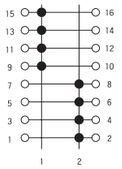
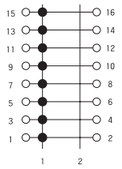
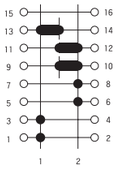
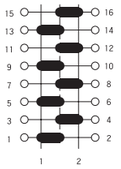
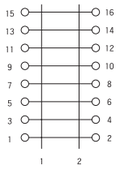
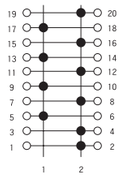
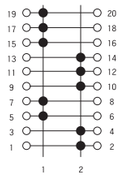
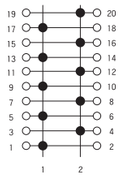
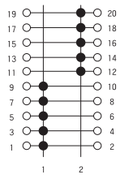
			

Code : 2409	Code : 2410	Code : 2411	
			

Code : 2501	Code : 2502	Code : 2503	Code : 2504
			

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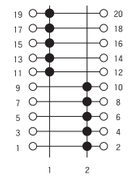	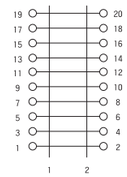	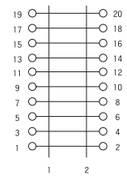	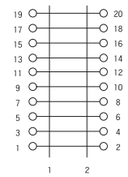

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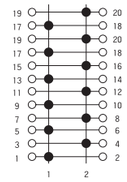	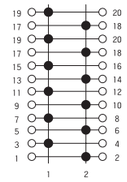	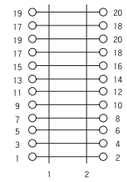	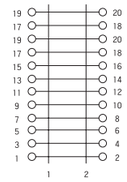

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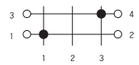	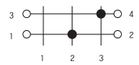	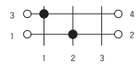	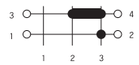

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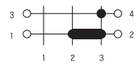	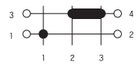	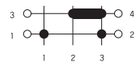	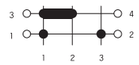

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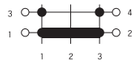	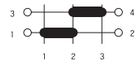		

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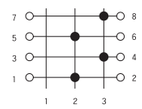	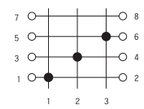	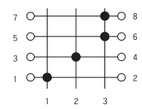	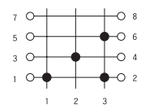

접점블록회로도 Base/contact block

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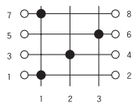	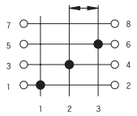	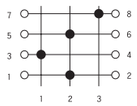	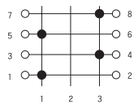

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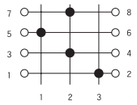	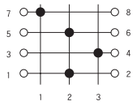	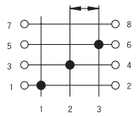	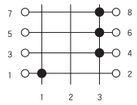

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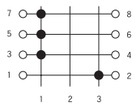	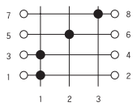	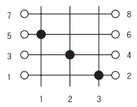	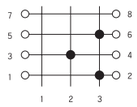

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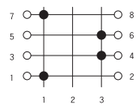	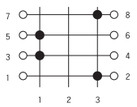	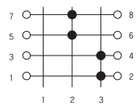	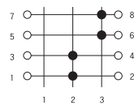

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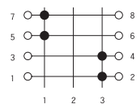	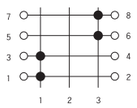	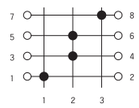	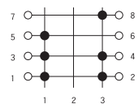

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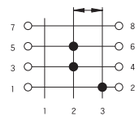	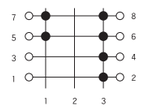	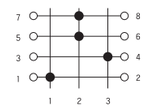	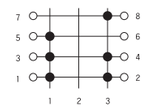

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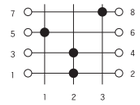	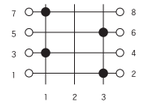	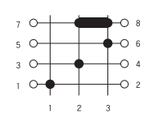	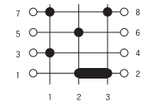

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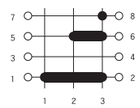	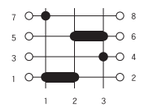	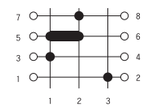	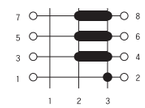

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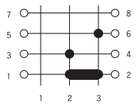	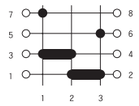	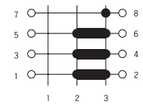	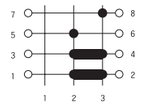

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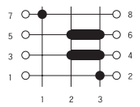	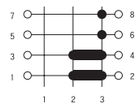	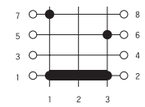	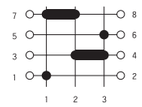

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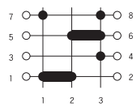	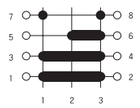	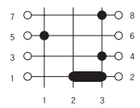	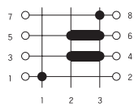

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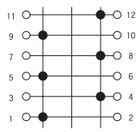	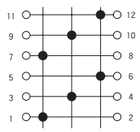	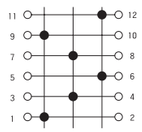	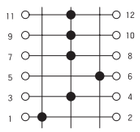

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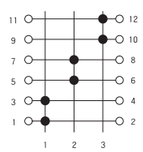	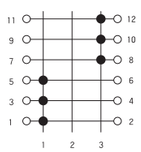	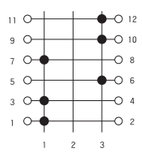	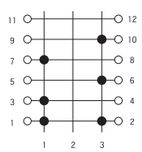

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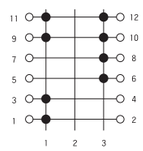	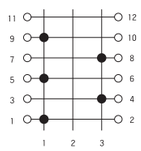	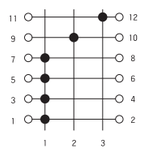	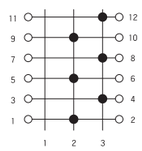

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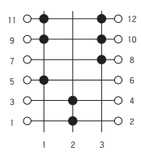	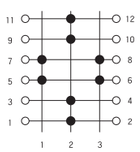	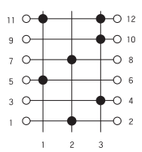	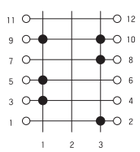

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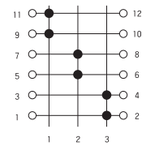	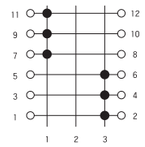	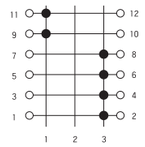	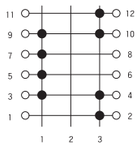

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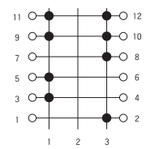	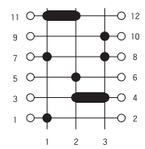	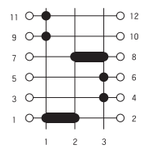	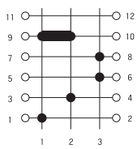

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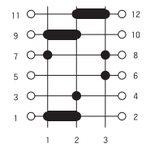	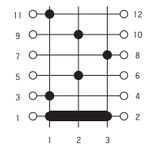	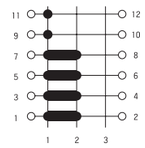	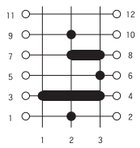

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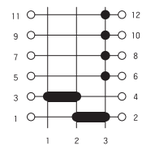	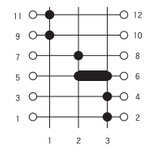	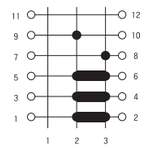	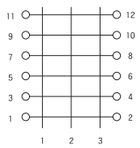

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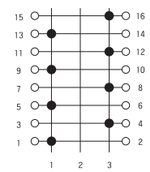	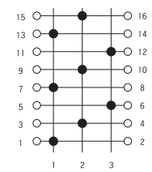	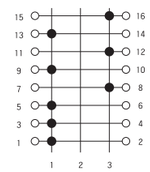	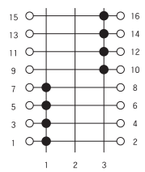

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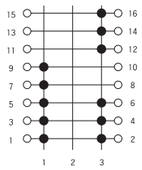	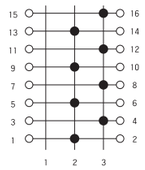	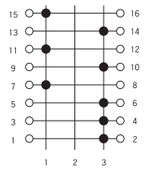	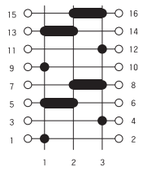

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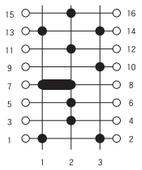	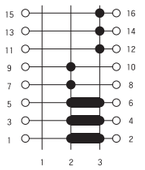	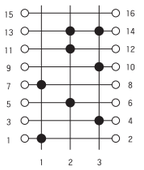	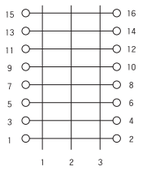

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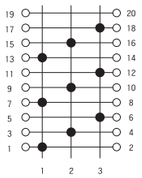	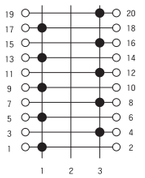	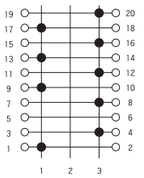	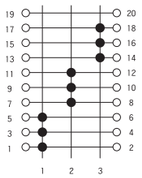

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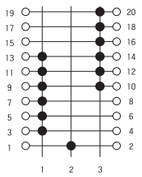	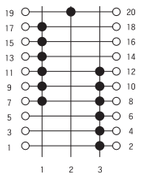	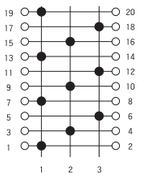	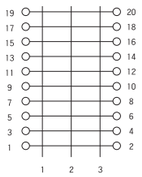

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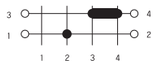	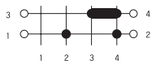	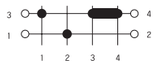	

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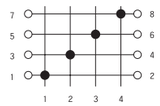	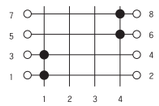	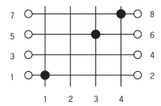	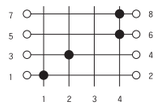

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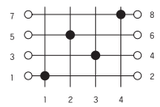	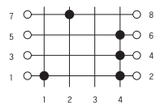	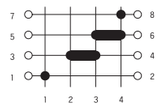	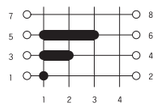

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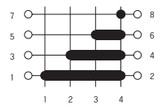	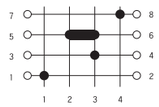	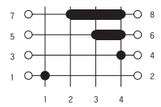	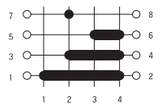

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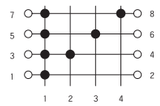	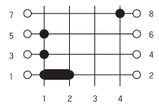	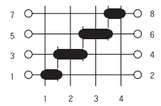	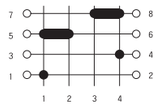

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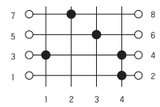
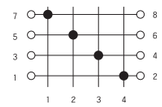
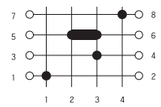
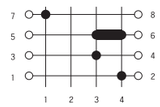
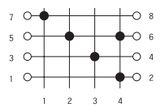
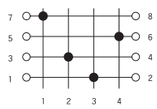
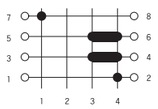
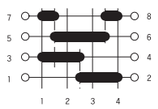
			

접점블록회로도 Base/contact block

Code : 4221	Code : 4222	Code : 4223	Code : 4224
			

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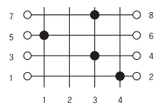	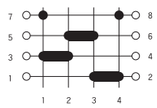	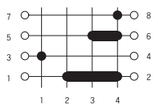	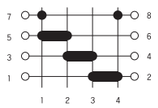

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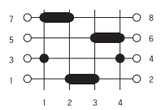	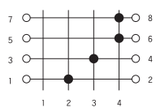	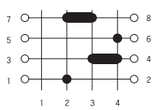	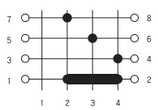

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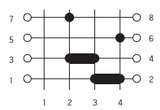	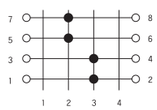	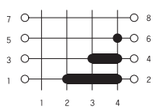	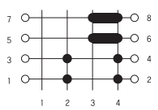

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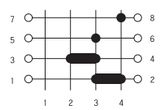	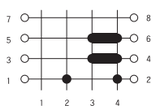	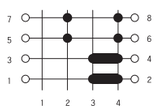	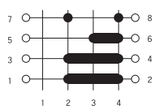

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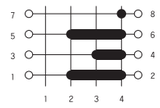	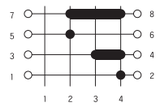	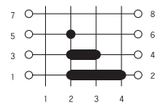	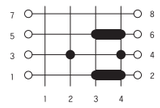

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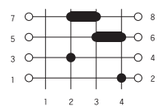	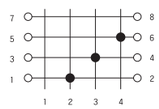	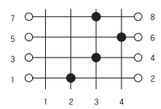	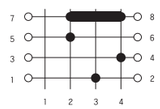

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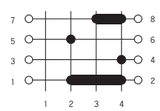	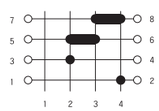	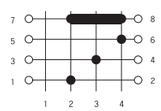	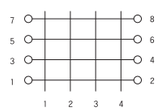

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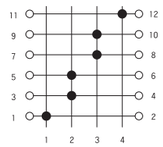	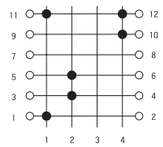	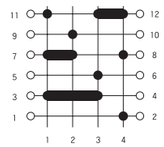	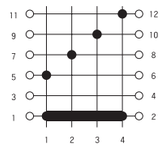

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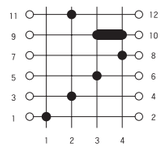	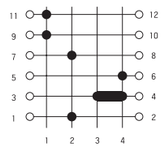	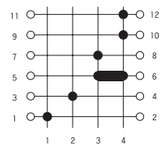	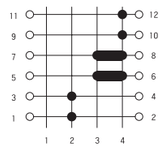

접점블록회로도 Base/contact block

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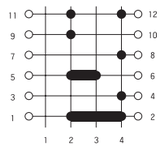

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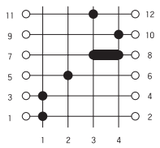

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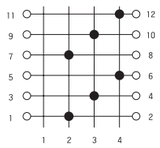

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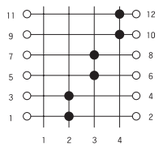

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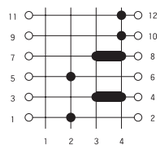

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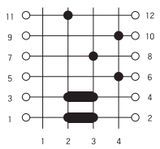

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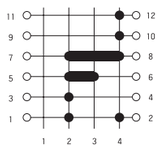

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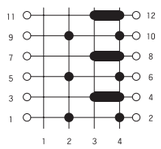

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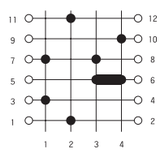

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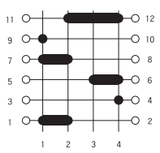

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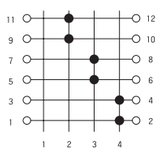

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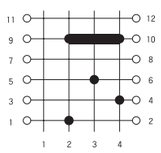

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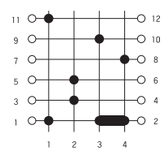

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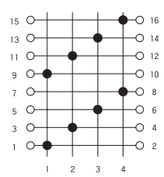

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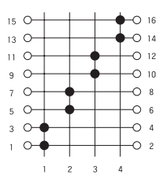

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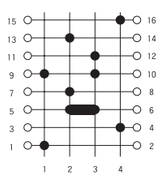

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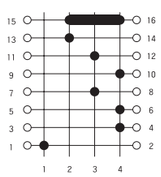

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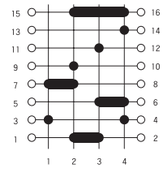

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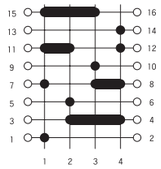

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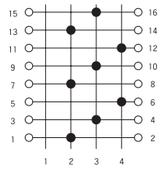

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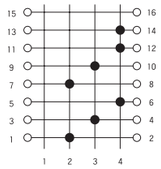

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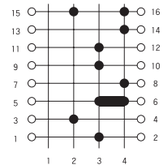

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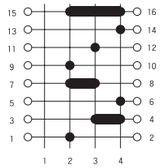

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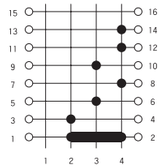

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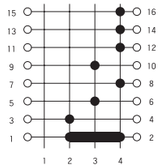
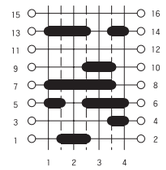
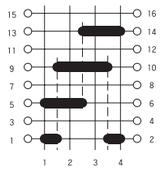
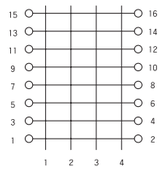


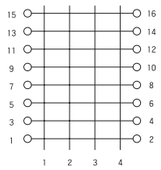
Code : 4413



Code : 4414







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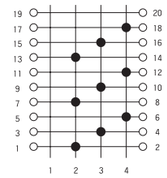

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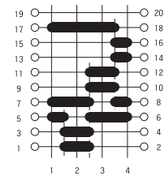

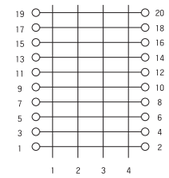

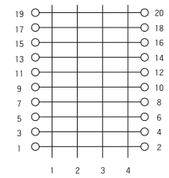

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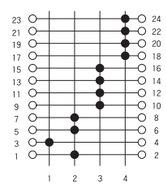

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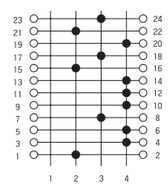

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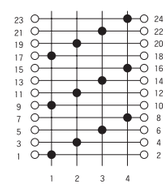
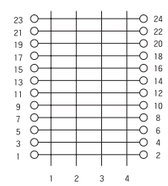
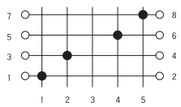
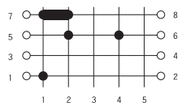
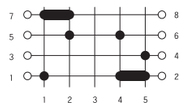
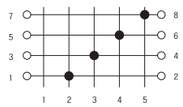




접점블록회로도 Base/contact block

Code : 5201	Code : 5202	Code : 5203	Code : 5204
			

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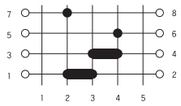
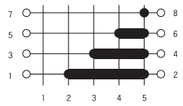
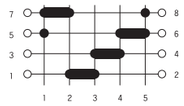
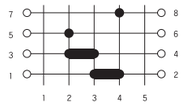
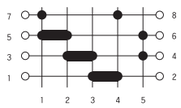
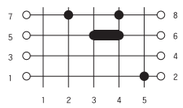
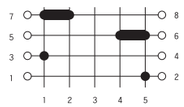
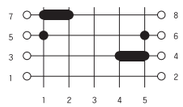
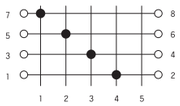
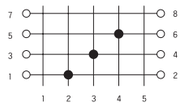
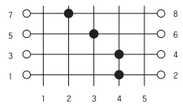
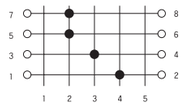
			

Code : 5209	Code : 5210	Code : 5211	Code : 5212
			

Code : 5213	Code : 5214	Code : 5215	Code : 5216
			

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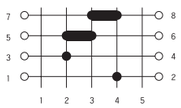
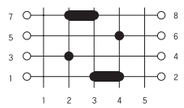
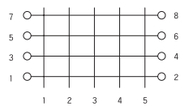
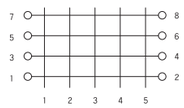
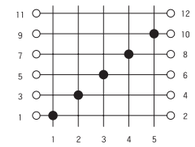
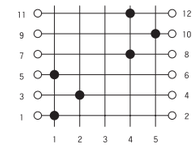
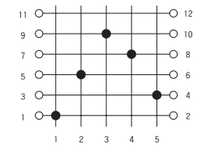
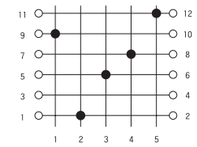
			

Code : 5301	Code : 5302	Code : 5303	Code : 5304
			

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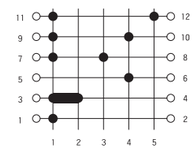	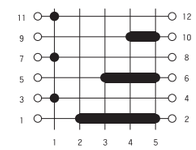	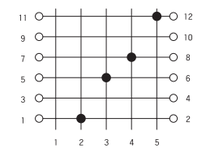	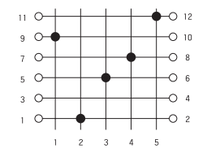

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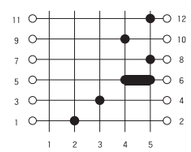
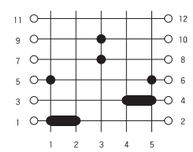
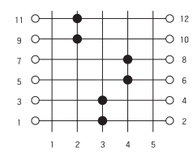
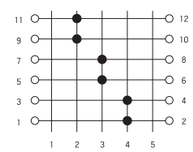
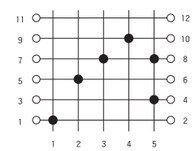
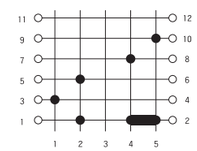
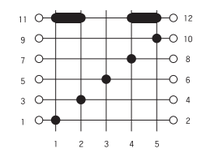
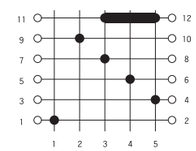
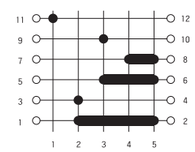
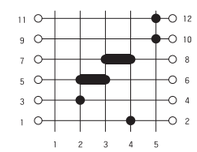
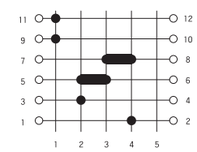
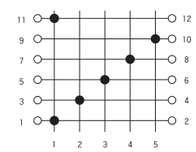
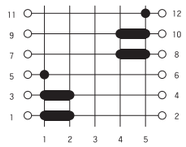
			

Code : 5313	Code : 5314	Code : 5315	Code : 5316
			

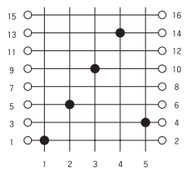
Code : 5317	Code : 5318	Code : 5319	Code : 5320
			

접점블록회로도 Base/contact block

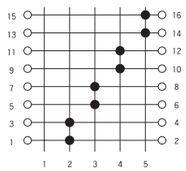
Code : 5320



Code : 5401



Code : 5402



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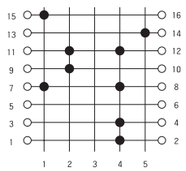

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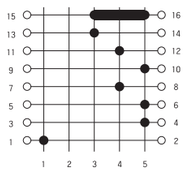

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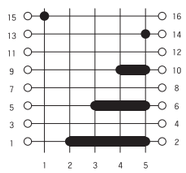

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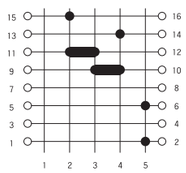

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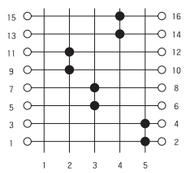

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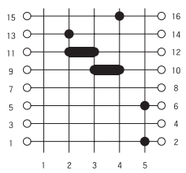

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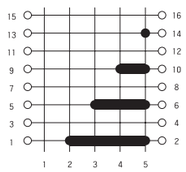

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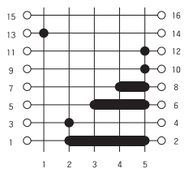

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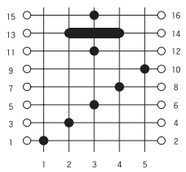

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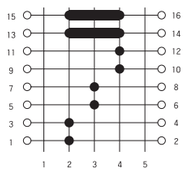

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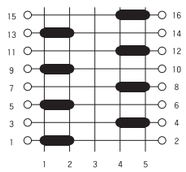

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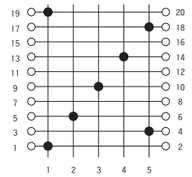

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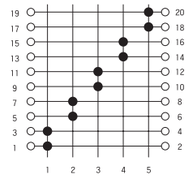

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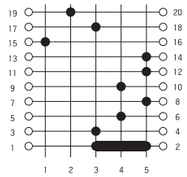

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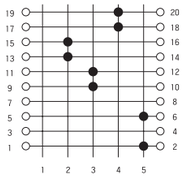

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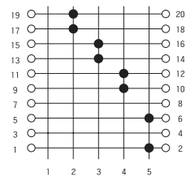

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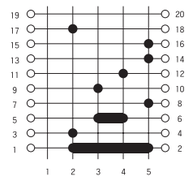

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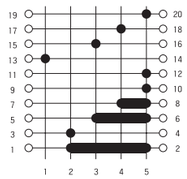

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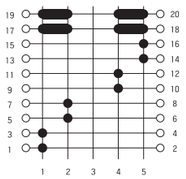

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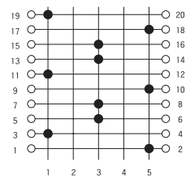

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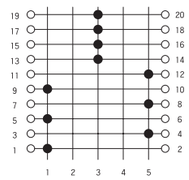

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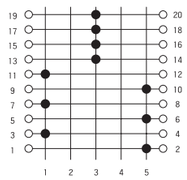

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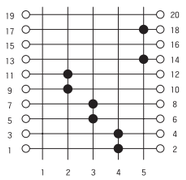

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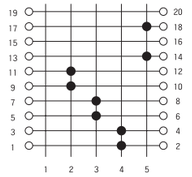

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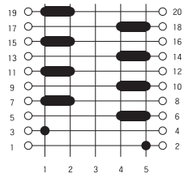

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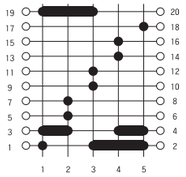

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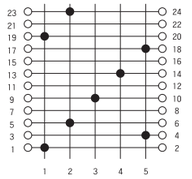

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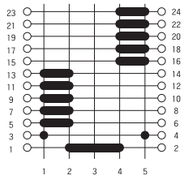

접점블록회로도 Base/contact block

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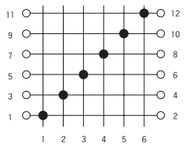	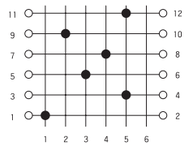	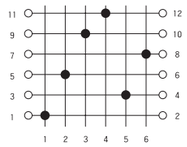	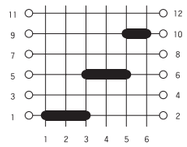

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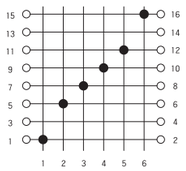	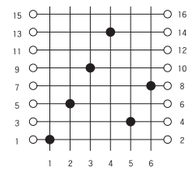	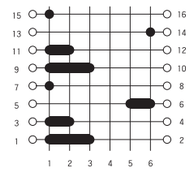	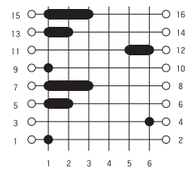

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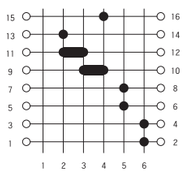	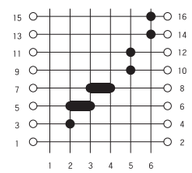	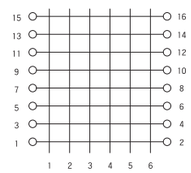	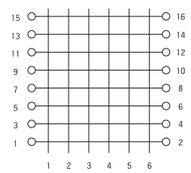

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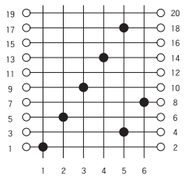	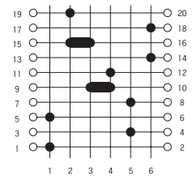	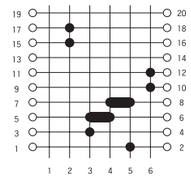	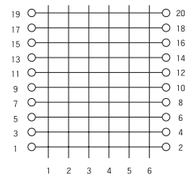

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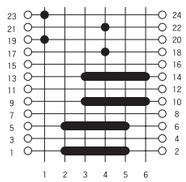
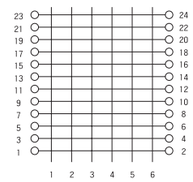
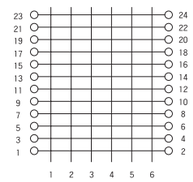
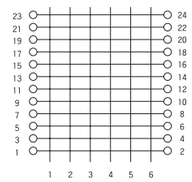
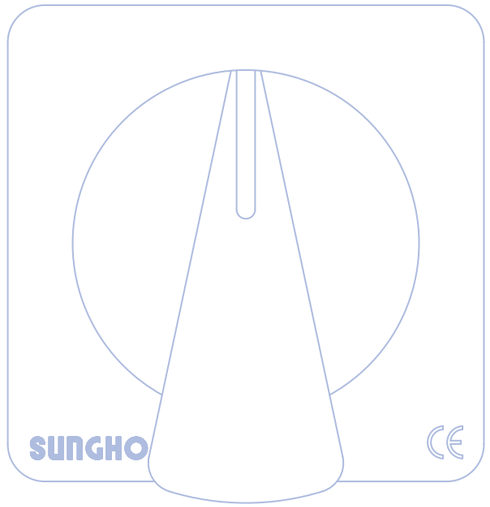
			

ROTARY CAM SWITCHES



CONTROL and SIGNALLING Devices
SQUARE LIGHT

집합표시등

ø 22–25겸용

표시등, 눌름버튼 · 셀렉터 · 비상정지눌름버튼 스위치

ø 25–30용

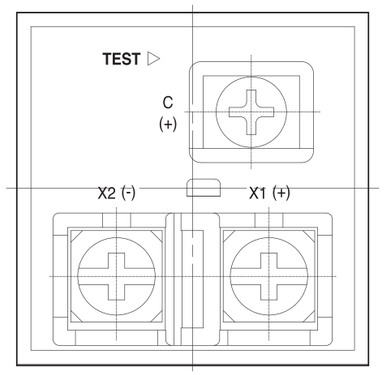
표시등, 눌름버튼 · 조광형눌름버튼 스위치
셀렉터 · 비상정지눌름버튼 스위치

집합 표시등 SQUARE LIGHT

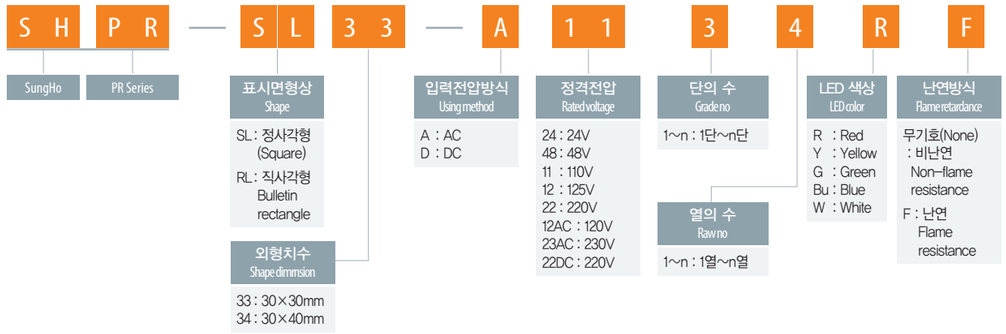
정격 및 성능
Characteristics

특징 Features	• 표시등 전면이 LED로 되어 있어 일정한 색상을 유지합니다. • LED LAMP는 소비전력이 적으며 고휘도 소자를 사용하여 조도가 밝습니다. • 조립이 간단하여 색상조립, 변경이 현장에서 가능합니다. • 내장되어 있는 문자 표시판과 LED LAMP의 탈부착이 간단하게 되어 있어 작업성이 우수합니다. • 연결 몸체가 일체형으로 되어있어 다량의 조합에도 흔들림이 없습니다. • 판넬두께는 1~6mm까지 가능합니다. • 색상은 적, 황, 녹, 청, 백색의 5종입니다. • DC LAMP는 CHECK TERMINAL을 사용하여 전면부 점등유무를 간단히 확인가능합니다. • 표시면의 외부규격은 30×30(mm), 30×40(mm)2종류입니다. • 후면에는 단자보호카바가 있어 안전합니다.(실용 및 디자인등록 출원)		
램프정격 Light ratings	정격전압 *Rated voltage*		DC24V
	사용전압 *Operated voltage*		DC24±10%
	정격전류 *Rated current*		20mA
	표시색상 *Illuminating color*		적색, 황색, 녹색, 청색, 백색 *red, yellow, green, blue, white*
성능 Other characteristics	조작전압 *Control voltage*		DC24V, 110V, 125V
			AC110V, 220V
	절연저항 *Insulation resistance*		100MΩ이상(DC500V MΩ 절연저항계) *min.100MΩ at DC500V*
	내전압 *Dielectric strength*	충전부간 *Between live parts*	AC 1,500V 50/60Hz 1min *Between live parts*
		비충전부간 *Between non-live parts*	AC 2,500V 50/60Hz 1min *Between non-live parts*
	사용주위온도 *Ambient temperature*	사용시 *Operation*	−20 ~ +40℃
		보관시 *Storage*	−25 ~ +55℃
	사용주위습도 *Ambient humidity*		45 ~ 85%
주의사항	• AC용은 Check 단자가 없습니다. • Check terminal 사용시 부가회로를 사용하지 마십시요. 램프체크시 역전압이 발생됩니다. • LED Unit 분해시는 반드시 전원을 차단하십시오. • 판넬부착시 집합표시등 본체의 중량, 배선에 의한 전선의 중량등을 고려하여 판넬두께를 결정하십시요.		

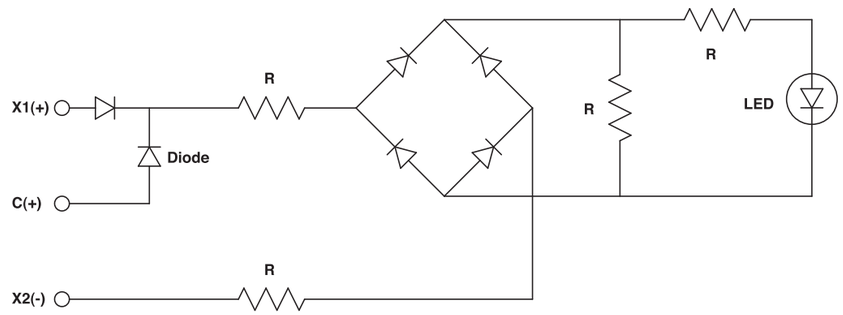
단자극성표시



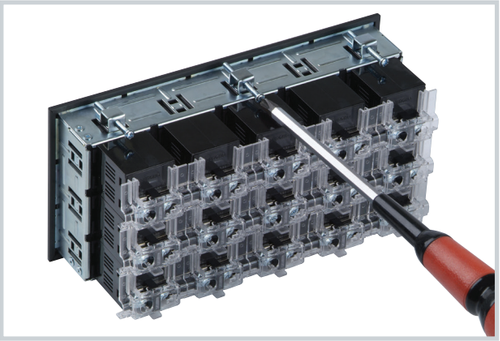
형명분류 Type classification diagram



CHECK TERMINAL 회로도 Check terminal circuit diagram



집합 표시등의 취부방법 Attachment method of square light

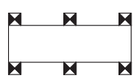
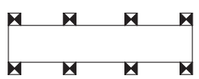
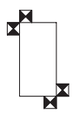
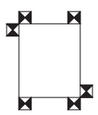
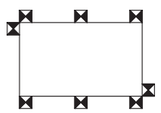
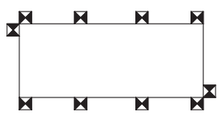
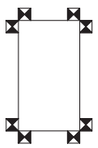
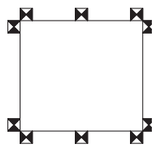
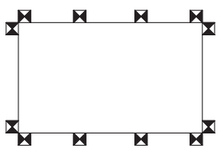


- 조립된 집합표시등을 판넬에 끼운후 좌측 그림과 같이 취부대를 찬넬 구멍에 걸고 볼트를 체결합니다.
- 찬넬 취부대는 조립된 집합체 수량에 따라 아래 표의 수량으로 체결합니다.
- 체결 및 분해시는 반드시 전원을 차단하여 주십시오.

집합 표시등의 취부방법 Number of jointing part

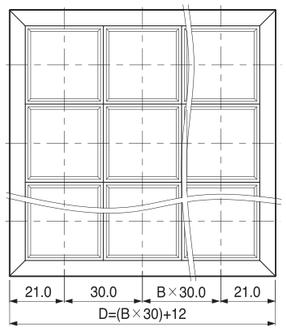
단 Grade \ 열 Row	1~2	3~8	9~15	16~20
1~2	2	4	6	8
3~6	4	6	8	10
7~10	6	8	10	12

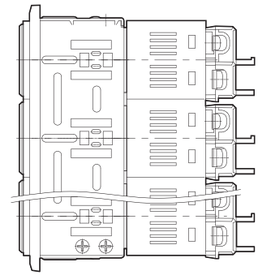
찬넬 고정대 적용예 Example of attachment

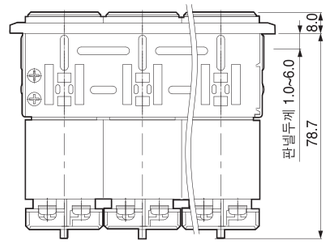
단 Grade \ 열 Row	1~2	3~8	9~15	16~20
1~2				
3~6				
7~10				

정사각형 표시등 외형 및 치수 Square lamp / dimension drawing

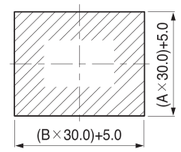
단의수 Grade no A	외형치수 Dimension C	열의 수 Raw no / 판넬가공치수 Panel cutouts	B	1	2	3	4	5	6	7	8	9	10
			D	42	72	102	132	162	192	222	252	282	312
				35	65	95	125	155	185	215	245	275	305
1	42	35											
2	72	65											
3	102	95											
4	132	125											
5	162	155											
6	192	185											
7	222	215											
8	252	245											
9	282	275											
10	312	305											

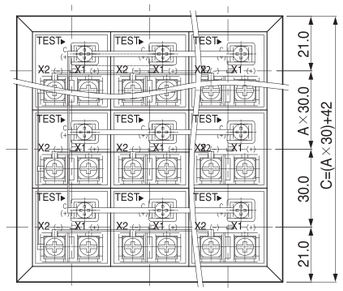




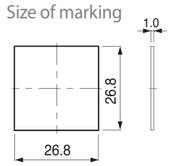


- 판넬가공치수
  Panel cutouts



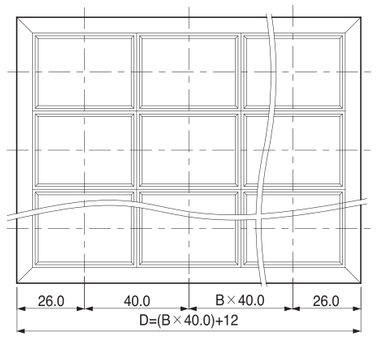


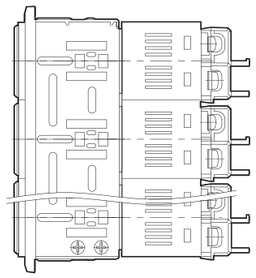
- 조각면치수
  Size of marking

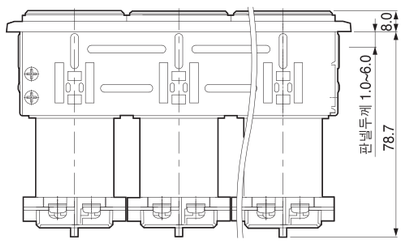


직사각형 표시등 외형 및 치수 Bulletin rectangle lamp / dimension drawing

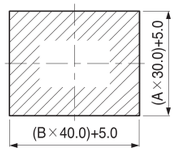
단의수 Grade no A	외형치수 Dimension C	열의 수 Raw no B	1	2	3	4	5	6	7	8	9	10
		D	52	92	132	172	212	252	292	332	372	412
		판넬가공치수 Panel cutouts	45	85	125	165	205	245	285	325	365	405
1	42	35										
2	72	65										
3	102	95										
4	132	125										
5	162	155										
6	192	185										
7	222	215										
8	252	245										
9	282	275										
10	312	305										

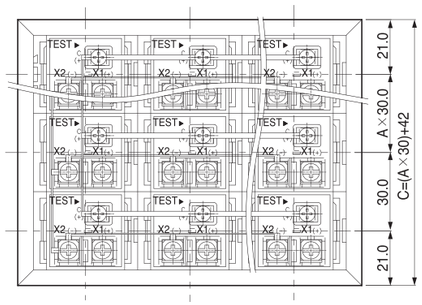




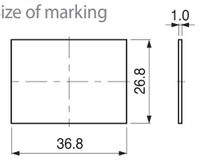


• 판넬가공치수
Panel cutouts





• 조각면치수
Size of marking

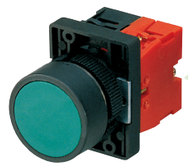


제어용 스위치, 표시등 PG SERISE

CONTROL AND SIGNALLING DEVICES, ϕ22 & ϕ25 COMMON USE TYPE PG... ϕ22, ϕ25 공용

눌름버튼스위치
Pushbutton

- 조광형
  Illuminated
- 비조광형
  Non-Illuminated



표시등
Pilot Lights

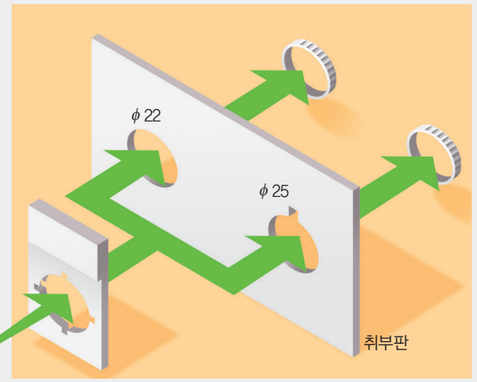
- 백열전구 방식
  With Incandescent Bulb
- LED 방식
  With LED

셀렉터스위치
Selector Switches

- 조광형
  Illuminated
- 비조광형
  Non-Illuminated
- 키형
  Key Operated

비상정지눌름버튼스위치
Emergency Stop Switches

- 자기복귀형
  Push-pull
- 푸쉬록 턴리셋방식
  Turn to Release
- 푸쉬록 키리셋방식
  Key Release



ϕ 22, ϕ 25 공용조각판

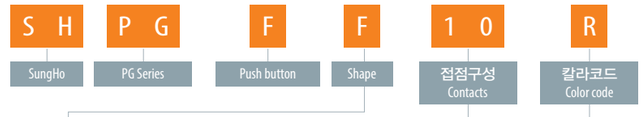
정격 및 성능 Characteristics

특징 Features	• 조작부와 접점부가 분리형으로 되어 있어 결합 또는 분리가 간단합니다. • 접점부의 분리시 별도의 공구가 필요치 않으며 파손될 염려가 없습니다. • 취부홀이 ϕ22, ϕ25겸용입니다. • 색상 및 기능의 다변화로 사용자 선택의 폭이 넓어졌습니다. • 판넬 전면의 상부는 IP64 내유형으로 어떠한 방향에서의 기름방울, 물거품으로도 해로운 영향을 받지 않습니다. • To combinate and separate is simple, because operation part and contact part are consist of separate type. • In case of separate the contact part, don't need any tools, and nothing to worry about damage. • For both ϕ22 and ϕ25. • As diversify the color and function, user's option become wider. • The upper part of the front side in panel is formed by IP64, don't affected by drop of oil, bubble, and the likes on all sides.						
접점용량 Contact ratings 주) 정격설정기준 주위온도20±2℃ 주위습도65±5% 조작속도20회/분	정격통전전류 *Thermal current*		10A				
	AC정격 *AC supply*		24V	110V	220V	380V	440V
		유도성부하 *Inductive load*	10A	6.5A	5A	2.5A	2A
		저항성부하 *Resistive load*	10A	10A	7A	5.5A	5A
	DC정격 *DC supply*		24V	110V	220V		
		유도성부하 *Inductive load*	5A	1.2A	0.45A		
		저항성부하 *Resistive load*	10A	5A	3A		
램프정격 Light ratings	백열램프 *Incandescent*	정격전압 *Rated voltage*	6.3V	14V	28V		
		사용전압 *Operated voltage*	5.7V	12V	24V		
		정격전류 *Rated current*	150mA	80mA	40mA		
	LED램프 *LED*	정격전압 *Rated voltage*	DC24V				
		사용전압 *Operated voltage*	DC24 ±5%				
		정격전류 *Rated current*	18mA				
성능 Other characteristics	허용동작빈도 *Max. operating cycles*	기계적 *Mechanical*	최대 60회/분 *60 cycles/min.*				
		전기적 *Electrical*	최대 30회/분 *30 cycles/min.*				
	절연저항 *Insulation resistance*		100MΩ 이상(DC500V MΩ 절연저항계) *min.100MΩ at DC500V*				
	내전압 *Dielectric strength*		AC 2,500V 50/60Hz 1min				
	내진동 *Vibration protection*		10~55Hz 복진폭 1.5mm				
	내충격 *Mechanical shock protection*		60G(600m/s²)				
	수명 *Lifetimes*	전기적 *Electrical*	10만회이상 *0.1 mil.operations*				
		기계적 *Mechanical*	눌름버튼스위치 *Pushbuttons*	150만회 이상 *1.5 mil.operations*			
			비상정지용 눌름버튼스위치 *Pushbuttons for emergency*	15만회 이상 *0.1 mil.operations*			
			셀렉터스위치 *Selector switches*	10만회 이상 *0.1 mil.operations*			
	주위온도 *Ambient temperature*	사용시 *Operation*	조광형 *Iluminated types*	−20 ~ +55℃			
			비조광형 *Non-illuminated types*	−20 ~ +70℃			
		보관시 *Storage*	−40 ~ +70℃				
	사용주위습도 *Ambient humidity*		35 ~ 85%RH				
	보호구조 *Degree of protection*		IP64				

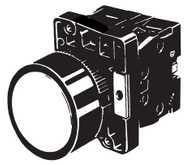
눌름버튼스위치 – 비조광형 PGF types Pushbutton, non-illuminated

자동복귀방식
Spring return

주문형식 Catalog No. structure
(Ordering information)



평형
Flush



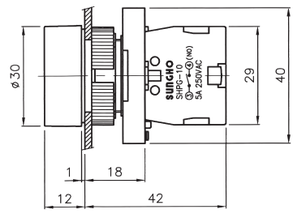
형상 Shape	접점구성 Contacts	형식 Type
평형 Flush	1a	PGF–F10
	1b	PGF–F20
	1a1b	PGF–F12
	2a	PGF–F11
	2b	PGF–F22

Code	Color
R	적색/Red
Y	황색/Yellow
B	흑색/Black
G	녹색/Green
BU	청색/Blue
W	백색/White

외형치수
Dimensions

평형
Flush

PGF–F



눌름버튼스위치 – 조광형 PGX types Pushbutton, illuminated

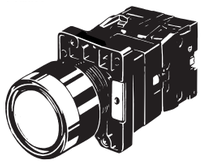
자동복귀방식
Spring return

주문형식 Catalog No. structure
(Ordering information)

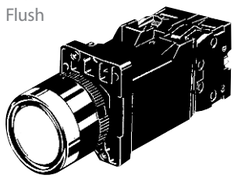
S	H	P	G	X	G	1	0	A	1	R
SungHo		PG Series		Push button lamp	Shape	접점구성 Contacts		조작전압 Voltage		칼라코드 Color code

A1 : AC110V
A2 : AC220V
D24 : DC24V

평형
Flush



평형
Flush



• Type

형상 Shape	조작전압 Voltage	조광방식 Illumination	접점구성 Contacts	형식 Type
평형 Flush	DC24V	백열전구 Incandescent w/o transformer	1a	PGX–G10B24
			1b	PGX–G20B24
			1a1b	PGX–G12B24
			2a	PGX–G11B24
			2b	PGX–G22B24
		LED w/o transformer	1a	PGX–G10L24
			1b	PGX–G20L24
			1a1b	PGX–G12L24
			2a	PGX–G11L24
			2b	PGX–G22L24
	AC110V	백열전구 트랜스내장 Incandescent w/ transformer	1a	PGX–G10A1
			1b	PGX–G20A1
			1a1b	PGX–G12A1
			2a	PGX–G11A1
			2b	PGX–G22A1
	AC220V	백열전구 트랜스내장 Incandescent w/ transformer	1a	PGX–G10A2
			1b	PGX–G20A2
			1a1b	PGX–G12A2
			2a	PGX–G11A2
			2b	PGX–G22A2

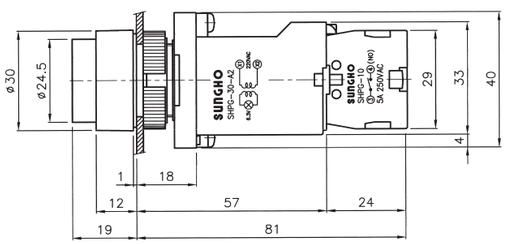
• Color code

Code	Color
R	적색/Red
Y	황색/Yellow
G	녹색/Green
BU	청색/Blue
W	백색/White

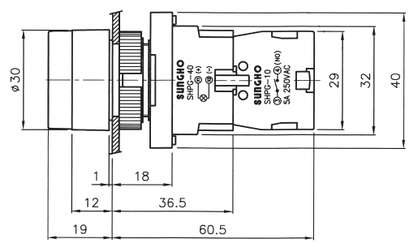
외형치수
Dimensions

평형
Flush

PGX–G12A



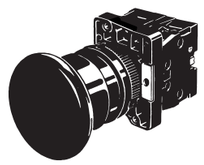
PGX–G12D

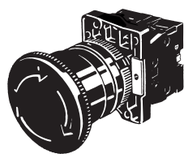


눌름버튼스위치 – 비상정지용 PGE types
Pushbutton with mushroom head for emergency stop

주문형식 Catalog No. structure
(Ordering information)

S	H	P	G	E	4	B	2	0	R
SungHo		PG Series		Energency stop	버튼외경 Diameter of head		접점구성 Contacts		칼라코드 Color code





• Type

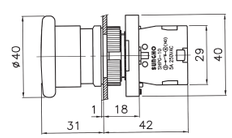
복귀방식 Type of return	접점구성 Contacts	형식 Type
자동복귀방식 Spring return	1b	PGE–4B20
	1a1b	PGE–4B12
	2b	PGE–4B22
잠금방식 push to latch turn to release	1b	PGE–4R20
	1a1b	PGE–4R12
	2b	PGE–4R22

• Color code

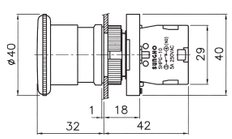
Code	Color
R	적색/Red
G	녹색/Green

외형치수
Dimensions

PGE–4B



PGE–4R

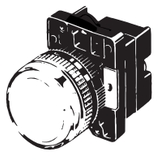


표시등– PGP types Pilot lights

주문형식 Catalog No. structure
(Ordering information)

S H	P G	P	A 1	R
SungHo	PG Series	Pilot lights	조작전압 Voltage	칼라코드 Color code

A1 : AC110V
A2 : AC220V
D24 : DC24V



• Type

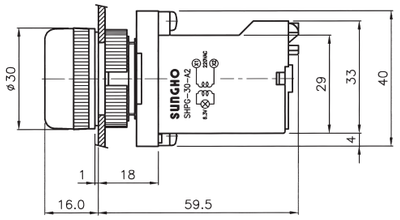
표면상태 Lense type	조작전압 Voltage	조광방식 Bulb type	형식 Type
기본형 standard lense	DC6V 직접인가 Direct supply	백열전구 Incandescent	PGP–D6F
	DC24V 직접인가 Direct supply	백열전구 Incandescent	PGP–D24F
		LED	PGP–L24F
	AC110V 트랜스내장형 Via transformer included	백열전구 Incandescent	PGP–A1F
		LED	PGP–LA1F
	AC220V 트랜스내장형 Via transformer included	백열전구 Incandescent	PGP–A2F
		LED	PGP–LA2F
	AC220V 직접인가 Direct supply	Neon	PGP–LA$_2$

• Color code

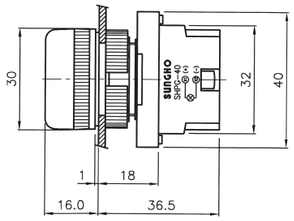
Code	Color
R	적색/Red
Y	황색/Yellow
G	녹색/Green
BU	청색/Blue
W	흰색/White

외형치수
Dimensions

PGP–A



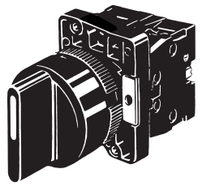
PGP–B



셀렉터스위치 – 비조광형 PGS types Selector switches, non-illuminated

주문형식 Catalog No. structure
(Ordering information)

S H	P G	S	S 2	1 0	B
SungHo	PG Series	Selector switches	절환수 Positions	접점구성 Contacts	칼라코드 Color code



• Type

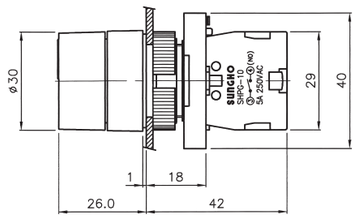
절환수 Positions	접점구성 Contacts	형식 Type
2단/수동(S2) 2-stay pu	1a	PGS–S210
	1a1b	PGS–S212
	2a	PGS–S211
3단/수동(S3) 3-stay put	2a	PGS–S311

• Color code

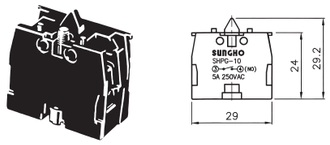
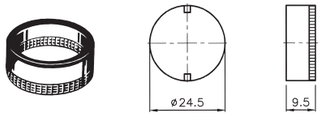
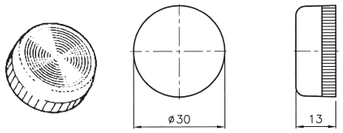
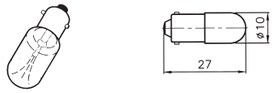
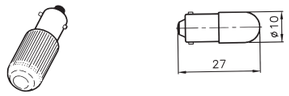
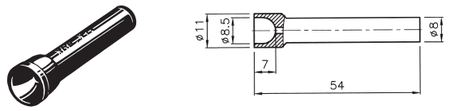
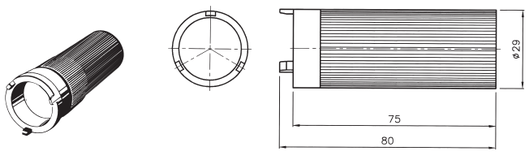
Code	Color
B	흑색/Black

외형치수
Dimensions

PGS–S

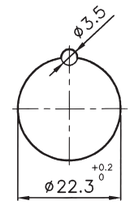


조립용 부품 Spare parts

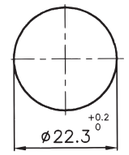
명칭 Name	형상 및 치수 Shape & Dimensions	내용 Specification	형식 Type	비고 Remarks
스위치유니트 Contact blocks		1a 1NO	PGF–F10	흑색 Black
		1b 1NC	PGF–F20	적색 Red
투명캡 Pushbutton caps			PG–61	
			PG–62	
백열전구 Incandescent bulbs		6.3V	PG–3016	BA 9s base
		12V	PG–8112	
		24V	PG–8124	
네온전구 Neon bulbs		AC 220V	PG–8222	BA 9s base
LED전구 LED		DC24V		BA 9S base
		적색/Red	PG–83LR	
		황색/Yellow	PG–83LY	
		녹색/Green	PG–83LG	
전구교환공구 Bulb extractor			PG–71	
너트조임공구 Tightening tool			PG–72	

판넬가공치수 Panel cutout

ϕ 22 사용
ϕ 22 Use

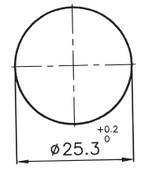


회전멈춤 사용
Rotating-stop Use



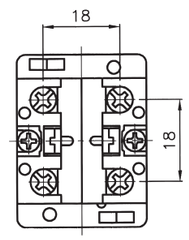
일반적 사용
General Use

ϕ 25 사용
ϕ 25 use

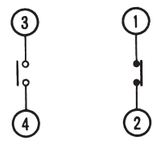


단자배치 및 결선도
Terminal layout and diagram

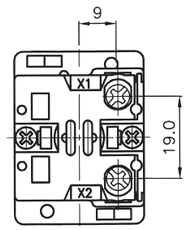
일반형
Non-illuminated



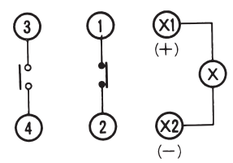
Bottom view



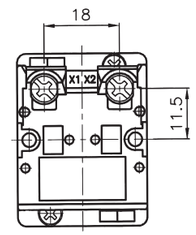
직접인가형
Illuminated w/o transformer



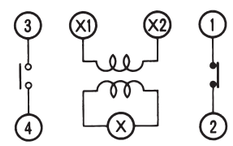
Bottom view



트랜스인가형
Illuminated with transformer



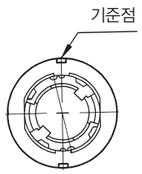
Bottom view



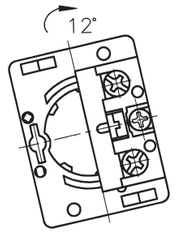
상하부 조립 및 분해방법 Assembling or disassembling of upper[lower] part

상하부 조립 및 분해
Assembling or disassembling of upper[lower] part

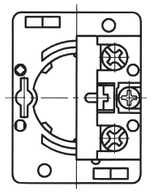
① 상부도면
Drawing of upper part



② 하부도면
Drawing of lower part

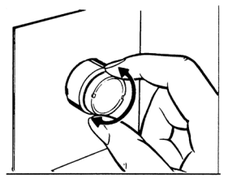


③ 조립완성도
Assembly finished drawing



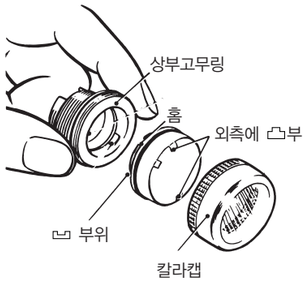
칼라캡의 교환 및 조립
Replacement and assembling of color cap

분해방법
Disassembling methods



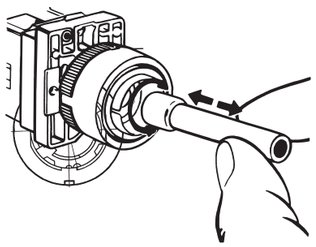
조광캡 조립
Assembling of pushbutton cap

표시등 캡 조립
Assembling of pilot lamp cap

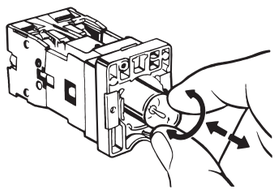


전구의 교환방법
Lamp replacement method

판넬전면에서의 교환
Replacement in the front side



판넬내부에서의 교환
Replacement in the inside



표시등 Indicator signal lamp

주문형식 Catalog No. structure
(Ordering information)

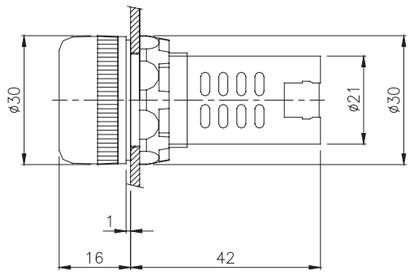
S H	P G	I	2 2	1 L	R
SungHo	PG Series	램프 Lamp	취부구경 Hole dia	조작전압 Voltage	칼라코드 Color code

• Type

형상 Shape	취부구경 Hole dia	조작전압 Voltage	조광방식 Ilumination	형식 Type
기본형 Standard lense	ϕ22	AC110V Direct Input	LED	PGI-22-1L
		AC220V Direct Input	LED	PGI-22-2L
		AC24V Direct Input	LED	PGI-22-5L

• Color code

Code	Color
R	적색/Red
G	녹색/Green
Y	노란색/Yellow
W	흰색/White



제어용 스위치, 표시등 PR SERISE

CONTROL AND SIGNALLING DEVICES, ϕ25 & ϕ30

TYPE PR ··· ϕ25 및 ϕ30

"스위치 단자부에 안전카바 부착"

눌름버튼스위치
Pushbutton

- 비조광형
  Non–Illuminated

표시등
Pilot Lights

- LED전구 방식
  With LED lamp

조광형 눌름버튼스위치
Pushbutton illuminated

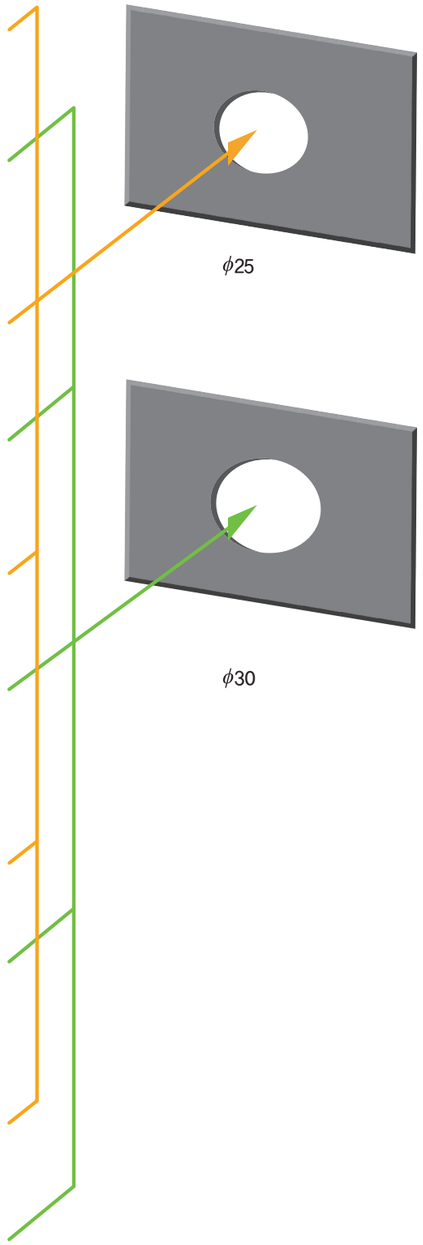
- LED전구 방식
  With LED lamp

셀렉터스위치
Selector Switches

- 비조광형
  Non-Illuminated

비상정지눌름버튼스위치
Emergency Stop Switches

- 자기복귀형
  Spring Return
- 수동복귀형
  Push Return
  Turn to release



정격 및 성능 Characteristics

특징
Features

- 조작부와 접점부가 일체형으로 되어 있고, 경제성, 견고성 및 내환경성을 지닌 장수명 제품입니다.
- 슬라이드형 접점 접촉구조로 저전압에서도 접촉 신뢰성을 유지합니다.
  또한 접촉부의 주변이 투명플라스틱 구조로 되어 있어 필요시 동작 확인을 쉽게 할 수 있습니다.
- 취부홀이 ϕ25, ϕ30 두가지가 있습니다.
- 버튼(Button) 및 캡(Cap)의 색상이 다양하여 사용자 선택의 폭이 넓어졌습니다.
- 조광형은 멀리서도 빛이 선명하게 보이도록 설계되었으며 트랜스와 접점부가 일체형으로 되어 있습니다.
- AI 너트도 생산가능합니다.
- 단자보호카바가 있어 제품안전성이 있습니다.
- Operating part and contact part are integration, and long-life and economical product with solid design.
- Consist of slide contact structure, contact with reliability in low tension
- For both ϕ25 and ϕ30.
- As diversify the color of button and cap, user's option become wider.
- Illuminated type is designed that can see as clear color from a distance also, and trans part and contact part are integration.

접점용량 Contact ratings			저항성(Resistance)	유도성(Inducetion)	
			5A, 250VAC	3A, 250VAC	
램프정격 Light ratings			6.3V	14V	28V
			5.7V	12V	24V
			150mA	80mA	40mA
	LED램프 *LED*	정격전압 *Rated voltage*	DC24V		
		사용전압 *Operated voltage*	DC24±5%		
		정격전류 *Rated current*	20mA		
성능 Other characteristics	조작전압 *Control voltage*		AC 110V, 220V, 380V, 440V ±10% 50/60HZ		
			DC 110V, 125V ±10%		
	허용동작빈도 *Max. operating cycles*	기계적 *Mechanical*	최대60회/분 *60 cycles/min.*		
		전기적 *Electrical*	최대30회/분 *30 cycles/min.*		
	절연저항 *Insulation resistance*		100MΩ 이상(DC500V MΩ 절연저항계) *min.100MΩ at DC500V*		
	내전압 *Dielectric strength*	충전부간 *Between live parts*	AC 1,500V 50/60Hz 1min		
		충전부간 *Between non-live parts*	AC 2,500V 50/60Hz 1min		
	내진동 *Vibration protection*		10 ~ 55Hz 복진폭 1.5mm		
	내충격 *Mechanical shock protection*		30G(300m/s²)		
	수명 *Lifetimes*	전기적 *Electrical*	10만회 이상 *0.1 mil .operations*		
		기계적 *Mechanical*	비조광형눌름버튼스위치 *Non-illuminated pushbuttons*	100만회 이상 *1 mil .operations*	
			조광형눌름버튼스위치 *Illuminated pushbuttons*	15만회 이상 *0.15 mil .operations*	
			셀렉터스위치 *Selector switches*	10만회 이상 *0.1 mil .operations*	
	주위온도 *Ambient temperature*	사용시 *Operation*	–5 ~ +40℃		
		보관시 *Storage*	–15 ~ +50℃		
	사용주위습도 *Ambient humidity*		45 ~ 85%RH		

눌름버튼스위치–비조광 평형 및 비상정지용 PR Series

Pushbuttons, non-illuminated …flush type and mushroom head emergency stop

자동복귀방식
Spring return

주문형식 Catalog No. structure
(Ordering information)

S H P R 2 5 B 1 — R F (난연)

- SungHo
- PR Series
- Push button
- 접점구성 Contacts
- 칼라코드 Color code
- 몸체재질 Body material: 무표시 : 일반 (No matk : general)

형상 Shape	홀치수 Diamete for panel	버튼외경 Diamete of head	접점구성 Contacts	형식 Type
평형 Flush	ϕ25	30mm	1a1b	PR–25B–1
			2a2b	PR–25B–2
			3a3b	PR–25B–3
	ϕ30	35mm	1a1b	PR–30B–1
			2a2b	PR–30B–2
			3a3b	PR–30B–3

• Type

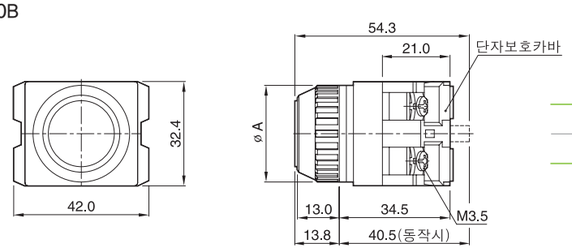
• Color code

Code	Coloor
R	적색/Red
Y	황색/Yellow
B	흑색/Black
G	녹색/Green
BU	청색/Blue
W	백색/White

방수보호커버
- PR–10(ϕ25)
- PR–20(ϕ30)

외형치수
Dimensions

PR–25B
PR–30B



기호	PR–25B	PR–30B
A	30.0	35.0

눌름버튼스위치–비조광 비상눌름버튼스위치 PR Series

자동복귀방식
Spring return

수동복귀방식
Push to latch
Turn to release

S H P R 2 5 E 1 — R F (난연)

- SungHo
- PR Series
- 비상스위치 EMERGENC4 Push Button switch
- 접점구성 Contacts
- 칼라코드 Color code
- 몸체재질 Body material: 무표시 : 일반 (No matk : general)

형상 Shape	홀치수 Diamete for panel	버튼외경 Diamete of head	접점구성 Contacts	형식 Type
평형 Flush	ϕ25	35mm	1a1b	PR–25E–1
			2a2b	PR–25E–2
	ϕ30	40mm	1a1b	PR–30E–1
			2a2b	PR–30E–2
비상정지용 Mushroom head	ϕ25	40mm	1a1b	PR–25ER–1
			2a2b	PR–25ER–2
	ϕ30	46mm	1a1b	PR–30ER–1
			2a2b	PR–30ER–2

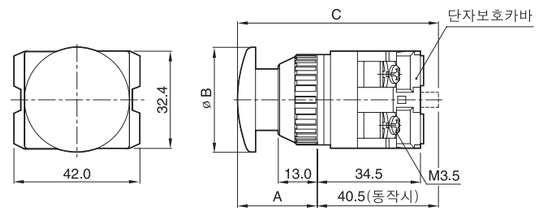
• Type

• Color code

Code	Coloor
R	적색/Red
Y	황색/Yellow
B	흑색/Black
G	녹색/Green
BU	청색/Blue
W	백색/White

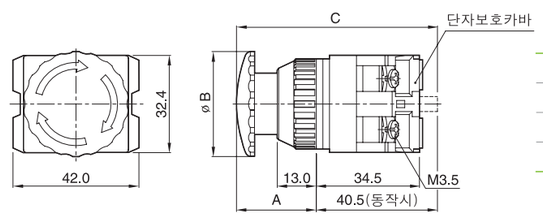
외형치수
Dimensions

PR–25E
PR–30E



기호	PR–25E	PR–30E
A	24.5	26.5
B	35.0	40.0
C	65.0	67.0

PR–25ER
PR–30ER



기호	PR–25ER	PR–30ER
A	24.5	26.5
B	40.0	46.0
C	65.0	67.0

눌름버튼스위치– 조광형 PR Series (LED type)

Pushbutton, illuminated

DC용은 Surge 전압발생 우려가 있는 곳에 사용시 사전대책이 필요합니다.
As use for DC can exist to surge voltage, protective action is necessary before use.
회로상 반불이 나타나는 경우 반불을 제거시키는 부품을 별도 주문하십시오.

주문형식 Catalog No. structure
(Ordering information)

S H P R 2 5 L 2 L — R F (난연)

- S H: SungHo
- P R: PR Series
- 2 5 L: illuminated Push Button switch
- 2: 정격전압 Rating Voltage
- L: LED타입
- R: 칼라코드 Color code

자동복귀방식
Spring return

형상 Shape	홀치수 Diamete for panel	조작전압 Voltage	조광방식 illumination	접점구성 Contacts	형식 Type
평형 Flush	ϕ25	AC110V 직접인가 Direct supply	LED	1a1b	PR–25L–1L
		AC120V 직접인가 Direct supply	LED	1a1b	PR–25L–12AL
		AC230V 직접인가 Direct supply	LED	1a1b	PR–25L–23AL
		DC220V 직접인가 Direct supply	LED	1a1b	PR–25L–22DL
		AC220V 직접인가 Direct supply	LED	1a1b	PR–25L–2L
		AC380V 직접인가 Direct supply	LED	1a1b	PR–25L–3L
		AC440V 직접인가 Direct supply	LED	1a1b	PR–25L–4L
		DC24V 직접인가 Direct supply	LED	1a1b	PR–25L–5L
		DC110V 직접인가 Direct supply	LED	1a1b	PR–25L–7L
		DC125V 직접인가 Direct supply	LED	1a1b	PR–25L–8L

• Type

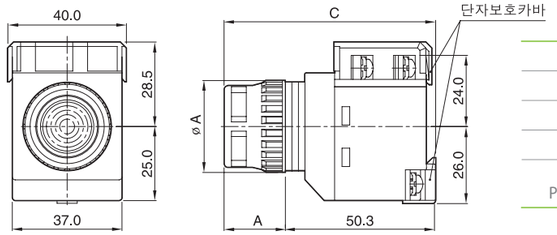
• Color code

Code	Coloor
R	적색/Red
Y	황색/Yellow
G	녹색/Green
BU	청색/Blue
W	백색/White

몸체재질 Body material general
무표시 : 일반
(No matk : general)

외형치수
Dimensions, mm

PR–25L(LED)
PR–30L(LED)



기호	PR–25L	PR–30L
A	20.7	21.2
B	31.0	34.0
C	71.0	71.5
소비전력 Power consumption	20mA	

S H P R 3 0 L 2 L — R F (난연)

- S H: SungHo
- P R: PR Series
- 3 0 L: illuminated Push Button switch
- 2: 정격전압 Rating Voltage
- L: LED타입
- R: 칼라코드 Color code

자동복귀방식
Spring return

형상 Shape	홀치수 Diamete for panel	조작전압 Voltage	조광방식 illumination	접점구성 Contacts	형식 Type
	ϕ30	AC110V 직접인가 Direct supply	LED	1a1b	PR–30L–1L
		AC120V 직접인가 Direct supply	LED	1a1b	PR–30L–12AL
		AC230V 직접인가 Direct supply	LED	1a1b	PR–30L–23AL
		DC220V 직접인가 Direct supply	LED	1a1b	PR–30L–22DL
		AC220V 직접인가 Direct supply	LED	1a1b	PR–30L–2L
		AC380V 직접인가 Direct supply	LED	1a1b	PR–30L–3L
		AC440V 직접인가 Direct supply	LED	1a1b	PR–30L–4L
		DC24V 직접인가 Direct supply	LED	1a1b	PR–30L–5L
		DC110V 직접인가 Direct supply	LED	1a1b	PR–30L–7L
		DC125V 직접인가 Direct supply	LED	1a1b	PR–30L–8L

• Type

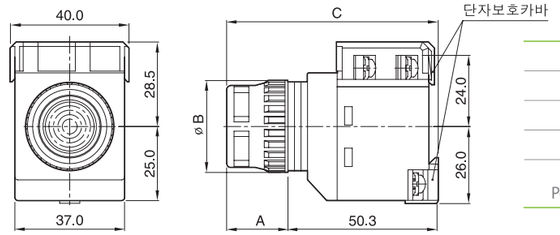
• Color code

Code	Coloor
R	적색/Red
Y	황색/Yellow
G	녹색/Green
BU	청색/Blue
W	백색/White

몸체재질 Body material general
무표시 : 일반
(No matk : general)

외형치수
Dimensions, mm

PR–25L(LED)
PR–30L(LED)



기호	PR–25L	PR–30L
A	20.7	21.2
B	31.0	34.0
C	71.0	71.5
소비전력 Power consumption	20mA	

표시등– PR series (LED type) Pilot lights

DC용은 Surge 전압발생 우려가 있는 곳에 사용시 사전대책이 필요합니다.
As use for DC can exist to surge voltage, protective action is necessary before use.
회로상 반불이 나타나는 경우 반불을 제거시키는 부품을 별도 주문하십시오.

주문형식 Catalog No. structure
(Ordering information)

S H	P R	2 5	P	2	L	—	R	F (난연)
SungHo	PR Series	취부구경	Pilo lamp	정격전압 (Rating Voltage)	LED타입		칼라코드 Color code	

몸체재질 Body material
무표시 : 일반 (No matk : general)

• Type

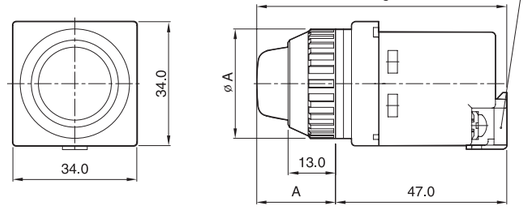
형상 Shape	홀치수 Diamete for panel	조작전압 Voltage	조광방식 illumination	형식 Type
반구형 Dome	ϕ25	AC110V 직접인가 Direct supply	LED	PR–25P–1L
		AC220V 직접인가 Direct supply	LED	PR–25P–2L
		AC120V 직접인가 Direct supply	LED	PR–25P–12AL
		AC230V 직접인가 Direct supply	LED	PR–25P–23AL
		DL220V 직접인가 Direct supply	LED	PR25P–22DL
		AC380V 직접인가 Direct supply	LED	PR–25P–3L
		AC440V 직접인가 Direct supply	LED	PR–25P–4L
		DC24V 직접인가 Direct supply	LED	PR–25P–5L
		DC110V 직접인가 Direct supply	LED	PR–25P–7L
		DC125V 직접인가 Direct supply	LED	PR–25P–8L

• Color code

Code	Coloor
R	적색/Red
Y	황색/Yellow
G	녹색/Green
BU	청색/Blue
W	백색/White

외형치수
Dimensions, mm

PR–25P(LED)
PR–30P(LED)



기호	PR–25P	PR–30P
A	21.5	24.0
B	30.0	35.0
C	68.5	71.0
소비전력 Power consumption	20mA	

주문형식 Catalog No. structure
(Ordering information)

S H	P R	3 0	P	2	L	—	R	F (난연)
SungHo	PR Series	취부구경	Pilo lamp	정격전압 (Rating Voltage)	LED타입		칼라코드 Color code	

몸체재질 Body material
무표시 : 일반 (No matk : general)

• Type

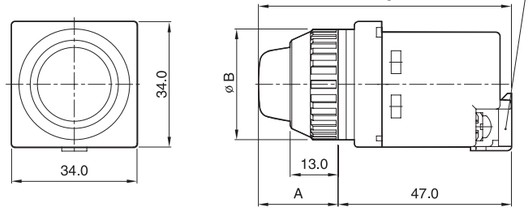
형상 Shape	홀치수 Diamete for panel	조작전압 Voltage	조광방식 illumination	형식 Type
	ϕ30	AC110V 직접인가 Direct supply	LED	PR–30P–1L
		AC220V 직접인가 Direct supply	LED	PR–30P–2L
		AC120V 직접인가 Direct supply	LED	PR–30P–12AL
		AC230V 직접인가 Direct supply	LED	PR–30P–23AL
		DC220V 직접인가 Direct supply	LED	PR–30P–22DL
		AC380V 직접인가 Direct supply	LED	PR–30P–3L
		AC440V 직접인가 Direct supply	LED	PR–30P–4L
		DC24V 직접인가 Direct supply	LED	PR–30P–5L
		DC110V 직접인가 Direct supply	LED	PR–30P–7L
		DC125V 직접인가 Direct supply	LED	PR–30P–8L

• Color code

Code	Coloor
R	적색/Red
Y	황색/Yellow
G	녹색/Green
BU	청색/Blue
W	백색/White

외형치수
Dimensions

PR–25P(LED)
PR–30P(LED)



기호	PR–25P	PR–30P
A	21.5	24.0
B	30.0	35.0
C	68.5	71.0
소비전력 Power consumption	20mA	

셀렉터스위치– 비조광형 PR types Selector switches, non-illuminated

주문형식 Catalog No. structure
(Ordering information)

S H	P R	2 5	S	2	1	—	S	—	B	F (난연)
SungHo	PR Series	취부구경 Attach. Hole Dia	Rotary switches	손잡이단수 Handle stoge no	접점구성 Contacts no		손잡이형태 stoge no		칼라코드 Color code	

• Type

홀치수 Diamete for panel	절환수 Positions		접점구성 Contacts	형식 Type
ϕ25	2단/수동 2-stay put		1a1b	PR–25S2–1
			2a2b	PR–25S2–2
	3단/수동 3-stay put		1a1b	PR–25S3–1
			2a2b	PR–25S3–2
ϕ30	2단/수동 2-stay put		1a1b	PR–30S2–1
			2a2b	PR–30S2–2
	3단/수동 3-stay put		1a1b	PR–30S3–1
			2a2b	PR–30S3–2

무기호	장레바 Long lever
S	단레바 Short lever

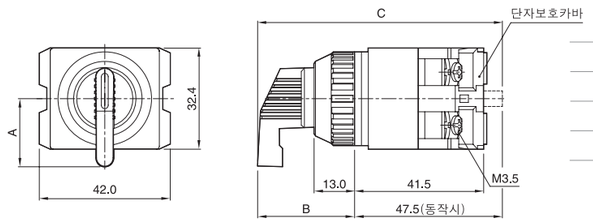
• Color code

Code	Coloor
B	흑색/Black

몸체재질 Body material
무표시 : 일반
(No matk : general)

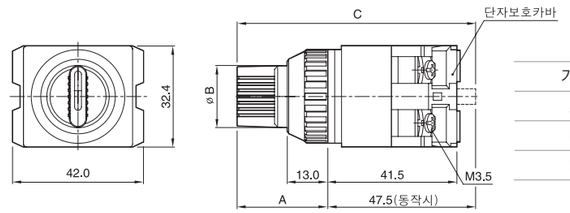
외형치수
Dimensions

PR–25S
PR–30S



기호	PR–25S	PR–30S
A	22.0	26.0
B	31.0	32.0
C	78.5	79.5

PR–25S–1S
PR–30S–1S



기호	PR–25S–1S	PR–30S–1S
A	20.0	20.0
B	20.5	25.5
C	67.5	67.5

BUZZER

버저

버저 BUZZER

특징
Features

- 음량이 80dB 정도 이므로 경보효과가 매우 좋습니다.
  It is sound level is about 80dB which is effective for Emergency alarm use.
- 소형이므로 취급하기가 용이합니다.
  Due to small it is good ro use & fix to machine.
- 소비전력이 적습니다.
  Small consumption of electric power.
- 전자식 소형 모델의 경우 연속음, 단속음을 선택 사용할 수 있습니다.
  In small sized electric model it can be select to use continues or pulse sound.
- 패널에 설치가 용이 합니다.
  Good to fitting on electric pannel.

형명분류
Type classification diagram

S H — M B — 6 0 — 1 1

SungHo

TYPE

MB : 기계식버저(Mechanic Buzzer)
EB : 전자식버저(Electric Buzzer)

취부구경 Attacjment dia

60 : ϕ65 판넬용 강력 버저 (Powerful buzzer for panel)
61 : 노출형 강력버저 (Powerfull buzzer for expsure)
30 : ϕ30 판넬용 소형 버저(small buzzer)
25 : ϕ25 판넬용 소형 버저(small buzzer)

40 : ϕ42 기구용 소형 버저(매입형) (AC 전용)

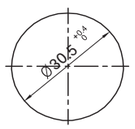
정격전압 Rating voltage

기계식 Mechanic : 1 1 : 110 VAC
: 2 2 : 220 VAC
전자식 Electronic : 2 4 : 12–24 VDC
: 2 5 : 110–125 VDC
: 1 2 : 110–220 VAC
F(FREE) : F : 110–220 VAC 110–220 VDC

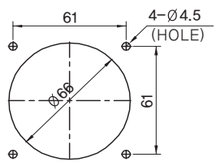
: 1 1 : 110 VAC
: 2 2 : 220 VAC

판넬 가공치수
Panel Cut-out Dimension

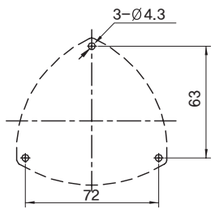
Ø25



Ø30



Ø65 (NUT 취부용)



노출형 (Exposure Type)

성능 및 사양

기계식 버저
Mechanica Type Buzzer

형명 Type	SH–MB–6011	SH–MB–6022	SH–MB–2511 SH–MB–3011	SH–MB–2522 SH–MB–3022
설치 외경	Ø66		SH–MB–25모델(Ø25), SH–MB–30모델(Ø30)	
정격 전압 Rating Voltage	110VAC(50/60Hz)	220VAC(55/60Hz)	110VAC(50/60Hz)	220VAC(50/60Hz)
소비전력 Power consumption	8W	7.5W	4W	4W
음량 Volume of sound	80dB		80dB	
절연저항	100MΩ(500VDC MΩ 절연저항계)			
내전압	1,000VAC 1분간(충전부–비충전부)			
사용주위온도	–10℃ ~ 55℃			
사용주위습도	45~80% R.H.			

전자식 버저
Electronic Type Buzzer

형명 Type	SH–EB–60F	SH–EB–2512 SH–EB–3012	SH–EB–2524 SH–EB–3024	SH–EB–2525 SH–EB–3025
설치 외경	Ø66		SH–EB–25모델(Ø25), SH–EB–30모델(Ø30)	
정격 전압 Rating Voltage	110VAC(50/60Hz) 110~220VDC	110~220VAC	12~24VDC	110~125VDC
소비전력 Power consumption	4W	4W	4W	4W
음량 Volume of sound	80dB	70dB	70dB	70dB
절연저항	100MΩ(500VDC MΩ 절연저항계)			
내전압	1,000VAC 1분간(충전부–비충전부)			
사용주위온도	–10℃ ~ 55℃			
사용주위습도	45~85% R.H.			

노출형 버저
Exposure Type Buzzer

형명 Type	SH–MB–6111	SH–MB–6122	SH–EB–61F
정격 전압 Rating Voltage	110VAC(50/60Hz)	220VAC(50/60Hz)	110–220VAC(50/60Hz) 110–220VDC
소비전력 Power consumption	8W	7.5W	4W
음량 Volume of sound	75dB		80dB
절연저항	100MΩ(500VDC MΩ 절연저항체)		
내전압	1,000 VAC 1분간(충전부 – 비충전부)		
사용주위온도	–10℃ ~ 55℃		
사용주위습도	45~85% R.H.		

기구용 소형 버저

형명 Type	SH-MB-4011	SH-MB-4022
정격 전압 Rating Voltage	110VAC(50/60Hz)	220VAC(50/60Hz)
소비전력 Power consumption	4W	4W
음량 Volume of sound	65dB	
절연저항	100MΩ(500VDC MΩ 절연저항계)	
내전압	1,000 VAC 1분간(충전부 – 비충전부)	
사용주위온도	-10℃ ~ 55℃	
사용주위습도	45~85% R.H.	

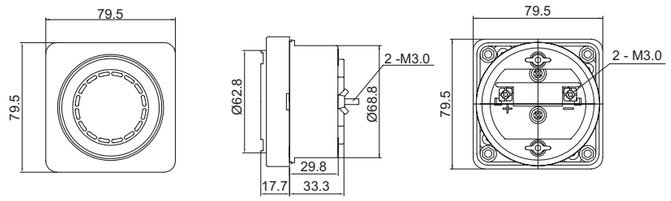
음색 선택(SH-EB-25 모델, SH-EB-30 모델 만 선택가능)

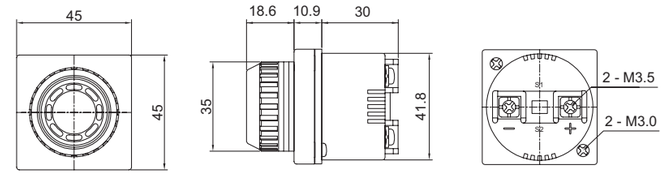
Select tone

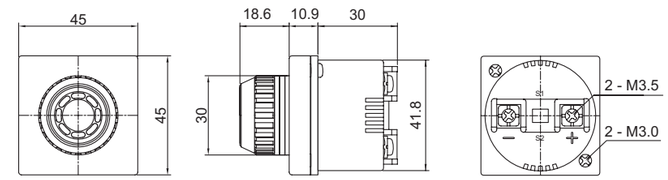
음색선택	음색기호	내용
선택1 Select-1		단속음
선택2 Select-2		장 단속음
개방 Remove		연속음

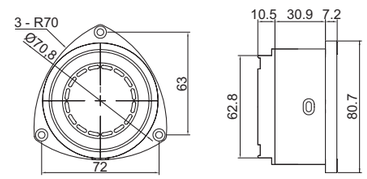
외형 치수

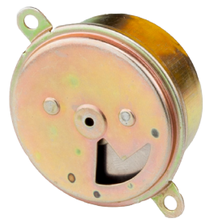
DEMENSION

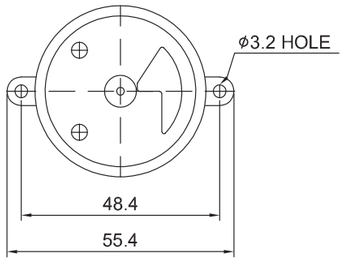


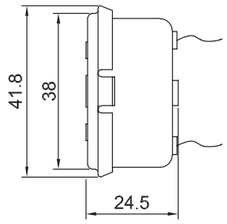




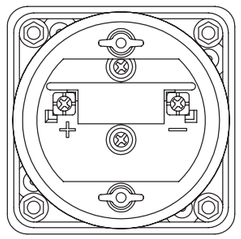


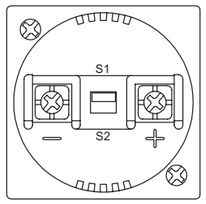






판넬에 조작핸들 취부요령



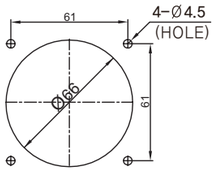


• 제품의 극성(+, −)에 맞게 결선 하시면 됩니다.

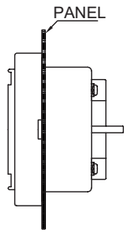
• 소형 버저 모델에 S1, S2 단자는 빠른 단속음 및 느린 단속음 개방시에는 음속음 입니다.

취부 방법

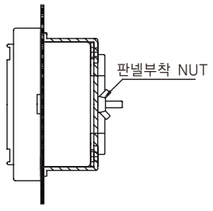
1. 판넬에 Ø66mm Hole 가공



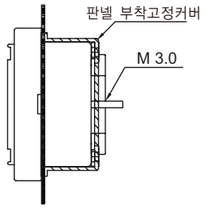
2. 판넬에 넣습니다.



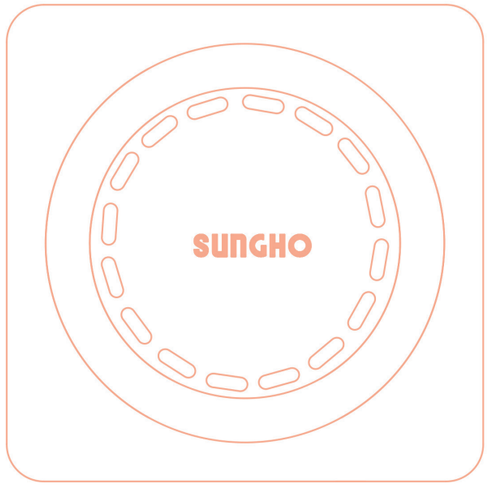
3. 판넬부착스티커



4. 커버를 버저에서 돌출된 볼트에 끼우고 너트를 조입니다.

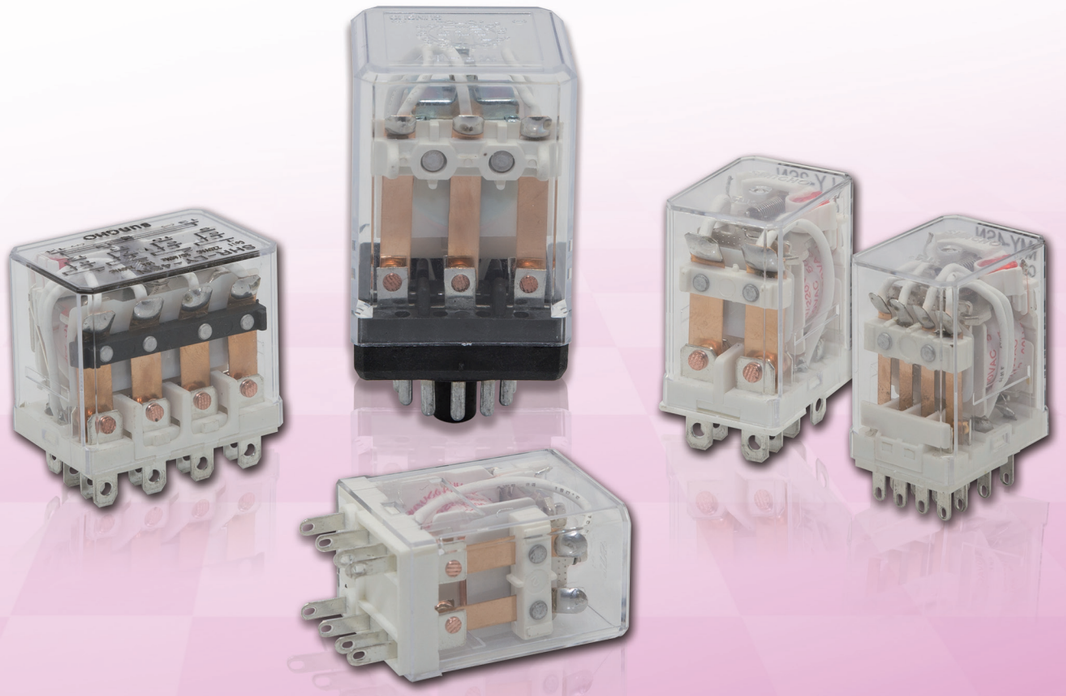


BUZZER



INDUSTRIAL RELAYS

제어용 릴레이



제어용 릴레이 INDUSTRIAL RELAYS TYPE SHR

신호전달용, MY Sequence Relay • 3, 5A • 2 & 4 Pole • Plug-in/PCB Terminals • Switching AC220V & DC110V max.		 • 소켓취부용 Mount to Socket
파워용, LY Power Relay • 10A • 2 & 4 Pole • Plug-in/PCB Terminals • Switching AC220V & DC110V max.		 • 소켓취부용 Mount to Socket
소형파워용, MP Miniature Power Relay • 5, 7. 5A • 2 & 3 Pole • Plug-in Terminals • Switching AC220V & DC100V max.		 • 소켓취부용 Mount to Socket
강력파워용 Large Power Relay • 30A • 2 & 3 Pole • Panel Mount • Switching AC380V & DC100V max.		

신호전달용, MY Sequence relay

정격
Ratings

형식	Type of relay	SHR-MY-2		SHR-MY-4	
		2pole		4pole	
최대개폐전압	Rated voltage	AC220V, DC125V			
정격통전전류	Rated continuous current	5A		3A	
정격전류	Rated opearting current	AC220V	DC24V	AC220V	DC24V
	저항부하 *Resist* (cosϕ=1)	5A	5A	3A	3A
	유도부하 *Induct* (cosϕ=0.4, L/R=7ms)	2A	2A	0.8A	1.5A

주문형식 Catalog No. structure
(Ordering information)

S H R — SungHo
M Y — 릴레이 My Relay
4 S — 극수 Poles contacts (2S : 2극, 4S : 4극)
N — 동작표시 Indicator
2 4 A — 조작코일전압 Control voltage code
X I — 서지방지형 Surge check

• Type

극수 Poles contacts	단자구조 Terminal	동작표시 Indicator	형식 Type
2극 2 pole 2 changeover DPDT	소켓형 Plug-in	없음 Without	SHR-MY-2S
		있음 With LED	SHR-MY-2SN
4극 4 pole 4 changeover	소켓형 Plug-in 4PDT	없음 Without	SHR-MY-4S
		있음 With LED	SHR-MY-4SN

접속소켓 Socket for plug-in	2극 2pole	SH-RS-MY2
	4극 4pole	SH-RS-MY4

• 서지방지형

Code	Voltage
6A	AC6V
12A	AC12V
24A	AC24V
48A	AC48V
110A	AC110V
220A	AC220V
6D	DC6V
12D	DC12V
24D	DC24V
48D	DC48V
110D	DC110V

정격 및 성능 Characteristics

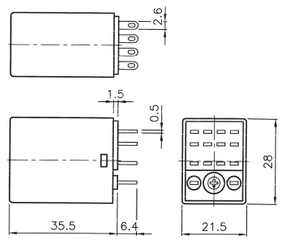
특징 Features	• 동작표시등 내장으로 제품신뢰성이 높습니다. • 소비전력이 적으며 응답속도가 예민합니다. • 2극형은 5A, 4극형은 3A의 부하를 개폐할 수 있는 소형 릴레이 입니다. • 아크를 차단하는 아크베리어를 부착하였습니다. • CUL승인품으로 제품의 안전도를 해외에서도 인정 받았습니다. • 서지방지용도 생산됩니다. • The reliability of product is high with indicating pilot lamp. • Power consumption is little, respond speed is rapid. • As even with mini type relay can switching of 5A(2 pole) load, 3A(3 pole) load. • It is installed arc-barrier for arc prevention. • Approved the quality around the world by passing the UL test.		
용도 Application	• 일반 제어회로, 전원장치, 성형기, 산업기계 및 업무용기기 • 자판기, 의료기, 로봇 등. • General control circuit, Power supply device, Molding machine, Industrial machine, Instrument for business use • Vending machine, Medical instrument, Robot, etc.		

조작코일정격 Operating coil ratings	AC코일 *AC supply*	전압 *Rated voltage*		6V	12V	24V	50V	110V	220V
		전류 Current	50Hz	229mA	114mA	57.8mA	27.7mA	14.4mA	7.2mA
			60Hz	190mA	95mA	48mA	23mA	12mA	6mA
		저항 *Resistiance*		12.2Ω	46Ω	180Ω	788Ω	3,750Ω	12,950Ω
주) 설정기준 주위온도 23℃ 전류오차 ±15℃ 저항오차 ±10℃	DC 코일 DC supply	전압 *Rated voltage*		6V	12V	24V	48V	110V	
		전류 *Current*		150mA	75mA	36.9mA	18.5mA	10mA	
		저항 *Resistiance*		40Ω	160Ω	650Ω	2,600Ω	11,000Ω	
	사용전압 *Operating(Pick-up)voltage*			코일정격전압의 80~110% *80~110% of the coil rated voltage*					
	복귀전압 *Release voltage*	AC		코일정격전압의 30% 이하 *Less than 30% of the coil rated voltage*					
		DC		코일정격전압의 10% 이하 *Less than 10% of the coil rated voltage*					
	소비전력 *Power consumption*	AC		약 0.9~1.3W (60Hz) *About 0.9~1.3W at 60Hz*					
		DC		약 0.9VA *About 0.9VA*					
기타특성 Other characteristics	허용동작빈도 *Max. operating cycles*	기계적 *Mechanical*		18,000회/시 *18,000 cycles/hr.*					
		전기적 *Electricall*		1,800회/시 1,800 cycles/hr.					
	동작시간 *Operating(Pick-up) time*			20ms 이하 *Max. 20ms*					
	복귀시간 *Release time*			20ms 이하 *Max. 20ms*					
	접촉저항 *Contact resistance*			50MΩ 이하 *Max. 50MΩ*					
	절연저항 *Insulation resistance*			100MΩ 이상(DC500V MΩ 절연저항계) *min.100MΩ at DC500V*					
	내전압 *Dielectric strength*	충전부간 *Between contacts in the same pole*		AC 1,000V 50/60Hz 1min					
		비충전부간 Between other parts		AC 2,000V 50/60Hz 1min					
	내진동 *Vibration protection*			10~55Hz 복진폭 1.0mm					
	내충격 *Mechanical shock protection*	내 구		1000m/s²(약 100G)					
		오동작		200m/s²(약 20G) 이상					
	수명 *Lifetimes*	전기적 *Electricall*		20만회 이상 0.2 mil .operations					
		기계적 *Mechanical*		500만회 이상 5 mil .operations					

신호전달용, MY-2 Sequence relay, MY-2

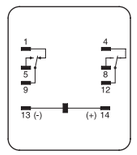
외형치수
Dimensions

MY-2S
MY-2SN
MY-2SN-X1



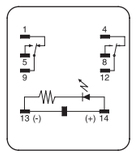
접속도
Circuit diagrams

MY-2S



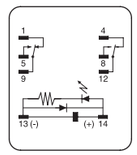
2극
2pole

MY-2SN



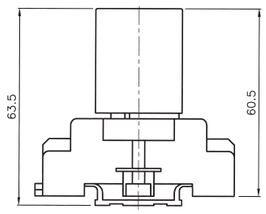
2극(LED부착)
2pole with LED

MY-2SN-X1



서지방지형

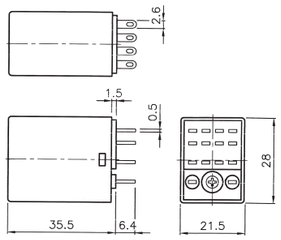
소켓설치시 치수
진동에 의한 탈락이 생기지 않도록 릴레이 고정쇠로 확실하게 고정, 사용하여 주시기 바랍니다.



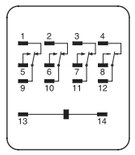
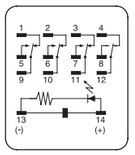
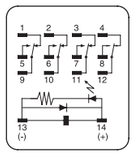
신호전달용, MY-4 Sequence relay, MY-4

외형치수
Dimensions

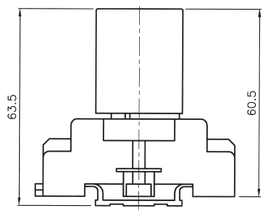
MY-4S
MY-4SN
MY-4SN-X1



접속도
Circuit diagrams

MY-4S	MY-4SN	MY-4SN-X1
		
2극 2pole	2극(LED부착) 4pole with LED	서지방지형

소켓설치시 치수
진동에 의한 탈락이 생기지 않도록 릴레이 고정쇠로 확실하게 고정, 사용하여 주시기 바랍니다.

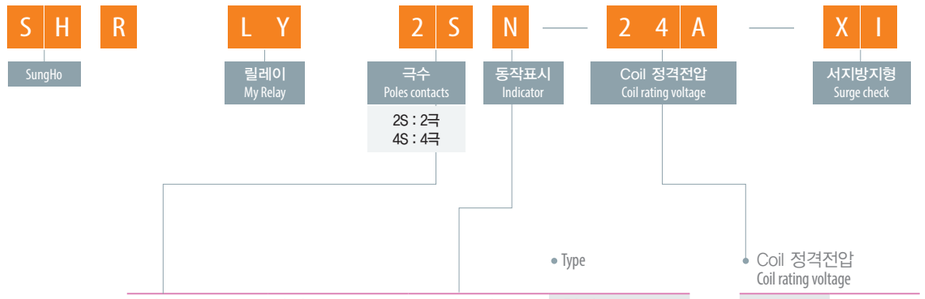


파워용, LY Power relay

정격
Ratings

형식	Type of relay	SHR-LY-2, 4 2, 4pole	
최대개폐전압	Rated coltage	AC220V, DC125V	
정격통전전류	Rated continuous current	10A	
정격전류	Rated opearting current	AC220V	DC24V
	저항부하 Resist (cosϕ=1)	10A	10A
	유도부하 Induct (cosϕ=0.4, L/R=7ms)	7.5A	5A

주문형식 Catalog No. structure
(Ordering information)



• Type

극수 Poles contacts	단자구조 Terminal	동작표시 Indicator	형식 Type
2극 2 pole 2 changeover	소켓형 Plug-in	없음 Without	SHR-LY-2S
		있음 With LED	SHR-LY-2SN
4극 4 pole 4 changeover	소켓형 Plug-in	없음 Without	SHR-LY-4S
		있음 With LED	SHR-LY-4SN

• Coil 정격전압
Coil rating voltage

Code	Voltage
6A	AC6V
12A	AC12V
24A	AC24V
48A	AC48V
110A	AC110V
220A	AC220V
6D	DC6V
12D	DC12V
24D	DC24V
110D	DC110V

접속소켓 Socket for plug-in	1극 1pole	SH-RS-LY2
	2극 2pole	SH-RS-LY2
	4극 4pole	SH-RS-LY4

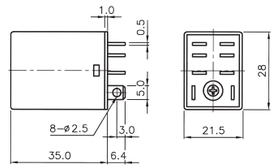
정격 및 성능 Characteristics

특징 Features	• 동작표시등 내장으로 제품신뢰성이 높습니다. • 소비전력이 적으며 응답속도가 예민합니다. • 2극형은 10A의 부하를 개폐할 수 있는 소형 릴레이 입니다. • 아크를 차단하는 아크베리어를 부착하였습니다. • CUL승인품으로 제품의 안전도를 해외에서도 인정 받았습니다. • 서지방지용도 생산됩니다. • The reliability of product is high with indicating pilot lamp. • Power consumption is little, respond speed is rapid. • As even with mini type relay can switching of 15A(1 pole) load, 10A(2 pole) load. • It is installed arc-barrier for arc prevention. • Approved the quality around the world by passing the UL test.								
용도 Application	• 일반 제어회로, 전원장치, 성형기, 산업기계 및 업무용기기 • 자판기, 의료기, 로봇등. • General control circuit, Power supply device, Molding machine, Industrial machine, Instrument for business use • Vending machine, Medical instrument, Robot, etc.								
조작코일정격 Operating coil ratings 주) 설정기준 주위온도 23℃ 전류오차 ±15℃ 저항오차 ±10℃	AC코일 *AC supply*	전압 *Rated voltage*		6V	12V	24V	50V	110V	220V
		전류 Current	50Hz	229mA	114mA	57.8mA	27.7mA	14.4mA	7.2mA
			60Hz	190mA	95mA	48mA	23mA	12mA	6mA
		저항 *Resistiance*		12.2Ω	46Ω	180Ω	788Ω	3,750Ω	12,950Ω
	DC 코일 DC supply	전압 *Rated voltage*		6V	12V	24V	48V	110V	
		전류 *Current*		150mA	75mA	36.9mA	18.5mA	10mA	
		저항 *Resistiance*		40Ω	160Ω	650Ω	2,600Ω	11,000Ω	
	사용전압 *Operating(Pick-up)voltage*			코일정격전압의 80~110% *80~110% of the coil rated voltage*					
	복귀전압 *Release voltage*	AC		코일정격전압의 30% 이하 *Less than 30% of the coil rated voltage*					
		DC		코일정격전압의 10% 이하 *Less than 10% of the coil rated voltage*					
	소비전력 *Power consumption*	AC		약 0.9~1.3W (60Hz) *About 0.9~1.3W at 60Hz*					
		DC		약 0.9VA *About 0.9VA*					
기타특성 Other characteristics	허용동작빈도 *Max. operating cycles*	기계적 *Mechanical*		18,000회/시 *18,000 cycles/hr.*					
		전기적 *Electricall*		1,800회/시 *1,800 cycles/hr.*					
	동작시간 *Operating(Pick-up) time*			25ms 이하 *Max. 25ms*					
	복귀시간 *Release time*			25ms 이하 *Max. 25ms*					
	접촉저항 *Contact resistance*			100MΩ 이하 *Max. 100MΩ*					
	절연저항 *Insulation resistance*			100MΩ 이상(DC500V MΩ 절연저항계) *min.100MΩ at DC500V*					
	내전압 *Dielectric strength*	충전부간 *Between contacts in the same pole*		AC 1,000V 50/60Hz 1min					
		비충전부간 *Between other parts*		AC 2,000V 50/60Hz 1min					
	내진동 *Vibration protection*			10~55Hz 복진폭 1.0mm					
	내충격 *Mechanical shock protection*	내 구		1000m/s²(약 100G)					
		오동작		200m/s²(약 20G) 이상					
	수명 *Lifetimes*	전기적 *Electricall*		20만회 이상 *0.2 mil .operations*					
		기계적 *Mechanical*		500만회 이상 *5 mil .operations*					

파워용, LY-2 Power relay, LY-2

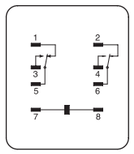
외형치수
Dimensions

LY-2S
LY-2SN
LY-2SN-X1



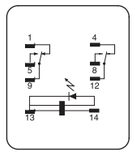
접속도
Circuit diagrams

LY-2S



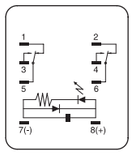
2극
2pole

LY-2SN



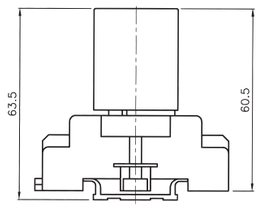
2극(LED부착)
2pole with LED

LY-2SN-X1



서지방지형

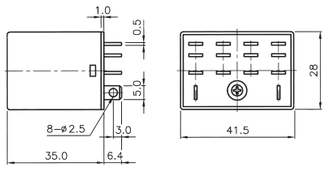
소켓설치시 치수
진동에 의한 탈락이 생기지 않도록 릴레이 고정쇠로 확실하게 고정, 사용하여 주시기 바랍니다.



파워용, LY-4 Power relay, LY-4

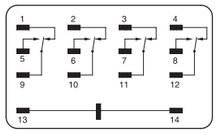
외형치수
Dimensions

LY-4S
LY-4SN
LY-4SN-X1



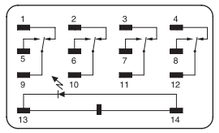
접속도
Circuit diagrams

LY-4S



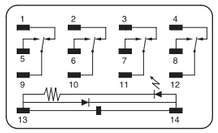
4극
4pole

LY-4SN



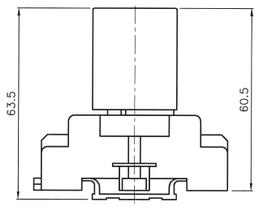
4극(LED부착)
4pole with LED

LY-4SN-X1



서지방지형

소켓설치시 치수
진동에 의한 탈락이 생기지 않도록 릴레이 고정쇠로 확실하게 고정, 사용하여 주시기 바랍니다.



정격 및 성능 Characteristics

특징 Features	• 소형이면서도 2, 3극 2종으로 되어 있으며, 10A의 부하를 개폐할 수 있는 고용량 파워 릴레이입니다. • 소비전력이 적으며 응답속도가 예민합니다. • 정격전압선택의 폭이 넓어 회로구성이 용이합니다. • 기계적 수명이 500만회 이상의 장수명 제품입니다. • 교환 및 유지보수가 쉬운 구조로 되어 있습니다. • As even with mini relay have 2 type of 2 pole and 3 pole. And a relay with large capacity for possible switching of 10A load. • Power consumption is little, respond speed is rapid. • Consist of circuit is easy, because range of rating voltage selection is wide. • With above 5 million times of mechanical lifetime, it can be long used. • Consist of structure that replacement and maintenance, repair.		
용도 Application	• 일반제어회로, 전원장치, 공작기계 • 의료기, 로봇 및 기타 범용 기계 • General control circuit, Power supply device, Machine tool • Medical instrument, Robot, and the like general-purpose machine.		

조작코일정격 Operating coil ratings 주) 설정기준 주위온도 23℃ 전류오차 ±15℃ 저항오차 ±10℃	AC코일 *AC supply*	전압 *Rated voltage*		6V	12V	24V	50V	110V	220V
		전류 *Current*	50Hz	404mA	202mA	98mA	43.6mA	24.7mA	12.9mA
			60Hz	360mA	180mA	88mA	39mA	21mA	11mA
		저항 *Resistiance*		5.3Ω	21.5Ω	91Ω	420Ω	1,620Ω	7,100Ω
	DC코일 *DC supply*	전압 *Rated voltage*		6V	12V	24V	48V	110V	
		전류 *Current*		255mA	126mA	56mA	29.5mA	14.7mA	
		저항 *Resistiance*		23.5Ω	95Ω	430Ω	1,630Ω	6,800Ω	

조작코일정격 Operating coil ratings	사용전압 *Operating(pick-up)voltage*		코일정격전압의 80~110% 80~110% of the coil rated voltage
	복귀전압 *Release voltage*	AC	코일정격전압의 30% 이하 Less than 30% of the coil rated voltage
		DC	코일정격전압의 10% 이하 Less than 10% of the coil rated voltage
	소비전력 *Power consumption*	AC	약 1.9~2.8W (60Hz) *About 1.9~2.8W at 60Hz*
		DC	약 1.5VA *About 1.5VA*
기타특성 Other characteristics	허용동작빈도 *Max. operating cycles*	기계적 *Mechanical*	18,000회/시 18,000 cycles/hr.
		전기적 *Electrical*	1,800회/시 1,800 cycles/hr.
	동작시간 Operating(Pick-up) time		AC 조작시 : 20ms 이하, DC 조작시 : 30ms 이하 AC supply : Max. 20ms, DC supply : Max. 25ms
	복귀시간 *Release time*		20ms 이하 *Max. 20ms*
	접촉저항 *Contact resistance*		100mΩ 이하 *Max. 100 MΩ*
	절연저항 *Insulation resistance*		100mΩ 이상(DC500V MΩ 절연저항계) *min.100MΩ at DC500V*
	내전압 *Dielectric strength*	충전부간 *Between contacts in the same pole*	AC 1,000V 50/60Hz 1min
		비충전부간 *Between other parts*	2 pole : AC 2,000V 50/60Hz 1min 3 pole : AC 1,500V 50/60Hz 1min
	내진동 *Vibration protection*		10~55Hz 복진폭 1.0mm
	내충격 *Mechanical shock protection*	내구	1000m/s²(약 100G)
		오동작	200m/s²(약 20G) 이상
	수명 *Lifetimes*	전기적 *Electricall*	20만회 이상 *0.2 mil. operations*
		기계적 *Mechanical*	500만회 이상 *5 mil. operations*

소형파워용, MP Miniature power relay

정격
Ratings

형식	Type of relay	SHR-MP-2		SHR-MP-3	
		2pole		3pole	
최대개폐전압	Rated coltage	AC220V, DC125V			
정격통전전류	Rated continuous current	7.5A		5A	
정격전류	Ratedopearting current	AC220V	DC24V	AC220V	DC24V
	저항부하 Resist (cosϕ=1)	7.5A	5A	5A	3A
	유도부하 Induct (cosϕ=0.4, L/R=7ms)	3A	4A	2A	2.5A

주문형식 Catalog No. structure
(Ordering information)

S H R — M P — 2 S — 2 4 A

- SH: SungHo
- R: Relay
- MP: 소형파워릴레이 Miniature power relay
- 2S: 극수 Poles contacts
  - 2 : 2P 2Pole
  - 4 : 4P 3Pole
- 24A: Coil 정격전압 Coil rating voltage

극수 Poles contacts	단자구조 Terminal	동작표시 Indicator	형식 Type
2극 2 pole 2 changeover DPDT	소켓형 Plug-in	없음 Without	SHR-MP-2
		있음 With LED	
	PCB형 PCB terminal	없음 Without	
		있음 With LED	
3극 3 pole 3 changeover 3PDT	소켓형 Plug-in	없음 Without	SHR-MP-3
		있음 With LED	
	PCB형 PCB terminal	없음 Without	
		있음 With LED	

• Type

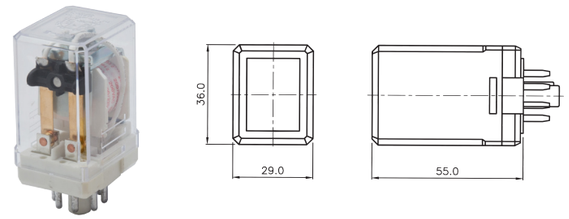
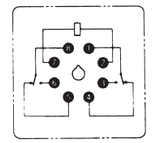
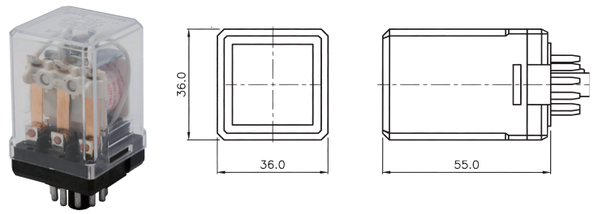
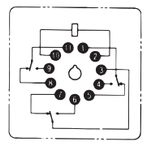
• Coil 정격전압
Coil rating voltage

Code	Voltage
6A	AC6V
12A	AC12V
24A	AC24V
48A	AC48V
110A	AC110V
220A	AC220V
6D	DC6V
12D	DC12V
24D	DC24V
48D	DC48V
110D	DC110V

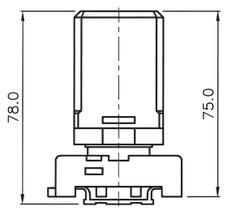
접속소켓 Socket for plug-in		
	2극 2pole	SH-RS-8
	3극 3pole	SH-RS-11

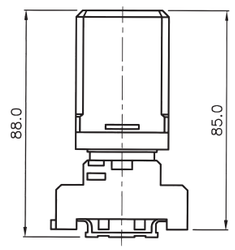
소형파워용, MP Miniature power relay

외형치수 및 접속도
Dimensions & circuit diagrams

Dimensions	Circuit diagrams
SHR-MP2 	 2극 2 pole
SHR-MP3 	 3극 3 pole

소켓설치시 치수
리레이를 확실하게 고정하여 진동충격에 의하여 탈락등을 막는데 사용하여 주십시요.





강력파워용 Large Power Relay

정격 및 성능
Characteristics

특징 Features	• 25A까지 전류를 개폐할 수 있어 다용도로 사용할 수 있습니다 • 동작음이 적고 절연성이 우수하며 대용량 전력회로의 개폐가 가능한 인지형 계전기입니다. • 가동부에는 보호카바가 있어 동작이 안전합니다. • 용량에 비해 가격이 저렴한 우수제품입니다. • A relay with large capacity for possible switching of 25A load, it can be wide use. • Widely used for mass device with action sound is quiet, insulation is excellent. • A moving part with protection cover is act safely. • As even with mass capacity, low priced and excellent product.					
용도 Application	• 냉동차, 전기온수기, 단상모타기동용, 항온장치의 히타개폐 • 펌프, 환풍기모터제어용, 기타 산업용기계. • Freezer car, Electric water heater, Starter motor, Heater switchgear of pyrostat. • Pump, Control device of ventilating fan motor, and the like industrial machines.					
조작코일정격 Operating coil ratings 주) 설정기준 주위온도 23℃ 전류오차 ±15℃ 저항오차 ±10℃	AC코일 *AC supply*	전압 *Rated voltage*		24V	110V	220V
		전류 *Current*	50Hz	500mA	116mA	58mA
			60Hz	410mA	96mA	48mA
		저항 *Resistiance*		48Ω	948Ω	3800Ω
	DC코일 *DC supply*	전압 *Rated voltage*		12V	24V	100V
		전류 *Current*		218mA	104mA	25mA
		저항 *Resistiance*		55Ω	230Ω	4,000Ω
	사용전압 *Operating(Pick-up)voltage*			코일정격전압의 80~110% *80~110% of the coil rated voltage*		
	복귀전압 *Release voltage*	AC		코일정격전압의 30% 이하 *Less than 30% of the coil rated voltage*		
		DC		코일정격전압의 10% 이하 *Less than 10% of the coil rated voltage*		
	소비전력 *Power consumption*	AC		약 9~10.6W (60Hz) *About 9~10.6W at 60Hz*		
		DC		약 1.5VA *About 1.5VA*		
기타특성 Other characteristics	허용동작빈도 *Max. operating cycles*	기계적 *Mechanical*		18,000회/시 *18,000 cycles/hr.*		
		전기적 *Electricall*		1,800회/시 *1,800 cycles/hr.*		
	동작시간 *Operating(Pick-up) time*			AC 조작시: 30ms 이하, DC 조작시: 40ms 이하 *AC supply : Max. 30ms, DC supply : Max. 40ms*		
	복귀시간 Release time			AC 조작시 : 30ms 이하, DC 조작시: 50ms 이하 *AC supply : Max. 30ms, DC supply : Max. 50ms*		
	접촉저항 *Contact resistance*			50mΩ 이하 *Max. 50mΩ*		
	절연저항 *Insulation resistance*			100MΩ 이상(DC500V MΩ 절연저항계) min. *100MΩ at DC500V*		
	내전압 *Dielectric strength*	충전부간 *Between contactsin the same pole*		AC 1,000V 50/60Hz 1min		
		비충전부간 *Between other parts*		AC 2,000V 50/60Hz 1min		
	내진동 *Vibration protection*			10~55Hz 복진폭 1.0mm		
	내충격 *Mechanical shock protection*		내구	1000m/s²(약 100G)		
			오동작	50m/s²(약 5G) 이상		
	수명 *Lifetimes*	전기적 *Electricall*		20만회 이상 *0.2 mil .operations*		
		기계적 *Mechanical*		500만회 이상 *5 mil .operations*		

사용시 주의사항

- 접속: 각 단자는 나사식 접속방식이므로 적당한 압착단자(M4)를 사용하시며 나사조임 시 무리한 힘을 가하지 마십시오.
- 부착방법: 가능한 수평부착을 하되 수직부착의 경우는 접점부분을 밑으로 향하게 부착하시고 부착장소는 습기, 먼지, 기름등이 없는 장소에 부착하여 주십시요.
- 보수: 사용중 떨림현상이 있을시는 고정 철심사이에 이물질이 끼어 있으므로 깨끗한 공기로 품어내거나 깨끗한 종이나 헝겊으로 닦아주십시요.

정격
Ratings

최대개폐전압	Rated voltage	AC220V, DC125V			
정격통전전류	Rated continuous current	25A			
정격전류	Rated opearting current	AC110V	AC220V	DC24V	DC110V
	저항부하 Resist (cosϕ=1)	30A	25A	15A	1.2A
	유도부하 Induct (cosϕ=0.4, L/R=7ms)	20A	15A	7.5A	0.6A

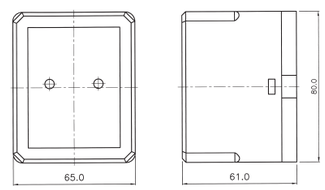
주문형식 Catalog No. structure
(Ordering information)

극수 Poles contacts	접점구성 Contacts (main)	보조접점 Aux. Contact	형식 Type
2극 2 pole	2a 2NO DPST	없음 Without	SHR–201
	2c 2 changeover DPDT	없음 Without	SHR–202
3극 3 pole	3a 3NO 3PST	없음 Without	SHR–203

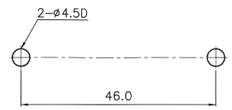
Code	Voltage
12A	AC12V
24A	AC24V
110A	AC110V
220A	AC220V
12D	DC12V
24D	DC24V
110D	DC110V

외형치수
Dimensions

SHR–201, 202, 203



판넬가공치수
Drilling



용어설명 Terms Explanation

(1) 일반용어
General Terms

• 힌지형 전자계전기
Hinge type electromagnetic relay

힌지형 전자계전기란 조작코일에 조작입력을 인가하거나 또는 제거함에 따라서 전자석의 접촉자가 지지점을 중심으로 회전운동을 하고, 그 움직임에 따라 직접 또는 간접으로 접점의 개폐를 하는 기구의 계전기로 일반적으로 릴레이라고 부릅니다.
The device which opens or closes contact directly or in directly according to the movement, which the contact pole of electromagnet does rotational movement with centering the supporting point, as actuation input is given to coil or removed.

• 신호전달
Signal transmission

조작코일의 소비전력이 자기와 거의 같은 값의 다른 리레이를 제어해서 전기신호를 제어하는 것입니다.
This is that the consuming power of coil controls other relay with almost same value as itself and transmits electric signal.

(2) 조작코일관계
Relation of operation coil

• 조작코일
Operating coil

리레이를 동작시키기 위하여 전압 또는 전류를 가하는 회로로서, 주로 권선으로 구성되는 부분입니다.
Operation coil is current, voltage supplying part for operating state of relay, it is composed of mainly winding.

• 조작입력
Operating inputt

조작코일에 가하여지는 전압 또는 전류.
Current or voltage for operation coil.

• 조작코일정격전압
Rated voltage of operating coil

릴레이를 통상상태로 사용하는 경우, 조작코일에 가하는 기준이 되는 전압을 말합니다.
Reference voltage given to operation coil for general use of relay.

• 조작코일의 정격전류(교류정격전압사양)
Rated current of operating coil

특정조건 23℃중에서 정격전압을 인가한 때의 수치로, 일반적으로 +15~–20%입니다.
The numerical value of supply a rating voltage in special condition 23°C. Generally +15 ~ -20%.

• 동작상태
Operating state

조작코일에 전압 또는 전류가 가해지고, 접점의 개폐가 완료된 상태입니다.
This is that condition of finished the opened or closed of contacts as supply current or voltage for operation coil.

• 복귀상태
Return state

조작코일의 전압 또는 전류가 제거되고, 접점의 개폐가 완료된 상태입니다.
This is that condition of finished the opened or closed of contacts as isolate current or voltage for operation coil.

• 동작
Operating

리레이가 복귀상태에서 동작상태로 이행되는 것입니다.
This is that a relay is carried out from return state to operating one.

• 복귀
Return

리레이가 동작상태에서 복귀상태로 이행되는 것입니다.
This is that a relay is carried out from operating state to return one.

• 코일저항(직류정격전압사양에 한함)
Coil resistance(limited direct rated voltage)

측정조건 23℃중에서의 값이고, 공차는 ±10%입니다.
This value is that condition of measurement is 23˚C, and common difference is ±10%.

• 정격소비전력
Rating consumption electric power

power코일에 정격전압을 가할 때 코일에서 소비되는 전력의 수치로 표시합니다. 교류의 경우는, 주파수 60㎐에 있어서의 수치입니다.
This is defined that using electric power in coil, as rating voltage given to coil.

• 동작전압
Operating voltage

복귀상태의 릴레이 코일에 입력을 차차 증가시켜 릴레이가 동작하는 전압치로 주위 온도가 23℃인 조건입니다.
The voltage when relay becomes operating state with increasing actuation input of relay in return state, and the condition is 23˚C in surrounding temperature.

• 복귀전압
Return voltage

리레이 코일 정격전압 입력을 점증시켜 리레이가 복귀하는 전압치로 주위 온도가 23℃인 것의 조건입니다.
The voltage when relay becomes return state with increasing actuation input of relay in operating state, and the condition is 23˚C in surrounding temperature.

• 최대허용전압
Maximum permissible voltage

리레이 코일의 조작전원 전압 허용 변동범위의 최대치입니다.
This is defined that maximum value of range of operating voltage change in the relay coil.

(3) 접점회로 관계
Relation of contact circuit

• 개폐부
Switching part

리레이에 의하여 개폐되는 외부회로에 접속되는 도전부분 전체를 리레이의 개폐부라 하고, 개폐부는 접점, 접촉스프링, 내부도선, 단자 등으로 구성됩니다.
Relay's switching part includes the entire conductive parts of relay which is connected to outer circuit switched by relay, and is composed of contact, contact spring, inside leading wire, terminal etc.

• 접점구성
Contact structure

접점구성이란, 접점 접촉 기구를 말합니다.
The part of interface in the contact.

• 접점극수
Contact pole

접점극수란, 접점 회로수를 말합니다.
The number of contact circuit.

• 상시 개로접점
Normally open contact

복귀상태에서 개로되고, 동작상태에서 폐로되는 접점, a 접점, 메이크 접점이라고도 합니다.
The contact which opening in return state while closed in operating and keeping state. It is also called as 'make contact' or 'a contact'.

• 상시 폐로접점
Normally closed contact

복귀상태에서 폐로되고, 동작상태에서 개로되는 접점, b접점, 브레이크 접점이라고도 합니다.
The contact which opening in return state while opened in operating and keeping state. It is also called as 'brake contact' or 'a contact'.

• 절환접점
Transfer contact

a접점, b접점을 모두 갖춘 접점구조로서, 가동접점축 또는 고정접점축의 도전부가 공통인 것. c접점 트랜스퍼접점이라고도 합니다.
As all equipped contact structure of a, b contact, the conductive part of movable contact side or fixed contact side is in common. Also called as C contact, transfer contact.

• 무개로 절환접점
No opened circuit transfer contact

상시 폐로접점과 상시개로 접점이 각 각 속하는 개폐부의 일부를 공유하는 구조로서, 리레이가 동작 및 복귀될 때 개로하는 접점의 개로보다 먼저 폐로되는 접점이 폐로하고, 일시적으로 쌍방의 접점이 폐로상태를 유지할 때의 절환접점 CI접점, 콘티뉴어스 접점, 메이크 비포어 브레이크 접점이라고도 합니다.
As a structure sharing some switching part to which normally closed and open contacts are belonged resp., this is the switching contacts when the closing contact, closed before the opening of opening contact when relay operates and returns, and both contact keep the closed state temporary. Also, called as CI contact, continuous contact, make before break contact.

• 정격부하
Rted load

개폐부(접점)의 성능을 결정하는 기준이 되는 수치로 접점전압과 접점전류의 조합으로 표현합니다.
Reference value to decide switching function in switchgear part. It is expressed by check up contact voltage and contact current.

• 정격통전전류
Rated continuous current

접점을 개폐하는 일 없고 동시에 온도 상승한도를 넘는 일 없이 연속해서 접점에 통전할 수 있는 전류입니다.
Continuously conductible current to switching part without switching contact and without exceeding temperature rise limit.

• 정격사용 전류
Rated operating current

개폐부의 성능을 정하는 기준이 되는 통전전류 이하의 전류입니다.
Reference current to decide switching function in switchgear part, it is decided below conductive current.

• 정격사용전압
Rated operating voltage

개폐부의 성능을 정하는 기준이 되는 전압입니다.
Reference voltage to decide switching function in switchgear part.

• 개폐빈도
Switching frequency

리레이의 단위시간에 대한 동작회수입니다.
Relay's operation frequency per unit time.

• 정격부하 개폐빈도
Rated load switching frequency

개폐부에 정격 부하를 인가하고, 연속하여 동작 및 복귀를 하여 전기적 수명을 만족할 수 있는 최대의 개폐빈도를 말합니다.
Maximum switchgear frequency that satisfy the electric life-time with supply a rating load in switchgear part, and operating and returning continuously.

• 무부하 개폐빈도
Non-load switching frequency

개폐부에 부하를 가하지 않고, 연속으로 동작 및 복귀를 하여 기계적 수명을 만족할 수 있는 최대의 개폐빈도를 말합니다.
Maximum switchgear frequency that satisfy the mechanical life-time without supply a rating load in switchgear part, and operating and returning continuously.

• 접점전압
Contact voltage

개폐부(접점)의 성능을 결정하는 기준이 되는 전류입니다. 이 수치는 정격 통전전류를 넘는 일은 없습니다. 사용시에는 접점전류의 최대치를 넘지 않도록 주의하십시오.
Reference current to decide switching function. This value is not exceed of rating conductive current. Please attention that don' texceed of maximum value in contact current in use.

• 개폐용량의 최대치
Maximum value of switchgear capacity

실제사용상, 지장없이 개폐할 수 있는 부하용량의 최대치입니다.
Maximum value of load capacity could open and close without difficulty in actual use.

접점에 관한 사항 The Matter Affecting Contact

(4) 전기적 성능Electric capacity

• 동작 시간
Operating time

주위온도 23℃일 때 릴레이의 코일에 코일정격전압을 가한 시점에서 a접점이 폐로상태로 되기까지의 시간을 말합니다.
As surround temperature is 23?C, operating time means that the time from supply coil rating voltage in coil of relay to closed condition of 'a' contact.

• 복귀시간
Release time

주위온도 23℃중 릴레이코일의 코일 정격전압을 제거한 시점에서 b접점이 폐로상태로 되기까지의 시간을 말합니다.
As surround temperature is 23?C, release time means that the time from remove coil rating voltage in coil of relay to closed condition of 'a' contact.

• 절연저항
Insulation resistance

접점 코일간이나 전기회로, 철심테, 철심과 같은 접지 비도전 금속부 사이 혹은 접점상호간의 저항을 말합니다.
Between the contact coil, or between the connected non-conduction metal like electric circuit, metal supporting frame, or resistance by mutually contact.

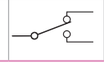
• 내전압
Dielectric strength

절연저항의 측정과 동일장소에 60Hz의 정현파에 가까운 전압으로 시험을 하였을 때 절선 파괴가 일어나지 않는 한계치를 나타내며 처음에는 규정전압치의 1/30이하의 전압을 인가하고 이후 규정치에 이를때까지 전압을 읽으면서 급속하게 상승시킵니다. 가압시간은 전압이규정치에 도달한 후 1분간으로합니다.
– 도전부단자와 노출된 비충전 금속부 사이
– 독립한 도전부 단자 사이
– 동극접점 단자 사이
It present limited value that line isn't cutting off when test in current near to Sine Curve of 60Hz in the same place with measurement of insulation resistance. Supply to voltage below the 1/3 of regulation voltage value in the first, and then makeincreasing rapidly with recognize the voltage until reach theregulation value.
- Between contact of electric conduction part and other exposed metal parts
- Between independent contact of electric conduction part
- Between same pole contact)

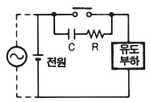
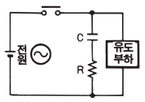
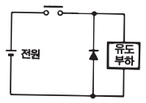
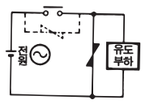
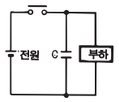
• 진동
Vibration

운반시, 취부시에 발생하는 비교적 큰 진동에 의한 특성변화와 파손에 대해 규제된 내구진동과 사용상태에서의 진동에 의한 오동작을 규제하는 오동작 진동으로 구분됩니다.
Vibration is classified into three types significantly. It is change of character by comparatively large vibration from transport and combine, and restricted vibration protection for damage, and vibration for error in action in use state.

• 접점기호
Symbol of contact

a접점 a contact	b접점 b contact	c 접점 c contact	2중차단 a접점 Double breaking A contact	2중차단 b접점 Double breaking B contact
				

• 접점보호회로
Contact protective circuit

회로예 Circuit example	적용 Application		특징 · 기타 Special feature, and the others
	AC	DC	
	* △	○	* AC 전압에서 사용하는 경우 부하의 인피더스가 CR의 인피던스보다 훨씬 작은점 When using AC voltage, induction load impedance smaller than CR's
	○	○	AC, DC 모두 적용 Both AC, DC applied.
	×	○	코일에 저장된 에너지를 병렬 다이오드에 따라 전류의 형태로 코일에 흐르게 하고 유도부하의 저항분으로 주울열로서 소비시킵니다. Make stored energy flowas AC diagram, and flowas Joule's law heatmethod in resistance of inductive load.
	○	○	바리스터 정전압 특성을 이용해 접점간에 그다지 높은 전압이 가해지지 않도록 하는 방식입니다. The method is to prevent supply to high voltage between contacts by use the feature of varistor regulator.
	×	×	차단시의 아크소호에는 굉장히 효과가 있지만 접점투입시에는 C로의 충전전류가 흐르므로 접점이 용착되기 쉽습니다. When projecting contact, contact is melted / attached due to the charged current flow of condenser.

유도부하를 개폐할 경우 앞 도표의 회로를 참고하면 접점의 수명을 연장하고, 잡음방지 및 아크에 의한 접촉장해를 방지하기 위하여 불꽃제거 회로로 보완하십시요. 또 불꽃제거 회로를 사용한 경우에 복귀시간(차단시간)이 다소 늦어지는 경우가 있으므로 주의해 주십시오.
When switching the inductive load, Please refer to the circuit in the diagram below. The reliability of contact is increased and lifetime longer. In case of using relay in inductive load (relay, solenoid, buzzer, etc.)switching, please compensate by framere moving circuit in order to prevent contact obstacle due to Arc. In this case please note return time can be delayed.

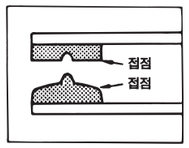
• 접점회로의 전압(AC, DC)
Voltage of contact circuit

접점회로의 전압은 회로에 유도를 포함할 때에는 굉장히 높은 역기전압이 발생하고 전압이 높을수록 에너지가 커져 접점을 파손시키며 이로 인해 접점의 소모량, 이전량이 증대되므로 리레이의 제어용량에 주의할 필요가 있습니다. 이것은 DC의 경우 AC 전류와 같이 제로점이 없고 한번 아크를 발생시키면 잘꺼지지 않아 아크시간이 길어지는 것이 주된 원인입니다.
Voltage of contact circuit with inducement is created exclusive high opposite voltage, the more voltage, the more energy is large. In this case, because of consumption, transference is increased, please note for control capacity of relay. In case of DC, the chief cause is that there is not zero-point differently with AC, maintain-time of arc is long.

• 접점회로의 전류
Current of contact circuit

접점의 폐로 및 개로시의 전류는 접점에 중요한 영향을 줍니다. 예를 들면 부하가 모터나 램프일때는 폐로시의 돌입 전류가 클수록 접점의 소모량이 전량이 증대되고 또한 접점의 용착, 이전에 의한 접점개리 불능이라는 지장을 일으킵니다.
Current of opening and closing of contact is important affect to contact. For example, according to rush current of closing is getting larger, consumption and transference of contact is getting larger, and lead to trouble of incapacity in contact if load is motor or lamp.

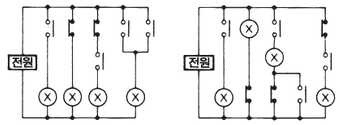
• 직류부하개폐
DC load switching
– 직류 부하 개폐에서는 접점을 직렬로 접속하면 등가적으로 접점 간격을 넓히게 되고 아크의 차단이 보다 확실하게 됩니다.
– If connect DC with contact in DC load switching, can intercept arc effectively.



– 직류 부하 개폐에서는 접점의 전이가 발생하며 ⊔⊔의 연루로 접점이 복구되지 않는 경우가 있습니다. 이것은, 접점 의접촉부에 발생하는 열 때문에 국부적으로 접점용적, 증발과 화학적 변화에 의해서 접점의 일부가 현저하게 소모되고 ⊔부가되며, 다른 쪽은 ⊔가 나오게 되는 것에 기인합니다. 릴레이 접점의 정격 전류이하의 부하전류에도 일어나는 경우가 있으므로 실기로 확인이 필요합니다.
– In DC load switching, come into transition of contact, and contact can be not returned caused by implication of ⊔, ⊔.
It means that one side contact is melted or evaporated to transfer to other contacts and the uneven phenomenon is appeared as shown in the fig. So, please checking at any time.

• 전위차 회로
Potential difference circuit

다극 리레이의 부하접속은 전위차 회로로 되지 않도록 아래 그림 ①의 방법으로 접속해 주십시오.
Load connection of multipolar relay is that please connect a smethod of picture ① to prevent potential difference circuit.



① 좋은 접속 ② 나쁜 접속

또한, 부하회로 전압이 20V 이하인 경우 및 개폐에 의해 아크 발생이 없는 경우는 그림 ②의 접속으로도 사용 가능합니다. 또 모터가 정역전인 경우도 똑같이 전위차 회로가 되므로 주의해 주십시요.
More over, if load circuit voltage is the below 20V, or if the occurrence of arc by switching is not exist, can use as method of picture ②. And, if the motor is reversed (backlashing), please note for potential difference circuit.

코일입력에 관한 사항

리레이의 동작을 확실히 행하기 위해 정격전압을 인가하는 것은 가장 기본적인 것입니다. 전원의 종류, 전압변동, 온도상승에 의한 코일저항의 변화 등을 고려하면 코일에는 정격전압을 인가하는 것이 필요합니다. 또 최대연속 인가전압 이상의 전압을 가하면 화재등을 일으키는 경우도 있으므로 주의가 필요합니다.

코일입력에 관한 사항

• 코일 온도상승
Coil temperature rise

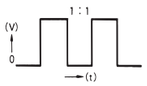
코일에 전류가 흐르면 코일 열동선, 교류전원에는 철심등 자기재료의 철손이 부가되고 열이 발생하여 온도상승이 일어납니다. 또한 접점에 전류를 흐르게 하면 접점부에 열이 발생하여 코일의 온도상승에 영향을 줍니다.

If flowing current to coil, coil copper loss(heat) and the iron loss of magnetic materials like iron core in AC power source are added and temperature is gone up due to heat occurrence. Moreover, if flowing current to contact, heating is occurred on contact part and gives very much influence on coil temperature rise.

• 맥동전압에 의한 온도상승
Temperature rise by ripple voltagee

ON시간 2분 이하의 맥동전압으로 사용한 경우, 코일온도 상승치는 ON 시간에 관계없이 ON, OFF 비율에 따라 다르고, 연속통전시와 비교해 상당히 작아집니다.

In case of using to ripple voltage below 2 min of on time, coil temperature rise value is related to ON time and there is difference depending on ON, OFF ratio. Also in continuous conducting there are some difference depending on ratio.



통전시간	%
연속통전의경우	온도상승치 100%로한다
ON:OFF=3:1	약 80%
ON:OFF=1:1	약 50%
ON:OFF=1:3	약 35%

• 코일온도상승에 의한 동작전압의 변화
Operation voltage change by coil temperature increasing

– 직류 조작 리레이에서는 코일에 연속통전한 후 한번 OFF하고 즉시 다시 ON하는 경우에는 코일의 온도상승에 따라 코일 저항이 증가하고 동작전압이 약간 높아지게 됩니다.
– 동선의 저항계수는 1℃ 부근 약 0.4%이고 이 비율로 코일저항이 증가합니다. 즉 리레이를 동작시키는데는 동작 전류 이상의 전류가 필요하고 저항치의 증가에 관계없이 높아지게 되는 것입니다.
– If immediately OFF and ON after continuously conducting to direct type current relay, operation voltage becomes a little higher due to coil resistance increased by coil temperaturerise. Furthermore, when using in higher ambient temperature, operation voltage also goes up.
– resistance temperature coefficient of copper wire is approx 0.4% at 1?C and with this ratio coil resistance increase. Therefore, in order to operate relay, the current over operating current is required and it gets higher depending on the rise of resistance value.

• 직류입력용 전원
Power source for DC input

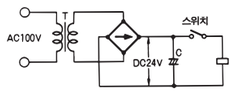
– DC 코일 방법은 코일극성(+, –)를 확인하십시오.
– 직류 리레이의 조작전류는 밧데리 전원 또는 리플율 50%이하의 직류전원을 원칙으로 하지만 정류회로를 통해 조작하는 경우 리플율의 대소에 따라 동작 복귀전압이 다르기 때문에 사용 전에 확인하십시오. 또 맥류가 극단적으로 커지면 맥놀이를 일으키는 경우가 있으므로 아래 그림과 같이 평활콘덴서의 삽입을 권합니다.
– Please note coil polarity in DC coil methods.
– Operation current of DC input relay is battery power supply or DC power supply below the 50% of reply rate as a rule, but in case of operation through commutation circuit, please note before use, because operating, return voltage is different as degree of reply rate.

• 교류코일의 인가전압
AC Coil's Applied Voltage

1. 리레이가 안정된 동작을 하도록 기본적으로 정격전압의 +10%, –20%의 범위 내에서 정현파 전압을 인가하여 주십시오.
2. 리레이 조작회로의 전원과 같은 라인에모터, 솔레노이드, 트랜스 등이 접속되어 있어서 그것들이 동작되었을 때 전원전압이 저하되고 이 때문에 리레이가 바이브레이션을 일으켜 접점을 소손시키는 경우가 있습니다. 특히 소형트랜스를 끼웠을때나 트랜스 용량에 여유가 없을 때 배선이 긴 경우 혹은 배선이 가는 경우등도 이러한 사용방법이 되므로 통상의 전압변동과 맞추어 주십시오.

1. Please apply Sine Curve voltage within +10%, -15% of rating voltage in order for relay to do stable operation.
2. Motor, Solenoid, Transformer is connected in same position with switching of relay operation circuit, in case of its operation, switching voltage getting lowering, and it cause vibration of relay, can be damaged contact.

〈콘데서를 이용한 전압변동흡수회로〉

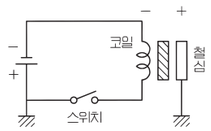


• 코일선의 전식(電食)
Coil's electrolytic corrosion

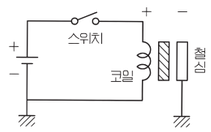
고온, 다습한 환경에서 리레이코일에 직류전압을 장시간 인가할 경우 회로에 따라서는 코일이 전기적으로 부식되어 전선이 되는 일이 있습니다. 이 전식(電食)을 방지하기 위하여 다음 사항을 유의하여 주십시오.

When relay's coil voltage circuit is high (especially above DC 48V), if DC relay conducts long or continuously in the place with higher temperature and humidity, wire can be disconnected by occurred electrolytic corrosion, the phenomenon which coil is corroded electrically. In order to protect this, please note the following points.

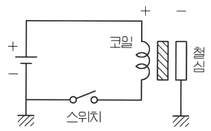
1. 전원은 +측을 접지합니다.
Please power source ground on + side.



2. +측의 접지가 불가능할 경우 스위치를 +측에 연결하여 코일과 철심 사이에 전위차가 생기지 않도록 하십시오.
If impossible ground on +side, please connect the switch to +side for prevent to potential difference between coil and iron core.



3. 전원의 –측을 접지하고, –측에 접점을 넣는 것을 피해 주십시오.
Please avoid grounding -side of power source and switching in.



• 돌입전류(부하특성)
Rush current(feature of load)

부하의 종류 및 전류 특성은 개폐에 관련하여 접점에 상당한 영향을 줍니다. 솔레노이드 부하, 모터부하, 경광등부하 등은 투입시에 정상 전류의 수배~수십배까지의 돌입 전류가 흘러 접점 용착의 큰 원인이 되기 때문에 이것을 충분히 고려하여 여유있는 리레이를 선택하여 주시기 바랍니다.

With reference to switching, load types and current features give big influence on contact. Please note and checking as input with solenoid load, motor load, several times~several ten times of rush current can be flowed.

1. 저항부하 : 돌입전류/ 정격전류 = i/io = 1배
2. 백렬등 : i/io = 10~15배(약1/3초)
3. 수은등 : i/io = 3배(3~5분)
4. 모–터부하 : i/io = 5~10배(0.2~0.5초)
5. 솔레노이드부하 : i/io = 10~20배(0.07~1초)
6. 전자접촉기부하 : i/io = 3~10배(1/60~1/30초)
7. 콘덴사부하: i/io = 20~40배(1/120~1/30초)

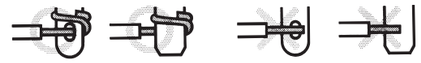
1. Resistance load : rush current/rated current=i/io=1time
2. Incandescent electric lamp : i/io=10~15times (approximate 1/3sec.)
3. Mercury lamp : i/io=3times (3~5 min.)
4. Motor load : i/io=5~10times (0.2~0.5 sec.)
5. Solenoid load : i/io=10~20times (0.07~1sec.)
6. Electronic contactor load : i/io=3~10times (1/60~1/30 sec.)
7. Condenser load : i/io=20~40times (1/120~1/30 sec.)

• 리드선접속방법
How to connect lead wire

1. 접속 시에 부하 전류의 크기에 따라 아래 표에 지시한 단면적 이상의 리드선을 사용하십시오.
When connecting lead wire, depending on the size of load current, please use above size of the section area in table.

허용전류(A) Allowable current(A)	단면적(m, m^2) Cross-sectional Area
2	0.2
3	0.3
5	0.5
7.5	0.75
12.5	1.25
15	2
20	2
30	3.5

2. 리드선의 리레이 단자의 걷어올림을 충분히 행하여 주십시오.
Please take up relay contact of lead wire sufficiently.



〈좋은 예〉 〈나쁜 예〉

• 프린트 기판에의 납땜
Soldering of print substrate

(1) 납땜 작업시 다음 사항에 유의하여 주십시오.
Please note for following points in soldering

1. 단자의 납땜시에는 가능한한 신속하게 작업하여 주십시오. 30W 정도의 인두끝의 온도는 약300~350℃ 정도로 2~3초간이 적당합니다.
2. 납의 양은 단자의 2/3이내가 적당합니다.

1. Please operate quickly as possible in contact soldering. Temperature of tip of 30W soldering iron is approximate 300~350℃, and 2~3 sec. is proper time.
2. The amount of solder is proper in below the 2/3 of contact.

(2) Dip Soldering시에는 다음 사항에 유의해 주십시오.
Please note for following points in Dip Soldering.

1. Flox는 필요한 이상이 되지 않도록 액면관리를 통하여 균일하면서도 얇게 도포해 주십시오.
2. Flox는 송진계의 부식성이 없는 것을 사용하여 주십시오.
3. Flox 도포후는 반드시 예비가열을 하여 주십시오.
4. Dip Soldering 공정에서는 온도관리에 충분히 주의하여 주십시오.

1. Please equalize supply the Flox through manage the surface.
2. Please use the Flox without corrosiveness of pine resin.
3. Should be preparatory heated after supply Flox.
4. Please note the management of temperature sufficiently in Dip Soldering work.

ANALOGUE TIMERS

아날로그타이머

미니타이머 MT, 타이머 L/M/n
TWIN 타이머 T

아날로그 타이머 ANALOGUE TIMERS

미니타이머, MT
Miniature Timer

- 제어시간범위, Ranges
  0.05sec to 3hrs (12 ranges)
- 출력접점, Contacts
  1c, 2c, 4c
- 노출형/소켓접속
  Surface Mount Via Socket

• 노출형
Surface Mount
미니타이머, MT
Miniature Timer
타이머, L/M/n_2
On-delay Timer
TWIN타이머, T
Twin Timer

타이머, L/M/n
On-delay Timer

- 제어시간범위, Ranges
  1sec to 48hrs (16 ranges)
- 출력접점, Contacts
  1a + 1c
- 취부: 노출 및 매입형
  Surface or Flush Mount

TWIN타이머, T
Twin Timer
On-Off Delay

- 제어시간범위, Ranges
  3sec to 3hrs (10 ranges)
- 출력접점, Contacts
  1c
- 취부: 노출 및 매입형
  Surface or Flush Mount

• 매입형
Flush Mount
타이머, L/M/n
On-delay Timer
TWIN타이머, T
Twin Timer

미니타이머 MT … 최대 3시간 Miniature timer, SHT-MT / On-delay / max. range 3hrs

주문형식 Catalog No. structure
(Ordering information)

• Type

S	H	T		M	T	1		1	S	—	2	4	D
SungHo		Timer		Miniature Timer		한시4C Timedelay 4C		정격시간 Rating time			Coil 정격전압 Coil rating voltage		

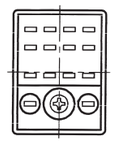
시간사양 Time SPEL
S : 초(sec)
M : 분(min)
H : 시간(hour)

• Type

출력접점구성 및 정격 Output contacts Configuration	Rating	제어시간범위 Settiing range Min. Max.	형식 Type
4c 4 Changeover 4NO+NC	3A, AC250V 저항부하 at resistive load	0.05sec ~ 1sec	SHT–MT1–1S
		0.1sec ~ 3sec	SHT–MT1–3S
		0.4sec ~ 6sec	SHT–MT1–6S
		0.5sec ~ 10ec	SHT–MT1–10S
		1.5sec ~ 30sec	SHT–MT1–30S
		2sec ~ 60sec	SHT–MT1–60S
		0.1min ~ 3min	SHT–MT1–3M
		0.2min ~ 6min	SHT–MT1–6M
		0.5min ~ 10min	SHT–MT1–10M
		1min ~ 30min	SHT–MT1–30M
		2min ~ 60min	SHT–MT1–60M
		6min ~ 3hrs	SHT–MT1–3H

• Coil 정격전압
Coil rating voltage

Code	Voltage
110A	AC110V
220A	AC220V
12D	DC12V
24D	DC24V



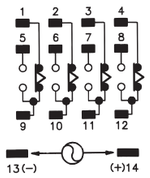
※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-RS-MY4

미니타이머 SHT – MT_1 series Miniature timer, SHT-MT_1

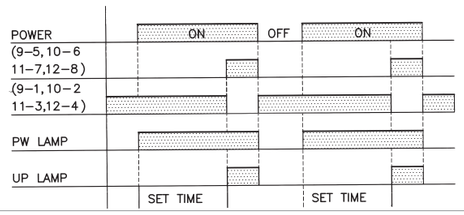
정격 및 성능
Characteristics

특징 Features	• 초소형 전용IC를 내장한 분주방식입니다. • 소형이면서 시간 사양이 광범위합니다(0.05초~ 3시간까지) • 동작표시 LED(적색)가 장착되어 있어 식별이 용이합니다. • PW LED : 전원(Power) 표시, UP LED : 동작(Timer ON)표시 • 소비전력이 매우 작습니다. (1VA, 1.2W) • This is frequency divide method using timer micro-mini exclusive IC. • This is small size, but wide time specification of 0.05 sec.~3 hours. • With indicating(Timer On, OFF) movement LED(Red color), identification is easy. • PW LED : indicating Power, UP LED : indicating movement(Timer ON) • Power consumption is little. (1VA, 1.2W)				
동작 Operation mode			ON–delay		
접점용량 Contact ratings	Types	접점구성/Contacts	Amp.	Volt	Load
	SHT–MT1	4c(4NO+NC)	3A	250VAC	저항부하 *(Resistive)*
정격전압 Rated voltage			AC 250V		
조작전압 Control voltage			AC 110V, 220V ±10% DC 12V, 24V, ±10% (주문사양, *Option*)		
동작시간정도 Accuracy	전압오차 *(Error by voltage)*		within ±0.5% 이내		
	설정오차 *(Error by setting)*		within ±10% 이내		
	온도오차 *(Error by ambient temp.)*		within ±4% 이내		
소비전력 Power consumption			AC 약 1VA, DC 약 1.2W		
내전압 Dielectric strength			AC 1,500V 50/60Hz 1min 충전부와 비충전금속부간 Between live part and dead metal part		
사용주위온도 Ambient temperature for operation			–10 ~ +50℃		
사용주위습도 Ambient humidity			40 ~ 75%RH		

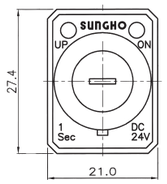
회로도
Circuit diagram

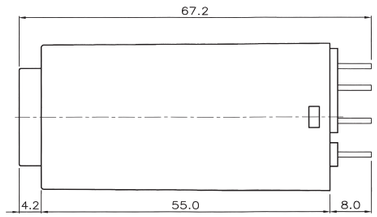


Timing chart



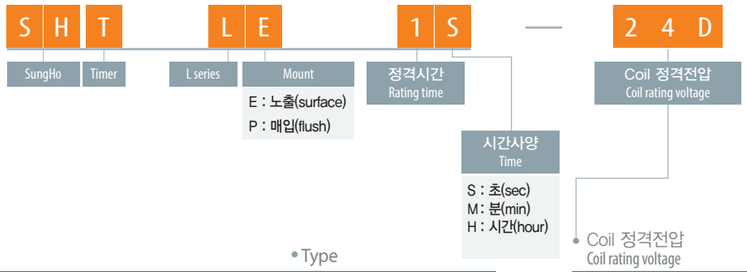
외형치수
Dimensions





타이머 L … 최대48시간 / 50x62mm 직사각단면형
On-delay timer, SHT-L / Max. range 48 hours / 50x60mm rectangular type

주문형식 Catalog No. structure
(Ordering information)



• Coil 정격전압
Coil rating voltage

Code	Voltage
110A/220A	AC110V/220V
12D	DC12V
24D	DC24V

• Type

취부방식 Mount	제어시간범위 Settiing range Min. Max.	형식 Type
노출형 Surface mount	0sec ~ 1sec	SHT–LE–1S
	0sec ~ 3sec	SHT–LE–3S
	0sec ~ 6sec	SHT–LE–6S
	0sec ~ 10sec	SHT–LE–10S
	0sec ~ 30sec	SHT–LE–30S
	0sec ~ 60sec	SHT–LE–60S
	0.1sec ~ 3min	SHT–LE–3M
	0.2sec ~ 6min	SHT–LE–6M
	0.4sec ~ 10min	SHT–LE–10M
	1.5sec ~ 30min	SHT–LE–30M
	3sec ~ 60min	SHT–LE–60M
	5sec ~ 3hrs	SHT–LE–3H
	10sec ~ 6hrs	SHT–LE–6H
	20sec ~ 12hrs	SHT–LE–12H
	40sec ~ 24hrs	SHT–LE–24H
	80sec ~ 48hrs	SHT–LE–48H
매입형 Flush mount	0sec ~ 1sec	SHT–LP–1S
	0sec ~ 3sec	SHT–LP–3S
	0sec ~ 6sec	SHT–LP–6S
	0sec ~ 10sec	SHT–LP–10S
	0sec ~ 30sec	SHT–LP–30S
	0sec ~ 60sec	SHT–LP–60S
	0.1sec ~ 3min	SHT–LP–3M
	0.2sec ~ 6min	SHT–LP–6M
	0.4sec ~ 10min	SHT–LP–10M
	1.5sec ~ 30min	SHT–LP–30M
	3sec ~ 60min	SHT–LP–60M
	5sec ~ 3hrs	SHT–LP–3H
	10sec ~ 6hrs	SHT–LP–6H
	20sec ~ 12hrs	SHT–LP–12H
	40sec ~ 24hrs	SHT–LP–24H
	80sec ~ 48hrs	SHT–LP–48H

※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-TS1

※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-TS2

타이머 M … 최대 48시간 / 48 x 48mm 정사각단면형

On-delay timer, SHT-M / Max. range 48 hours / 48x48mm rectangular type

주문형식 Catalog No. structure
(Ordering information)

S H T — M E — 1 S — 2 4 D

- SungHo
- Timer
- M series
- mount: E : 노출(surface) / P : 매입(flush)
- 정격시간 Rating time
- 시간사양 Time SPEL: S : 초(sec) / M : 분(min) / H : 시간(hour)
- 조작전압 Control voltage code

• Type

취부방식 Mount	제어시간범위 Settiing range Min. Max.	형식 Type
노출형 Surface mount	0sec ~ 1sec	SHT–ME–1S
	0sec ~ 3sec	SHT–ME–3S
	0sec ~ 6sec	SHT–ME–6S
	0sec ~ 10sec	SHT–ME–10S
	0sec ~ 30sec	SHT–ME–30S
	0sec ~ 60sec	SHT–ME–60S
	0.1sec ~ 3min	SHT–ME–3M
	0.2sec ~ 6min	SHT–ME–6M
	0.4sec ~ 10min	SHT–ME–10M
	1.5sec ~ 30min	SHT–ME–30M
	3sec ~ 60min	SHT–ME–60M
	5sec ~ 3hrs	SHT–ME–3H
	10sec ~ 6hrs	SHT–ME–6H
	20sec ~ 12hrs	SHT–ME–12H
	40sec ~ 24hrs	SHT–ME–24H
	80sec ~ 48hrs	SHT–ME–48H
매입형 Flush mount	0sec ~ 1sec	SHT–MP–1S
	0sec ~ 3sec	SHT–MP–3S
	0sec ~ 6sec	SHT–MP–6S
	0sec ~ 10sec	SHT–MP–10S
	0sec ~ 30sec	SHT–MP–30S
	0sec ~ 60sec	SHT–MP–60S
	0.1sec ~ 3min	SHT–MP–3M
	0.2sec ~ 6min	SHT–MP–6M
	0.4sec ~ 10min	SHT–MP–10M
	1.5sec ~ 30min	SHT–MP–30M
	3sec ~ 60min	SHT–MP–60M
	5sec ~ 3hrs	SHT–MP–3H
	10sec ~ 6hrs	SHT–MP–6H
	20sec ~ 12hrs	SHT–MP–12H
	40sec ~ 24hrs	SHT–MP–24H
	80sec ~ 48hrs	SHT–MP–48H

Code	Voltage
110A/220A	AC110V/220V
12D	DC12V
24D	DC24V
48D	DC48V

※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-TS1

※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-TS2

브라켓(Braket)을 별도로 구입하여 노출형에 조립하면 매입형으로 사용할 수 있습니다.
단, 소켓은 매입형 SH–TS2를 사용해야 합니다.

Surface mount type can be flush mounted with the optional bracket.
However socket SH-TS2 for flush mount should be used.

타이머 N … 최대 48시간 / 38 x 48mm 정사각단면형

On-delay timer, SHT-N / Max. range 48 hours / 38x48mm rectangular type

주문형식 Catalog No. structure
(Ordering information)

S H T — n 2 E — 1 S — 2 4 D

- SungHo
- Timer
- n series
- mount: E : 노출(surface) / P : 매입(flush)
- 정격시간 Rating time
- 시간사양 Time SPEL: S : 초(sec) / M : 분(min) / H : 시간(hour)
- 조작전압 Control voltage code

• Type

취부방식 Mount	제어시간범위 Settiing range Min. Max.	형식 Type
노출형 Surface mount	0sec ~ 1sec	SHT–nE–1S
	0sec ~ 3sec	SHT–nE–3S
	0sec ~ 6sec	SHT–nE–6S
	0sec ~ 10sec	SHT–nE–10S
	0sec ~ 30sec	SHT–nE–30S
	0sec ~ 60sec	SHT–nE–60S
	0.1sec ~ 3min	SHT–nE–3M
	0.2sec ~ 6min	SHT–nE–6M
	0.4sec ~ 10min	SHT–nE–10M
	1.5sec ~ 30min	SHT–nE–30M
	3sec ~ 60min	SHT–nE–60M
	5sec ~ 3hrs	SHT–nE–3H
	10sec ~ 6hrs	SHT–nE–6H
	20sec ~ 12hrs	SHT–nE–12H
	40sec ~ 24hrs	SHT–nE–24H
	80sec ~ 48hrs	SHT–nE–48H
매입형 Flush mount	0sec ~ 1sec	SHT–nP–1S
	0sec ~ 3sec	SHT–nP–3S
	0sec ~ 6sec	SHT–nP–6S
	0sec ~ 10sec	SHT–nP–10S
	0sec ~ 30sec	SHT–nP–30S
	0sec ~ 60sec	SHT–nP–60S
	0.1sec ~ 3min	SHT–nP–3M
	0.2sec ~ 6min	SHT–nP–6M
	0.4sec ~ 10min	SHT–nP–10M
	1.5sec ~ 30min	SHT–nP–30M
	3sec ~ 60min	SHT–nP–60M
	5sec ~ 3hrs	SHT–nP–3H
	10sec ~ 6hrs	SHT–nP–6H
	20sec ~ 12hrs	SHT–nP–12H
	40sec ~ 24hrs	SHT–nP–24H
	80sec ~ 48hrs	SHT–nP–48H

Code	Voltage
110A/220A	AC110V/220V
12D	DC12V
24D	DC24V
48D	DC48V

※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-RS8

※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-TS2

브라켓(Braket)을 별도로 구입하여 노출형에 조립하면 매입형으로 사용할 수 있습니다.
단, 소켓은 매입형 SH–TS2를 사용해야 합니다.

Surface mount type can be flush mounted with the optional bracket.
However socket SH-TS2 for flush mount should be used.

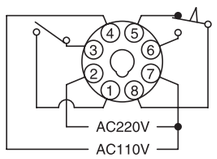
타이머 SHT – L, M, n_2 series On-delay timer, SHT-L, M, N series

정격 및 성능
Characteristics

특징 Features	• 전용 IC를 내장한 분주방식입니다. • 취부방식이 다양합니다. • 노출형/ 매입형, □48×48, 40×50, 50×62 • 동작표시 LED(적색)가 장착되어 있어 식별이 용이합니다. PW LED : 전원(Power) 표시, UP LED : 동작(Timer ON) 표시 • 소비전력이 매우작습니다. (2.5VA 이하) • This is frequency divide method using timer exclusive IC. • This can be applied in a various devices. • Exposure type / Within type • With indicating(Timer On, OFF) movement LED(Red color), identification is easy. • PW LED : indicating Power, UP LED : indicating movement(Timer ON) • Power consumption is little. (below 2.5VA)

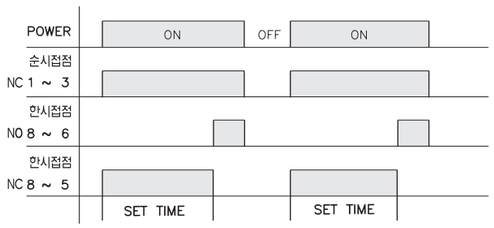
동작 Operation mode		ON–delay
접점구성 Contact configuration		1a+1c 1NO+1C/O
접점용량/정격전압 Contact ratings /Rated voltage		Amp. / Volt / Load 10A / 125VAC / 저항부하 *(Resistive)* 5A / 250VAC 8A / 30VDC
조작전압 Control voltage		AC 110V/220V 겸용*(common use)* ±10% DC 12V, 24V, 48V ±10% (주문사양, *Option*)
동작시간정도 Accuracy	전압오차 *(Error by voltage)*	within ±0.5% 이내
	설정오차 *(Error by setting)*	within ±3% 이내
	온도오차 *(Error by ambient temp.)*	within ±2% 이내
	반복도오차 *(Error by repeat)*	within ±0.3% 이내
소비전력 Power consumption		AC 2.5VA, DC 1W *(after time up)*
내전압 Dielectric strength		AC 2,000V 50/60Hz 1min 충전부와 비충전금속부간 Between live part and dead metal part
사용주위온도 Ambient temperature for operation		–10 ~ +55℃
사용주위습도 Ambient humidity		40 ~ 75%RH

회로도
Circuit diagram



Timing chart

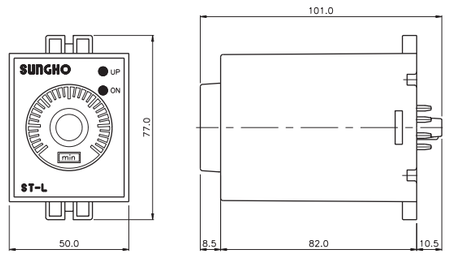
순시 한시
Time



외형치수
Dimensions

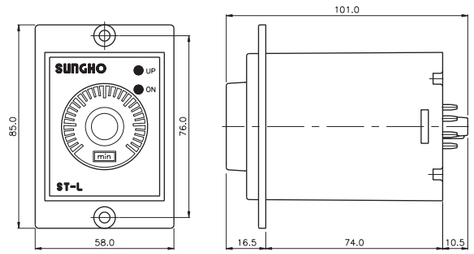
노출형
Surface mount

SHT–LE

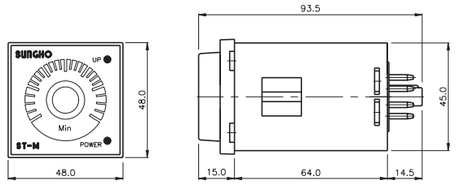


매입형
Flush mount

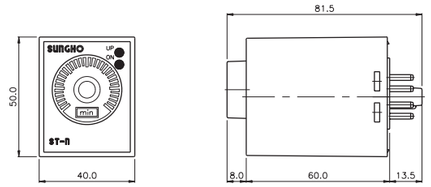
SHT–LP



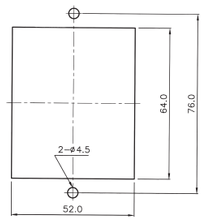
SHT–M



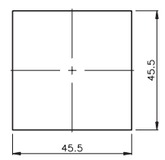
SHT–n



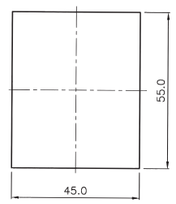
판넬가공
Cutouts



SHP–LP, TP



SHT–MP



SHT–MP

트윈타이머 T … 최대 3시간 / 50×62mm 직사각단면형

Twin timer, SHT-T / Max. range 3hrs ON-OFF delay / 50×62mm rectangular type

주문형식 Catalog No. structure
(Ordering information)

• Type

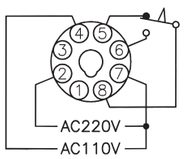
취부방식 Mount	제어시간범위 Max. Settiing range ON delay	OFF delay	형식 Type
노출형 Surface mount	3sec	3sec	SHT–TE–3S
	6sec	6sec	SHT–TE–6S
	10sec	10sec	SHT–TE–10S
	30sec	30sec	SHT–TE–30S
	60sec	60sec	SHT–TE–60S
	3min	3min	SHT–TE–3M
	6min	6min	SHT–TE–6M
	10min	10min	SHT–TE–10M
	30min	30min	SHT–TE–30M
	60min	60min	SHT–TE–60M
	3hrs	3hrs	SHT–TE–3H
매입형 Flush mount	3sec	3sec	SHT–TP–3S
	6sec	6sec	SHT–TP–6S
	10sec	10sec	SHT–TP–10S
	30sec	30sec	SHT–TP–30S
	60sec	60sec	SHT–TP–60S
	3min	3min	SHT–TP–3M
	6min	6min	SHT–TP–6M
	10min	10min	SHT–TP–10M
	30min	30min	SHT–TP–30M
	60min	60min	SHT–TP–60M
	3hrs	3hrs	SHT–TP–3H

Code	Voltage
120A	AC110V/220V
12D	DC12V
24D	DC24V
48D	DC48V

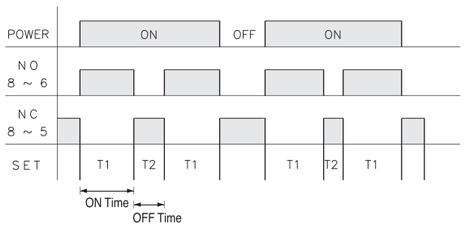
※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-TS1

※ 적용소켓(별도주문품)
Applicable socket(optional)
SH-TS2

회로도
Circuit diagram



Timing chart



트윈타이머 T … 최대3시간 / 50×62mm 직사각단면형

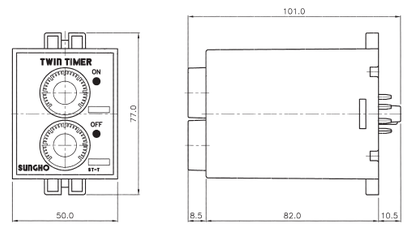
Twin timer, SHT-T

정격 및 성능
Characteristics

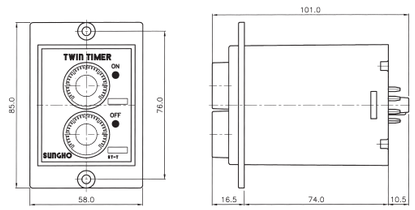
특징 Features		• 전용 IC를 내장한 분주방식입니다. • 취부방식이 다양합니다. – 노출형/ 매입형 • 동작표시LED(적색)가 장착되어 있어 식별이 용이합니다. • 소비전력이 작은 절전형입니다. (2.5VA이하) • This is frequency divide method using timer exclusive IC. • This can be applied in a various devices. • Exposure type / Within type • With indicating(Timer On, OFF) movement LED(Red color), identification is easy. • Power consumption is little. (below 2.5 VA)
동작 Operation mode		ON–OFF delay
접점구성 Contact configuration		1c 1C/O(1NO+NC)
접점용량/정격전압 Contact ratings/Rated voltage		Amp. / Volt / Load 10A / 125VAC / 저항부하 *(Resistive)* 5A / 250VAC 8A / 30VDC
조작전압 Control voltage		AC 110V/220V 겸용(common use) ±10% DC 12V, 24V, 48V ±10% (주문사양, *Option*)
동작시간정도 Accuracy	전압오차 *(Error by voltage)*	within ±0.5% 이내
	설정오차 *(Error by setting)*	within ±3% 이내
	온도오차 *(Error by ambient temp.)*	within ±2% 이내
	반복도오차 *(Error by repeat)*	within ±0.3% 이내
소비전력 Power consumption		AC 2.5VA, DC 1W *(after time up)*
내전압 Dielectric strength		AC 2,000V 50/60Hz 1min 충전부와 비충전금속부간 Between live part and dead metal part
사용주위온도 Ambient temperature for operation		–10 ~ +55℃
사용주위습도 Ammbbiieenntt hhuummiiddiitty		40 ~ 75%RH

외형도
Dimensions

노출형
Surface mount
SHT–T1E



매입형
Flush mount
SHT–T1P



주) 판넬가공 치수는 135page 참조 See 135 page for Cutout

FLOATLESS Level Switches
ELECTRODE Holder

수위조절기

전극봉 및 전극봉홀더

수위 조절기 /전극봉홀더

FLOATLESS LEVEL SWITCHES AND ELECTRODE HOLDERS

수위조절기

Floatless Level Switches Type SHF-60 series

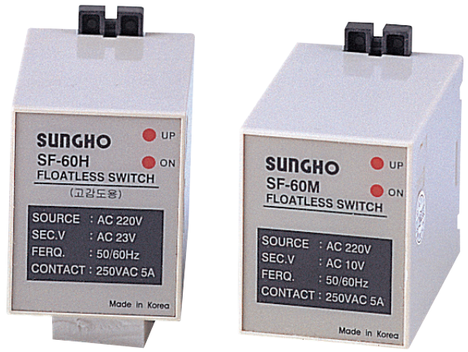
LED동작표시

Operation LED Indicator

소형, 8핀 소켓방식

Compact and Mountable on Socket

- 저감도형
  With Low Sensitivity
- 기본형
  With Medium Sensitivity
- 고감도형
  With High Sensitivity
- 가변식
  With Adjustable Sensitivity



전극봉

Electrode

1, 2m Length and 5mm Diameter

전극봉홀더

Electrode Holder
Type SH-H series

3, 4, 5 Pole

수위조절기 Floatless level switches Type SHF-60 series

LED동작표시

Operation indicated by LED

소형, 8핀소켓방식

Compact and mountable on socket

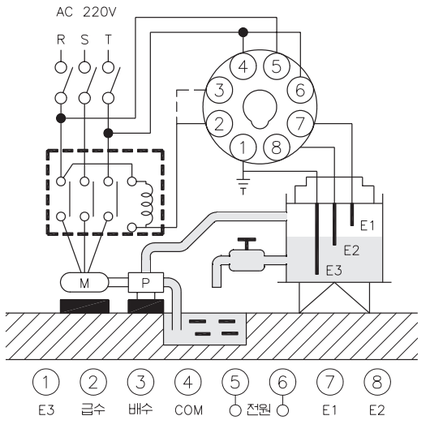
종류 Description distance	도달거리 Sensing resistance	동작저항 Operating resistance	복귀저항 Release between electrodes	전극간전압 2nd. voltage	주문형식 Type
기본형 With medium sensitivity	Max. 1km	0 ~ 7kΩ	Min. 15kΩ	10VAC	SHF-60M
고감도형 With high sensitivity	Max. 50m	15 ~ 70kΩ	Min. 100kΩ	24VAC	SHF-60H

공통사양

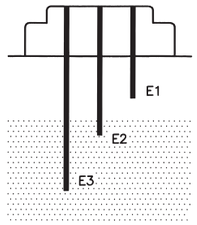
General specification

정격전압 / *Rated voltage*	AC 220V 60Hz, AC 230V 50/60Hz
전극간전류 / *Current between electrodes*	Max. AC 1mA
소비전력 / *Power consumption*	Max. 3.2VA
접점용량 / *Contact rating*	5A, 250VAC (저항부하, Resistive load) (급수, 배수)
내전압 / *Dielectric Strength*	1500VAC for 1min (충전부와 비충전부간)
사용주위온도 / *Ambient temp.*	-10℃~ +60℃
사용주위습도 / *Humidity*	45 ~ 80%RH
응답속 도 / *Response time*	20ms이하
취부용소켓 / *Mountable socket*	SH-TS-1 (199 page참조)

결선도
Example of wiring diagram



제어범위
The range of control

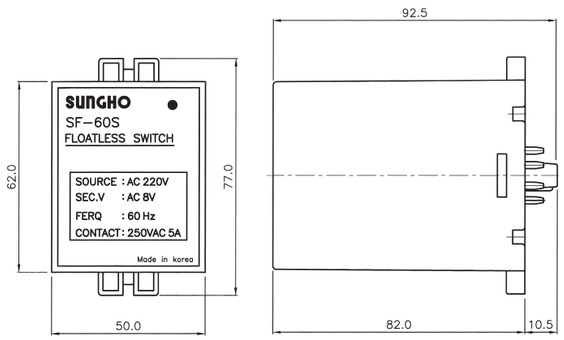


동작
action

1. E1에 도달하면 모터가 정지됩니다.
2. E2 이하가 되면 모터가 동작됩니다.
3. 배수로 사용하는 경우는 3번 단자로 결선하여 주십시오.
4. E3 전극봉 튜브 탈피(E1위치, E2위치)감도개선

1. As reach to E1, motor turns stop.
2. As belo w the E2, motor turns stop.
3. Please connect no. 3 contact in case of use the water supply.
4. Improved sensitivity in break from E3 electrode tube. (position of E1, E2)

외형치수
Dimensions



LED표시상태
LED Indicating condition

	모터	POWER ON	UP
급수로	가동	ON	OFF
	정지	OFF	ON
배수로	가동	OFF	ON
	정지	ON	OFF

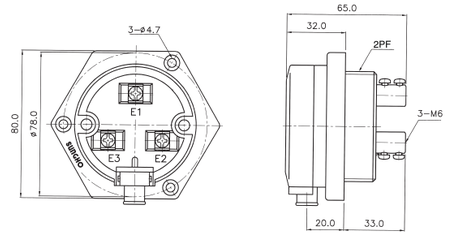
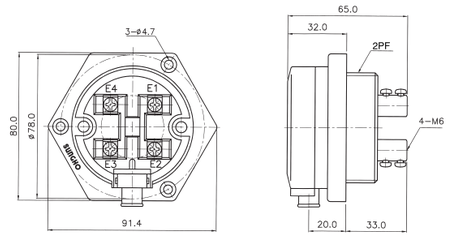
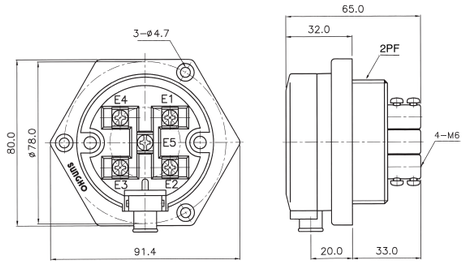
*수조에 액 흐름 상태표시

물의 종류별 고유저항
Native resistance as kind of water

종류	고유저항	적용 Model
수도수	7~12kΩ Cm	SF-60M, SF-60H
천수	5~17kΩ Cm	
정수	7~15kΩ Cm	
해수	0.04kΩ Cm	
보일러수	60~80kΩ Cm	SF-60H
증류수	110kΩ Cm	

전극봉홀더 Electrode holders type SH-H series

- 봉은 가능한 스탠레스봉(5)을 사용하십시오.
- 봉의 TIP부는 장기간 사용하면 스케일이 생겨 도전성이 떨어질 우려가 있으니 6개월 주기로 닦아주십시오.
- 봉의 TIP부분은 최소한 100mm 이상 피복이 되어 있으면 오동작을 할 수 있습니다
- Please use stainless steel electrode in possible.
- Please clean tip of electrode periodically (6 months) for conductivity.
- If covering min. 100mm in tip of electrode, can make an error in action.

극수 및 외관 Poles & appearance	주문형식 Type	외형치수 Dimensions
3 pole	SH-H3P	
4 pole	SH-H4P	
5 pole	SH-H5P	

전극봉
Electrodes

길이 Length	주문형식 Type	사양 Specification
1m	SH-S01	Stainless steel SUS304, ϕ5"
2m	SH-S02	

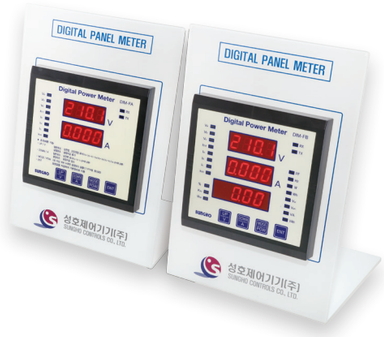
INTELLIGENT

다기능 디지털 계측기

다기능 디지털 계측기 DIGITAL INTELLIGENT

특징
Features

- 7-Segments 표시창을 통하여 전력선로의 Parameter를 표시
- CT비와 PT비를 전면 판넬을 통하여 설정할수 있음
- 다양한 결선 방법(3상3선, 3상4선, 단상2선, 단상3선)
- RS485 통신회로를 통해 원격에서 확인 가능
- 사용중인 전력라인의 부하율 표시(삼상평균)



기본사양

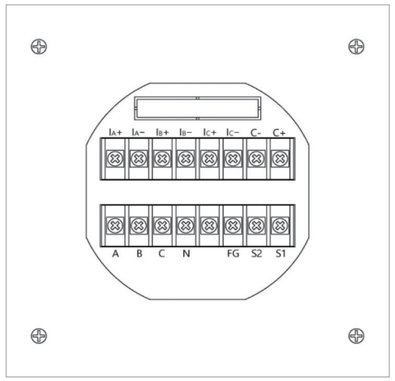
항 목		정 격
결선방식		3상3선식, 3상4선식, 단상2선식, 단상3선식
정격	주파수	60Hz[50Hz Option]
	CT2차	CT : 5[A]
	PT2차	PT : 110[V]
입력범위	전류	AC0.05[A] ~ 6[A]
	전압	AC50[V] ~ 300[V](VL-N)
절연저항		DC500[V] 100MΩ
상용 주파 내전압		AC2kV 1분
과도응답(EFT Burst)		Power, CT, PT입력 4kV
정전기(ESD)		Air 8kV / Contact 6kV
과부하내량	전류회로	정격전류 X 2배 : 3시간 인가시 이상없음
	전압회로	정격전압 X 1.3배 : 2초간 인가시 이상없음
사용환경	동작온도	-10℃ ~ 50℃
	보존온도	-25℃ ~ 70℃
	습 도	85% 이하(단, 이슬이 맺히지 않을것)
제어전원		AC/DC 110[V] ~ 220[V] (±20%)
통신방식		RS485
프로토콜		MODBUS RTU
Dimension		144(W) X 144(H) X 67(D)
무게		0.5kg
적용규격		IEC60255, IEC61000-4

계측 표시범위

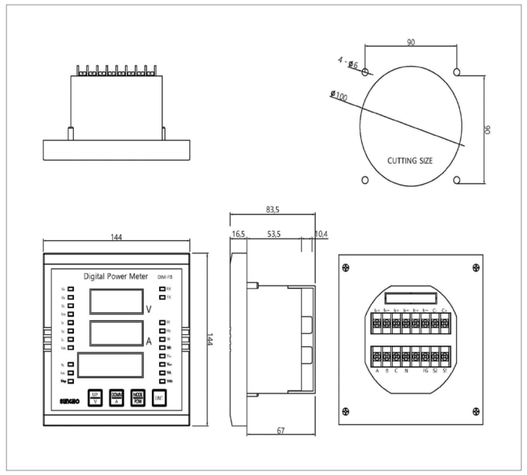
Parameter		명 칭	표시범위	정밀도
1	Va	상전압(Phase Voltage)	0 ~ 999.9kV	±0.5%
2	Va-Vb	선간전압(Phase-Phase Voltages)	0 ~ 999.9kV	±0.5%
3	A	상전류(Phase Currents)	0 ~ 999.9kA	±0.5%
4	W	유효전력(Active Power)	0 ~ 999.9kW	±0.5%
5	Var	무효전력(Reactive Power)	0 ~ 999.9kVar	±0.5%
6	VA	피상전력(Apparent Power)	0 ~ 999.9kVA	±0.5%
7	PF	역률(Power Factor)	0 ~ 1.000	±0.5%
8	Wh	유효전력량(Activer Energy)	0 ~ 999.9Mwh	±1.0%
9	Varh	무효전력량(Reactive Energy)	0 ~ 999.9Mvarh	±1.0%
10	Vah	피상전력량(Apparent Power Energy)	0 ~ 999.9MVAh	±1.0%
11	Hz	주파수(Frequency)	45 ~ 65	±0.5%
12	Load Factor	평균부하율	0 ~ 120%	±0.5%

※ 정격에 대한 오차

후면 단자배열



외형치수 Dimensions



DIM–FA FA:7-Segment display(전압-전류 계측 type)

특징
Features

- 7–Segments 표시창을 통하여 전력선로의 Parameter를 표시
- CT비와 PT비를 전면 판넬을 통하여 설정할수 있음
- 다양한 결선 방법(단상2선, 단상3선, 3상3선, 3상4선)
- RS485 통신회로를 통해 원격에서 확인 가능

FRONT 구조 및 기능

KEY기능

UP/V	일반모드	상전압,선간전압표시(Va-Vb-Vc-Va/Vb-Vb/Vc-Vc/Va 순서로 순환)
	설정모드	Parameter입력값의 증가기능
DOWN/A	일반모드	상전류표시(Ia-Ib-Ic 순서로 순환)
	설정모드	Parameter입력값의 감소기능
MODE/POW	설정모드	3 초 동안 계속 누르면 설정모드로 진입
ENT		Parameter 값을 저장하며 기본창으로 이동

계측 표시범위

Parameter		명 칭	표시범위	정밀도
1	Va	상전압(Phase Voltage)	0 ~ 999.9kV	±0.5%
2	Va-Vb	선간전압(Phase-Phase Voltages)	0 ~ 999.9kV	±0.5%
3	A	상전류(Phase Currents)	0 ~ 999.9kA	±0.5%

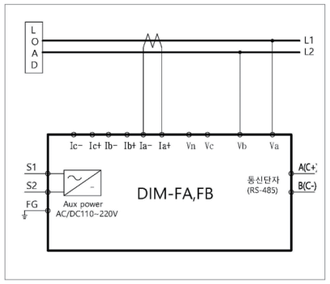
※ 정격에 대한 오차

정격사양

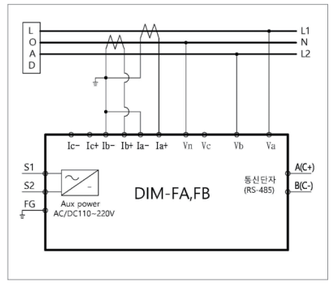
항목		정격
결선방식		단상 2선식, 단상 3선식, 3상 3선식, 3상 4선식
정격	주파수	60Hz
	CT2차	CT : 5[A]
	PT2차	PT : 110[V]
입력범위	전류	AC0.05[A] ~ 6[A]
	전압	AC50[V] ~ 300[V](VL–N)
사용환경	동작온도	–10℃ ~ 50℃
	보존온도	–20℃ ~ 70℃
	습도	80% 이하(단, 이슬이 맺히지 않을것)
제어전원		AC/DC 110[V] ~ 220[V] (±20%)
통신방식		RS485
프로토콜		MODBUS RTU
Dimension		144(W) X 144(H) X 67(D)

외부 결선방법

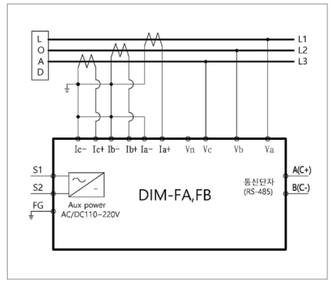
단상 2선식



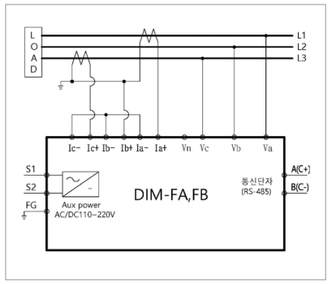
단상 3선식



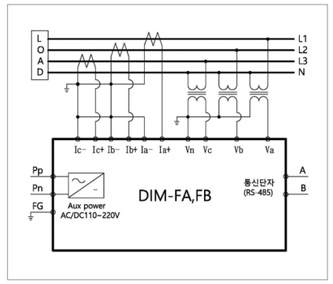
3상 3선식(3CT 직접결선)



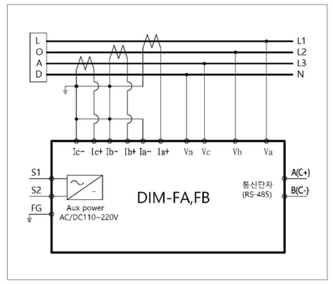
3상 3선식(2CT 직접결선)



3상 4선식(3CT, 3PT)



3상 4선식(3CT 직접결선)



DIM-FB FB:7-Segment display(다기능 계측 type)

특징
Features

- 7-Segments 표시창을 통하여 전력선로의 Parameter를 표시
- CT비와 PT비를 전면 판넬을 통하여 설정할수 있음
- 다양한 결선 방법.(단상2선, 단상3선, 3상3선, 3상4선)
- RS485 통신회로를 통해 원격에서 확인 가능
- 사용중인 전력라인의 부하율 표시(삼상평균)

FRONT 구조 및 기능

KEY기능

UP/V	일반모드	상전압,선간전압표시(Va–Vb–Vc–Va/Vb–Vb/Vc–Vc/Va 순서로 순환)
	설정모드	Parameter입력값의 증가기능
DOWN/A	일반모드	상전류표시(Ia–Ib–Ic 순서로 순환)
	설정모드	Parameter입력값의 감소기능
MODE/POW	일반모드	전력 Parameter 측정값 %(부하율), PF, Hz, W, Wh, Var, Varh, VA, VAh 순서로 순환
	설정모드	3 초 동안 계속 누르면 설정모드로 진입
ENT		Parameter 값을 저장하며 기본창으로 이동

계측 표시범위

Parameter		명 칭	표시범위	정밀도
1	Va	상전압(Phase Voltage)	0 ~ 999.9kV	±0.5%
2	Va–Vb	선간전압(Phase–Phase Voltages)	0 ~ 999.9kV	±0.5%
3	A	상전류(Phase Currents)	0 ~ 999.9kA	±0.5%
4	W	유효전력(Active Power)	0 ~ 999.9kW	±0.5%
5	Var	무효전력(Reactive Power)	0 ~ 999.9kVar	±0.5%
6	VA	피상전력(Apparent Power)	0 ~ 999.9kVA	±0.5%
7	PF	역률(Power Factor)	0 ~ 1.000	±0.5%
8	Wh	유효전력량(Activer Energy)	0 ~ 999.9Mwh	±1.0%
9	Varh	무효전력량(Reactive Energy)	0 ~ 999.9Mvarh	±1.0%
10	Vah	피상전력량(Apparent Power Energy)	0 ~ 999.9MVAh	±1.0%
11	Hz	주파수(Frequency)	45 ~ 65	±0.5%
12	Load Factor	평균부하율	0 ~ 120%	±0.5%

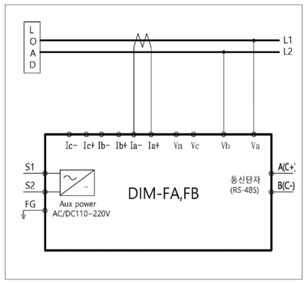
※ 정격에 대한 오차

정격사양

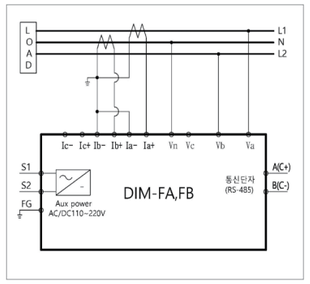
항목		정격
결선방식		단상 2선식, 단상 3선식, 3상 3선식, 3상 4선식
정격	주파수	60Hz
	CT2차	CT : 5[A]
	PT2차	PT : 110[V]
입력범위	전류	AC0.05[A] ~ 6[A]
	전압	AC50[V] ~ 300[V](VL–N)
사용환경	동작온도	–10℃ ~ 50℃
	보존온도	–20℃ ~ 70℃
	습도	80% 이하(단, 이슬이 맺히지 않을것)
제어전원		AC/DC 110[V] ~ 220[V] (±20%)
통신방식		RS485
프로토콜		MODBUS RTU
Dimension		144(W) X 144(H) X 67(D)

외부 결선방법

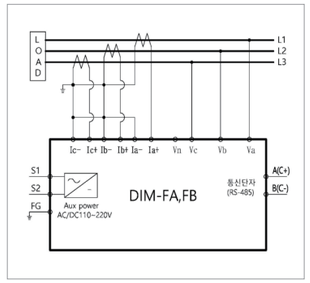
단상 2선식



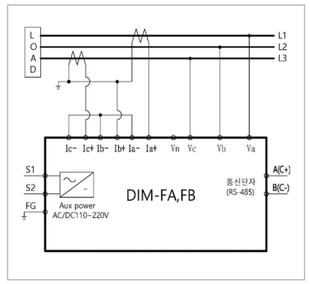
단상 3선식



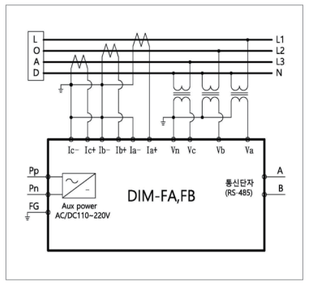
3상 3선식(3CT 직접결선)



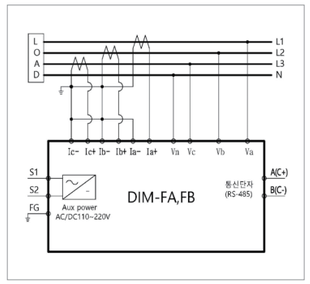
3상 3선식(2CT 직접결선)



3상 4선식(3CT, 3PT)



3상 4선식(3CT 직접결선)



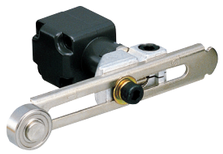
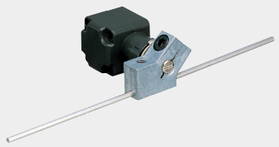
LIMIT Switches
MICRO Switches
TOGGLE Switches

리미트 스위치

마이크로 스위치

토글 스위치

리미트 스위치 LIMIT SWITCHES

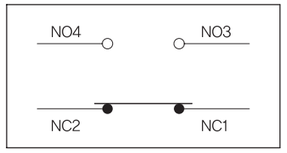
	조작부 종류 Shapes of Operating Heads	본체 종류 Shapes of Main Bodies
가변레바형 With Adjustable Swing Roller		 • 일반형 : 램프기능없음 Without a Indicating Lamp
고정레바형 With Swing Roller 1a1b (1NO+1NC) AC480V/DC250V		
스프링레바형 With Flexible Spring Rod		
가변핀레바형 With Adjustable Swing Roller		 • 램프기능형 With a Indicating Lamp
롤러푸시형 With Roller Plunger		
볼푸시형 With Ball Plunger		

정격 및 성능 Characteristics

특징 Features	• 알루미늄 다이캐스팅의 견고한 케이스로 되어 있어 외부의 충격에도 긴수명을 유지합니다. • 내장 스위치는 2회로 쌍단 기본스위치로 구성되어 있으며, 열에강한 Phenol재질로 되어 있습니다. • 내열, 내유 및 방진의 견고한 구조이며 특히 기계적강도가 우수한 재질을 사용하였습니다. • 레버의 과동작방지와 긴 수명유지를 위한 설정위치표시가 부착되어 있어 장기간 안전 사용이 가능합니다. • 어떠한 장치에서도 사용할 수 있도록 다양한 레바를 제공합니다. – 가변레바형, 가변핀레바형, 스프링레바형, 롤러푸시형, 볼푸시형 • 램프부착형카바는 내열성수지를 사용하여 용접시 비산되는 슬래그 및 금속입자로부터 보호가 가능합니다. • 보호구조는 IP67로 제작되었습니다. • Maintain long-life by aluminum Die-casting housing in spite of outside impact. • High temperature components throughout by Phenol made, and internal switch has 2 circuit, 2 step. • With heat resistance, oil resistance, and protection against dust, especially designed by material with high mechanical strength. • To use safely for long time is possible by stick to set up indicating valve for maintain long-life and prevent to over-working of lever. • It has a diversity of lever for use in variety instrument. - with adjustable swing roller, swing roller, flexible spring rod, roller plunger, adjustable swing rod, ball plunger. • Cover with indicating lamp is consist of heat-resistance material, so to protect against slag and metal piece dispersed from welding in welding line. • Protective structure is manufactured IP67.						
용도 Application	• 각종 공작기계의 위치결정 • 하역운반기계의 통과확인 및 방향제어 • 기타 일반 산업용기계 • Determine a position of all sorts of machine tool. • Operation (certification of passage and operation of direction) of cargo handling machine. • And many general industrial machine.						
접점용량 Contactratings	AC정격 *AC supply*	유도성부하 *Inductive load*	전동기부하 *Motors*	125V	250V	480V	
				5A(NC)	3A(NC)	1.5A(NC)	
				2.5A(NO)	1.5A(NO)	0.8A(NO)	
			전동기이외의 부하 *Others*	10A	6A	3A	
		무유도성부하 *Non-inductive load*	저항부하 *Resistive loads*	10A	6A	4A	
			전동기이외의 부하 *Lamps*	3A(NC)	2A(NC)	1.5A(NC)	
				1.5A(NO)	1A(NO)	0.8A(NO)	
	DC정격 *DC supply*			8V	14V	30V	125V	250V
		유도성부하 *Inductive load*	전동기부하 *Motors*	6A	6A	4A	0.2A	0.1A
			전동기이외의 부하 *Others*	10A	10A	6A	0.8A	0.1A
		무유도성부하 *Non-inductive load*	저항부하 Resistive *loads*	10A	10A	6A	0.8A	0.4A
			전동기이외의 부하 *Lamps*	6A(NC)	6A(NC)	4A(NC)	0.2A(NC)	0.1A(NC)
				3A(NC)	3A(NC)	3A(NC)	0.2A(NC)	0.1A(NC)
성능 Othercharacteristics	허용동작빈도 *Max. operating cycles*		기계적 *Mechanical*	최대 120회/분 *120 cycles/Min.*				
			전기적 *Electrical*	최대 30회/분 *30 cycles/Min.*				
	허용조작속도 *Max. operating speed*			1mm~1m/s (SHLS–102경우) **Swing Roller type only*				
	절연저항 *Insulation resistance*			100MΩ 이상(DC500V MΩ 절연저항계) *Min. 100MΩ at DC500V*				
	접촉저항 *Contact resistance*			25㎧ 이하(초기치) *Max. 25㎧at the begininng*				
	내전압 *Dielectric strength*		충전부간 *Between live parts*	AC 1,500V 50/60Hz 1min				
			비충전부간 *Between non-live parts*	AC 2,500V 50/60Hz 1min				
	내진동 *Vibration protection*			10~55Hz 복진폭 1.5mm (스프링레바형제외)				
	내충격 *Mechanical shock protection*		내구	1000m/s²이상				
			오동작	300m/s²이상				
	수명 *Lifetimes*		전기적 *Electrical*	50만회이상 *0.5 mil .operations*				
			기계적 *Mechanical*	500만회이상 *5 mil .operations*				
	사용주위온도 *Ambient temperature for operation*			–10 ~ +80℃				
	사용주위습도 *Ambient humidity*			95%RH 이하				
	보호구조 *Degree of protection*			IP67				

내부접점회로도 Circuit diagrams

기본형
Without a indicating lamp



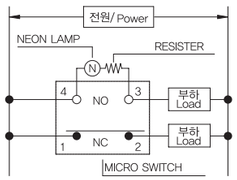
내장스위치
Built-in switch

전면 후면

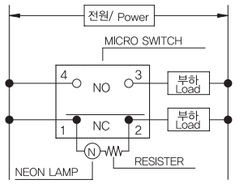
수분침투 방지 처리함

램프기능형
With a indicating lamp

NC일 때 lamp "On"



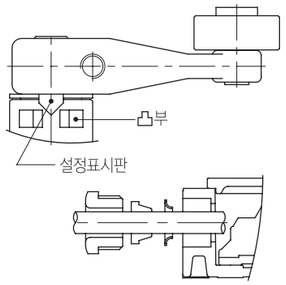
NO일 때 lamp "On"



설정위치 표시부착
Stick to set up indicating valve

설정표시판의 지침은 레바와 함께 회전하며 헤드의 凸 부 지역에 설정지침을 설정하여 레바를 지나치게 밀거나 밀어넣는 부족이 없어지고, 장기간 안전되게 사용할 수 있도록 만든 장치입니다.

The pointer of set up indicating valve is revolve with lever, set up the pointer in position for prevent to over-working, and maintain long-life.



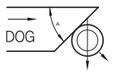
취급시 주의사항
Matters that require attention in handling

1. Lead선 처리방법(결합방법)
   How to handling with Lead line(combination method)
   - 콘덱타 사용시 결합방법 Combination method with use of connector
     케이블 외경에 맞추어 밀봉형 고무를 선정하십시요. 기름, 물이 비산되는 장소나 실외에 사용할 경우에는 반듯이 콘덱타를 사용하시고 보호카바를 취부하여 주십시오.
     Please use sealing up rubber as cable external diameter.
     If you use where outdoor or wet place, should stick to connector and protective cover.

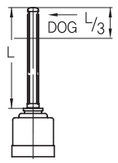
주) 사용되는 케이블의 외경은 8.8~10.5 ϕ로 하십시요

2. DOG의 형상
   The shape of DOG

일반 DOG
General DOG



특수 DOG
Special DOG



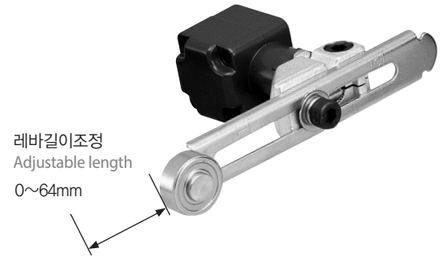
DOG 각도는 조작속도에 맞추어 45°이하로 선정하십시오.
the angle of DOG should settled below 45°as operation speed.
특수 DOG의 경우는 레바 전체길이 L의 L/3까지 닿도록 해주십시오.
special DOG should settled as L/3 of general length L.

3. 일반적 주의사항
   General Attention

각 체결부의 나사는 완전히 잠길때까지 체결하여 주십시오. 절삭물, 먼지, 이물질이 많은 장소에는 보호카바를 사용하여 주십시요. 특수한 조건에서 사용할 경우는 당사에 문의하여 주십시오.

Please screw up completely in conclusion part. Please use protective cover in place there is many cutting tools, dusts, motes. Please

가변레바형 With adjustable swing roller

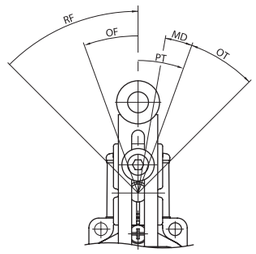


동작표시램프 Indicator	접점구성 Contacts	주문형식 Type ordering code
일반형 – 램프기능 없음 Without a indicating lamp	1a1b 1NO+1NC	SHLS–101
램프기능형 – 네온(LED)램프 부착 With a indicating lamp	1a1b 1NO+1NC	SHLS–101L

램프동작

제품출고시 "레바동작전 켜짐", "레바동작후 꺼짐"으로 조립되어 있으며, 설치시 반대로도 변경이 가능합니다.

The lamp is "ON"when the lever is released.
It is changebale to the other position when wiring.



동작에 필요한 힘, OF Operating force, max	최대 1.0kgf(MAX)
복귀되는 힘, RF Recovering force, min	최소 0.227kgf(MIN)
동작까지의 움직임, PT Swing stroke to complete switching ON, max	최대 15°±5° (MAX)
동작후의 움직임, OT Extra swing stroke after switching ON, min	최소 30°(MIN)
응차의 움직임, MD Swing stroke to maintain contact pressure, max	최대 12°(MAX)

고정레바형 With Swing Roller

동작표시램프 Indicator	접점구성 Contacts	주문형식 Type ordering code
일반형 – 램프기능 없음 Without a indicating lamp	1a1b 1NO+1NC	SHLS–102
램프기능형 – 네온(LED)램프 부착 With a indicating lamp	1a1b 1NO+1NC	SHLS–102L

램프동작

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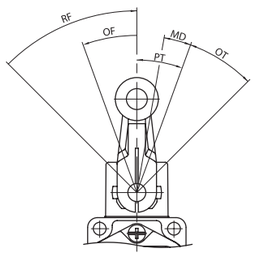
The lamp is "ON" when the lever is released.
It is changebale to the other position when wiring.



동작에 필요한 힘, OF Operating force, max	최대 1.0kgf(MAX)
복귀되는 힘, RF Recovering force, min	최소 0.227kgf(MIN)
동작까지의 움직임, PT Swing stroke to complete switching ON, max	최대 15°±5°(MAX)
동작후의 움직임, OT Extra swing stroke after switching ON, min	최소 30°(MIN)
응차의 움직임, MD Swing stroke to maintain contact pressure, max	최대 12°(MAX)

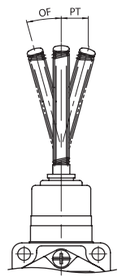
스프링레바형 With flexible spring rod

동작표시램프 Indicator	접점구성 Contacts	주문형식 Type ordering code
일반형 – 램프기능없음 Without a indicating lamp	1a1b 1NO+1NC	SHLS–103
램프기능형 – 네온(LED)램프부착 With a indicating lamp	1a1b 1NO+1NC	SHLS–103L

램프동작

제품출고시"레바동작전켜짐", "레바동작후꺼짐"으로 조립되어있으며, 설치시 반대로도 변경이 가능합니다.

The lamp is "ON" when the lever is released.
It is changebale to the other position when wiring.



동작에 필요한 힘, OF Operating force, max	최대 0.15kgf(MAX)
동작까지의 움직임, PT Swing stroke to complete switching ON, max	최대 20°±10mm(MAX)

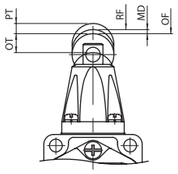
롤러푸시형 With roller plunger

동작표시램프 Indicator	접점구성 Contacts	주문형식 Type ordering code
일반형 – 램프기능 없음 Without a indicating lamp	1a1b 1NO+1NC	SHLS–104
램프기능형 – 네온(LED)램프 부착 With a indicating lamp	1a1b 1NO+1NC	SHLS–104L

램프동작

제품출고시 "레바동작전 켜짐", "레바동작후 꺼짐"으로 조립되어 있으며, 설치시 반대로도 변경이 가능합니다.

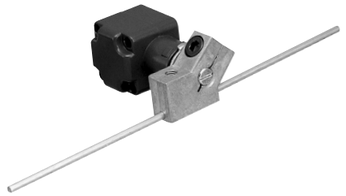
The lamp is "ON" when the lever is released.
It is changebale to the other position when wiring.



동작에 필요한 힘, OF Operating force, max	최대 2.72kgf(MAX)
복귀되는 힘, RF Recovering force, min	최소 0.91kgf(MIN)
동작까지의 움직임, PT Swing stroke to complete switching ON, max	최대 1.7mm(MAX)
동작후의 움직임, OT Extra swing stroke after switching ON, min	최소 5.6mm(MIN)
응차의 움직임, MD Swing stroke to maintain contact pressure, max	최대 1mm(MAX)

가변핀레바형 With adjustable swing rod

레바길이조정
Adjustable length
0~115mm

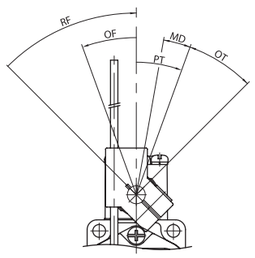


동작표시램프 Indicator	접점구성 Contacts	주문형식 Type ordering code
일반형 – 램프기능 없음 Without a indicating lamp	1a1b 1NO+1NC	SHLS–105
램프기능형 – 네온(LED)램프 부착 With a indicating lamp	1a1b 1NO+1NC	SHLS–105L

램프동작

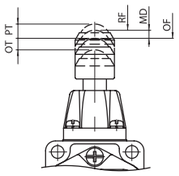
제품출고시 "레바동작전 켜짐", "레바동작후 꺼짐" 으로 조립되어 있으며, 설치시 반대로도 변경이 가능합니다.

The lamp is "ON" when the lever is released.
It is changebale to the other position when wiring.



동작에 필요한 힘, OF Operating force, max	최대 1.0kgf(MAX)
복귀되는 힘, RF Recovering force, min	최소 0.227kgf(MIN)
동작까지의 움직임, PT Swing stroke to complete switching ON, max	최대 15°±5°(MAX)
동작후의 움직임, OT Extra swing stroke after switching ON, min	최소 30°(MIN)
응차의 움직임, MD Swing stroke to maintain contact pressure, max	최대 15°(MAX)

볼푸시형 With ball plunger



동작표시램프 Indicator	접점구성 Contacts	주문형식 Type ordering code
일반형 – 램프기능 없음 Without a indicating lamp	1a1b 1NO+1NC	SHLS–106
램프기능형 – 네온(LED)램프 부착 With a indicating lamp	1a1b 1NO+1NC	SHLS–106L

램프동작

제품출고시 "레바동작전 켜짐", "레바동작후 꺼짐"으로 조립되어 있으며, 설치시 반대로도 변경이 가능합니다.

The lamp is "ON"when the lever is released.It is changebale to the other position when wiring.

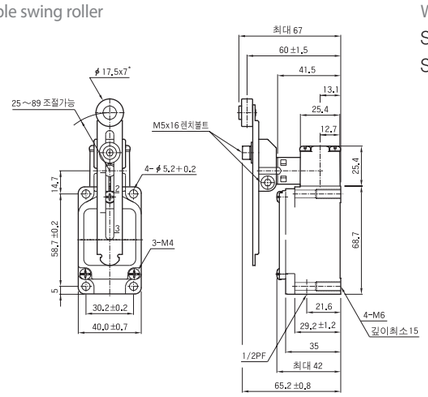
동작에 필요한 힘, OF Operating force, max	최대 2.72kgf(MAX)
복귀되는 힘, RF Recovering force, min	최소 0.91kgf(MIN)
동작까지의 움직임, PT Swing stroke to complete switching ON, max	최대 1.7mm(MAX)
동작후의 움직임, OT Extra swing stroke after switching ON, min	최소 4mm(MIN)
응차의 움직임, MD Swing stroke to maintain contact pressure, max	최대 1mm(MAX)

외형치수
Dimensions, mm

가변레바형
With adjustable swing roller

SHLS–101

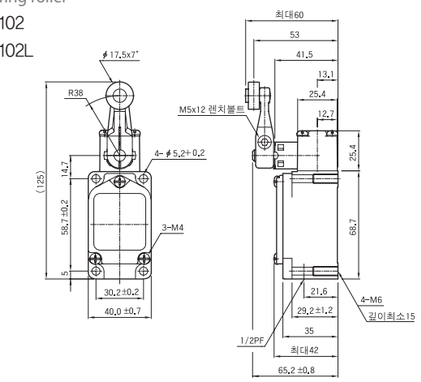
SHLS–101L



고정레바형
With swing roller

SHLS–102

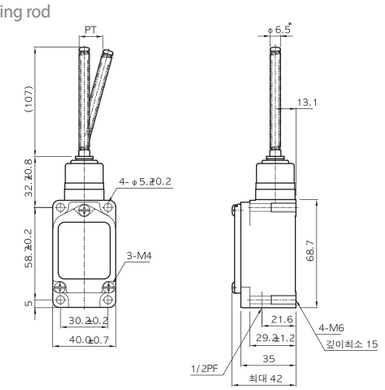
SHLS–102L



스프링레바형
With flexible spring rod

SHLS–103

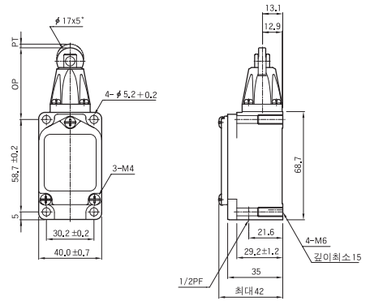
SHLS–103L



롤러푸시형
With roller plunger

SHLS–104

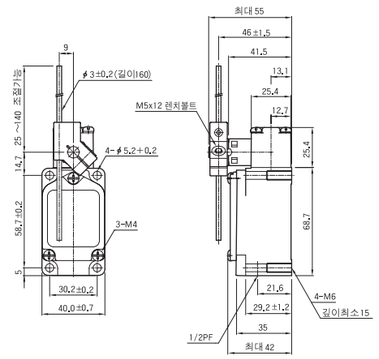
SHLS–104L



가변핀레바형
With adjustable swing rod

SHLS–105

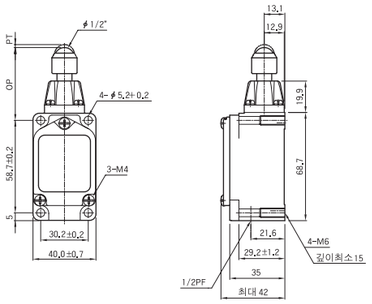
SHLS–105L



볼푸시형
With ball plunger

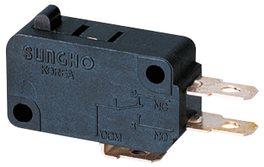
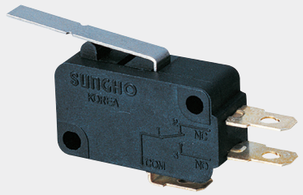
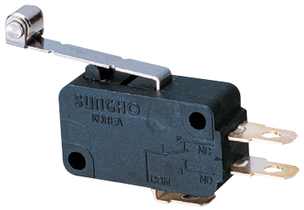
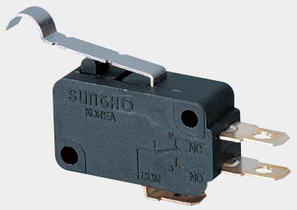
SHLS–106

SHLS–106L

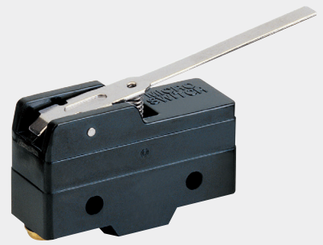


마이크로 스위치 MICRO SWITCH

V형 마이크로 스위치 V TYPE MICRO SWITCH

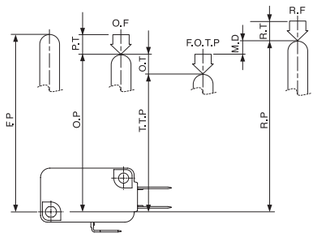
	조작부 종류 Shapes of Operating Heads
핀눌름버튼 Pin plunger • 0.1A~16A • 35g~400g • SPDT(1c), SPST(1a, 1b)	
힌지레바 Hing lever • 힌지레바 Hinge lever • 힌지롱레바 Hinge long lever • 0.1A~16A • 35g~400g • SPDT(1c), SPST(1a, 1b)	
힌지롤러레바 Hinge roller lever • 힌지롤러쇼트레바 Hinge roller short lever • 힌지롤러레바 Hinge roller lever • 0.1A~16A • 35g~400g • SPDT(1c), SPST(1a, 1b)	
특수레버 Specical lever • 0.1A~16A • 35g~400g • SPDT(1c), SPST(1a, 1b)	

Z형 마이크로 스위치 Z TYPE MICRO SWITCH

	조작부 종류 Shapes of Operating Heads
눌름버튼 Push button • 장눌름버튼 Long Push button • 단눌름버튼 Short Push button • 핀눌름버튼 Pin Push button • 눌름버튼 Push button • 롤라눌름버튼 Roller Push button	
힌지레바 Hing lever • 힌지단레바 Hinge short lever • 힌지중레바 Hinge medium lever • 힌지장레바 Hinge long lever • 힌지특장레바 Hinge speciall long lever	
힌지롤러레바 Hinge roller lever • 힌지롤라단레바 Hinge roller short lever • 힌지롤라중레바 Hinge roller medium lever • 힌지롤라장레바 Hinge roller long lever • 힌지롤라특장레바 Hinge roller special long lever	
보호커버 Protection Cover	

동작특성 Definitions and operating characteristics

본 카다로그에서 사용하는 중요한 용어의 도해와 의미는 아래와 같습니다.
The explanatory diagram and the meaning of important words used in this catalogue are as follows.



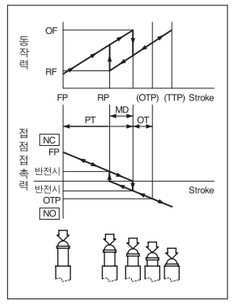
용어 terms	기호 period	단위 unit	정의 definition
동작에 필요한 힘 Operating force	OF	gf kgf gf–mm	자유위치에서 동작위치로 엑츄에이터를 움직이고, 가동접점을 반전시키는데 필요한 힘. The force required to move from free to operating position, and turns over of operating contact.
돌아가는 힘 Releasing force	RF		복귀위치에서 가동접점을 반전시키는데 필요한 힘. The force required to turns over of operating position, and turns over of operating.
동작까지의 움직임 Pre travel	PT		엑튜에이터의 자유위치에서 동작위치까지의 이동거리. Moving distance from actuator's free position to position.
동작후의 움직임 Over travel	OT	mm,度	엑튜에이터의 동작위치에서 동작한도위치까지의 이동거리. Moving distance from actuator's operating positing position.
응차의 움직임 Movement differential	MD		엑튜에이터의 동작위치에서 복귀위치까지의 이동거리. Moving distance from actuator's sperating position to release position.
자유위치 Free position	FP		스위치 구멍 중심으로부터 엑튜에이터 상단까지의 이동거리. The distance from the center of switch's hole to actuator's upper position.
동작위치 Operating position	OP		엑튜에이터에 힘이 가해지고 가동접점이 자유위치의 상태에서 반전할때의 위치. The position when the operating contact turns over soon by giving force to actuator in position state.
돌아가는위치 Releasing position	RP		엑튜에이터의 힘을 감소시켜 가동접점이 동작위치의 상태에서 자유위치의 상태로 반전할 때의 위치. Actuator's position when operating contact turns over from operating position to free with reducing actuator's outer force.
동작한도위치 Total travel position	TTP		엑튜에이터가 움직이지 않게 될 때까지 밀었을때의 위치. Actuatpr's the difinition of Maximum and Minimum in operating-character regulations.

Note : **동작특성상의 규정에 있어서 최대 최소의 해석**
스위치 동작 특성을 설명할 때에 자주 최대, 최소의 가치를 이용하고 있습니다. 이것은 어디까지나 스위치 자체가 갖는 특정치로서의 규정 방법입니다. 예를 들면 SHV–16–3D5의 OF는 최대 200g으로 규정되어 있습니다. 이것은 엑튜에이터에 가해지는 힘을 0에서 서서히 가해져 가고 200g에 이를때는 더 이상의 힘은 의미가 없습니다. 어느 스위치를 특성상으로 사용하는 최대, 최소의 의미는 스위치를 사용하는 기계측의 조건에서 보면 거꾸로 최소, 최대가 되므로 주의하십시오.

The definition of maximum and minimum in operating-character regulations
Make use frequently of the maximim and minimum's value for explain operating-character of switch. This is method for regulation as switch's own character. For example, OF(Operating Force)of SHV-16-3D5 is prescribed max. 200g plase note that the meaning of max. and min. generally be contary concept with mechanical conditions.

기계적인 주의사항 Mechanical Care

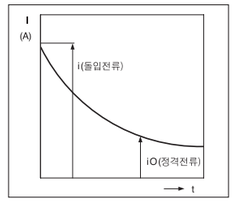
동작력, 스트로크, 접촉특성
Operating force, stroke and contact



– 마이크로 스위치가 고성능을 얻기 위해서는 스트로크 설정이 중요합니다.
– 옆의 그림은 동작력 스트로크 접점 접촉력의 관계를 나타냅니다. 고신뢰성을 얻기 위해서는 적절한 접촉 범위내에서 사용해야 합니다.
– 상시폐로(NC)사용시는 조작체를 에튜에이터가 자유위치에 오도록 해야 합니다.
– 상시개로(NO)사용시는 동작후의 움직임(OT)규격치의 70~100%까지 눌러지도록 설정해야 합니다.
– 스트로크의 설정이 동작위치(OP)의 근처나 동작한도위치(TTP)로 되었을 경우, 접촉불안정의 원인이 됩니다.
– The setting of stroke is important to getting higher performance.
– Right figure showsthe relations of stroke contact. For getting higher performance, should be used in proper contact range.
– For using NC, operation parts should be located for actuator to get back free position easily.
– For using NO, should be set up for pushing 70~100% of OT.
– If the stroke setting is near to OP, or be TTP, it can be the cause of unstable touch and break.

기계적 조건과 스위치 선정
Mechanical conditions and selection of switch

– 조작체에 맞는 액튜에이터의 선정이 필요합니다.
– 동작속도, 빈도 등을 성능표와 비교 확인해야 합니다. (허용동작빈도를 초과하면 접점전환이 안됩니다.)
– 충격적인 동작은 파손의 원인이 됩니다.
– 동작속도가 극단적으로 느린 경우 접점전환이 불안정하여 접촉불량이나 용착의 원인이 됩니다.
– OR, RP점으로 스트로크를 설정할 경우 불안정한 접촉이되므로 진동이나 충격에 약한 곳은 피해주시기 바랍니다.
– Proper selection of actuator for operation type needed.
– The speed and frequency of operations should be checked with performance table.(If exceed to permissible operating frequency, not to turnover of contact.)
– Given impacted operating is caused breakdown.
– If the operation speed is getting quite slow, on and off speed of contact is unstable, and contact can be melt.
– In the case of set up the stroke to OP, RP position, it can be unstable contact, so please avoid the vibrations, and the weak-place against impact.

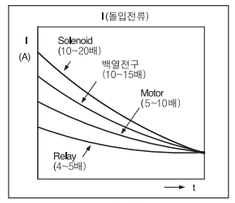


전기적인 주의사항 Electrical care

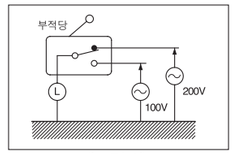
전기적 조건과 스위치 선정
Electrical conditions and selection of switch

– 전원이 AC, DC에 따라 접점차단 능력이 서로 다르므로 정격표를 반드시 확인하여 주십시오.
– 돌입전류, 정상전류, 돌입시간을 확인하여 주십시오.
– 각형명의 성능, 항목중 접촉저항은 DC6~8V, 1A의 전압 강하법으로 측정합니다.〈그림 1〉
– 부하종류에 따라 정상전류와 돌입전류의 차이가 크기 때문에 허용돌입전류치를 확인하십시오.
– 직류회로에서 시정수(L/R)에 특히 영향이 크므로 주의하십시요.〈그림 2〉
– 회로간 전압이 서로 상이하면 혼촉에 의한 용착이 발생합니다.〈그림 3〉
– The specification of AC and DC is different, so please refer to ratings.
– Check theInrush current, rate current, and rush time.
– The contact resistance of "performance"category in each type is measured by drop method of electric pressure ranged in DC6~8V, 1A<plase refer to Figure 1>
– The difference rated current and Irush current can be big by the load type, so please should check the value of permitted Inrush current.
– Especially, the effect by LR in DC circuit is big, so please attention.<Figure 2>
– If the voltage between circuits are different, can be melted.<Figure 3>

〈그림 1〉



〈그림 2〉

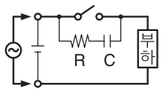


〈그림 3〉

주로 직류로 사용할 때 사용하며 R은 수 Ω이 상이 필요합니다. 교류로 사용할 경우 부하용량이 작아야 합니다.

R : 수10Ω~100Ω

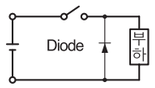
C : 0.05~0.1μF



Normall being used in DC, and "r" need more than several Ω.
R : Several 10Ω~100O
C : 0.05~0.1μF

직류에만 사용 가능

충분한 Diode를 선정하여 사용하십시오.

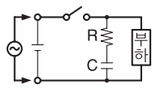


Only being used in DC.
Plase use elected enough Diode.

교류, 직류적용이 가능합니다.

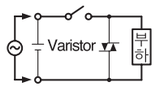
R : 수10Ω

C : 0.1~0.2μF



Normally being used in AC and DC.
R : Several10Ω
C : 0.1~0.2μF

교류, 직류적용 가능합니다. 전원전압의 1.5배 이상의 Varistor를 사용하십시오.



Normally being used in AC and DC.
Please use more than 1.5 times varistor comparing with source voltage.

– 유도부하 개폐회로에서는 개폐시에 역기전력(Surge)이나 돌입전류(Inrush)가 발생하므로 접촉장애가 발생합니다.
그러므로 상기표의 회로와 같은 보호회로 설치를 적극 권장합니다.

The switching circuit of induction load can make serge, or inrush current when switching.
So, encourage to install the protective circuit like the above table.

V형 마이크로 스위치 V type micro switch

형명분류
Type classification diagram

S H V — 1 6 3 — 1 D 5 L C

SungHo

정격 Rating	
01	0.1A
3	3A
6	6A
11	11A
16	16A
21	21A

엑츄에이터 Actuators	
표시 없음	핀눌름버튼 Pin plunger
1	힌지쇼트레바 Hinge short lever
2	힌지레바 Hing lever
3	힌지롱레바 Hinge long lever
4	힌지 R 레바 Hinge R lever
5	힌지롤라쇼트레바 Hinge roller short lever
6	힌지롤라레바 Hinge roller lever
7↑	특수레바 Specical lever

접점사양 Contact configuration	
1	1c
2	1b
3	1a

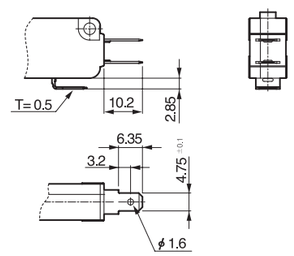
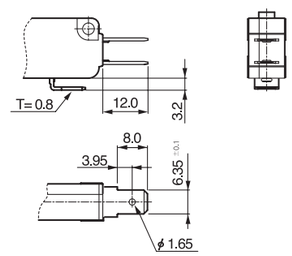
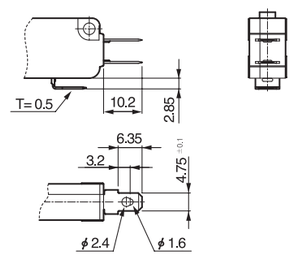
단자사양 Terminal	
A	#187 tap
B	#187 tap 0.8mm
C	#250 tap
D	Solder or #187 tap
F	6˚ bending #250 tap

동작력 Operating postion	
E	30g
1	50g
3	100g
4	120g
5A	150g
5	200g
6A	300g
6	400g

레버위치 Lever point	
표시없음 None	표준형 Standard type
L	앞면조립형 Front type

특수형 Pecial type	
S	상업용 Commerce
R	Rodund 금접점 Roundgoldcontact
C	레버코팅 Lever coatting
B	ϕ4 접점 4ϕ contact

단자종류
Terminal type

#187 단자(A) #187 tap (A)	#250 단자(A) #250 tap (A)	납땜, tap 공용단자(D) Solder and #187 tap (D)
		

V형 마이크로 스위치 V type micro switch

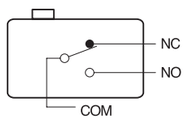
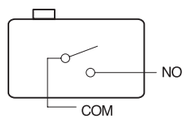
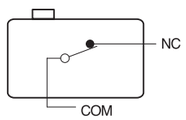
특징 Features	• 0.1A부터 최대 21A까지 개폐 가능한 소형 스위치입니다. • 종래의 V형을 완전히 개선하여 사용이 편리합니다. • 적재적소에 따른 다양한 액츄에이터가 준비되어 있습니다. • 각종 자동화기기에는 물론 가전제품용에도 적합한 범용 스위치입니다. • Wide switching capacity range from 0.1A to 21A. • Convenient utility though improvement of existing V type. • Variety of actuators and contact configuration. • Fitness from automatic equipments to electric equip.
용도 Application	• 전자레인지 • 자동판매기, 복사기 • 전산기, 주변단말기 • 의료기기, 통신기기 • 가전제품등 • Microwave ovens. • Autormatic vending machines, copy machines. • Monitors related to computer. • Medical instruments, communication machines. • Electric equipments, etc.

마이크로스위치 생산품 현황표
Micro switch products status

정격 Rating	형식 Model	접점간격 Contact gap	단자 Terminal			동작에 필요한 힘 Operating force(OF)				
		1mm	위치 Position	형상 Type		30g	50g	100g	200g	400g
				A, D(#187)	C(#250)					
250V AC 21A	SHV–21	●	Below		●					●
250V AC 16A	SHV–16	●	Below	●	●				●	●
250V AC 11A	SHV–11	●	Below	●	●			●	●	
250V AC 6A	SHV–6	●	Below	●	●		●	●	●	
250V AC 3A	SHV–3	●	Below	●		●	●	●	●	

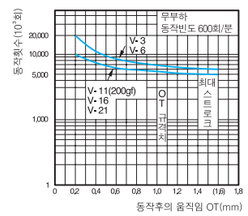
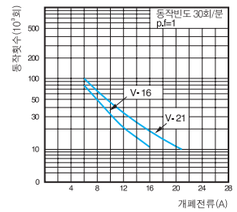
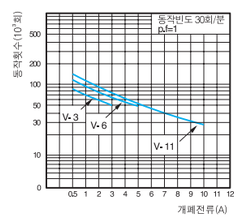
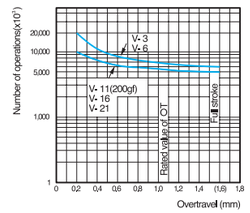
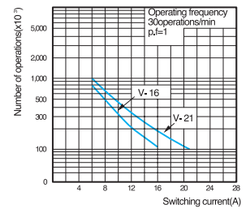
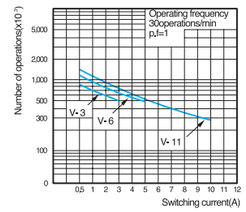
Note : 상기표의 "OF"는 핀눌름버튼형의 값입니다.
The "OF" shown in the chart above is the for the type of pin push button switchs.

접촉형식
Contact configuration

단극쌍투형(SPDT)	상시개로형(SPST–No, 1a)	상시폐로형(SPST–Nc, 1b)
		

성능 Characteristics		SHV–21	SHV–16	SHV–11	SHV–6	SHV–3
허용조작속도 Operating speed		0.1mm~1m/sec(핀눌름버튼인 경우) 0.1mm~1m/sec(at plunger)				
허용동작빈도 Operating cycle		기계적 : 600회/1분, 전기적 : 20회/1분 Machanically: 600 operation/Min, Electrically:20 operation/Min				
절연저항 Insulation resistance		100MΩ 이상(DC 500V MΩ 절연저항계) 100MOmin(at 500VDC)				
접촉저항 Contact resistance		최대 15mΩ(초기치) 15mΩ max(Initial)			최대 30mΩ(초기치) 30mΩ max(Initial)	
내전압 Dielectric strength		비연속단자간 AC 1,000V 50/60Hz 1분간 견딤 1,000VAC, 50/60Hz for 1minute between noncontinuous terminal 각 단자와 비충전부간, 각 단자와 AC 1,500V 50/60Hz 견딤 1,500VAC, 50/60Hz for 1minute between current-carrying and non-current-carrying and between each terminal and ground				
진동 Vibration protection		10~60Hz 진동폭 1.5mm Malfunction durability:10~60Hz 1.5mm double amplitude				
충격 Shock	내구 Mechanical durability	1,000m/s²(약 100G) Approx. 400m/s²(approx.40G)				400m/s²(약 40G) Approx. 400m/s²(approx.40G)
	오동작 Malfunction durability	300m/s²(약 30G) Approx. 300m/s²(approx.30G)		200m/s²(약 20G) Approx. 200m/s²(approx.20G)		100m/s²(약 10G) Approx.100m/s²(approx.10G)
수명 Life times	기계적 Mechanical	1,000만회 이상 10,000,000 operations min				
	전기적 Electric	10만회 이상 10,000 operations min				50만회 이상 500,000 operations min
중량 Weight		6.2g(핀눌름버튼형) Approx.6.2g(General-purpose pin plunger type)				

특성자료
Characterstic data

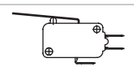
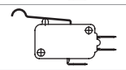
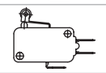
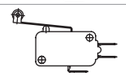
기계적수명곡선 Mechanical service life	전기적 수명곡선 Electrical service life	
		
		

V형 마이크로 스위치 V type micro switch

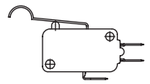
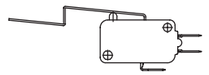
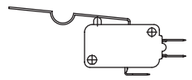
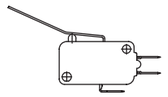
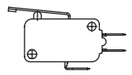
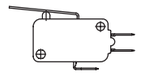
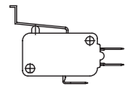
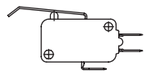
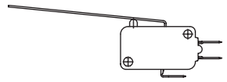
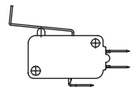
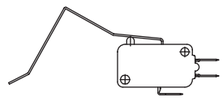
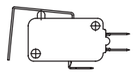
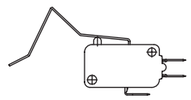
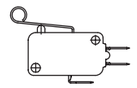
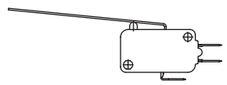
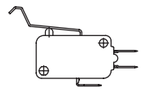
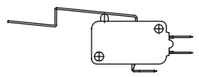
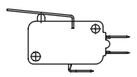
정격
Rating

Item / type	정격전압 Rated voltage	무유도부하(A) Non-inductive load(A)				유도부하(A) Inductive load(A)			
		저항부하 Resistive load		램프부하 Lamp load		유도부하 Inductive load		전동기부하 Motor load	
		상시폐로 NC	상시개로 NO	상시폐로 NC	상시개로 NO	상시폐로 NC	상시개로 NO	상시폐로 NC	상시개로 NO
21A	250VAC	21.0		3.0		12.0		4.0	
	30VDC	14.0		5.0		12.0		5.0	
	125VDC	0.6		0.1		0.6		0.1	
	250VDC	0.3		0.05		0.3		0.05	
16A	250VAC	16.0		2.0		10.0		3.0	
	30VDC	10.0		4.0		10.0		4.0	
	125VDC	0.6		0.1		0.6		0.1	
	250VDC	0.3		0.05		0.3		0.05	
11A	250VAC	11.0		1.5		6.0		2.0	
	30VDC	6.0		3.0		6.0		3.0	
	125VDC	0.6		0.1		0.6		0.1	
	250VDC	0.3		0.05		0.3		0.05	
6A	250VAC	6.0		0.5		4.0			
	30VDC	6.0		3.0		4.0			
	125VDC	0.4		0.1		0.4			
	250VDC	0.3		0.05					
3A	250VAC	3.0							
	30VDC	3.0							
	125VDC	0.2							
	250VDC	0.1							

종류
Type

엑츄에이터 종류 RatingActuator	형상 Description	정격 Rating 21A	16A	11A	6A	3A
단자형식 *Terminal*		C	D	D	D	D
핀눌름버튼 Pin pluge		SHV–21–1C6	SHV–16–1D5	SHV–11–1D3	SHV–6–1D1	SHV–3–1D1
힌지쇼트레버 Hinge short lever		SHV–211–1C6	SHV–161–1D5	SHV–111–1D3	SHV–61–1D1	SHV–31–1D1
힌지레버 Hinge lever		SHV–212–1C6	SHV–162–1D5	SHV–112–1D3	SHV–62–1D1	SHV–32–1D1
힌지롱레바 Hinge long lever		SHV–213–1C6	SHV–163–1D5	SHV–113–1D3	SHV–63–1D1	SHV–33–1D1
힌지R레버 Hinge R lever		SHV–214–1C6	SHV–164–1D5	SHV–114–1D3	SHV–64–1D1	SHV–34–1D1
힌지롤라쇼트레버 Hinge roller short lever		SHV–215–1C6	SHV–165–1D5	SHV–115–1D3	SHV–65–1D1	SHV–35–1D1
힌지롤라레바 Hinge roller lever		SHV–216–1C6	SHV–166–1D5	SHV–116–1D3	SHV–66–1D1	SHV–36–1D1

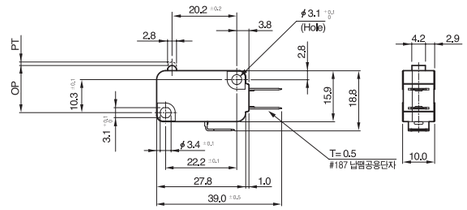
특수제작 액츄에이터
Special lever(Actuatros)

형명 Type	형상 Shape	Lever (mm)	형명 Type	형상 Shape	Lever (mm)
Lever(7)		27.3	Lever(16)		45.1
Lever(8)		50.2	Lever(17)		27.5
Lever(9)		22.8	Lever(18)		27.5
Lever(10)		25.7	Lever(19)		28.3
Lever(11)		61.0	Lever(20)		22.8
Lever(12)		72.0	Lever(21)		15.0
Lever(13)		66.0	Lever(23)		16.1
Lever(14)		70.0	Lever(24)		33.5
Lever(15)		43.3	Lever(25)		39.5

V형 마이크로 스위치 V type micro switch

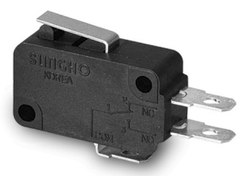
외형치수 및 특성
Demension and operating characteristics

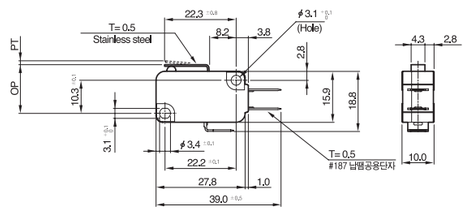
핀눌름 버튼형
Pin plunger



주문형식 Ordering information		SHV-3-□□□	SHV-6-□□□	SHV-11-□□□	SHV-16-□□□
OF Max	Operating position	50g	50g	100g	200g
RF Min	Rlleasing force	10g	10g	25g	50g
PT Max	Pre travel	1.6mm			
OT Min	Over travel	0.8mm			
MD Max	Movement differential	0.4mm			
OP	Operating position	14.8±0.4mm			

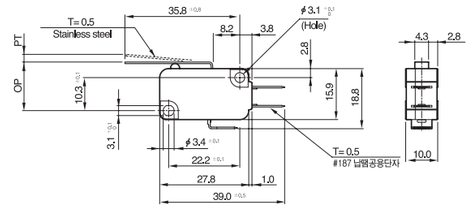
힌지쇼트레버
Hinge short lever





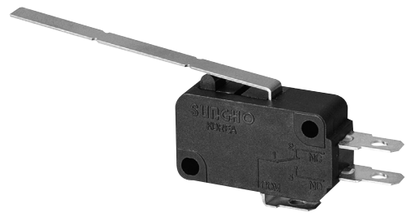
주문형식 Ordering information		SHV-31-□□□	SHV-61-□□□	SHV-111-□□□	SHV-161-□□□
OF Max	Operating position	50g	50g	100g	200g
RF Min	Rlleasing force	6g	6g	15g	50g
PT Max	Pre travel	1.6mm			
OT Min	Over travel	0.8mm			
MD Max	Movement differential	0.4mm			
OP	Operating position	15.2±0.5mm			

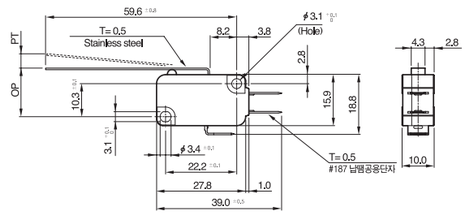
힌지레버
Hinge lever



주문형식 Ordering information		SHV-32-□□□	SHV-62-□□□	SHV-112-□□□	SHV-162-□□□
OF Max	Operating position	30g	30g	60g	125g
RF Min	Rlleasing force			6g	14g
PT Max	Pre travel	4.0mm			
OT Min	Over travel	1.6mm			
MD Max	Movement differential	1.5mm			
OP	Operating position	15.2±1.2mm			

힌지롱레버
Hinge long lever



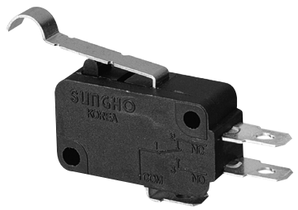


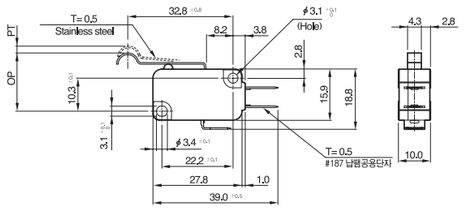
주문형식 Ordering information		SHV-33-□□□	SHV-63-□□□	SHV-113-□□□	SHV-163-□□□
OF Max	Operating position	20g	20g	35g	70g
RF Min	Rlleasing force				6g
PT Max	Pre travel	9.0mm			
OT Min	Over travel	2.0mm			
MD Max	Movement differential	2.8mm			
OP	Operating position	15.2±3.0mm			

V형 마이크로 스위치 V type micro switch

외형치수 및 특성
Demension and operating characteristics

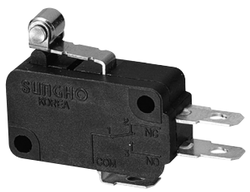
힌지 R 레버
Simulated hinge lever

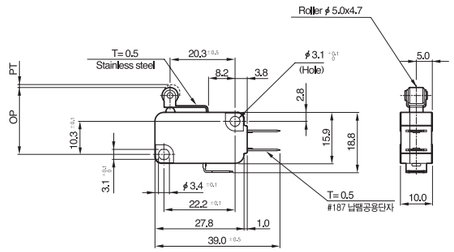




주문형식 Ordering information		SHV-34-□□□	SHV-64-□□□	SHV-114-□□□	SHV-164-□□□
OF Max	Operating position	30g	30g	60g	125g
RF Min	Rlleasing force			6g	14g
PT Max	Pre travel	4.0mm			
OT Min	Over travel	1.6mm			
MD Max	Movement differential	1.5mm			
OP	Operating position	18.7±1.7mm			

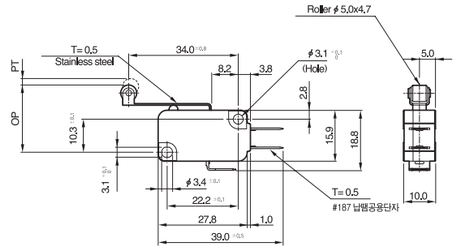
힌지롤라쇼트레버
Hinge roller short lever





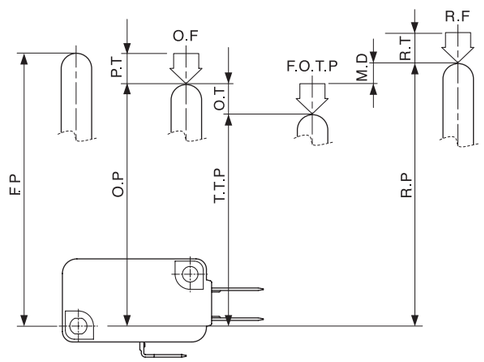
주문형식 Ordering information		SHV-35-□□□	SHV-65-□□□	SHV-115-□□□	SHV-165-□□□
OF Max	Operating position	60g	60g	120g	240g
RF Min	Rlleasing force	6g	6g	15g	5g
PT Max	Pre travel	1.6mm			
OT Min	Over travel	0.8mm			
MD Max	Movement differential	0.6mm			
OP	Operating position	20.7±0.8mm			

힌지롤라레바
Hinge roller lever

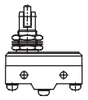
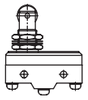


주문형식 Ordering information		SHV-36-□□□	SHV-66-□□□	SHV-116-□□□	SHV-166-□□□
OF Max	Operating position	30g	30g	60g	125g
RF Min	Rlleasing force			6g	14g
PT Max	Pre travel	4.0mm			
OT Min	Over travel	1.6mm			
MD Max	Movement differential	1.5mm			
OP	Operating position	20.7±1.6mm			

동작특성
Definitions and operating characteristics



종류별 형식구분
Actuator type

분류명 Classified type	형상 Shape	주문형식 Type	특성 및 사용 예 Characteristics & Application
장눌름 버튼형 Long push button		SHZM–P503A–15GA	수동을 요하는 기계적 동작일 때 저속 CAM과 함께 사용가능합니다. It is possible to use with low-speed CAM when passive mechanical movement.
단눌름 버튼형 Short push button		SHZM–P503B–15GA	버튼 길이가 짧고 직경이 넓어 작동이 편리하며 플런져의 지름이 넓은 것을 사용하십시요. The length of button is short, and diameter is wide. Please use of wide-diameter plunger.
핀눌름 버튼형 Pin push button		SHZM–P503C–15GA	짧은 직선 Stroke의 장소에 적합하며 예민하고 작동거리가 적어 확실한 stopper가 필요합니다. It is suited to short straight-stroke, and because of sharp, operation range is short, so need certain stopper.
로라눌름 버튼형(세로) Vertically roller push button		SHZM–P504A–15GA	장눌름 버튼형에 로라를 부착한 것으로 사용 위치에 따라 Roller 회전면을 가로, 세로 방향으로 선택하여 사용합니다 As it is long push button type with roller, can select of length and width by position.
로라눌름 버튼형(가로) Horizontal roller push button		SHZM–P504B–15GA	
힌지단레바형 Hinge short lever		SHZM–L502A–15GA	저속캠에 사용하며 동작력, 수명, 정확도에 따라 선택이 가능하며 내진동성, 내충격성이 뛰어납니다. It is in use of low-speed CAM with resisting-vibration, resisting-impact. It is possible to select as lifetime, accuracy, movement capacity.
힌지중레바형 Hinge medium lever		SHZM–L502B–15GA	
힌지장레바형 Hinge long lever		SHZM–L502C–15GA	
힌지특장레바형 Hinge special long lever		SHZM–L502D–15GA	

형명분류
Type classification diagram

엑츄에이터 종류 Actuators		정격용량 Rating capacity		접점간격 Contact interval		전압 Voltage	
R501A	힌지로라 단레바형 Hinge roller lever	15	15A	G	0.5mm	A	AC
R501B	힌지로라 중레바형 Hinge roller medium leve						
R501C	힌지로라 장레바형 Hinge roller long lever						
R501D	힌지로라 특장레바형 Hinge roller special long lever						
L502A	힌지 단레바형 Hinge short lever						
L502B	힌지 중레바형 Hinge medium lever						
L502C	힌지 장레바형 Hinge long lever						
L502D	힌지 특장레바형 Hinge special long lever						
P503A	장눌름 버튼형 Long push button						
P503B	단눌름 버튼형 Short push button						
P503C	핀눌름 버튼형 Pin push button						
PR504A	로라 눌름버튼형(세로) Vertically roller push button						
PR504B	로라 눌름버튼형(가로) Horizontal roller push button						

교류용 마이크로 스위치(Z형) Alternating current micro switch(Z type)

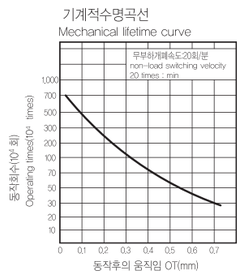
형명분류
Type classification diagram

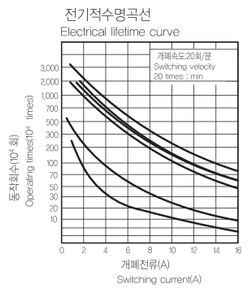
특징 Features	• 기종이 풍부하여 제품적용 선택의 폭이 넓어졌습니다. • 15A의 높은 개폐용량을 가지고 있습니다. • 구조가 내아크성, 내연, 내열재질로서 절연성이 우수합니다. • 엑츄에이터는 눌름버튼, 힌지레버, 롤라레바 등으로 종류가 다양합니다. • 높은 접촉 신뢰성을 갖고 있습니다. • 부착은 국제규격을 적용했습니다. • With types of switch is various, can be widening select in the application of product • With high switching capacity of 15A • Excellent in insulation property with high structure of heat resistance,oil resistance, insulation corrosion resistance. • Actuator's types are various with Pin Plunger, Hinge roller lever. • With high contact performance. • Application of international standards.		
용도 Application	• 산업용기계. • 공작기계. • 압력, 온도, 액면, 중량, 시간 등의 제어용 및 자동제어부품. • 배전반 • Industrial machine • Machine tool • Controller and auto-controller's parts of pressure, temperature, weight, time, etc. • Controll panel		
성능 Characteristics	허용동작빈도 *Max. operating cycles*	기계적 *Mechanical*	240회/분 *240 cycles/Min*
		전기적 *Electical*	20회/분 *20 cycles/Min*
	허용조작속도 *Max. operating speed*		0.1mm~1mm
	절연저항 *Insulation resistance*		100MΩ이상(DC500V MΩ 절연저항계) *Min. 100MΩ at DC500V*
	접촉저항 *Contact resistance*		15mΩ 이하 *Max. 15mΩ at the begining*
	내전압 *Dielectic strength*	충전부간 *Between live parts*	AC 1,000V 50/60Hz 1분간 *AC 1,000V 50/60Hz 1min*
		비충전부간 *Between non-live parts*	AC 2,000V 50/60Hz 1분간 *AC 2,000V 50/60Hz 1min*
	내진동 *Vibration protection*		10~55Hz, 진동폭: 1.5mm *10~55Hz, vibration range:1.5mm*
	내충격 *Mechanical shock protection*	내구 *Endurance*	1,000m/s^2 이상(약 100G 이상) *Min. 1,000m/s^2(approx.100G)*
		오동작 *Malfunction*	50m/s^2 이상(약 5G 이상) *Min. 50m/s^2(approx.5G)*
	수명 Lifetimes	전기적 *Electrical*	10만회 이상 *0.1 mill operations min*
		기계적 *Mechanical*	1,000만회 이상 *10 mill operations min*
	사용주위온도 *Ambient temperature for operation*		–10 ~ +80℃
	사용주위습도 *Ambient humidity*		96%RH 이하 *Max. 96%*

정격
Rating

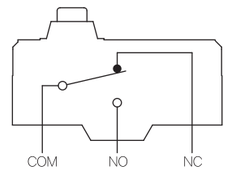
정격전압(V) Rating voltage(v)		무유도부하(A) Non-inductive load(A)				유도부하(A) Inductive load(A)			
		저항부하 resistance load cos ϕ=1		램프부하 Lamp load		유도부하 Inductive load cos ϕ=1		전동기부하 Motor load	
		상시폐로 normally closed	상시개로 normally closed	상시폐로 normally closed	상시개로 normally closed	상시폐로 normally closed	상시개로 normally closed	상시폐로 normally closed	상시개로 normally closed
AC	125	15		2	1	7		2.5	2
	250	15		1	0.5	5		1.5	1
DC	8	15		2	1	7		3	1.5
	14	15		2	1	7		3	1.5
	30	2		2	1	1		1	0.5
	125	0.4		0.4	0.4	0.03		0.03	0.03
	250	0.2		0.2	0.2	0.02		0.02	0.02

수명곡선
Lifetime curve

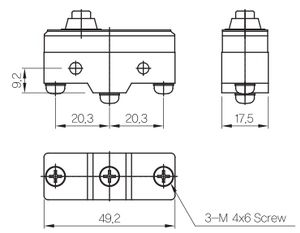




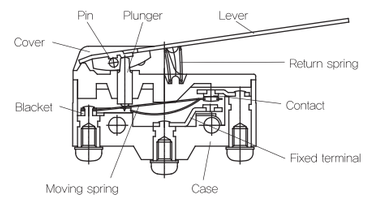
접점회로도
Circuit diagram



단자종류
Terminal types



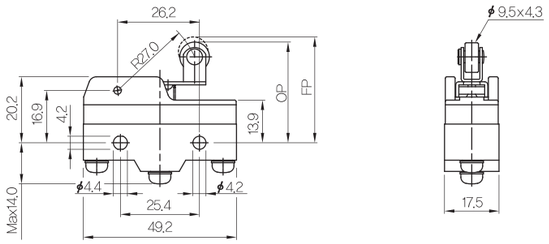
내부구조
Inside structure diagram



교류용 마이크로 스위치(Z형) Alternating current micro switch(Z type)

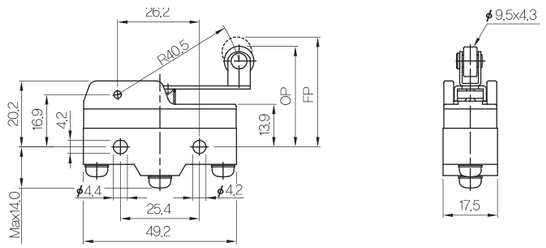
외형치수 및 특성
Demension and operating characteristics

힌지로라단레바형
Hinge roller lever



주문형식 Ordering information		SHZM-R501A-15GA
OF Max	Operating position	160gf
RF Min	Rlleasing force	42gf
PT Max	Pre travel	5.0mm
OT Min	Over travel	2.4mm
MD Max	Movement differential	1.2mm
FP Max	Free Position	32.9mm
OP	Operating position	30.2±0.4mm

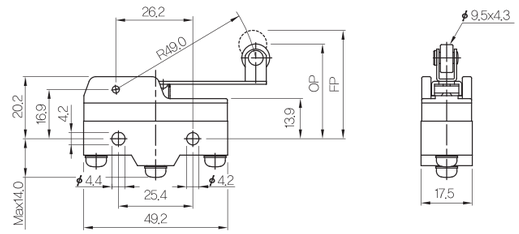
힌지로라중레바형
Hinge roller medium lever



주문형식 Ordering information		SHZM-R501B-15GA
OF Max	Operating position	120gf
RF Min	Rlleasing force	22gf
PT Max	Pre travel	8.0mm
OT Min	Over travel	4.0mm
MD Max	Movement differential	2.0mm
FP Max	Free Position	35.0mm
OP	Operating position	30.2±0.8mm

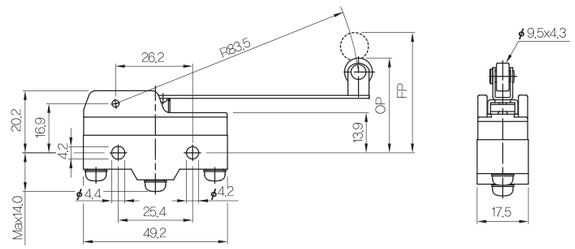
외형치수 및 특성
Demension and operating characteristics

힌지로라장레바형
Hinge roller long lever



주문형식 Ordering information		SHZM-R501C-15GA
OF Max	Operating position	90gf
RF Min	Rlleasing force	10gf
PT Max	Pre travel	5.0mm
OT Min	Over travel	2.0mm
MD Max	Movement differential	2.4mm
FP Max	Free Position	36.5mm
OP	Operating position	30.2±1.0mm

힌지로라특장레바형
Hinge roller special long lever

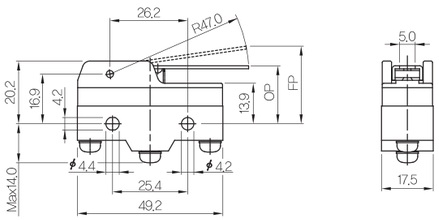


주문형식 Ordering information		SHZM-R501D-15GA
OF Max	Operating position	75gf
RF Min	Rlleasing force	14gf
PT Max	Pre travel	14.0mm
OT Min	Over travel	13.0mm
MD Max	Movement differential	5.0mm
FP Max	Free Position	46.6mm
OP	Operating position	30.2±1.6mm

교류용 마이크로 스위치(Z형) Alternating current micro switch(Z type)

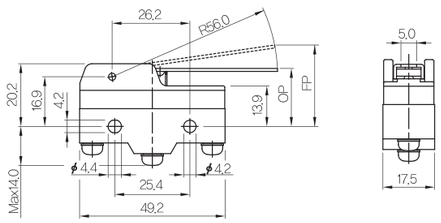
외형치수 및 특성
Demension and operating characteristics

힌지단레바형
Hinge roller medium lever



주문형식 Ordering information		SHZM-R501A-15GA
OF Max	Operating position	95gf
RF Min	Rlleasing force	25gf
PT Max	Pre travel	6.0mm
OT Min	Over travel	4.0mm
MD Max	Movement differential	2.0mm
FP Max	Free Position	24.8mm
OP	Operating position	19.0±0.8mm

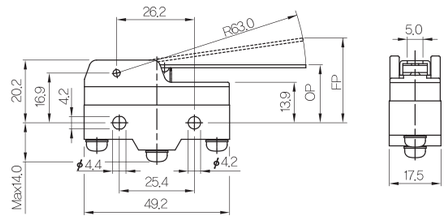
한지중레바형
2 stage roller lever



주문형식 Ordering information		SHZM-L502B-15GA
OF Max	Operating position	90gf
RF Min	Rlleasing force	40gf
PT Max	Pret ravel	8.0mm
OT Min	Over travel	8.0mm
MD Max	Movement differential	3.0mm
FP Max	Free Position	26.4mm
OP	Operating position	19.0±0.8mm

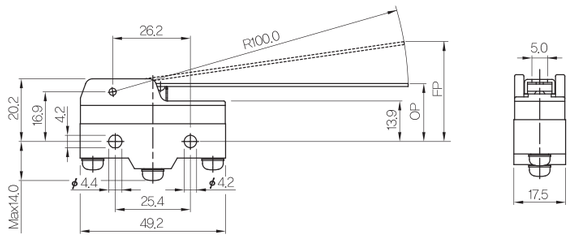
외형치수 및 특성
Demension and operating characteristics

힌지장레바형
Hinge long lever



주문형식 Ordering information		SHZM-L502C-15GA
OF Max	Operating position	85gf
RF Min	Rlleasing force	25gf
PT Max	Pre travel	10.0mm
OT Min	Over travel	6.0mm
MD Max	Movement differential	2.4mm
FP Max	Free Position	29.0mm
OP	Operating position	19.0±0.8mm

힌지 특장레바형
Hinge special long leve

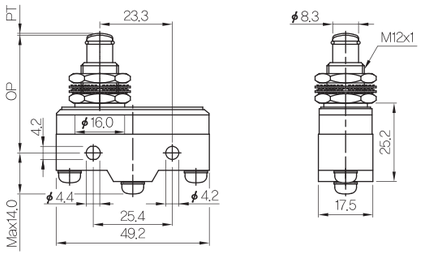


주문형식 Ordering information		SHZM-L502D-15GA
OF Max	Operating position	80gf
RF Min	Rlleasing force	14gf
PT Max	Pre travel	14.0mm
OT Min	Over travel	13.0mm
MD Max	Movement differential	5.0mm
FP Max	Free Position	34.9mm
OP	Operating position	19.0±1.6mm

교류용 마이크로 스위치(Z형) Alternating current micro switch(Z type)

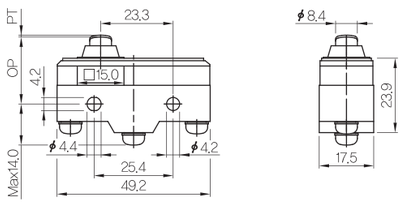
외형치수 및 특성
Demension and operating characteristics

장눌름버튼형
Long push button



주문형식 Ordering information		SHZM-P503A-15GA
OF Max	Operating position	350gf
RF Min	Rlleasing force	114gf
PT Max	Pre travel	0.4mm
OT Min	Over travel	5.8mm
MD Max	Movement differential	1.0mm
OP	Operating position	21.8±0.8mm

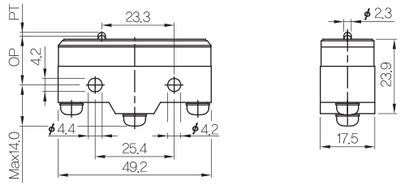
단눌름버튼형
Short push button



주문형식 Ordering information		SHZM-P503-15GA
OF Max	Operating position	350gf
RF Min	Rlleasing force	114gf
PT Max	Pre travel	0.4mm
OT Min	Over travel	1.6mm
MD Max	Movement differential	0.1mm
OP	Operating position	21.5±0.5mm

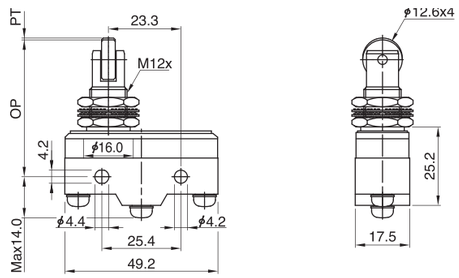
외형치수 및 특성
Demension and operating characteristics

핀눌름버튼형
Pin push button



주문형식 Ordering information		SHZM-P503C-15GA
OF Max	Operating position	350gf
RF Min	Rlleasing force	114gf
PT Max	Pre travel	0.4mm
OT Min	Over travel	1.6mm
MD Max	Movement differential	0.1mm
OP	Operating position	16.0±0.4mm

로라눌름버튼형(세로)
Vertically roller push button

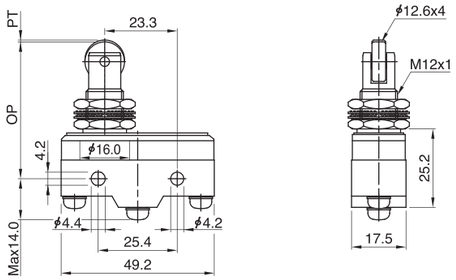


주문형식 Ordering information		SHZM-PR504A-15GA
OF Max	Operating position	350gf
RF Min	Rlleasing force	114gf
PT Max	Pre travel	0.4mm
OT Min	Over travel	3.6mm
MD Max	Movement differential	1.0mm
OP	Operating position	33.4±1.2mm

교류용 마이크로 스위치(Z형) Alternating current micro switch(Z type)

외형치수 및 특성
Demension and operating characteristics

로라눌름버튼형(가로)
Horizontal roller push button



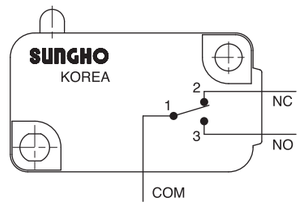
주문형식 Ordering information		SHZM-PR504B-15GA
OF Max	Operating position	350gf
RF Min	Rlleasing force	114gf
PT Max	Pre travel	0.4mm
OT Min	Over travel	3.6mm
MD Max	Movement differential	0.1mm
OP	Operating position	33.4±1.2mm

발판 스위치 FOOT SWITCH

특징 Features	• 정밀도가 높은 V형 마이크로 스위치가 내장되어 있어 동작이 확실하고 신뢰성이 우수합니다. • 접점용량이 크면서 차단속도가 빠르며 긴 수명을 갖습니다. • 프라스틱용은 가벼우며 충격에도 강한 포리카보네이트를 사용하였습니다. • 2a2b 접점 생산도 가능합니다. • 접점용량은 250V 16A입니다. • Excellent in the movement and the reliability with exact V-type micro switch. • Lifetime is long, contact capacity and isolation speed is high. • Plastic case made by polycabonate material which is light and high impact resistance. • It's possible to produce of 2a2b contact. • Contact capacity is 250V 16A.
용도 Application	• 소형공작기계, 용접기계, 의료기기, 사무기기등. • Light machine tool, Welding machine, Business machine, etc.

형명 Features	SHFS-M1	SHFS-D1	SHFS-D2
접점용량(저항부하시)	250VAC 16A		
내장스위치형명	SHV-16-1D5		
외관재질	포리카보네이트 Polycabonate	알루미늄 다이캐스팅 Aluminum die-casting	
배선길이	1.5m		
중량	120g	175g	360g

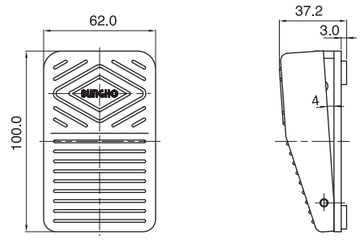
회로도
Circuit detail



주문형식
Type

SHFS-M1

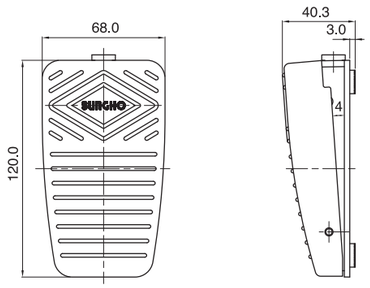
외형치수
Dimensions



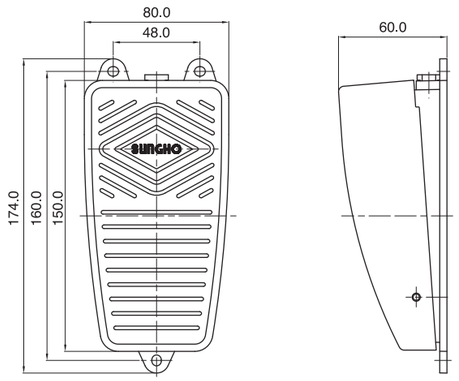
주문형식
Type

외형치수
Dimensions

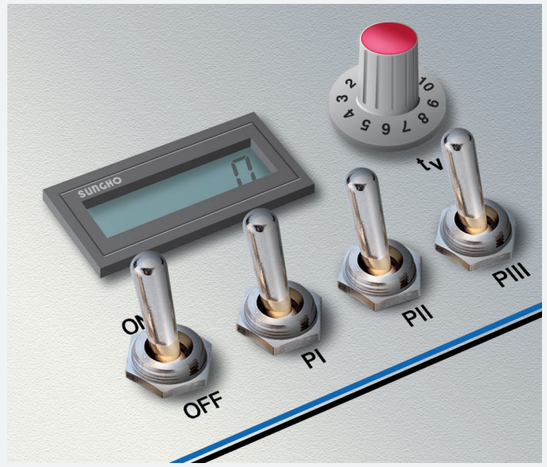
SHFS-D1



SHFS-D2



토글 스위치 TOGGLE SWITCHES



- **단투(2단자)형**
  Single Throw Switches
  with two Positions
  a접점으로 구성
- **쌍투(3단자)형**
  Double Throw Switches
  c접점으로 구성
  - 2-위치형
    With Two Positions
    a-b
  - 3-위치형
    Three Positions
    a(ON)-OFF-b(ON)
    - 수동형
      Stay Put
    - 한쪽자동복귀형
      Momentary Function
      a or b Spring Returning to OFF
    - 양쪽자동복귀형
      Momentary Function
      a and b Spring Returning to OFF

정격용량 : 3A, 6A, 10A, 250VAC
Rating

- 1극형 Single Pole
- 2극형 Double Pole

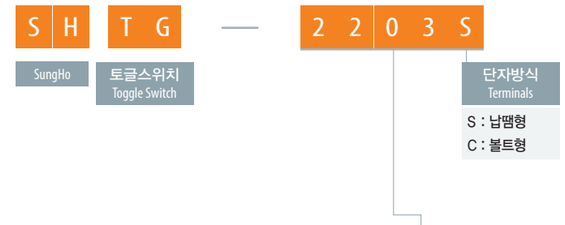
- 납땜형 Solder
- 볼트형 Screw

정격 및 성능 Characteristics

특징 Features	• 간편한 조작과 부드러운 촉감을 갖춘 높은 정밀도의 토글스위치입니다. • 다양한 종류의 부하용량을 갖고 있어 소비자의 선택폭이 넓어졌습니다. • 내열, 내연 및 내아크성 재질의 구조로 되어 있어 절연성이 우수합니다. • 단자는 납땜형과 볼트형으로 분류되어 있습니다. • 명판은 한글은 물론 영문으로도 가능합니다. • Toggle switch of high detailed drawing having easy operation, and feel soft to the touch. • With various load capacity, can be widening selected by user. • Excellent in insulation property with high structure of heat resistance, oil resistance, insulation corrosion resistance. • Terminal is divided by solder and screw type. • Nameplate produced by English, or Korean.		
용도 Application	• 산업용기계, 공작기계, 배전반, 자동제어기기 등 • Industrial machine, building machine, panel board, automatic control instruments, and so on.		
성능 Characteristics	허용동작빈도 *Characteristics*	기계적 *Max. operating cycles mechanical*	240회/분 *240cycles/min*
		전기적 *Elctrical*	20회/분 *20cycles/min*
	접촉저항 *Contact resistance*		50mΩ 이하(초기치) *Max. 50mΩ at the beginning*
	절연저항 *Insulation resistance*		100MΩ이상(DC500V MΩ 절연저항계) *Min. 100mΩ at DC500V*
	내전압 *Dielectric strength*	충전부간 *Between live parts*	AC 1,500V 50/60Hz 1min
		비충전부간 *Between non-live parts*	AC 2,000V 50/60Hz 1min
	내진동 *Vibration protection*		10 ~ 55Hz 복진폭 1.5mm
	내충격 *Mechanical shock protection*	내구	1000m/s²(약 100G)
		오동작	200m/s²(약 20G) 이상
	수명 *Lifetimes*	전기적 *Electrical*	10만회 이상 *0.1 mil .operations*
		기계적 *Mechanical*	100만회 이상 *1 mil .operations*

2위치형 – 단투(2단자) 및 쌍투(3단자)
Single & double throw switches with two positions

주문형식 Catalog No. structure
(Ordering information)



접점방식 Contact type	극수 Pole	단자방식 Terminals	정격용량 Rating	주문형식 Type
단투(2단자)형 Single throw	1극 1a, Single pole	납땜형 Solder	3A / 250V	SHTG–2203S(주문형)
			6A / 250V	SHTG–2206S(주문형)
			10A / 250V	SHTG–2210S
		볼트형 Screw	3A / 250V	SHTG–2203C(주문형)
			6A / 250V	SHTG–2206C(주문형)
			10A / 250V	SHTG–2210C
	2극 2a, Double pole	납땜형 Solder	6A / 250V	SHTG–2406S(주문형)
			10A / 250V	SHTG–2410S
		볼트형 Screw	6A / 250V	SHTG–2406C(주문형)
			10A / 250V	SHTG–2410C
쌍투(3단자)형 Double throw	1극 1c, Single pole	납땜형 Solder	3A / 250V	SHTG–2303S(주문형)
			6A / 250V	SHTG–2306S(주문형)
			10A / 250V	SHTG–2310S
		볼트형 Screw	3A / 250V	SHTG–2303C(주문형)
			6A / 250V	SHTG–2306C(주문형)
			10A / 250V	SHTG–2310C
	2극 2c, Double pole	납땜형 Solder	3A / 250V	SHTG–2603S(주문형)
			6A / 250V	SHTG–2606S(주문형)
			10A / 250V	SHTG–2610S
		볼트형 Screw	3A / 250V	SHTG–2603C(주문형)
			6A / 250V	SHTG–2606C(주문형)
			10A / 250V	SHTG–2610C

3위치형 – 단투(2단자) 및 쌍투(3단자)

Double throw switches with center-OFF-three positions

주문형식 Catalog No. structure
(Ordering information)

S	H	T	G	—	2	2	0	3	S
SungHo		토글스위치 Toggle Switch							단자방식 Terminals

S : 납땜형
C : 볼트형

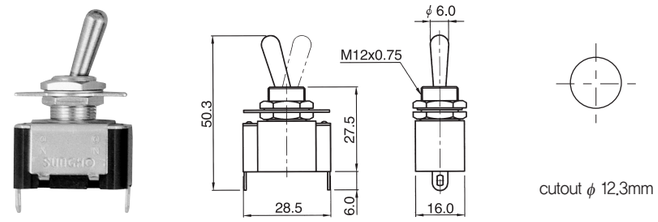
제품명

접점방식 Contact type	극수 Pole	단자방식 Terminals	정격용량 Rating	주문형식 Type
단투(2단자)형 Single throw	1극 1a, Single pole	납땜형 Solder	3A / 250V	SHTG–2203S(주문형)
			6A / 250V	SHTG–2206S(주문형)
			10A / 250V	SHTG–2210S
		볼트형 Screw	3A / 250V	SHTG–2203C(주문형)
			6A / 250V	SHTG–2206C(주문형)
			10A / 250V	SHTG–2210C
	2극 2a, Double pole	납땜형 Solder	6A / 250V	SHTG–2406S(주문형)
			10A / 250V	SHTG–2410S
		볼트형 Screw	6A / 250V	SHTG–2406C(주문형)
			10A / 250V	SHTG–2410C
쌍투(3단자)형 Double throw	1극 1c, Single pole	납땜형 Solder	3A / 250V	SHTG–2303S(주문형)
			6A / 250V	SHTG–2306S(주문형)
			10A / 250V	SHTG–2310S
		볼트형 Screw	3A / 250V	SHTG–2303C(주문형)
			6A / 250V	SHTG–2306C(주문형)
			10A / 250V	SHTG–2310C
	2극 2c, Double pole	납땜형 Solder	3A / 250V	SHTG–2603S(주문형)
			6A / 250V	SHTG–2606S(주문형)
			10A / 250V	SHTG–2610S
		볼트형 Screw	3A / 250V	SHTG–2603C(주문형)
			6A / 250V	SHTG–2606C(주문형)
			10A / 250V	SHTG–2610C

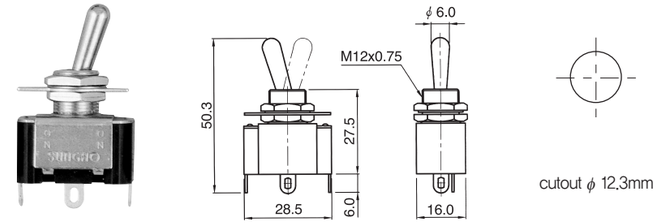
외형치수

Dimensions, mm

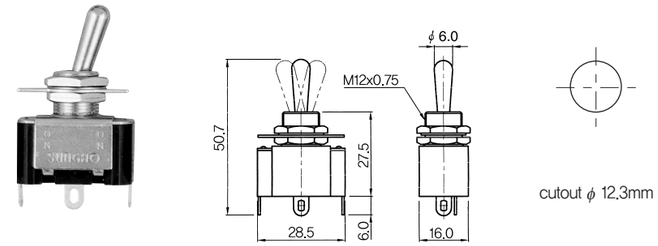
SHTG–2203S(주문형)
SHTG–2206S(주문형)
SHTG–2210S



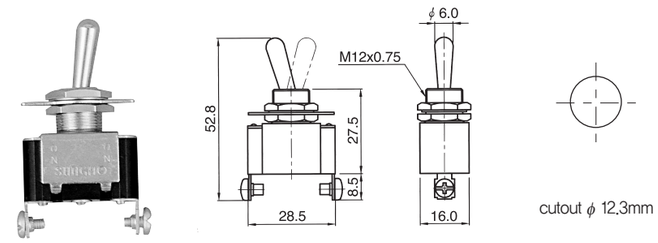
SHTG–2303S(주문형)
SHTG–2306S(주문형)
SHTG–2310S



SHTG–3303S(주문형)
SHTG–3306S(주문형)
SHTG–3310S
SHTG–3303SA(주문형)
SHTG–3306SA(주문형)
SHTG–3310SA
SHTG–3303SB(주문형)
SHTG–3306SB(주문형)
SHTG–3310SB

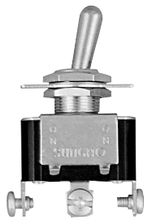


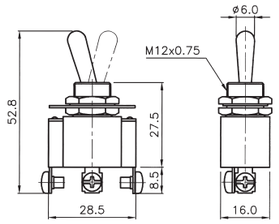
SHTG–2203C(주문형)
SHTG–2206C(주문형)
SHTG–2210C



외형치수
Dimensions, mm

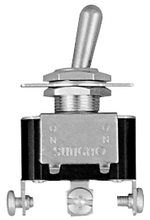
SHTG-2303C(주문형)
SHTG-2306C(주문형)
SHTG-2310C

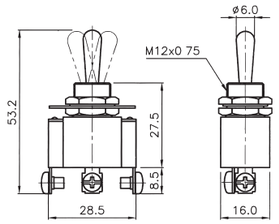




cutout ϕ 12.3mm

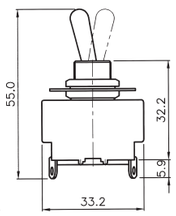
SHTG-3303C(주문형)
SHTG-3306C(주문형)
SHTG-3310C
SHTG-3303CA(주문형)
SHTG-3306CA(주문형)
SHTG-3310CA
SHTG-3303CB(주문형)
SHTG-3306CB(주문형)
SHTG-3310CB





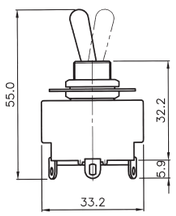
cutout ϕ 12.3mm

SHTG-2403S(주문형)
SHTG-2406S(주문형)
SHTG-2410S



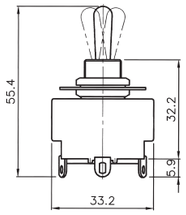
cutout ϕ 12.3mm

SHTG-2603S(주문형)
SHTG-2606S(주문형)
SHTG-2610S



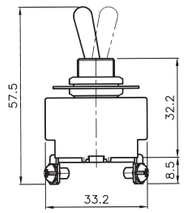
cutout ϕ 12.3mm

SHTG-3603S(주문형)
SHTG-3606S(주문형)
SHTG-3610S
SHTG-3603SA(주문형)
SHTG-3606SA(주문형)
SHTG-3610SA
SHTG-3603SB(주문형)
SHTG-3606SB(주문형)
SHTG-3610SB



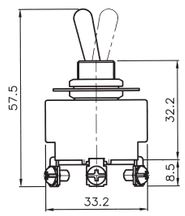
cutout ϕ 12.3mm

SHTG-2403C(주문형)
SHTG-2406C(주문형)
SHTG-2410C



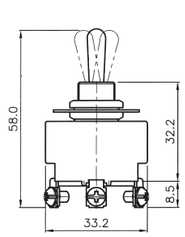
cutout ϕ 12.3mm

SHTG-2603C(주문형)
SHTG-2606C(주문형)
SHTG-2610C



cutout ϕ 12.3mm

SHTG-3603C(주문형)
SHTG-3606C(주문형)
SHTG-3610C
SHTG-3603CA(주문형)
SHTG-3606CA(주문형)
SHTG-3610CA
SHTG-3603CB(주문형)
SHTG-3606CB(주문형)
SHTG-3610CB



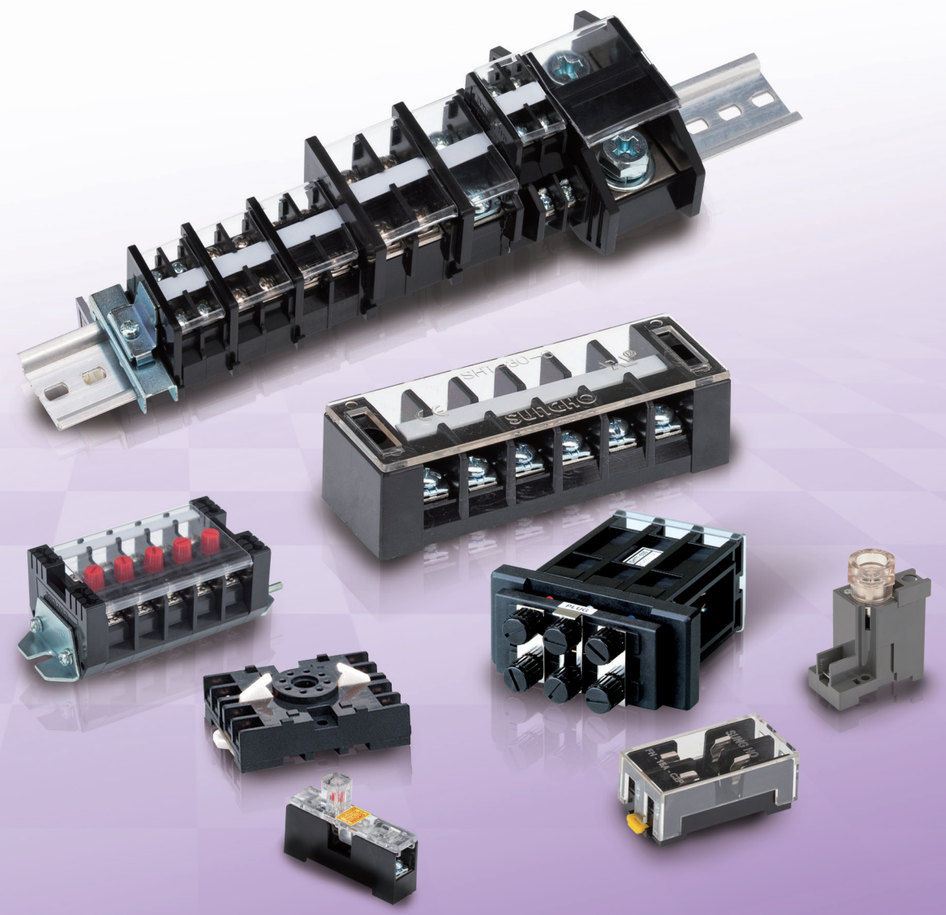
cutout ϕ 12.3mm

TERMINAL Blocks
FUSE Holders
SOCKETS

단자대

휴즈홀더

소켓

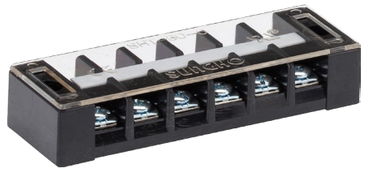


당사 제품에 사용되는 볼트(BOLT)의 조임 토크(Torque) 표

단자나사의 호칭지름 mm	2.5	3	3.5	4	5	6	8	10	12	16
조임 토크 N.m	0.4	0.5	0.8	1.2	2	2.5	6	10	14	25
kgf.cm	4.056	5.07	8.113	12.169	20.282	25.353	60.847	101.14	141.98	253.53

고정식단자대
SHT - 10 to 600
Terminal Blocks Factory Built Type

- 10...600A, 600VAC
- 3 to 20 pole
- Screw Terminal
- Screw Mount



조립식단자대
TB- 10 to 200
Terminal blocks User Assembly Type

- 10...200A, 600VAC
- poles Unlimited
- Screw Terminal
- DIN Rail Terminal

시험용단자대

단락회로부단자대
Terminal blocks with Short Circuit

- 40A 250VAC
- Shaft Assembly
- Rail Assembly
- Standard Products

고정식 단자대
Terminal block factory built type

60A 이상 고용량 BODY는 난연등급과 충격에 강한 재질을 사용하여 충격에의한 BODY 파손을 최소화 하였습니다.

특징 Features	• 전류별 종류가 다양하여 용도에 따른 선택의 폭이 넓어졌습니다. • 절연성과 강도가 우수한 재질을 사용하였습니다. • 단자대 카바는 투명하며 깨지지 않는 재질로 되어 있어 견고하며 번호판 문자의 식별이 용이합니다. • 선박용 및 화학제품용 등 부식성이 강한 곳에서 사용할 수 있는 스테인레스 볼트도 생산이 가능합니다. • With various kind by electric current, can be widening selected by user. • High non-conductivity and strength material use. • Terminal block's cover is consist of transparent materials, the letter number plate becomes easier. • It is possible to use in easy-corrode place as ship and chemical prod	
용도 Application	• 공작기계, 배전반, 자동제어기기 등 • Machine tool, Supply of electric power, Auto control devices, etc.	
성능 Characteristics	정격절연전압 *Rated insulation voltage*	AC 600V
	정격전류 *Rated current*	10~600A(10종)
	절연저항 *Insulation resistance*	100MΩ 이상(DC500V MΩ 절연저항계) 100MΩ at DC500V
	내전압(비충전부간) *Dielectric strength between non-live parts*	AC 2,000V 50/60Hz 1min
	내진동 *Vibration protection*	10~55Hz 복진폭 1.5mm
	온도상승 *Temperature rise*	Max. 45℃

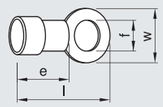
부품재질
Part materials

부품 Part	재질 Materials
몸체 Body	포리카보네이트 Polycarbonate resin
단자 Terminal	황동 brass
볼트 Bolt	SWRM-3, STS(Option)
카바 Cover	포리카보네이트 Polycarbonate resin

10A 고정식 단자대 10A Terminal block factory built type

전기적 특성/적용압착 단자
Electric characteristics/Applicable terminal sizes

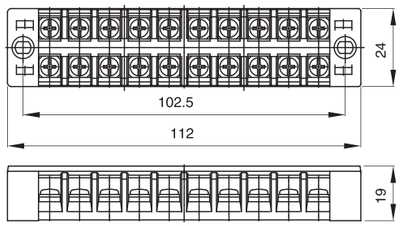
형식 Type		SHT–10–10
정격절연전압	Rating insulation voltage	Max 600VAC
정격전류	Rating current	250VAC 10A
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계) *min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2500V 50/60Hz 1min
적용적합전선	Rating suitable wire	2.0mm²
단자나사	Terminal screw size	M3
연결단자 Terminal	e	Min 10.0mm
	f	Min ϕ3.1
	w	Max 6.8mm
	l	Min 20.6mm



주문형식
Type

SHT–10–10

외형치수
Dimensions

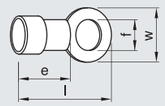


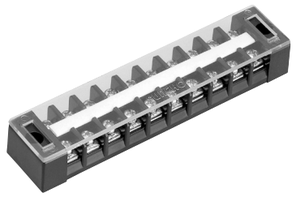
Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

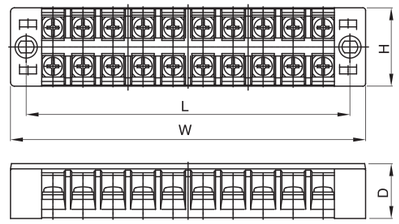
20A 고정식 단자대 20A Terminal block factory built type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT–20
정격절연전압	Rating insulation voltage	Max 600VAC
정격전류	Rating current	250VAC 20A
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계) *min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2500V 50/60Hz 1min
적용적합전선	Rating suitable wire	3.5mm²
단자나사	Terminal screw size	M4
연결단자 Terminal	e	Min 10.0mm
	f	Min ϕ4.1
	w	Max 8.3mm
	l	Min 21.5mm
조임토크 Torque		12kgf.cm







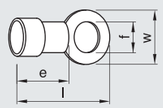
주문형식 Type	극수 Pole	치수 (Dimensions, mm) 가로 W	세로 H	높이 D	취부간격 L	취부구멍 Hole
SHT–20–3	3P	56	30	21	45	ϕ4.5
SHT–20–4	4P	68			57	
SHT–20–6	6P	89			78	
SHT–20–10	10P	136			127	
SHT–20–12	12P	162			151	
SHT–20–15	15P	198			187	
SHT–20–20	20P	251			242	

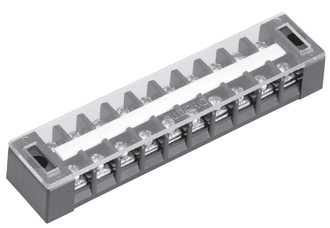
Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

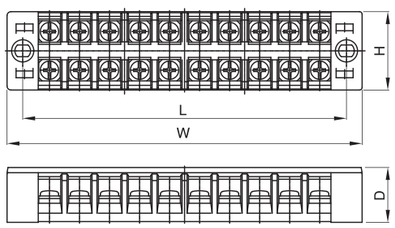
30A 고정식 단자대 30A Terminal block factory built type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-30
정격절연전압	Rating insulation voltage	Max 600VAC
정격전류	Rating current	250VAC 30A
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계) *min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2500V 50/60Hz 1min
적용적합전선	Rating suitable wire	5.5mm²
단자나사	Terminal screw size	M4
연결단자 Terminal	e	Min 14.5mm
	f	Min ϕ4.6
	w	Max 9.8mm
	l	Min 21.5mm
조임토크 Torque		15kgf.cm







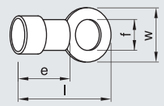
주문형식 Type	극수 Pole	치수 (Dimensions, mm) 가로 W	세로 H	높이 D	취부간격 L	취부구멍 Hole
SHT-30-3	3P	66	35	28	56	ϕ6.1
SHT-30-4	4P	83			64	
SHT-30-6	6P	100			90	
SHT-30-10	10P	154			144	

Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

60A 고정식 단자대 60A Terminal block factory built type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-60-3	SHT-60-4
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 60A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2500V 50/60Hz 1min	
적용적합전선	Rating suitable wire	22mm²	
단자나사	Terminal screw size	M6	
연결단자 Terminal	e	Min 14.5mm	
	f	Min ϕ6.1	
	w	Max 14.5mm	
	l	Min 35.5mm	
조임토크 Torque		25kgf.cm	



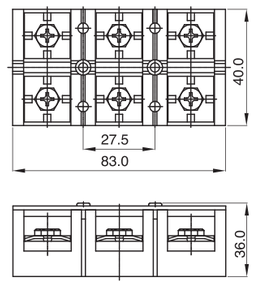
주문형식
Type

SHT-60-3

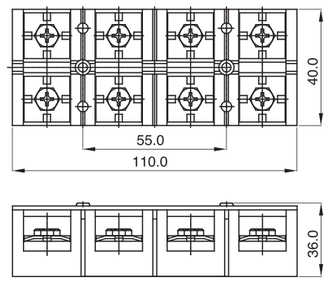
SHT-60-4

외형치수
Dimensions

SHT-60-3



SHT-60-4

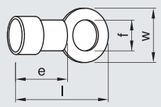


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

100A 고정식 단자대 100A Terminal block factory built type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT–100–3	SHT–100–4
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 100A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2500V 50/60Hz 1min	
적용적합전선	Rating suitable wire	38mm²	
단자나사	Terminal screw size	M8	
연결단자 Terminal	e	Min 20.5mm	
	f	Min ϕ8.1	
	w	Max 19.5mm	
	l	Min 50.5mm	
조임토크 Torque		60kgf.cm	



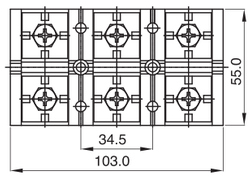
주문형식
Type

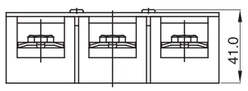
SHT–100–3

SHT–100–4

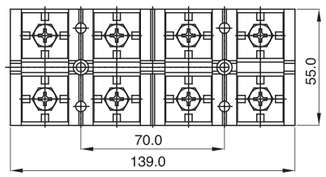
외형치수
Dimensions

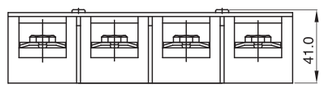
SHT–100–3





SHT–100–4



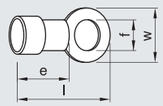


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

150A 고정식 단자대 150A Terminal block factory built type

전기적 특성/적용압착 단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT–150–3	SHT–150–4
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 150A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩMΩ at DC500V*
내전압	Dielectic strength	AC 2500V 50/60Hz 1min	
적용적합전선	Rating suitable wire	60mm²	
단자나사	Terminal screw size	M8	
연결단자 Terminal	e	Min 20.5mm	
	f	Min ϕ10.1	
	w	Max 22.0mm	
	l	Min 55.5mm	
조임토크 Torque		60kgf.cm	



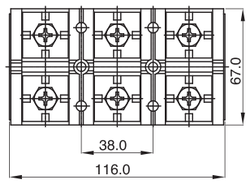
주문형식
Type

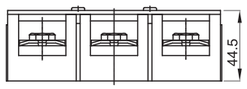
SHT–150–3

SHT–150–4

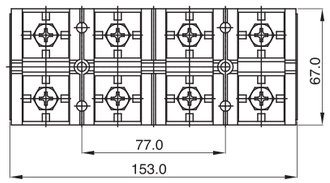
외형치수
Dimensions

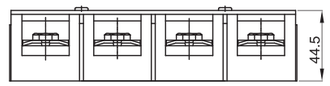
SHT–150–3





SHT–150–4



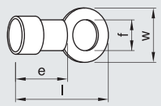


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

200A 고정식 단자대 200A Terminal block factory built type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-200-3	SHT-200-4
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 200A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2500V 50/60Hz 1min	
적용적합전선	Rating suitable wire	$60mm^2$	
단자나사	Terminal screw size	M10	
연결단자 Terminal	e	Min 20.5mm	
	f	Min ϕ10.1	
	w	Max 28.5mm	
	l	Min 55.5mm	
조임토크 Torque		100kgf.cm	

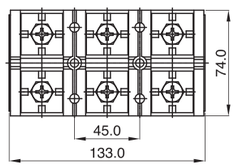


주문형식
Type

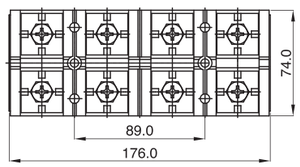
SHT-200-3

외형치수
Dimensions

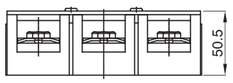
SHT-200-3

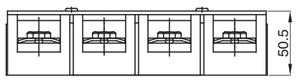


SHT-200-4



SHT-200-4



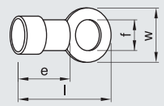


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

300A 고정식 단자대 300A Terminal block factory built type

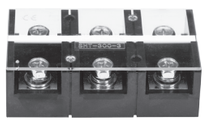
전기적 특성/적용압착 단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-300-3	SHT-300-4
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 300A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩat DC500V*
내전압	Dielectric strength	AC 2500V 50/60Hz 1 min	
적용적합전선	Rating suitable wire	$150mm^2$	
단자나사	Terminal screw size	M12	
연결단자 Terminal	e	Min 25.5mm	
	f	Min ϕ12.2	
	w	Max 36.0mm	
	l	Min 55.5mm	
조임토크 Torque		120kgf.cm	



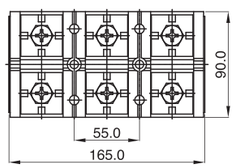
주문형식
Type

SHT-300-3

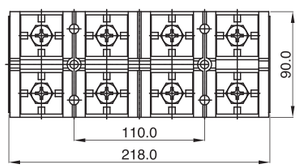


외형치수
Dimensions

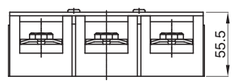
SHT-300-3

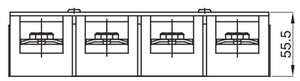


SHT-300-4



SHT-300-4



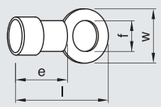


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

400A 고정식 단자대 400A Terminal block factory built type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-400-3	SHT-400-4
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 400A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2500V 50/60Hz 1min	
적용적합전선	Rating suitable wire	150mm²	
단자나사	Terminal screw size	M12	
연결단자 Terminal	e	Min 25.5mm	
	f	Min ϕ12.2	
	w	Max 36.0mm	
	l	Min 55.5mm	
조임토크 Torque		120kgf.cm	



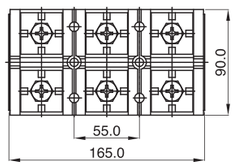
주문형식
Type

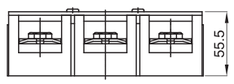
SHT-400-3

SHT-400-4

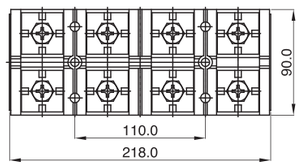
외형치수
Dimensions

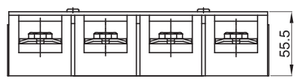
SHT-400-3





SHT-400-4



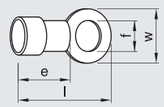


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

600A 고정식 단자대 600A Terminal block factory built type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-600-3	SHT-600-4
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	600A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2500V 50/60Hz 1min	
적용적합전선	Rating suitable wire	200~250mm²	
단자나사	Terminal screw size	M12	
연결단자 Terminal	e	Min 35.5mm	
	f	Min ϕ12.5	
	w	Max 52.0mm	
	l	Min 88.0mm	
조임토크 Torque		120kgf.cm	



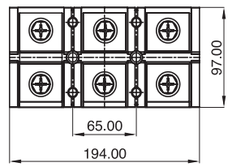
주문형식
Type

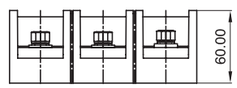
SHT-600-3

SHT-600-4

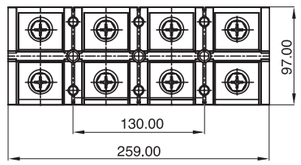
외형치수
Dimensions

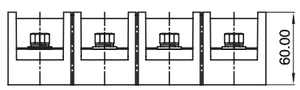
SHT-600-3





SHT-600-4

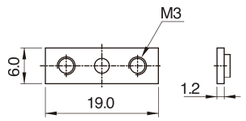




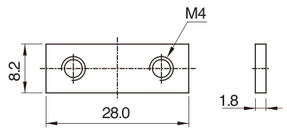
Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

단자 외형치수 Terminal dimensions

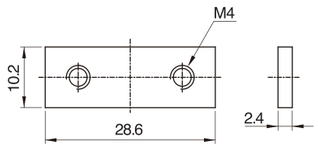
SHT–10



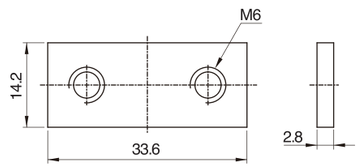
SHT–20



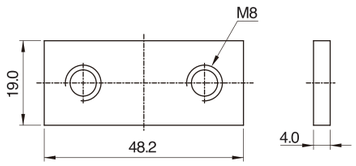
SHT–30



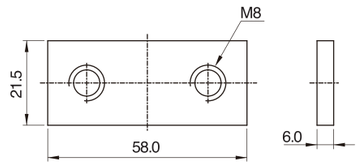
SHT–60



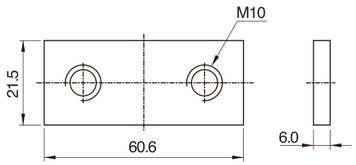
SHT–100



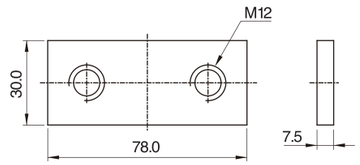
SHT–150



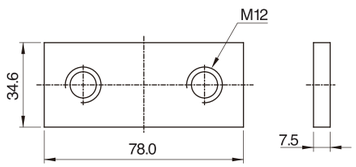
SHT–200



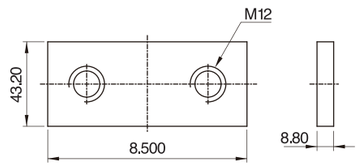
SHT–300



SHT–400



SHT–600

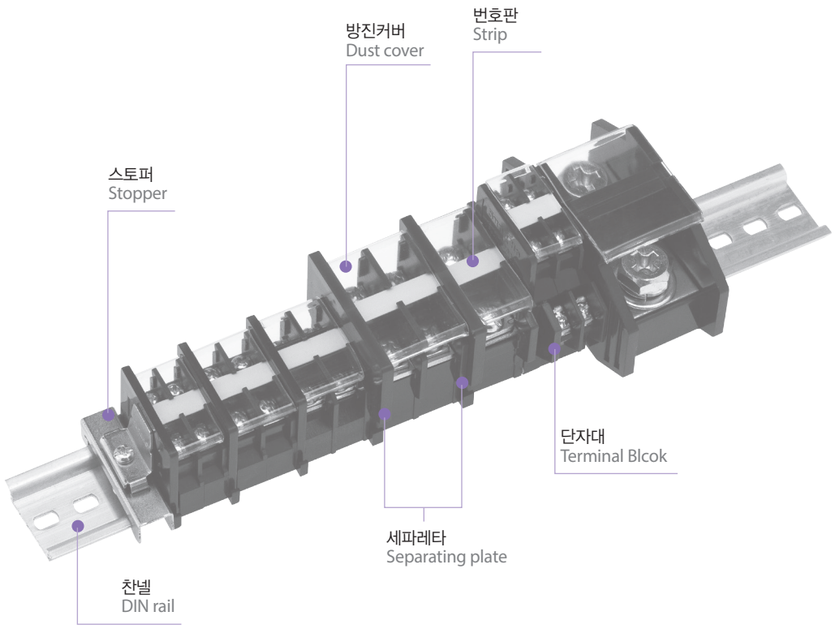


조립식 단자대 TB–10 to 200 Assembly terminal block type

특징 Features	• 충분한 전류용량을 가진 다양한 종류로 용도에 따라 선택이 용이합니다. • 한 개의 찬넬에 용량이 다른 여러종류의 단자를 필요한 순서와 개수로 조립할 수 있습니다 • 찬넬은 타이머, 릴레이소켓을 병행하여 사용할 수 있어 취부시간 및 면적이 적습니다. • 배선 작업시 임의위치에서 분해가 가능합니다. • 내부 스프링에 의해 단자의 나사가 따라 올라 오므로 배선시 작업시간이 단축되며 경제적입니다. • 몸체 재질은 난연성을 지닌 포리카보네이트로 되어 있어 내구성 및 열에 강합니다. • 찬넬은 알루미늄 피막으로 되어 있어 절연성이 우수합니다. • With various kind by sufficient electric current, can be widening selected by user. • Channel can use with timer relay socket, so corporate time is short, and used space are small. • It is possible to disassemble in any position when wiring work. • As contact of bolt get on with the inside spring, working hours get shorter, and is economical. • Body material is consist of polycarbonate with heat resistance. • Channel plated aluminum has excellent insulating properties.	
용도 Application	• 공작기계, 배전반, 자동제어기기 등 • Machine tool, Supply of electric power, Auto control devices, etc.	
성능 Characteristics	정격절연전압 *Rated insulation voltage*	Max 600VAC
	정격전류 *Rated current*	10~200A
	절연저항 *Insulation resistance*	100MΩ 이상.(DC500V MΩ 절연저항계) *100MΩ at DC500V*
	내전압(비충전부간) *Dielectric strength between non-live parts*	AC 2000V 50/60Hz 1min
	내진동 *Vibration protection*	10~55Hz 복진폭 1.5mm
	온도상승 *Temperature rise*	Max. 45℃

부품재질
Part materials

부품 Part	재질 Materials
몸체 Body	포리카보네이트 Polycarbonate resin
단자 Terminal	황동 brass
볼트 Bolt	SWRM–3, STS(Option)
카바 Cover	포리카보네이트 Polycarbonate resin

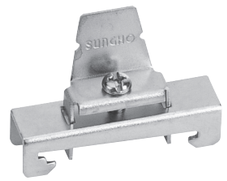
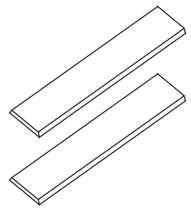


부속품
Other accessories

형명 Model	주문형식 Type	적용모델 Applied	형상 Description
세파레타 Separater	SHNO–10	SHT–TB–10	
	SHNO–15, 25	SHT–TB–15	
		SHT–TB–25	
	SHNO–35	SHT–TB–35	
	SHNO–60	SHT–TB–60	
	SHNO–100	SHT–TB–100	
	SHNO–15AW	SHT–TB–15AW	

조립식 단자대, TB–10 to 200 Assembly terminal block type

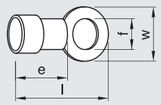
부속품
Other accessories

형명 Model	주문형식 Type	적용모델 Applied	외관 Appearance
스토파 Stopper	SH–SN–10	SHT–TB–10	
	SH–SN	SHT–TB–15	
		SHT–TB–25	
		SHT–TB–35	
		SHT–TB–60	
		SHT–TB–100	
		SHT–TB–150	
		SHT–TB–200	
		SHT–TB–15AW	
찬넬 Din rail	SH–C–10(1m)	SHT–TB–10	
	SH–C1(1m)	SHT–TB–15	
	SH–C2(2m)	SHT–TB–25	
		SHT–TB–35	
		SHT–TB–60	
		SHT–TB–100	
		SHT–TB–150	
		SHT–TB–200	
		SHT–TB–15AW	
방진카바 Dust cover	SH–SC–10(1m)	SHT–TB–10	
	SH–1C(1m)	SHT–TB–15	
		SHT–TB–15AW	
		SHT–TB–25	
		SHT–TB–35	
	SH–2C(1m)	SHT–TB–60	
		SHT–TB–100	
		SHT–TB–150	
		SHT–TB–200	
번호판 Strip	SH–NN–10(50cm)	SHT–TB–10	
	SH–NN(50cm)	SHT–TB–15	
		SHT–TB–25	
		SHT–TB–35	
		SHT–TB–60	
		SHT–TB–100	
		SHT–TB–150	
		SHT–TB–200	
		SHT–TB–15AW	

10A 조립식 단자대 10A Assembly terminal block type

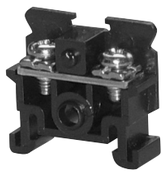
전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

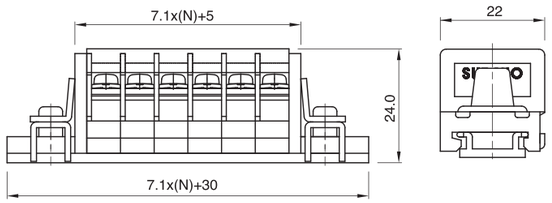
형식 Type		SHT–TB–10	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 10A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩat DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	1.25mm²	
연결단자 Terminal	e	Min 4.5mm	
	f	Min ϕ3.1	
	w	Max 6.0mm	
	l	Min 15.7mm	



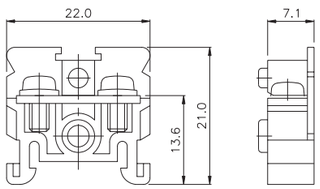
주문형식
Type

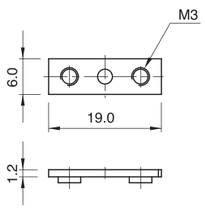
SHT–TB–10





외형치수
Dimensions



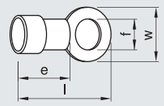


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

10A 조립식 2단 단자대 10A Assembly terminal block in 2 stage-type

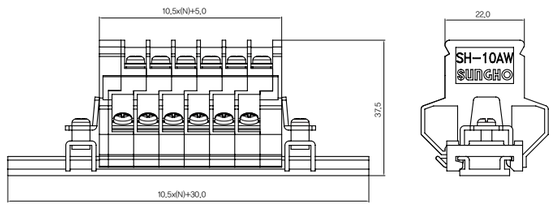
전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT–TB–10AW	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 10A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	1.25mm²	
연결단자 Terminal	e	Min 4.5mm	
	f	Min ϕ3.1	
	w	Max 6.0mm	
	l	Min 15.7mm	

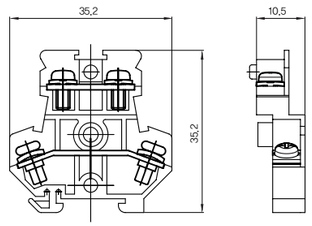


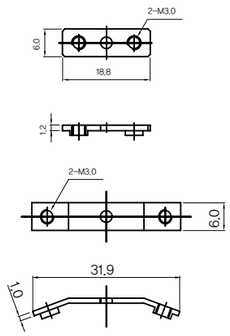
주문형식
Type

SHT–TB–10AW



외형치수
Dimensions



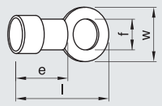


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

15A 조립식 단자대 15A Assembly terminal block type

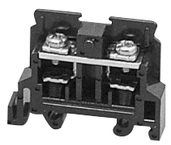
전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

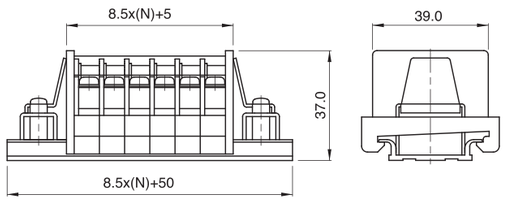
형식 Type		SHT-TB-15	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 15A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	2.0mm²	
연결단자 Terminal	e	Min 8.0mm	
	f	Min ϕ3.6	
	w	Max 6.8mm	
	l	Min 20.0mm	



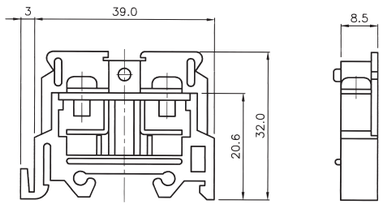
주문형식
Type

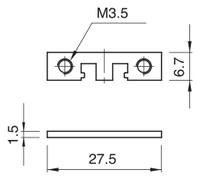
SHT-TB-15





외형치수
Dimensions



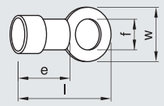


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

15A 조립식 2단 단자대 15A Assembly terminal block in 2 stage-type

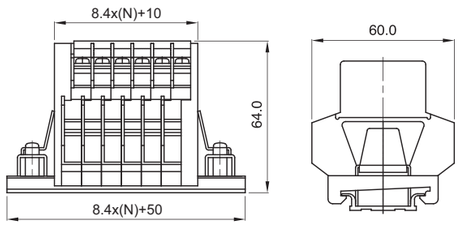
전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-TB-15AW	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 15A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	2.0mm²	
연결단자 Terminal	e	Min 8.0mm	
	f	Min ϕ3.6	
	w	Max 6.8mm	
	l	Min 20.0mm	

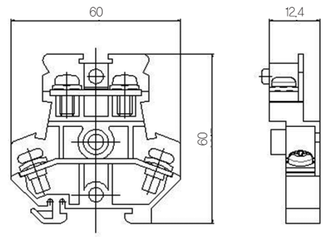


주문형식
Type

SHT-TB-15AW



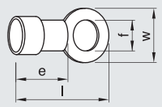
외형치수
Dimensions



Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

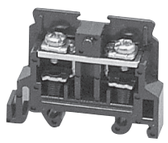
25A 조립식 단자대 25A Assembly terminal block type

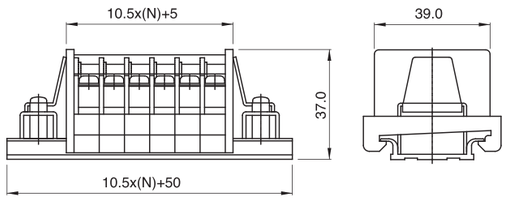
전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-TB-25	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 25A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	3.5mm²	
연결단자 Terminal	e	Min 14.0mm	
	f	Min ϕ4.1	
	w	Max 8.7mm	
	l	Min 27.0mm	

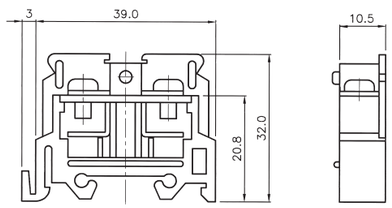
주문형식
Type

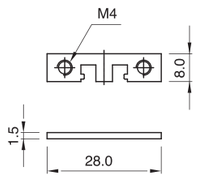
SHT-TB-25





외형치수
Dimensions

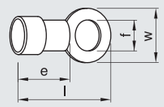




Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

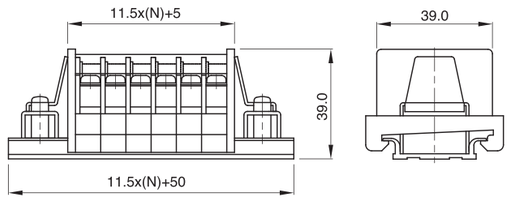
35A 조립식 단자대 35A Assembly terminal block type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

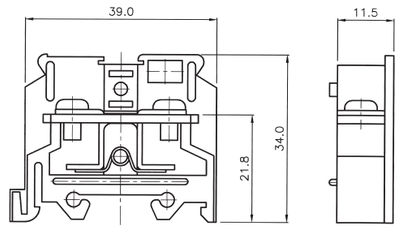
형식 Type		SHT-TB-35	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 35A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	5.5mm²	
연결단자 Terminal	e	Min 14.0mm	
	f	Min ϕ4.1	
	w	Max 9.6mm	
	l	Min 27.0mm	

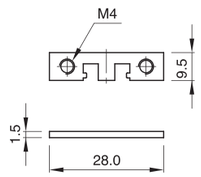
주문형식
Type

SHT-TB-35



외형치수
Dimensions



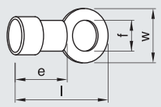


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

60A 조립식 단자대 60A Assembly terminal block type

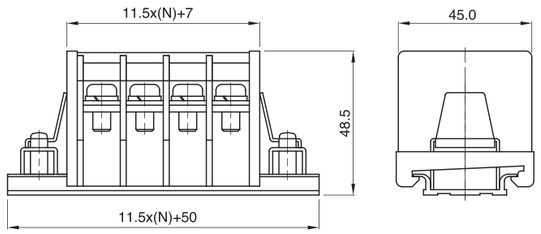
전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-TB-60	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 60A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	14mm²	
연결단자 Terminal	e	Min 14.5mm	
	f	Min ϕ6.1	
	w	Max 12.4mm	
	l	Min 45.0mm	

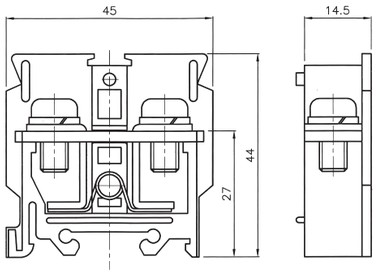


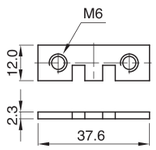
주문형식
Type

SHT-TB-60



외형치수
Dimensions



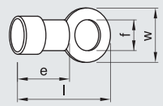


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

100A 조립식 단자대 100A Assembly terminal block type

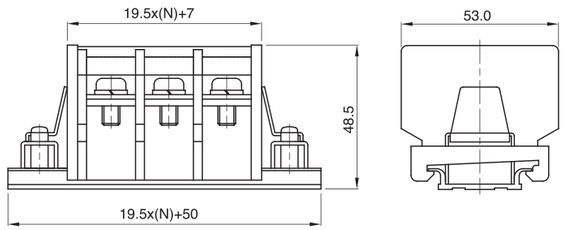
전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-TB-100	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 100A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	38mm²	
연결단자 Terminal	e	Min 20.5mm	
	f	Min ϕ6.1	
	w	Max 16.5mm	
	l	Min 45.0mm	

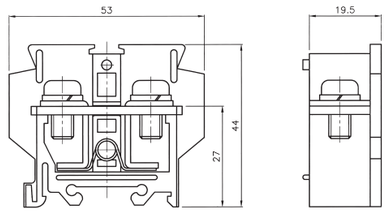


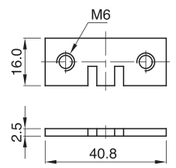
주문형식
Type

SHT-TB-100



외형치수
Dimensions

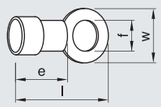




150A 조립식 단자대 150A Assembly terminal block type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

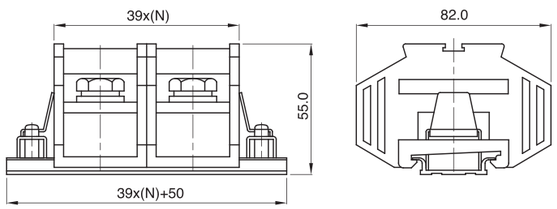
형식 Type		SHT-TB-150	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 150A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	50mm²	
연결단자 Terminal	e	Min 20.5mm	
	f	Min ϕ10.1	
	w	Max 24.5mm	
	l	Min 45.5mm	



주문형식
Type

SHT-TB-150

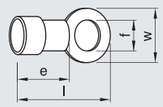
외형치수
Dimensions



200A 조립식 단자대 200A Assembly terminal block type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

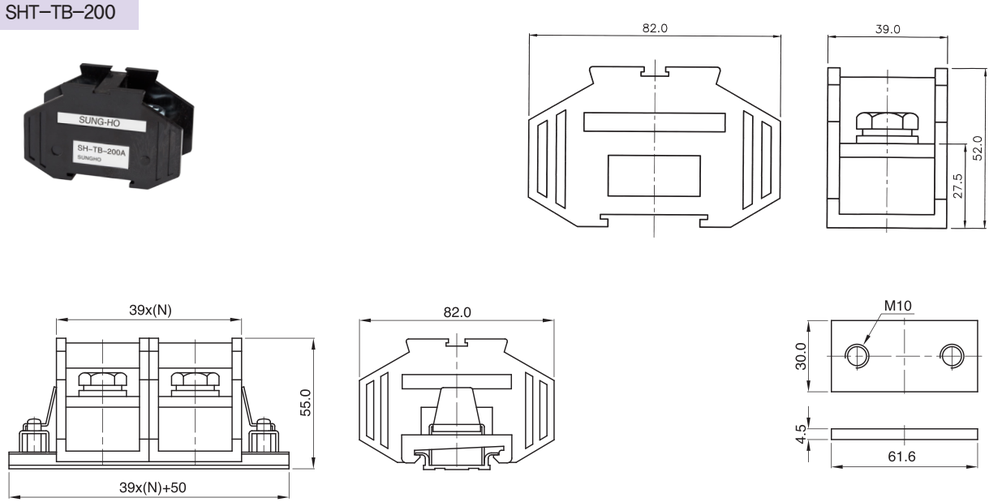
형식 Type		SHT-TB-200	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 200A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	100mm²	
연결단자 Terminal	e	Min 20.5mm	
	f	Min ϕ12.1	
	w	Max 29.0mm	
	l	Min 55.5mm	



주문형식
Type

SHT-TB-200

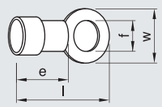
외형치수
Dimensions



N15 조립식 단자대 N15 Assembly terminal block type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

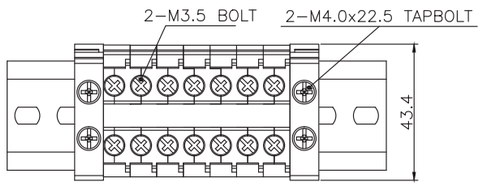
형식 Type		SHT-TB-N15	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 15A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	2.0mm²	
연결단자 Terminal	e	Min 8.0mm	
	f	Min f3.6	
	w	Max 6.8mm	
	l	Min 20.0mm	

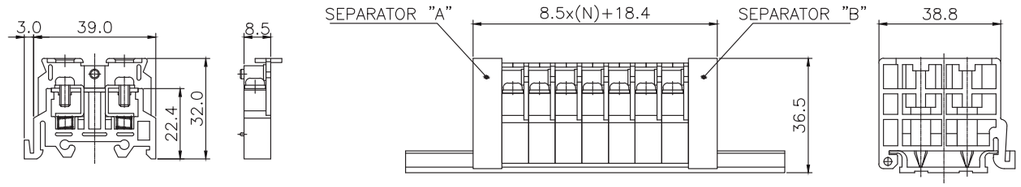


주문형식
Type

SHT-TB-N15

외형치수
Dimensions



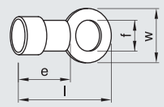


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

N25 조립식 단자대 N25 Assembly terminal block type

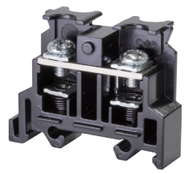
전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SHT-TB-N25	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 25A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	5.5mm²	
연결단자 Terminal	e	Min 14.0mm	
	f	Min f4.1	
	w	Max 8.7mm	
	l	Min 27.0mm	

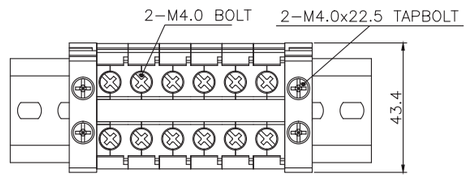


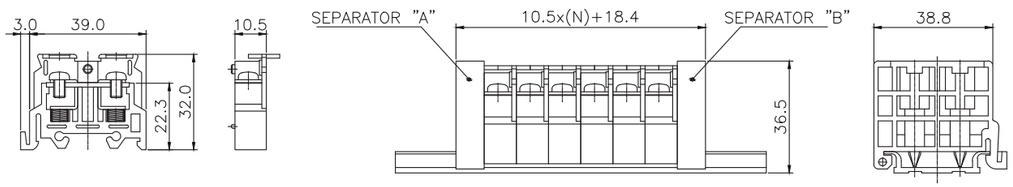
주문형식
Type

SHT-TB-N25



외형치수
Dimensions



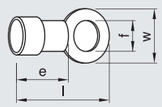


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

N35 조립식 단자대 N35 Assembly terminal block type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

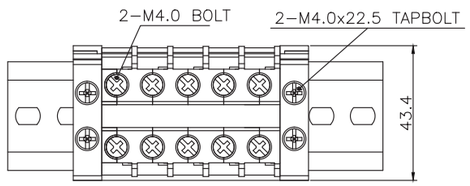
형식 Type		SHT-TB-N35	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 35A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	3.5mm²	
연결단자 Terminal	e	Min 14.0mm	
	f	Min f4.1	
	w	Max 9.6mm	
	l	Min 27.0mm	

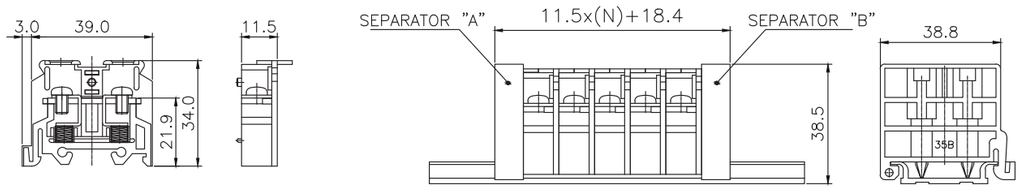


주문형식
Type

SHT-TB-N35

외형치수
Dimensions



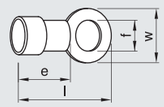


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

N60 조립식 단자대 N60 Assembly terminal block type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

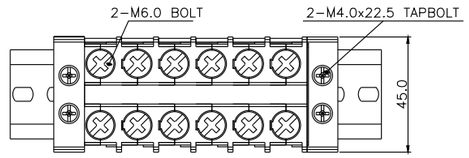
형식 Type		SHT-TB-N60	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 60A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectric strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	14mm²	
연결단자 Terminal	e	Min 14.5mm	
	f	Min f6.1	
	w	Max 12.4mm	
	l	Min 45.0mm	

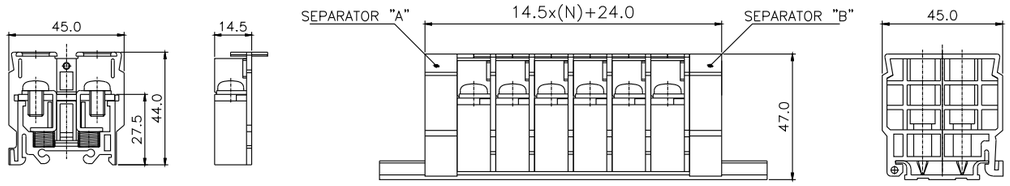


주문형식
Type

SHT-TB-N60

외형치수
Dimensions



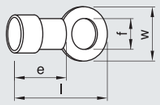


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

N100 조립식 단자대 N100 Assembly terminal block type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

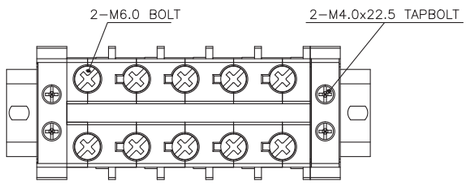
형식 Type		SHT-TB-N100	
정격절연전압	Rating insulation voltage	Max 600VAC	
정격전류	Rating current	250VAC 100A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2000V 50/60Hz 1min	
적용적합전선	Rating suitable wire	38mm2	
연결단자 Terminal	e	Min 20.5mm	
	f	Min f6.1	
	w	Max 16.5mm	
	l	Min 45.0mm	

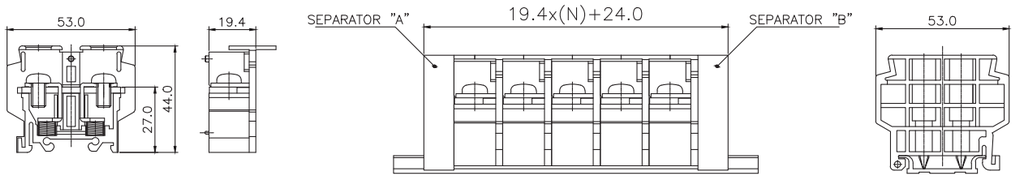


주문형식
Type

SHT-TB-N100

외형치수
Dimensions

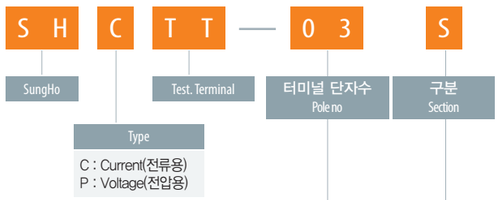




시험용 단자대 Test terminal block

특징 Features	• Test terminal은 회로가 개방되는 것을 방지하도록 설계되어 있습니다. • 접촉자의 접촉은 스프링에 의해 천천히 작동하므로 신뢰성이 높습니다. • 단자는 3P, 4P로 되어 있습니다. • 고품질의 플라스틱을 보호재질로 사용함으로써, 높은 절연성, 연소성 그리고 내 충격성을 제공합니다. • Test terminal for CT circuits are designed to prevent the circuit from being opened. • As contacting of contactor is coasting type by spring, reliability is high. • Terminal types are divided 3P, 4P. • For the housing material, high-performance engineering plastics is used to provide high insulation, inflammability, and impact resistance.	
성능 Characteristics	정격절연전압 *Rated insulation voltage*	AC, DC 500V
	정격통전전류 *Rated current*	10A
	절연저항 *Insulation resistance min.*	100MΩ 이상(DC500V MΩ 절연저항계) min 100MΩ at DC500V
	내전압 *Dielectric strength*	1minute at 2500VAC 50/60Hz
	사용주의온도 *Operating temperature*	–25~50℃
	온도상승 *Temperature rise*	30℃ 이하 Max. 30℃
	보존온도 *Storing temperature*	–40~85℃
	최대접속전선 *Rating suitable wire*	Max. 5.5 mm^2

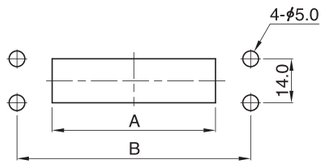
형명분류
Type classification diagram



터미널 단자수 Pole no.	
03	3Pole
04	4Pole

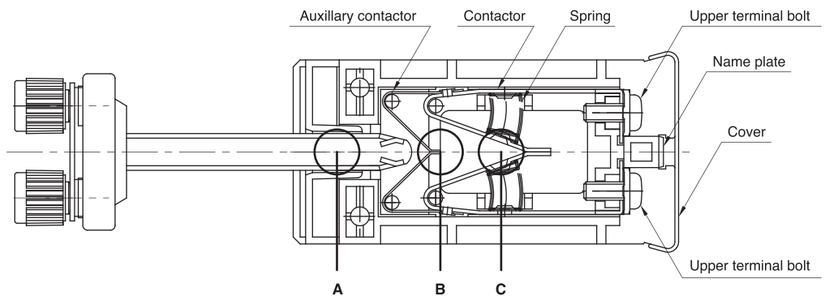
구분 Section	
P	Plug
C	Consent
S	Set

판넬가공치수
Panele cutouts



Symbol	3P	4P
A	52.0	70.0
B	75.0	94.0

구조 및 동작설명
Structure explanation



플러그와 콘센트 결합
Combination of Plug and consent

단자는 주요–보조접촉기의 이중 접촉기 구조로 되어 있습니다. 덧붙여 말하면, 플러그는 자체의 끝부분까지 접촉되는 긴 전도체 부분을 가지고 있습니다. 그러므로 플러그가 삽입되면, 단자가 개방되어 (C)부분에서 연결되기 전에 두개의 접촉자(A)와 (B)에서 먼저 작용합니다. 따라서 이 결합은 회로가 개방되는 것을 방지하는데에 탁월한 기능을 가집니다.

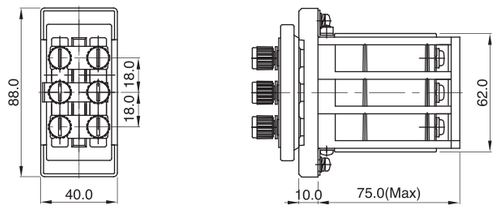
The terminal has a dual-contactor structure consisting of main and auxiliary contactor. In addition, the plug has a long conductive part forcontact up to its leading end. Therefore, when the plug is inserted, the contact is completed at two contacts (A) and (B) before the contact(C) of the terminal is opened. Thus, this combination provides excellent function for preventing circuit from being opened.

주문형식
Type

외형치수
Dimensions

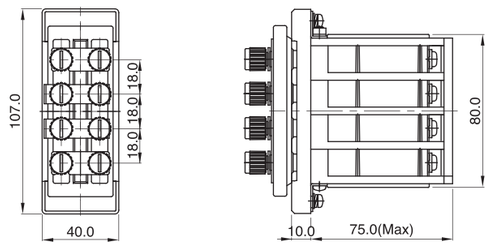
SHTT–03S

S H C T T — 0 3 S



SHTT–04S

S H C T T — 0 4 S



단락회로부 단자대 Terminal block with short circuit

특징 Features	• Shot bolt 사용에 의하여 단락회로의 단로를 자유롭게 선택 사용할 수 있습니다. • Shot bolt를 사용하지 않을시는 분실하지 않도록 세파레터에 끼워 보관할 수 있도록 되어 있습니다. • 엑츄에이터는 누름버튼, 힌지레버, 롤러레바 등으로 종류가 다양합니다. • 조립식으로 되어 있기 때문에 필요한 회로수에 따라 조립이 가능합니다. • 고정식과 찬넬 조립식으로 구성되어 있습니다. • 기본 단자볼트는 철로 생산되며 스테인레스 단자볼트는 주문에 의해 생산됩니다. • It is possible to assembling as circuit-number, because it's the assembling type. • Free use of short circuit by using shot bolt. • If not use of shot bolt, can safekeeping with separator for prevent loss. • Actuator has many type of Pushbutton, Hinge lever, Roller lever, etc. • The basic terminal bolt is produced steel, and steinless steel terminal bolt is produced • Machine tool, Supply of electric power, Auto control devices, etc.	
용도 Application	• 공작기계, 배전반, 자동제어기기 등 • Machine tool, Supply of electric power, Auto control devices, etc.	
성능 Characteristics	정격절연전압 Rated insulation voltage	250VAC/DC
	정격통전전류 Rated current	40A
	절연저항 Insulation resistancemin.	100MΩ이상(DC500V MΩ 절연저항계) min 100MΩ at DC500V
	내전압 Dielectric strength	AC 2500V 50/60Hz 1min
	사용주의온도 Operating temperature	–25~50℃
	보존온도 Storing temperature	–40~85℃
	사용상태(거리) Service condition(altitude)	2000m 이하 Max. 2000m
	최대접속전선 Rating suitable wire	14mm^2
	단자나사 Terminal screw size	M5 x 10

부속품
Other accessories

● Short bolt

● 세파레타

형명분류
Type classification diagram

S H C T B — F S 0 4

SungHo

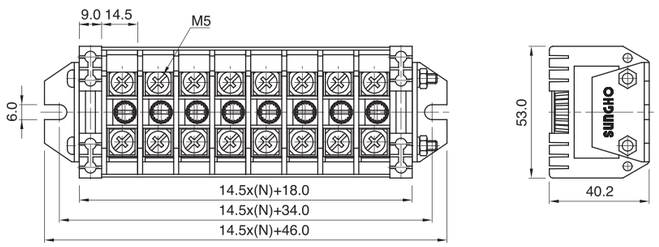
조립방법
Assembling methode
F : 고정식(fixed type)
C : 찬넬조립식 (channel assembling type)

단락회로단자대 Common terminal block	조립방법 Assembling methode	볼트재질 Screw material		단자블럭수 Terminal block no.	
		표시 없음	철 Fe	02	2P
				03	3P
		S	스테인레스 Stainess	04	4P
				05	5P
				06	6P
				08	8P
				09	9P
				12	12P

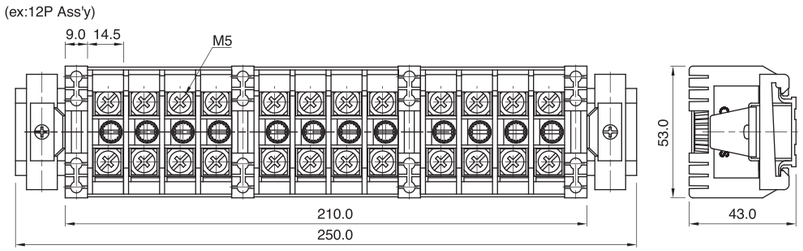
외형치수
Dimension drawing

조립형
Table of assembled dimension

● 고정식
Shaft assembly



● 조립식
Rail assembly(DIN rail)

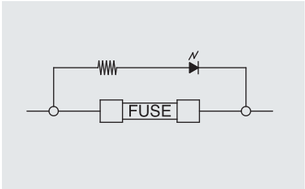


휴즈홀더 FUSE HOLDER

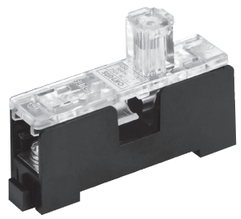
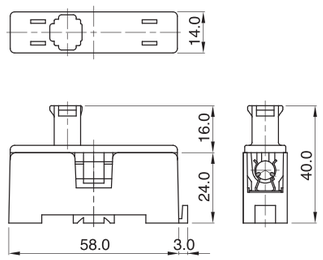
LED 램프 표시형 휴즈홀더 LED Lamp type fuse holder

특징 Feat ures	• 휴즈의 단락과 동시에 LED의 발광으로 휴즈의 시기를 바로 알려줍니다 • 사용자의 입장에서 설계되어 개별적인 탈부착이 가능합니다. • 연결대(OPTION)를 이용하여 연결 사용이 가능하므로 2련 3련의 재고가 필요없습니다. • 카바손잡이(발광부)에 돌출된 부분이 있어 휴즈 교환이나 점검시 휴즈관의 탈부착이 가능합니다. • 취부구멍은 범용으로 설계되어 있습니다. • DIN레일의 취부가 가능합니다. • The visual indication lamp (LED light) provided when the fuse blows and reduces downtime. • User friendly designed for individual attach/detachment of holders. (patent pending) • As may use the connector(option),for sequent use, no need to keep stock for 2 and 3 layer. • Each fuse block is self-contained with a lever which is very convinient to attach and detach. • The holes are designed for general use. • Possible to Mount on DIN RAIL.			
용도 Application	• 공작기계, 배전반, 자동제어기기 등 • Machine tool, Supply of electric power, Auto control devices, etc.			
사양 Characteristics		SHFH-15A(AC) SHFH-10D(DC)		
	회로전압 Voltage	A C	380VAC	
		D C	12 ~ 28V	
	회로전류 Current	A C	최대 7.5A ,연속 5A 7.5A Max, 5A Repeat	최대 15A ,연속 10A 15A Max, 10A Repeat
		D C	최대 7.5A, 연속 5A 7.5A Max, 5A Repeat	최대 15A, 연속 10A 15A Max, 10A Repeat
	본체고정 Terminal screw		M4볼트 & 찬넬장착 M4&Channel attachment	M5볼트 & 찬넬장착 M5&Channel attachment
	적합휴즈 Compatible fuse		ϕ 6.4 x 30	
	발광램프 Indication lamp		LED	
	램프전류 lamp current		1 ~ 4mA	

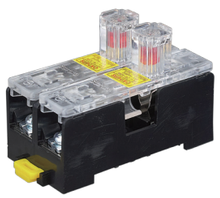
회로도
Circuit detail



LED 램프 표시형 휴즈홀더 LED Lamp type fuse holder

외관 Appearance	주문형식 Type	외형치수 Dimensions
 SHFH-15A-L1P(LED) SHFH-10D-L1P(LED)	SHFH-15A-L1P(AC)LED형 L2P(AC)LED형 L3P(AC)LED형 SHFH-10D-L1P(DC)LED형 L2P(DC)LED형 L3P(DC)LED형 SHFH-15A-(1P) Cover형 (2P) Cover형 (3P) Cover형	

SHFH-15A-L2P
SHFH-10D-L2P

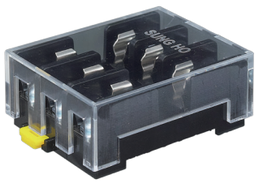


SHFH-15A-C1P

SHFH-15A-C2P

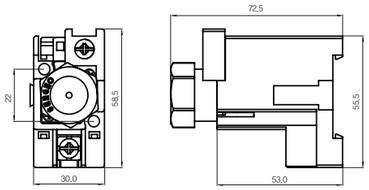
SHFH-15A-L3P
SHFH-10D-L3P

SHFH-15A-C3P



사기 휴즈형 휴즈홀더 LED Lamp type fuse holder

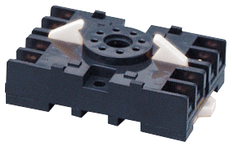
특징 Features	• 볼트 또는 찬넬취부 선택이 가능하며 주변 다른 기기와 조화가 용이합니다. • 난연성 폴리카보네이트 재질을 사용하여 내구성이 좋고 열에 강합니다. • 디자인과 사용자의 안전성이 뛰어납니다. • Screw or DIN mountable. • Nonflammable polycarbonate resin user for the frame. • Designed for the safety to use.		
용도 Application	• 공작기계, 배전반, 자동제어기기 등 • Machine tool, Supply of electric power, Auto control devices, etc.		
사양 Characteristics	전압 Voltage	AC 250V	AC 380V
	전류 Current	최대15A 15A Max	최대 7.5A 7.5A Max
	본체고정 Terminal screw	M4볼트 & 찬넬장착 M4 & Channel attachment	

취부방식 Mount	외관 Appearance	주문형식 Type	외형도 Dimensions
커버일체형(연결식 휴즈홀더) Integral Cover		SHFH-30C	

소 켓 SOCKET

소켓 Sockets

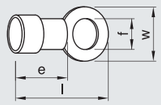
- 릴레이, 타이머 등 취부
  For use With Relays, Timers and etc.
- 찬넬 및 나사취부 겸용
  DIN Rail or Screw Mountable
- 정격전류 7A, 10A
  Rating 7A, 10A 250VAC



MY 릴레이 소켓 Sequence relay socket type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SH-RS-MY2	SH-RS-MY4
정격절연전압	Rating insulation voltage	AC 250V	
정격전류	Rating current	250VAC 7A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2000V 50/60Hz 1min	
단자나사	Terminal screw size	M3	
연결단자 Terminal	e	Min 4.5mm	
	f	Min ϕ3.1	
	w	Max 6.0mm	
	l	Min 15.7mm	

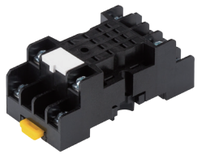


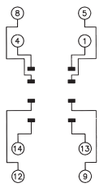
주문형식
Type

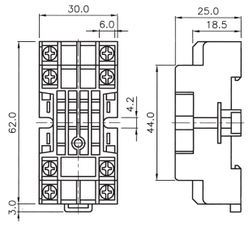
회로접속도
Diagram

외형치수
Dimensions

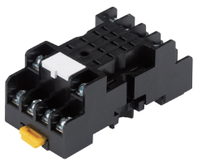
SH-RS-MY2

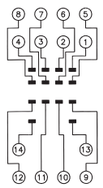


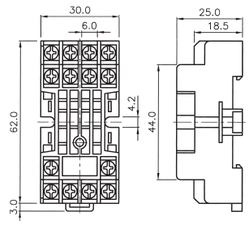




SH-RS-MY4





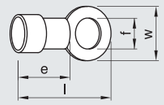


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

LY 릴레이 소켓 Power relay socket type

전기적특성/적용압착단자
Electric characteristics/Applicable terminal sizes

형식 Type		SH-RS-LY2	SH-RS-LY4
정격절연전압	Rating insulation voltage	AC 250V	
정격전류	Rating current	250VAC 10A	
절연저항	Insulation resistance	100MΩ 이상(DC500V MΩ 절연저항계)	*min 100MΩ at DC500V*
내전압	Dielectic strength	AC 2000V 50/60Hz 1min	
단자나사	Terminal screw size	M3.5	
연결단자 Terminal	e	Min 4.5mm	
	f	Min ϕ3.6	
	w	Max 6.8mm	
	l	Min 15.7mm	

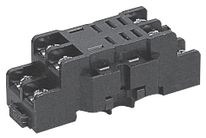


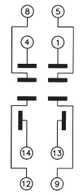
주문형식
Type

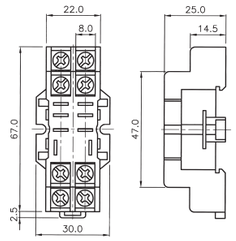
회로접속도
Diagram

외형치수
Dimensions

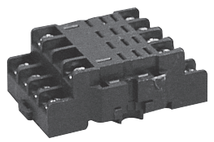
SH-RS-LY2

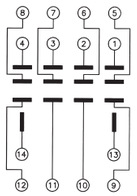


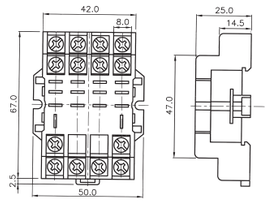




SH-RS-LY4





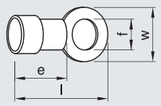


Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

8핀, 11핀 소켓 8pin, 11pin relay/timer socket type

전기적 특성/적용압착 단자
Electric characteristics/Applicable terminal sizes

형식 Type		SH-RS-8	SH-RS-11	SH-TS-1	SH-TS-2
정격절연전압 Rating insulation voltage		AC 250V			
정격전류 Rating current		250VAC 10A			
절연저항 Insulation resistance		100MΩ 이상(DC500V MΩ 절연저항계) *min 100MΩ at DC500V*			
내전압 Dielectic strength		AC 2000V 50/60Hz 1min			
단자나사 Terminal screw size		M3.5			
연결단자 Terminal	e	Min 4.5mm			
	f	Min ϕ3.6			
	w	Max 6.8mm			
	l	Min 15.7mm			

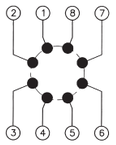


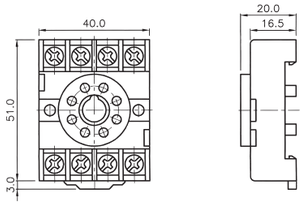
주문형식
Type

회로접속도
Diagram

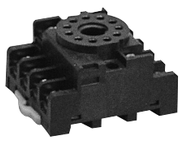
외형치수
Dimensions

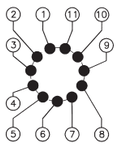
SH-RS-8

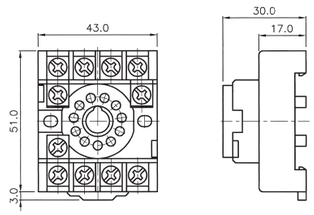




SH-RS-11







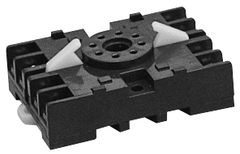
Note : 단자나사의 재질은 스테인레스도 가능합니다.
The material of the terminal screw is mild steel as standard.
Stainless steel screw are available on request.

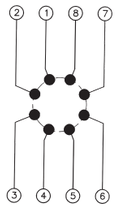
주문형식
Type

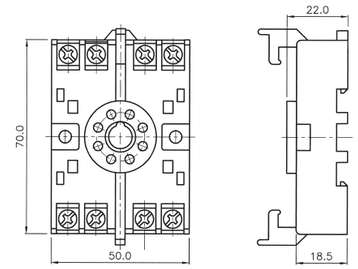
회로접속도
Diagram

외형치수
Dimensions

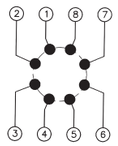
SH-TS-1

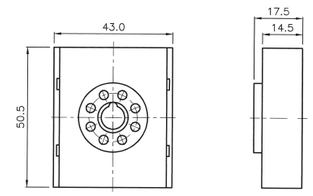






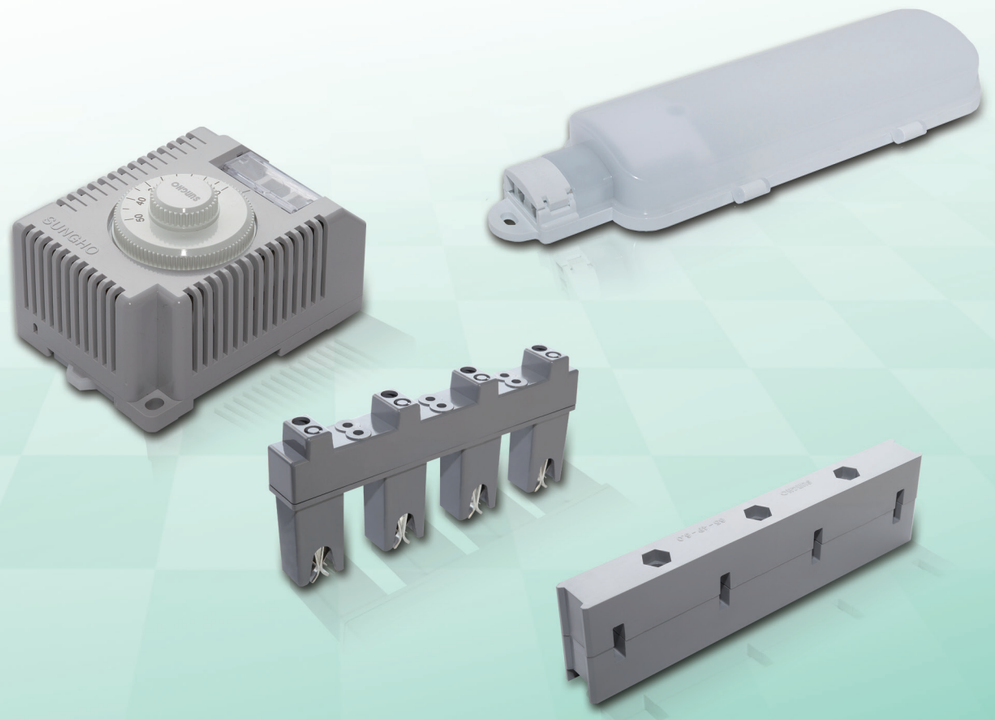
SH-TS-2





ACCESSORIES

악세사리

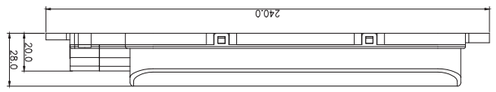


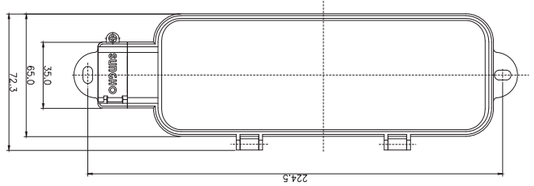
LED 램프 Attachment LED LAMP

특징
Features

- 배전함 자동제어함에 부착 배선작업이 아주 편리합니다.
  It's much convencience work for connecting line of auto control box control panel.
- 케이스 재질은 광확산PC(폴리카보네이트) 난연제 V2 급입니다.
  (광확산PC재질로 측면에도 간접 조명이 됩니다.)
  The case has made polycarbonate fireproof V2 grade.

외형치수
Dimensions





사양
Specifications

MODEL	전압 voltage	전력 walt	주파수 Hz	가로 Width	세로 Heghit	높이 Length	고정홀 Attachment hole	중량 Weight	조도 Illuminometor 1M heghit
SH-ALL-5	AC/DC 110V ~ AC240V	5W	50/60Hz	240	72.3	28	224×32.5	153g	890Lux
SH-ALL-10	AC/DC 110V ~ AC240V	10W	50/60Hz	240	72.3	28	224×32.5	153g	1.600Lux

사용주의온도	사용주의습도	보관온도	재질	단자볼트	고정볼트	압착단자
-20~90℃	30~80% RH	-20~90℃	PC(Polycarbonate) UL-94 V-2 난연성재질	M4×10	M4×8	1.5-4Y

직부등 Ceiling light

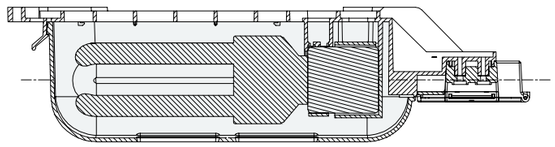
특징
Features

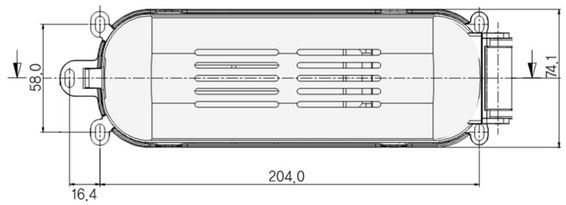
- 전구조립이 간편하게 되어 있습니다.
- 백열전구 및 삼파장 전구 공용으로 사용 가능합니다.
- 반사경이 3면으로 되어 있어 빛의 퍼짐이 좋습니다.
- 내열수지를 사용하여 장시간에도 틀어짐이 없습니다.
- 충격에 강한 수지를 사용하였습니다.

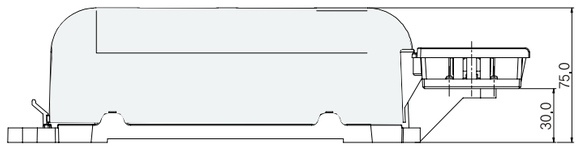
성능
Other characteristics

정격소비전력	백열전구	Max 60W
	삼파장전구	23 W
본체고정	M4볼트	

외형치수
Dimensions



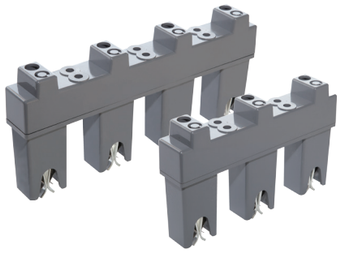




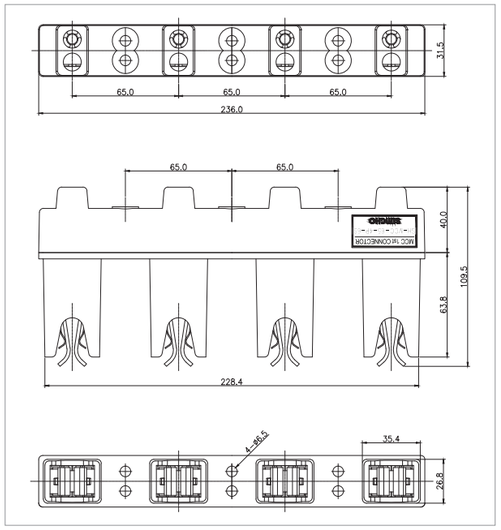
MCC 1st Connector

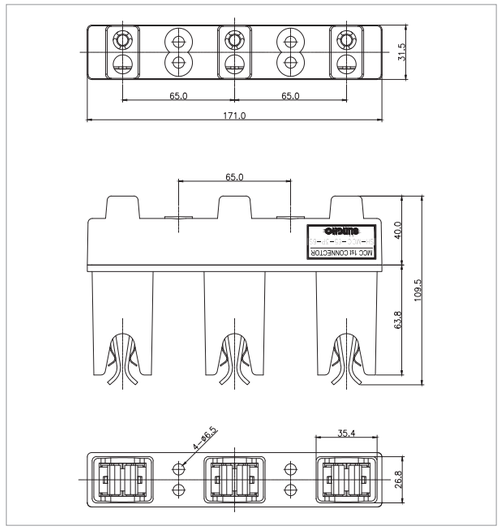
특징
Features

- 콘넥터의 접속저항이 최대치로 설계하여 매우 우수합니다.
- 외관은 충격에 강한 재질을 사용하였습니다.
- 단자와 전선과의 인장력은 45kg을 견디도록 설계하였습니다.
- 외관이 현대 감각에 맞게 디자인 되어 MCCB판넬 조립시 고급스럽습니다.
- 콘넥터는 전면 및 후면취부 어느곳이든 가능하도록 설계하였습니다.
- SIS전선도 생산 가능합니다.



외형치수
Dimensions





형명분류

SH-MC	65	3P	C10
성호제어기기 SUNGHO 1ST Connector	모선간격 Distance Btn busbar and busbar	콘넥터 수량 no. of connecter	전선 및 콘넥터 용량 cable and connector capacity

60	60mm
65	65mm

3P
4P

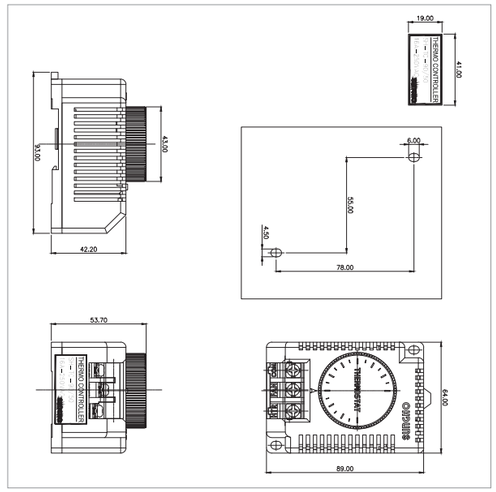
C06S	60mm
C10S	10mm²
C16S	16mm²
C25S	25mm²

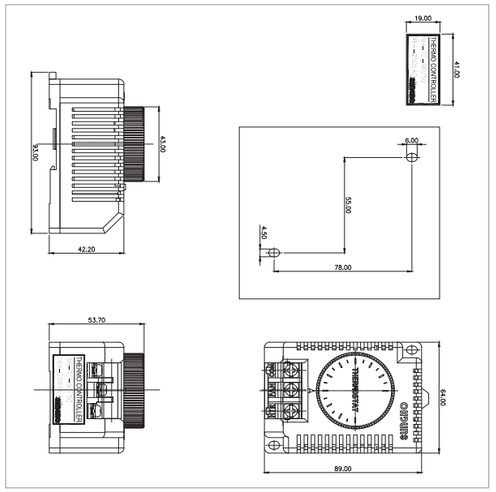
스페이스히터용 온도조절기 Thermo Controller

특징
Features

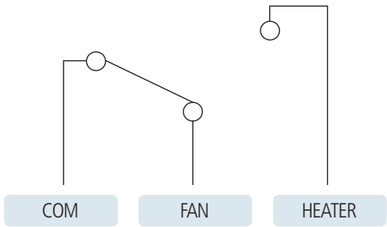
- 15A의 높은 개폐 용량을 가지고 있습니다.
- 구조가 내아크성, 내연, 내열재질로 절연성이 우수합니다.
- 단자보호커버가 있어 제품안전성이 우수합니다.

외형치수
Dimensions





결선도



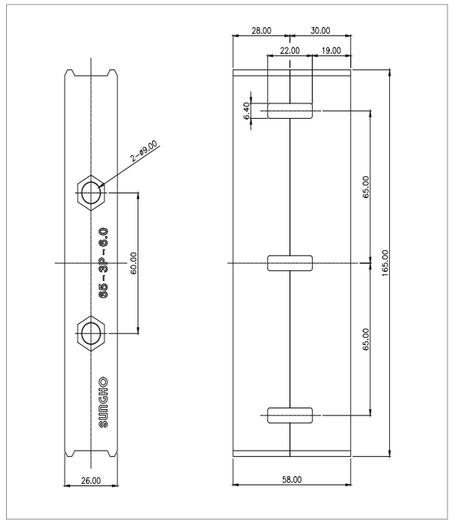
사양
Specifications

항목	SHTC – 50	SHTC – 90
온도조절범위	0 ~ 50	0 ~ 90
온도 허용차	4±2℃	4±3℃
접점용량	250VAC 16A	
본체고정	M3.5 BOLT 및 DIN RAIL	

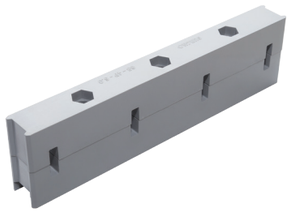
BUS bar Supporting Insulator

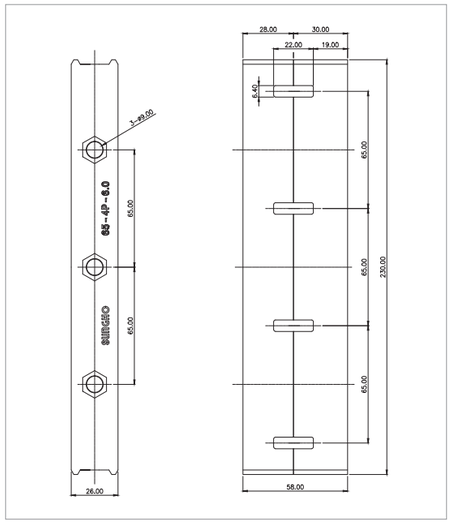
외형치수
Dimensions

SH - BBS - 65 - 6 - 3P



SH - BBS - 65 - 6 - 4P





사양
Specifications

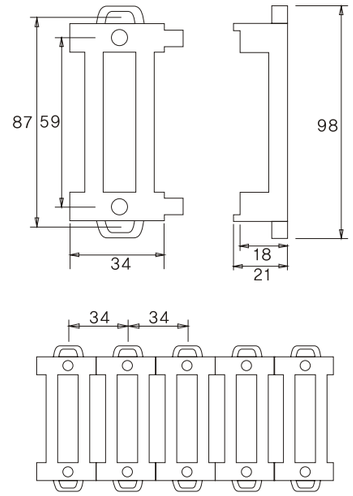
모선지지 간격 bus bar supporting space	65mm
모선두께 bus bar thickness	6mm

모선지지 간격 bus bar supporting space	65mm
모선두께 bus bar thickness	6mm

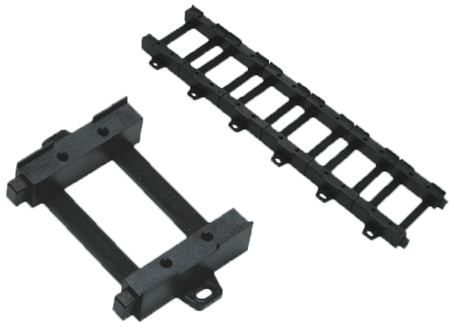
ELB 지지대 ELB Support Fixture

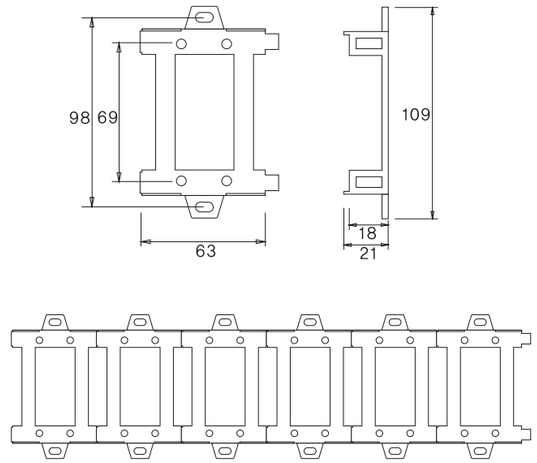
외형치수
Dimensions

ELB 소형 지지대



ELB 대형 지지대

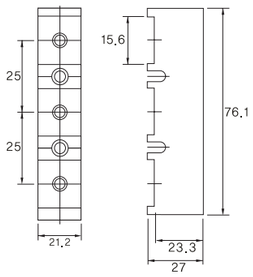




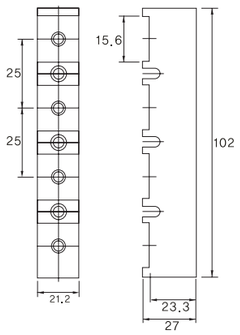
부스바 지지대

외형치수
Dimensions

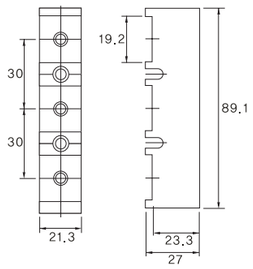
D-BH 50A-3P



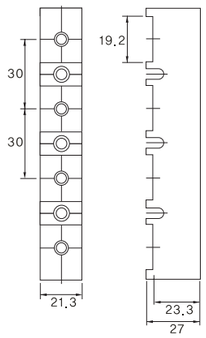
D-BH 50A-4P



D-BH 100A-3P



D-BH 100A-4P



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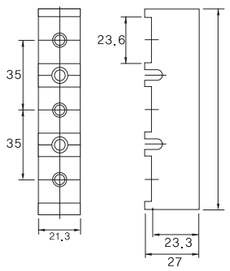

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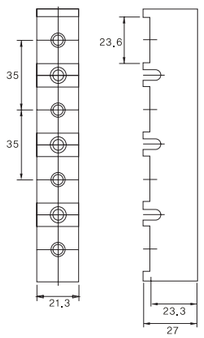
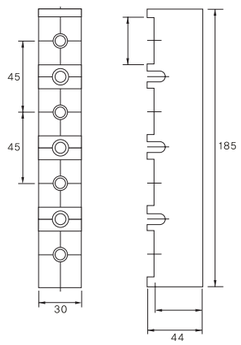
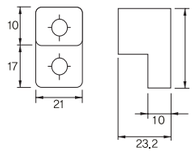


D-BH 400A-4P

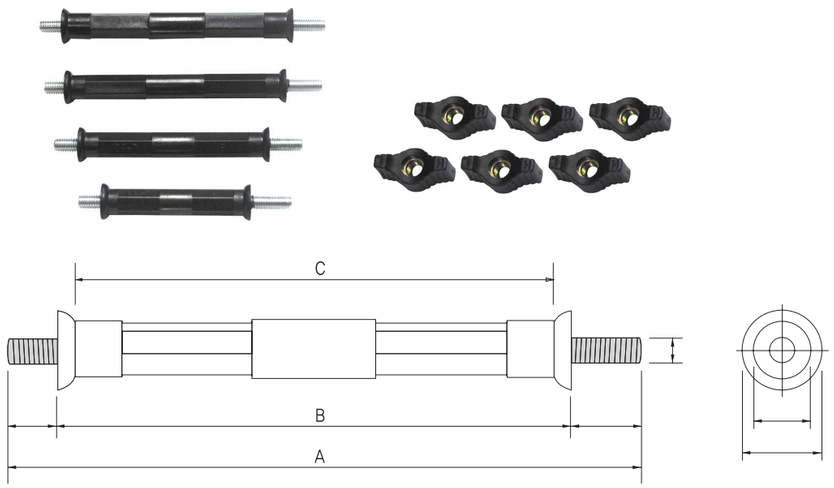


D-BH-1
50A, 100A, 200A



P-cover Bolt

외형치수
Dimensions



사양
Specifications

모델명	A	B	C
SH P-60	85	60	48
SH P-68	95	68	63
SH P-80	105	80	68
SH P-95	120	95	83
SH P-103	128	103	91

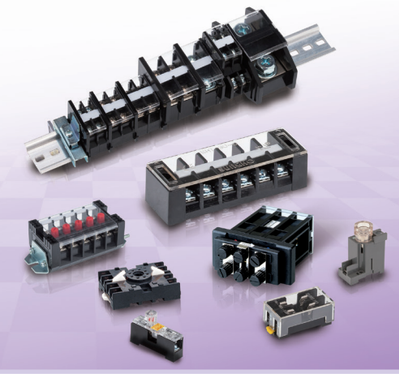
캠스위치
CAM Switches

한국전기연구원개발시험합격

- 단자보호카바장착형으로 안전합니다.
- 전면조각은 소비자가 원하는 사양대로 가능합니다.

단자대, 소켓류
Terminal Blocks

- 전류별 종류가 다양하여 용도에 따른 선택의 폭이 넓어 졌습니다.
- 절연성과 강도가 우수한 재질을 사용하였습니다.



제어용스위치, 표시등
Control and Signalling Devices

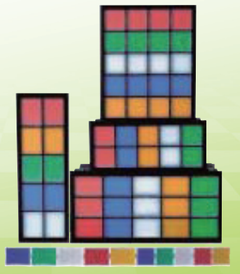
- 단자보호카바 정착형으로 안전합니다.

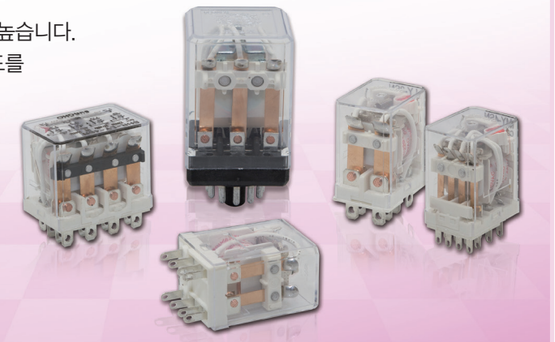
버저
Buzzer

- 음량이 80dB 정도 이므로 경보효과가 매우 좋습니다.
- 소형이므로 취급하기가 용이합니다.
- 소비전력이 적습니다.
- 전자식 소형 모델의 경우 연속음, 단속음을 선택 사용할 수 있습니다.
- 패널에 설치가 용이 합니다.

집합표시등
Square Light

- 내장되어 있는 문자표시판과 LED LAMP의 탈부착이 간단하게 되어 있어 작업성이 우수합니다
- 단자보호카바장착형으로 안전합니다.



제어용 릴레이
Industrial Relays

- 동작표시등 내장으로 제품 신뢰성이 높습니다.
- CUL, CCC 승인품으로 제품의 안전도를 해외에서도 인정받았습니다.