

2

캠 스위치류 CAM SWITCHES



For use on a flat surface of a type 1 enclosure
File No. E242380



KSC 4519
제 8406호

■ 한국전기연구원개발시험합격 (Certified by KERI's R & D Test)

2-1 캠 스위치 (10,20,30A)	2-1 Cam Switch (10,20,30A)
2-2 조광형 캠 스위치 (10,20,30A)	2-2 Illuminated Cam Switch (10,20,30A)
2-3 캠 스위치 5A (Ø22, □30, □48)	2-3 Cam Switch 5A (Ø22, □30, □48)
2-4 조광형 캠 스위치 (5A)	2-4 Illuminated Cam Switch (5A)
2-5 키 캠 스위치	2-5 Key Cam Switch
2-6 키 캠 스위치 (5A)	2-6 Key Cam Switch (5A)
2-7 로크아웃 릴레이	2-7 Lockout Relay
2-8 43PD 모터 캠스위치	2-8 43PD Motor Cam Switch
2-9 모자이크용 캠스위치 (AC250V, 5A)	2-9 Discrepancy Cam Switch (AC250V, 5A)
2-10 모자이크용 캠스위치 (AC250V, 10A)	2-10 Discrepancy Cam Switch (AC250V, 10A)
2-11 누름 버튼 캠 스위치 (10A)	2-11 Push Button Cam Switch (10A)

2-1

캠 스위치 (AC250V-10A, 30A / DC125V-20A) Cam Switch (AC250V-10A, 30A / DC125V-20A)

특징 | Features |

- 기기의 폭넓은 동작이 가능하도록 다양한 규격으로 연구개발하였습니다.
- 캠 스위치의 생명인 회로구성의 다양성으로 모든 기기에 완벽하게 사용할 수 있습니다. (별도의 회로집 참조)
- 엄격한 실험을 통해 표준화 회로에 따라 균일하게 생산 품질을 향상시켰습니다.
- 캠 스위치는 85년 11월 한국전기연구원개발시험에 합격하여 그 품질의 우수성을 인정받아 한국전력에 많은 납품실적을 올리게 되었습니다.
- Researched & Developed with various standard for wide operating of device.
- With various circuit formation which is Cam Switch's key part, can be perfectly applied to all kinds of devices. (Refer to separate circuit collection.)
- Improved production quality according to standardization circuit through strict testing.
- Approved the quality by passing the KERI's R & D Test in 1985/11,
Cam Switch has recorded many delivery results in Korea Electric Power Corporation.

점점의 동작 기호 설명 | Explanation of Contact's Operating Marks

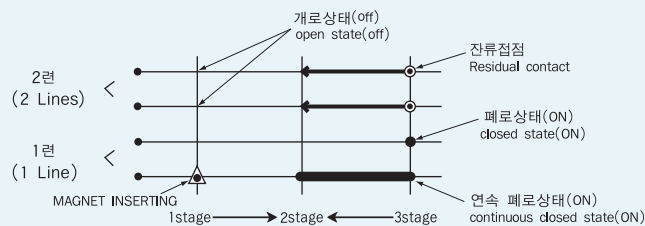
●	폐로위치를 나타낸다. (ON)	●	Closed position (ON)
+	개로위치를 나타낸다. (OFF)	+	Open position (OFF)
▬	폐로위치의 구간을 나타낸다.	▬	Interval of closed position
⊖	잔류 접점을 나타낸다.	⊖	Residual contact
△	DC 20A Magnet 삽입표시를 나타낸다.	△	Mark of DC 20A magnet inserting contact

예) YS DNC - 3201A의 표준접속도

핸들 단수 : 3단
 점점 블록수 : 2런
 점점 구성 번호 : 01
 핸들 동작 : A (자동복귀방식)

ex) Standard connection diagram of YS DNC - 3201A

Number of handle stage : 3 stages
 Number of contact block : 2 lines
 Contact composition No. : 01
 Handle operating : A (Automatic return type)

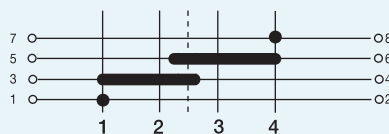


· 절환시 중첩되는 회로 (Circuit superimposed when transfer)

핸들 절환시 단과 단 사이의 중심부에서 개로측 접점과 폐로측 접점이 일정구간 중첩되었다 단락되는 회로

EX) AS

Circuit which open/closed side contacts are superimposed and shorted for a certain distance in the central part between stages when handle transfer.



· 잔류 접점회로 (Residual contact circuit)

핸들이 1단 개로(OFF) 상태로 동작했다가 자동 복귀했을 때 개로(OFF) 상태를 유지하고, 3단 폐로(ON) 상태로 동작했다가 자동 복귀했을 때는 계속 폐로(ON) 상태로 유지하는 접점회로.

Contact circuit which keeps open state(OFF) when auto-returning after handle Operates at 1 stage open state(OFF), while maintaining closed(ON) state when auto-returning after operating at 3 stage closed(ON) state.



접점 구성시 주의사항 | Remark on Contact Form

- 캠스위치 안에 내장되어 있는 2접점(4단자)은 캠에 대하여 대조적으로 배치되어 있어서 핸들의 각도가 180° 회전되면 2접점 모두 폐로 또는 개로상태가 되니 임의개조하지 마십시오.
- Please note 2 contacts all will be close or open state if handle angle turns 180° as 2 contacts (4terminals) built-in Cam Switch are arranged in contrast to cam.

예 Example	90° 전환 3단일 때 90° transfer 3 stages	60° 전환 4단일 때 60° transfer 4 stages	45° 전환 5단일 때 45° transfer 5 stages	30° 전환 7단일 때 30° transfer 7 stages
회로전개도 Circuit Diagram				

- 내장된 캠과 접점, 핸들위치 (90° 3단일의 예)
- Built-in cam and contact, handle position (example of 90°, 3stages)

핸들위치 Handle Position			
접점과 캠 Contact & Cam			

부품 재질 | Part Materials

부 품 (Part)	재 질 (Materials)
몸 체 (Body)	ABS내열 (Heat resistance ABS) Resin
C A M	Acetal Resin
접 점 (Contact)	은산화 Cadmium 합금 (Silver-cadmium oxide alloy)
단 자 (Terminal)	황동 (Brass)
볼 트 (Bolt)	탄소강 (Carbon Steel)
스프링 (Spring)	Stainless 강 (Stainless steel)

성능 개요 | Performance Summary

수명 (Lifetime)	기계적 (Mechanical)	above 500,000 times (switching freq : 20times/min.)
	전기적 (Electrical)	above 100,000 times (switching freq : 20times/min.)
절연저항 (Insulation resistance)		above 100MΩ (DC 500V. Meg)
접촉저항 (Contact resistance)		below 50mΩ (initial value)
내전압 (Withstand voltage)		AC 2,500V/min (50~60Hz)
내진동 (Withstand vibration)	내 구 (Endurance)	10~55Hz, 복진폭 1.5mm
	오동작 (Malfunction)	10~15Hz, 복진폭 1.0mm
내충격 (Withstand impact)	내 구 (Endurance)	약 30g (300 ㄱ)
	오동작 (Malfunction)	약 10g (100 ㄱ)
작동에 필요한 힘 (Operating force)		560g
사용주위온도 (Ambient temperature)		-25℃ ~ +40℃
상대습도 (Relative humidity)		45 ~ 85%

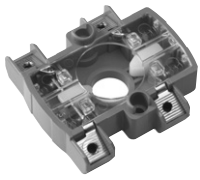
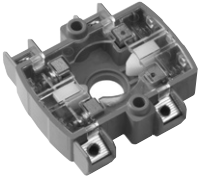
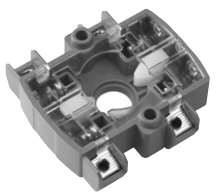
핸들 위치 표준 표본도 | Handle Position Standard Diagram |

복귀방법 Return method	절환각도 Transfer angle	각 단 핸들위치 표본(Each handle position sample)												
		2단 (stage)	3단 (stage)	4단 (stage)	5단 (stage)	6단 (stage)	7단 (stage)	8단 (stage)	9단 (stage)	10단 (stage)	11단 (stage)	12단 (stage)		
수동복귀식 기호(M) Manual return mark(M)	90°													
	60°													
	45°													
	30°													
자동복귀식 기호(A) Automatic return mark(A)	45°				핸들이 1단, 3단에서 중앙2단으로 자동복귀(3 stage) Automatic handle return from 1, 3 stage to center.								2단(stage) • 좌측1단, 2단으로 자동복귀 • 우측2단, 1단으로 자동복귀	
	30° 10A ONLY					핸들이 1, 2, 4, 5단에서 중앙3단으로 자동복귀								
핸들걸림식 기호(R) Handle suspending mark(R)	45°				핸들이 1단, 3단에서 중앙으로 자동복귀. 단, 핸들을 조작할 때는 반드시 앞으로 당겨 조작합니다. Automatic handle return from 1, 3 stage to center. Only in handle operating, pull forward it.									
혼합복귀식 기호(C) Composite return mark(C)	45° 10A ONLY				1단에서 2단으로 자동복귀, 3단에서 2단으로는 수동복귀 Automatic return from 1 stage to 2. Manual return from 3 stage to 2 stage.									
					3단에서 2단으로 자동복귀 1단에서 2단으로는 수동복귀 Automatic return from 3 stage to 2. Manual return from 1 stage to 2.									
	30° 10A ONLY					(4단일 경우) case of 4 stage 1단에서 2단으로만 자동복귀 Automatic return only from 1 stage to 2. (5단일 경우) case of 4 stage 1단에서 2단으로만 자동복귀 Automatic return only from 1 stage to 2. 5단에서 4단으로만 자동복귀 Automatic return only from 5 stage to 4.								
핸들걸림식 기호(JA) Handle suspending mark(JA)	45° 10A ONLY					자연상태에서 핸들이 2단, 4단에서 중앙으로 자동복귀(자동복귀식과 같은 구조)되고, Push 후 1단 Locking Type, 5단 Locking Type으로 구성됨. (단, 핸들을 조작할 때에는 반드시 밀어서 조작합니다.) Automatic handle return(same structure as automatic return type) in natural stage, and after push composed of 1 stage locking type, 5 stage locking type, 1, 5 stage locking type 5 stage locking type, 1-5stage locking type. (in handle operation, push it.)								
	45° 20/30A ONLY					자연상태에서 핸들이 2단, 4단에서 중앙으로 자동복귀되고, 당김 후 1단 5단 Locking type. Automatic handle return in natural stage, and after pull, composed of 1 stage & 5 stage locking type.								

제작 가능 연수 | Possible Manufacturing Number of Connection Block |

	10A	20A, 30A
수동 복귀식 (Manual Return Type)	12련 (12 Block)	12련 (12 Block) · NC Type
자동 복귀식 (Automatic Return Type)	5련 (5 Block)	5련 (5 Block)
핸들 걸림식 (Handle suspending Type)		
혼합 복귀식 (Composite Return Type)	5련 (5 Block)	—

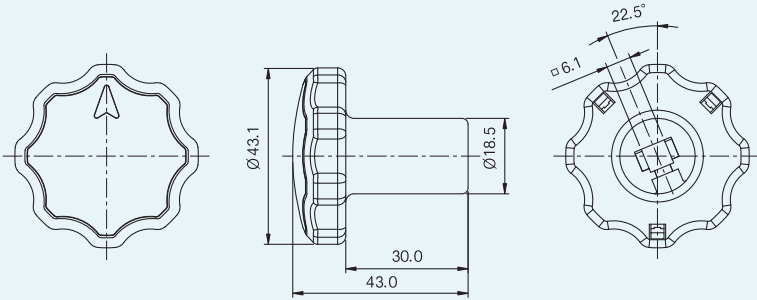
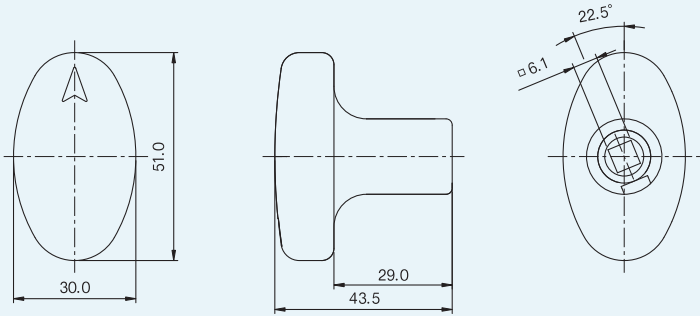
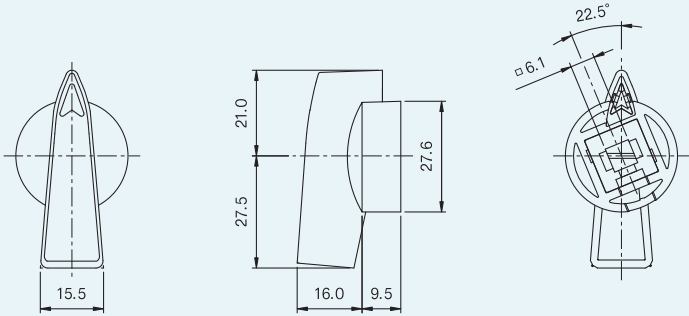
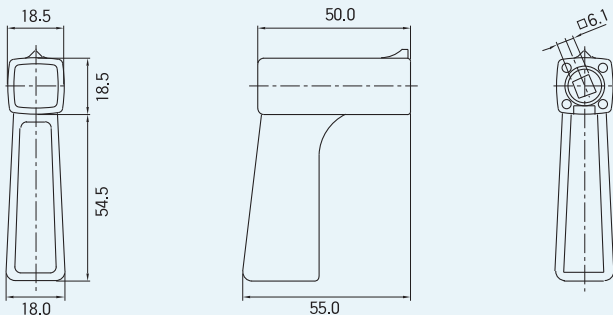
하부 및 연결 단자 | Contact Block & Connection Terminal

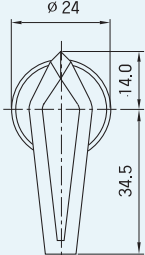
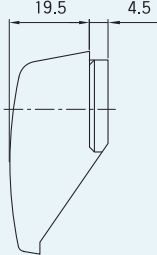
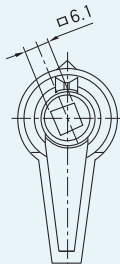
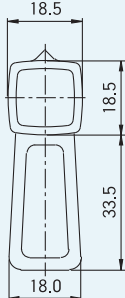
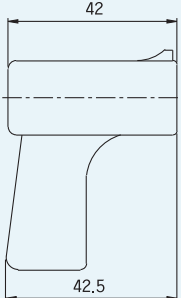
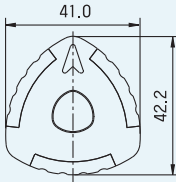
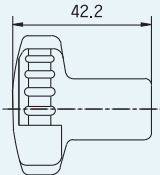
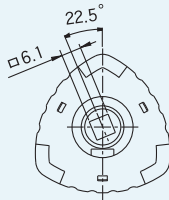
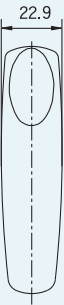
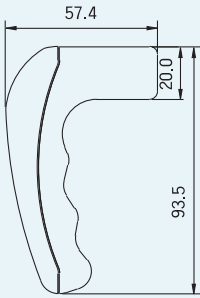
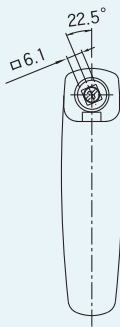
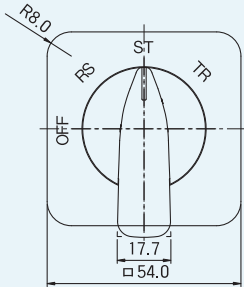
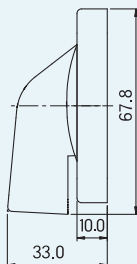
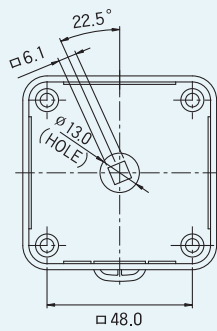
부품명 (Parts Name) 정격 (Rating)	하 부 (Contact Block)	연 결 단 자 (Connection Terminal)	
		가로용 (Horizontal Type)	세로용 (Vertical Type)
AC220V 5A			
AC220V 5A			
AC220V 10A			
DC125V 20A			
AC220V 30A			

핸들 | Handle |

(unit : mm)

- 스위치에 부착하는 핸들은 절환용, 조정용, 조작용 등 용도에 따라 선택합니다.
- 핸들의 색상은 흑색, 적색 2종류이며, 흑색을 표준으로 합니다.
- Handle for switch attachment is chosen depending on applications for transfer, adjusting, operating etc.
- Handle colors are 2 types of black and red, and black is standard.

핸들종류 (Handle Type)	외형치수 (Shape Dimension)		
R형 : 국화형 (R type : Chrysanthemum)			
E형 : 달걀형 (E type : Egg)			
O형 : 지침형 (O type : Compass)			
P형 : 권총형 (P type : Pistol)			

핸들종류 (Handle Type)	외형치수 (Shape Dimension)		
C형 : 소형 지침형 (C type : Small Compass) 			
G형 : 소형 권총형 (G type : Small Pistol) 			
T형 : 삼각형 (T type : Triangle) 			
D형 : 당김형 (D type : Draw) 			
J형 : 유럽형 (J type : Europe) 			

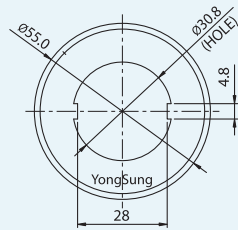
표준 전면판 | Standard Front Plate |

(unit : mm)

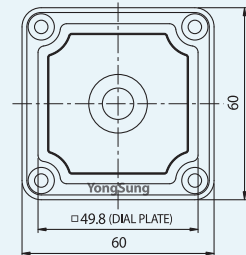
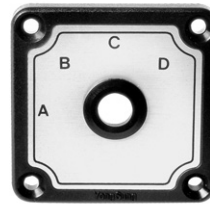
전면판 종류 (Front Plate)

외형 치수 (Shape Dimension)

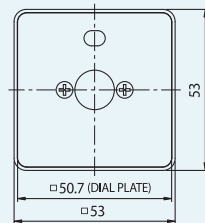
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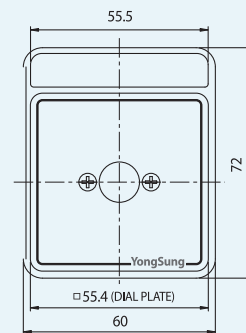
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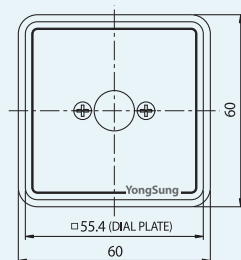
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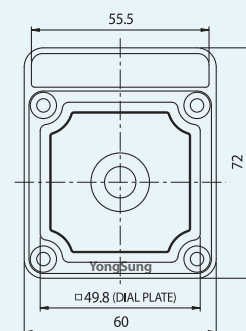
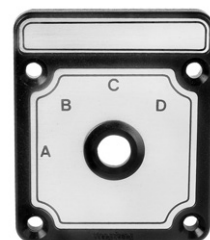
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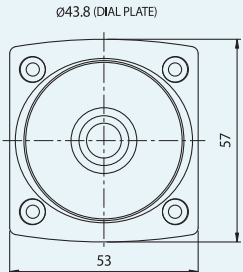
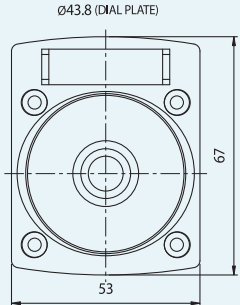
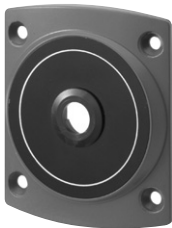
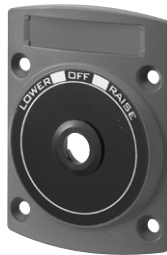
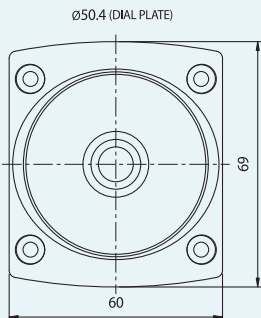
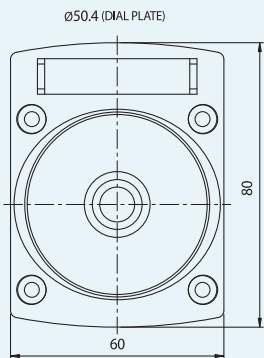
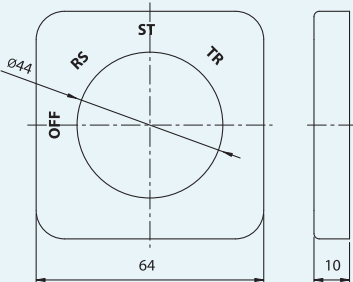
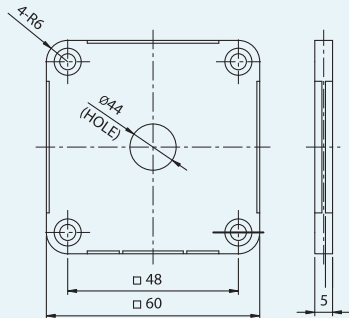


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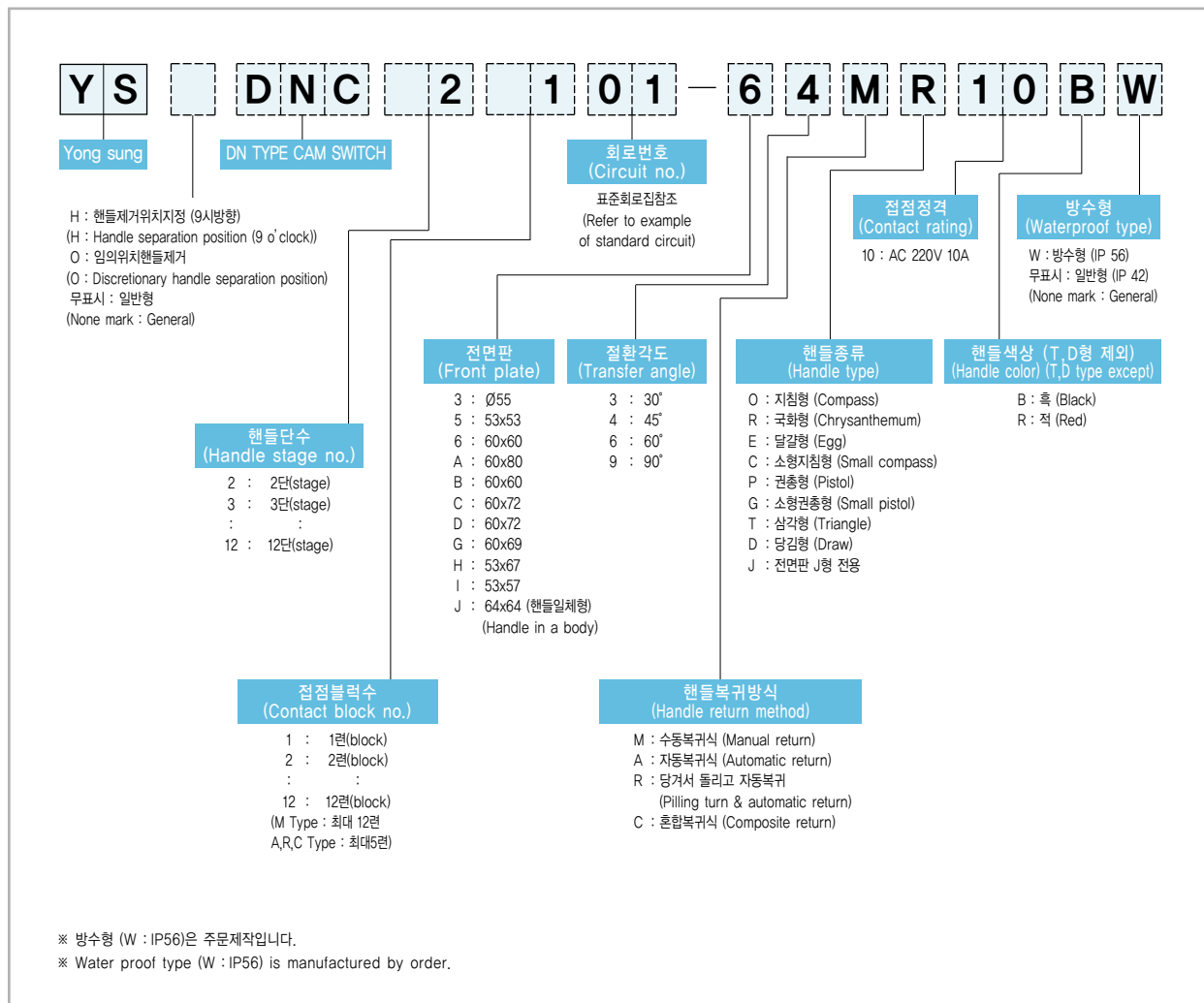


D TYPE



전면판 종류 (Front Plate)		외형 치수 (Shape Dimension)	
I TYPE		H TYPE	
			
			
G TYPE		A TYPE	
			
			
전면판 종류 (Front Plate)		외형 치수 (Shape Dimension)	
J TYPE	커버 (Cover)	사각판 (Square Plate)	
			

형식 구분도 | Type Classification Diagram - DNC 10A |



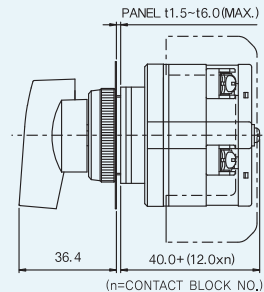
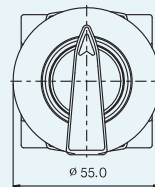
접점 정격 | Contact Rating - DNC 10A |

정격절연전압 (Rating insulation voltage)			AC600V, DC250V		
정격통전전류 (Rating conductive current)			20A		
AC	정격전압 (Rated votage)		110~120V	250V	380~440V
	정격전류 (Rated current)	저항부하 (Resistive load)	20A	10A	6A
		유도부하 (Inductive load)	6.6A	3.3A	1.65A
DC	정격전압(Rated votage)		110V	125V	220V
	정격전류 (Rated current)	저항부하 (Resistive load)	5A	4.4A	2.5A
		유도부하 (Inductive load)	1A	0.9A	0.5A

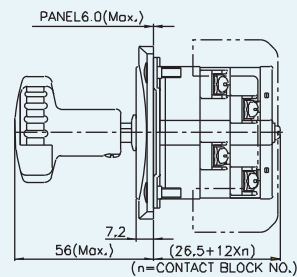
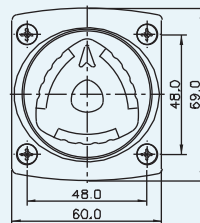
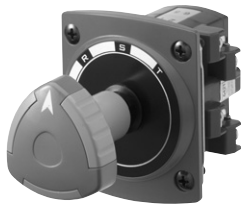
유도부하 (Inductive load) ----- COSØ=0.4, T_{0.95} = 300ms

적용규격 (Applied standard) ----- KSC 4519, IEC 60947-5-1

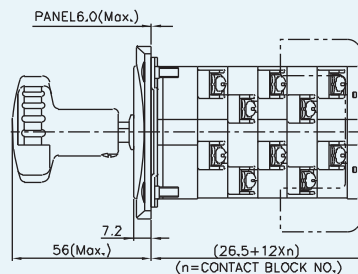
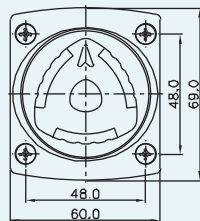
Ø30 (3 Type)



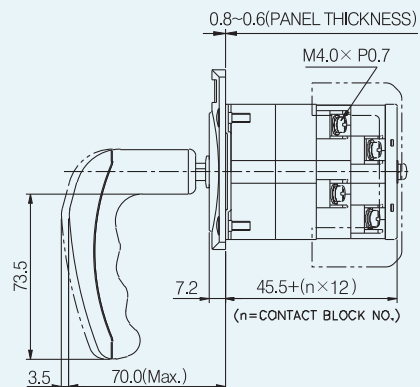
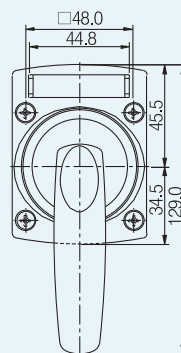
수동복귀식 (M Return)



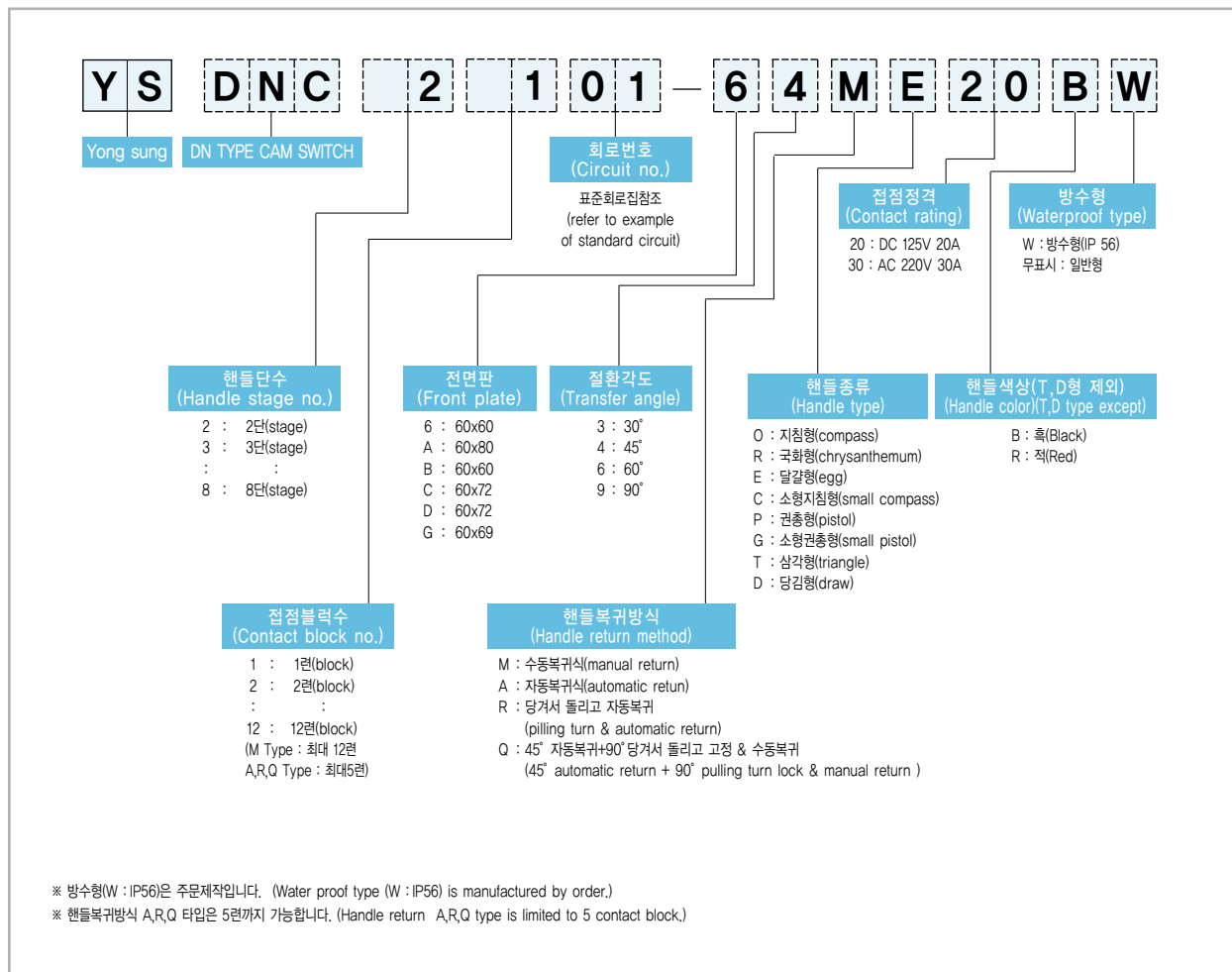
자동복귀식 (A Return)



핸들걸림식 (R-Return)



형식 구분도 | Type Classification Diagram - DNC 20A, 30A |



접점 정격 | Contact Rating - DNC 20A |

정격절연전압 (Rating insulation voltage)			DC250V		
정격통전전류 (Rating Conductive current)			35A		
DC	정격전압 (Rated votage)		110V	125V	220V
	정격전류 (Rated current)	저항부하 (Resistive load)	22A	20A	10A
		유도부하 (Inductive load)	4A	3.5A	2A

유도부하 (Inductive load) ----- $T_{0.95} = 300\text{ms}$

적용규격 (Applied standard) ----- KSC 4519, IEC 60947-5-1

※ 직류 20A용은 영구자석이 부착되어 있습니다.
(For DC 20A, permanent magnet is attached.)

접점 정격 | Contact Rating - DNC 30A |

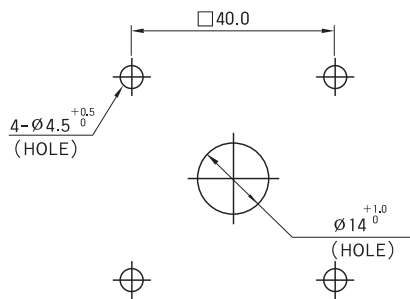
정격절연전압 (Rating insulation voltage)			AC600V, DC250V		
정격통전전류 (Rating Conductive current)			35A		
AC	정격전압 (Rated votage)		110~120V	220~240V	380~440V
	정격전류 (Rated current)	저항부하 (Resistive load)	30A	30A	15A
		유도부하 (Inductive load)	20A	10A	5A
DC	정격전압 (Rated votage)		110V	125V	220V
	정격전류 (Rated current)	저항부하 (Resistive load)	10A	8.8A	5A
		유도부하 (Inductive load)	2.5A	2.1A	1.2A

유도부하 (Inductive load) ----- $\cos\phi=0.4$, $T_{0.95}=300\text{ms}$
 적용규격 (Applied standard) ----- KSC 4519, IEC 60947-5-1

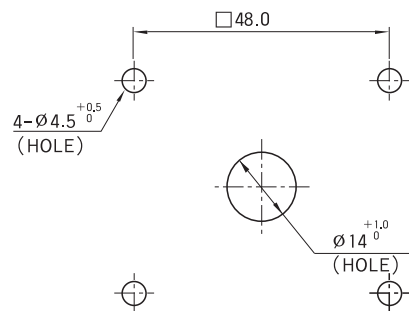
판넬 가공 치수 | Cut-out Dimension |

(unit : mm)

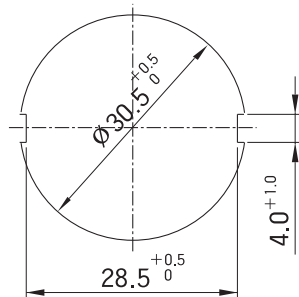
5, H, I TYPE



6, A, B, C, D, G TYPE



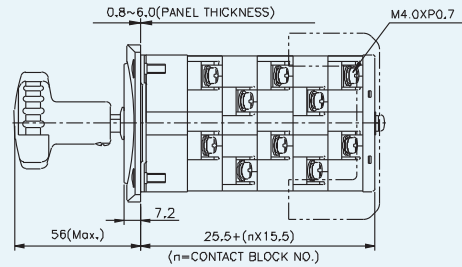
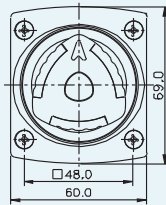
3 TYPE



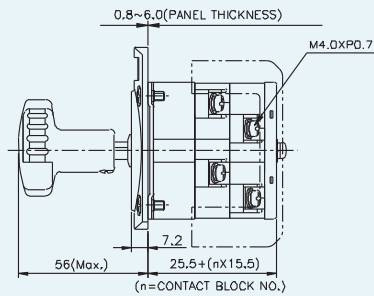
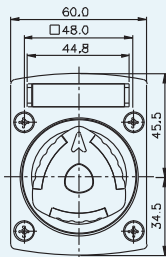
외형 / 치수도 | Shape / Dimension Drawing

(unit : mm)

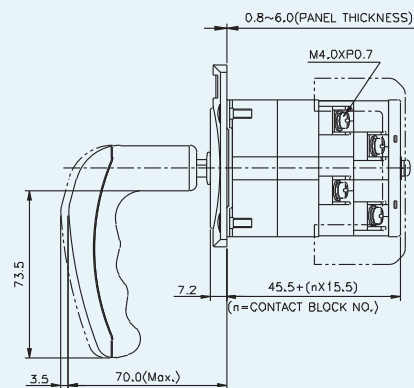
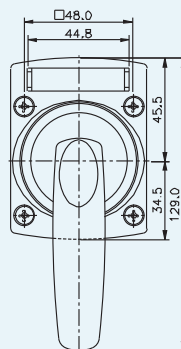
수동복귀 (M Type)



자동복귀 (A Type)



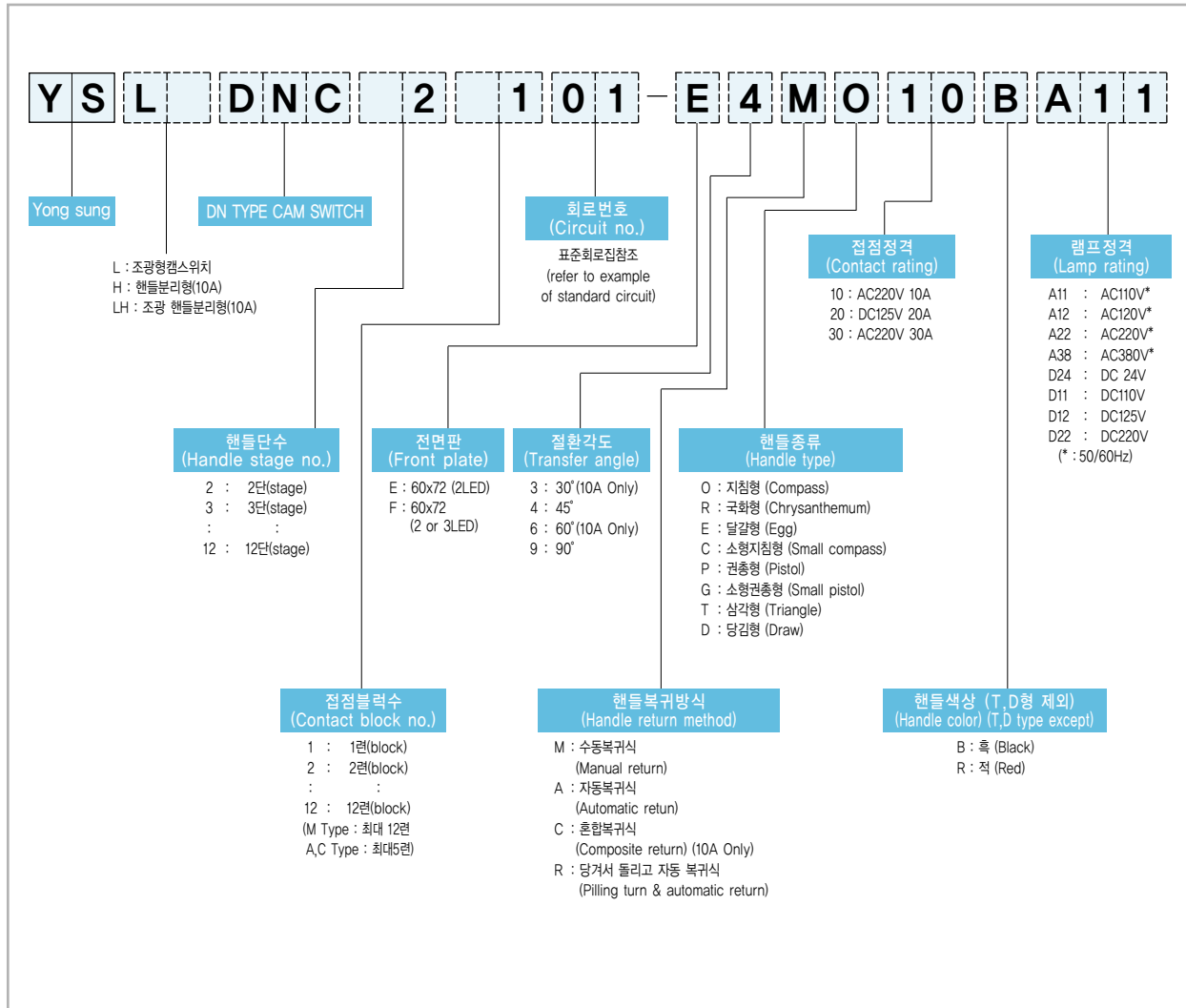
핸들걸림 (R, Q Type)



2-2

조광형 캠 스위치 (10A, 20A, 30A) Illuminated Cam Switch (10A, 20A, 30A)

형식 구분도 | Type Classification Diagram - LDNC |



특징 | Features |

- LED(적색, 녹색)를 사용하여 스위치 동작 상태를 전기적으로 확인 가능
- 자체 Lamp 장착으로 별도의 Lamp가 필요없음
- Cheek possibility electrically by using LED (red, green).
- Special lamp does not need due to lamp mounting itself.

사용시의 주의사항 | Remarks in Use |

- Lamp용 단자 배선시 LED 색상에 주의하십시오
- LED 점등용으로 무접점 스위치, PLC, 접점 보호 회로 등을 사용할 경우 누설 전류에 의해 출력 OFF 상태에서도 LED가 반 점등하는 경우가 있습니다.
- Notice LED color when wires terminal of lamp.
- In lighting LED unit, LED can be done half-illumination due to leakage current by non-contact switch, PLC or contact protective circuit, in even output OFF state.

부품 재질 | Part Materials |

부 품 (Part)	재 질 (Materials)
케이스 (Case)	PBT수지 (PBT Resin)
단자대 (Terminal block)	PBT수지 (PBT Resin)
절연카바 (Insulation cover)	PBT수지 (PBT Resin)
단자 (Terminal)	황동 (Brass)

▶ 스위치 재질은 기존 캠스위치와 동일합니다. Switch material is same as Cam Switch existed.

램프 정격 | Lamp Rating |

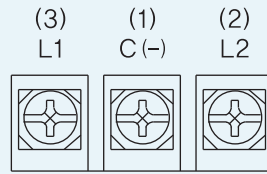
정격전압 (1차전압) (Rating primary voltage)	DC24V±10%	AC 110V±10% 50/60Hz DC 125V±10%	AC 220V±10% 50/60Hz DC 220V±10%
소비전력 (Power consumption)	1W 이하 (below 1W)	2.2W이하 (below 2.2W)	5W이하 (below 5W)
Lamp 전류 (Lamp current)	20mA 이하 (below 20mA)		
Lamp 색상 (Lamp color)	적, 녹 (red, green)		

▶ 접점 정격은 기존 캠스위치와 동일합니다. Contact rating is same as Cam Switch.

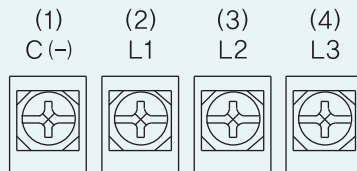
성능 개요 | Performance Summary |

절연저항 (Insulation resistance)	100MΩ 이상 (Above 100MΩ <DC500V, Meg>)
내전압 (Withstand voltage)	AC 2,000V/min
사용주위온도 (Ambient temperature)	-25℃ ~ + 40℃
상대습도 (Relative humidity)	45 ~ 85%

램프 접속도 | Lamp Connection Diagram |



(E TYPE)

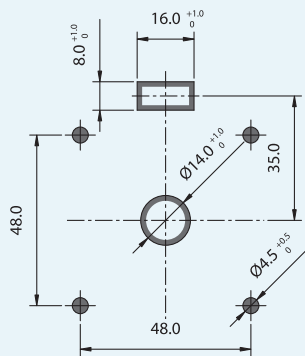


(F TYPE)

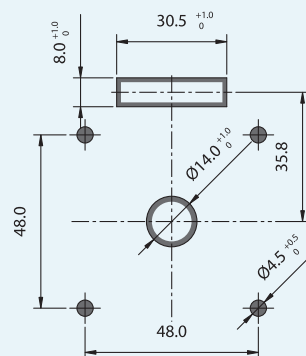
- ▶ 단자부 극성은 주문에 따름. (기본 - com).
4Polarity of terminal part based on customer's order. (Basic is “-” comon).
- ▶ + Common은 주문사양.
+ Common is manufactured by order.

판넬 가공 치수 | Cut-out Dimension |

(unit : mm)



E TYPE (2색)

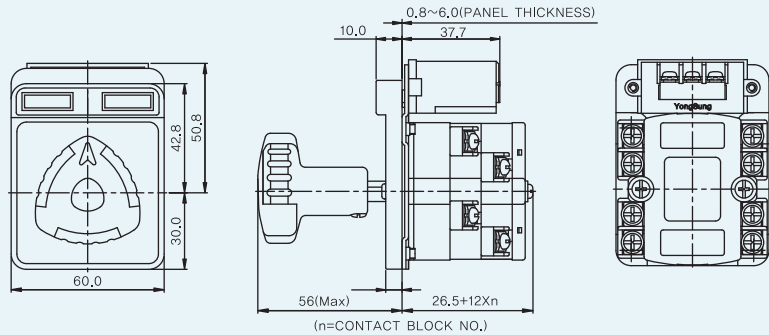


F TYPE (3색)

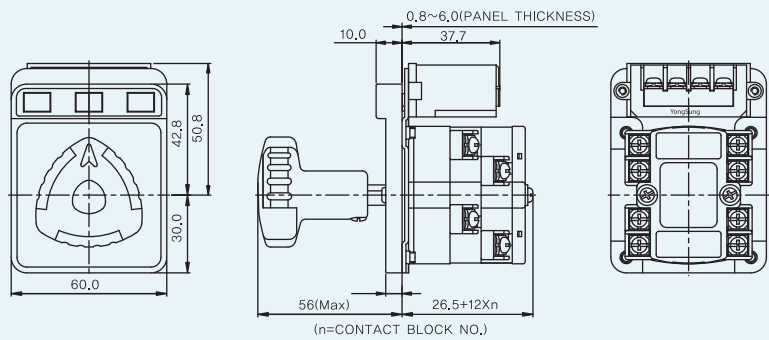
외형 / 치수도 | Shape / Dimension Drawing

(unit : mm)

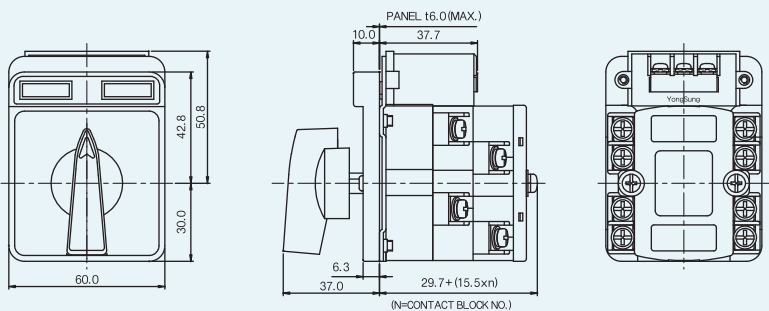
E-TYPE 10A



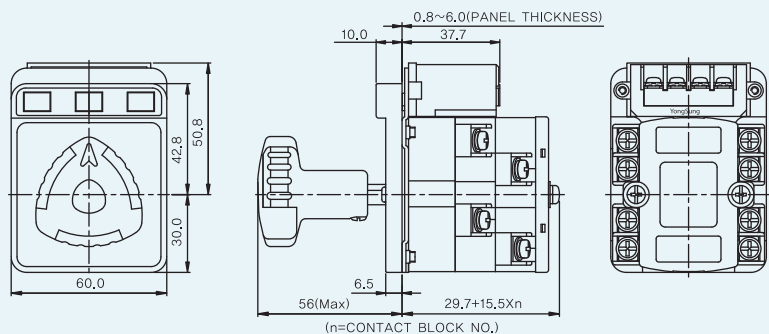
F-TYPE 10A



E-TYPE 20A / 30A



F-TYPE 20A / 30A



2-3

캠 스위치 5A (Ø22, □30, □48) Cam Switch 5A (Ø22, □30, □48)



특징 | Features |

- Ø22, □30은 조작부와 접점부가 분리형으로 되어 있습니다.
- 조작부와 접점부는 한번의 밀착으로 자동 LOCKING이 되도록 설계되었습니다.
- 제품의 소형화 및 경량화를 목적으로 개발되었습니다.
- Ø22 & □30 Cam switch 5A are separated the operating part from the contact part (body).
- They are designed automatically locking at once.
- It is developed for light weight and small size.

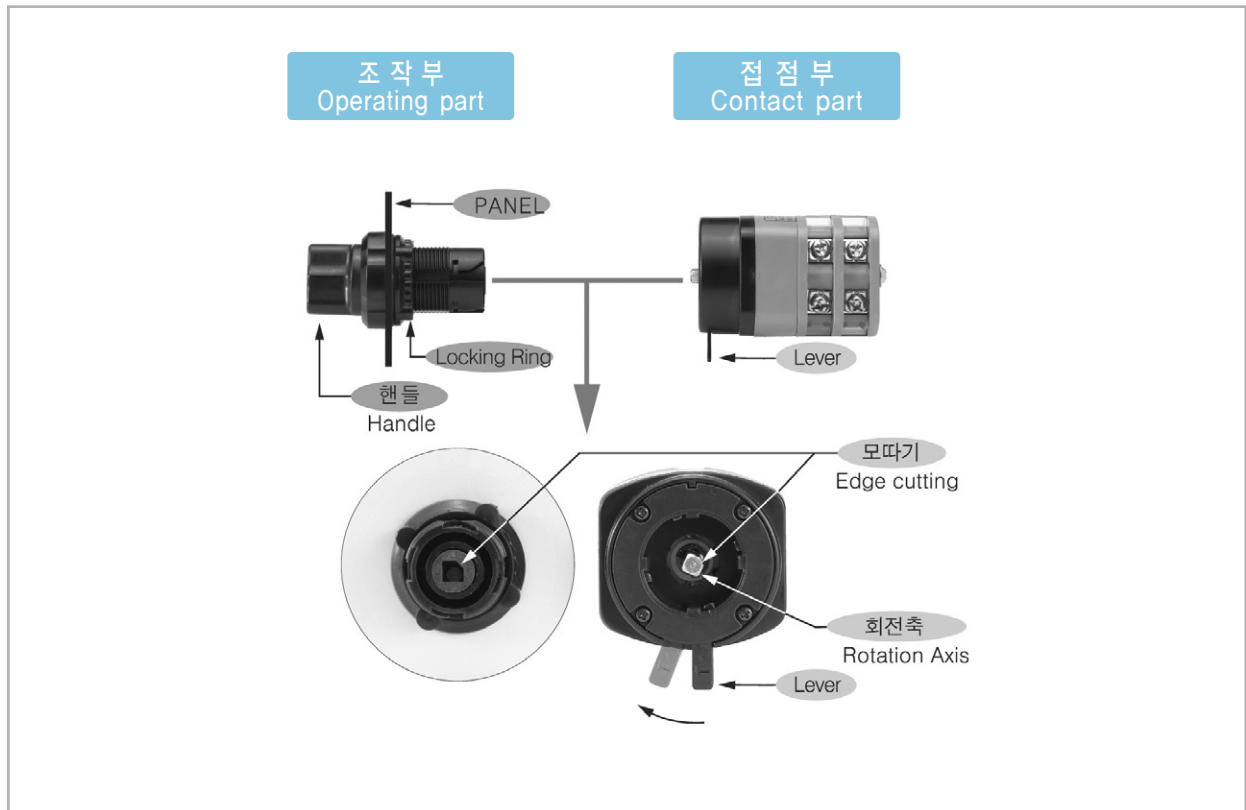
취급시 주의사항 | Instruction |

1. 사용하기전에 반드시 취급설명서를 확인 후 사용하십시오.
 2. 정격을 확인하여 정격 이외의 사용을 하지 마십시오.
 3. 스위치 이외의 목적에는 사용하지 마십시오.
 4. 환경조건(습기, 먼지)을 확인하여 안전조치를 취하십시오. (감전 및 쇼트의 원인)
 5. CAM SWITCH 안에 내장되어 있는 2접점(4단자)은 캠에 대하여 대칭으로 배치되어 있어서 핸들의 각도가 180° 회전되면 2접점 모두 폐로 또는 개로 상태가 되니 임의 개조하지 마십시오.
 6. 배선시無理하게 비틀거나 힘을 가하지 마십시오.
 7. 나사의 조임강도는 8 kgf·cm 이하로 해주십시오.
 8. 자동 LOCKING 제품은 조작부와 접점부를 분리시켰다가 재조립시 자리파기홈과 회전축의 모따기가 일치되어 조립되지 않으면 회로가 변경될 수 있으니 취급설명서에 준하여 사용하십시오.
- ※ 상기 취급시 주의사항에 명기된 내용은 제품 고장을 유발할 수 있으므로 반드시 지켜주십시오.

1. Read the instruction before using.
2. Make sure your rated current. Do not use it but right rated current.
3. Use only for the switch.
4. Check the surrounding condition (Moisture, Dust), and make sure safety condition (Reason of an electric shock) and shut.
5. Do not convert or disassemble. 4terminal points (2 contact point) in CAM SWITCH positioned symmetry point of CAM. Therefore when handle turns at an angle of 180 degrees, all 2 contact point are opened or closed.
6. Do not twist or give pressure to them, when wiring.
7. Screw up under 8 kgf·cm.
8. AUTO LOCKING product can be changed the circuit, if you do not assemble correctly space-groove cutting of the operating part with edge cutting of rotation-axis of the contact part.
So please follow our user guide.

※ When you use this, these happening can be occurred. Please observe the instruction.

조립 방법 - Type Ø22 | Assembling Method - Type Ø22 |



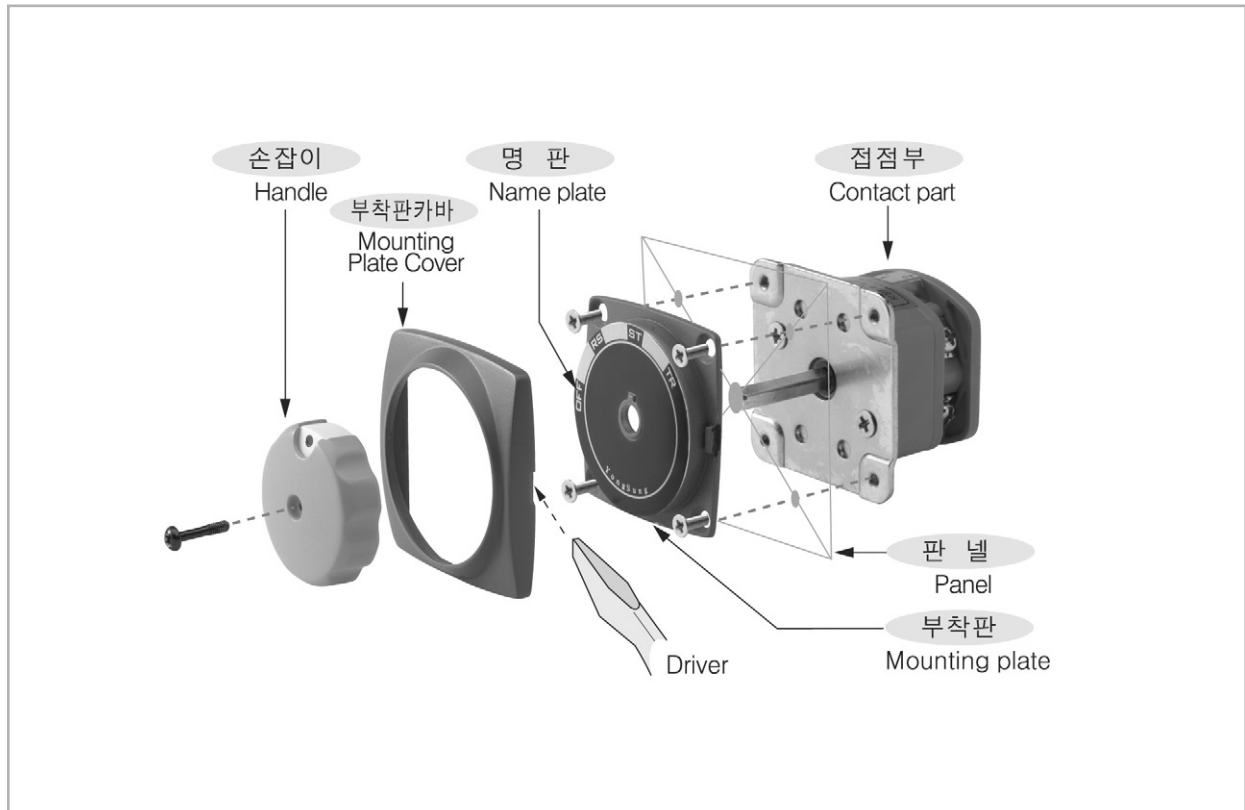
1. 레바를 돌려 조작부와 접점부를 분리합니다.
2. Locking Ring을 빼낸 후 조작부를 Panel에 삽입시키고 다시 Locking Ring으로 고정합니다.
3. 조작부의 모따기와 접점부의 회전축 모따기가 서로 일치 하도록 밀착시켜 결합합니다.

주의사항 : 분리한후에는 Panel에 부착하여 설치가 완료되기 전 까지는 조작부 핸들을 임의 조작하지 마십시오.
(회로가 변경될 수 있습니다.)

1. Turn the lever, and then separate the operating part and the contact part.
2. After taking off the LOCKING RING, insert the operating part to PANEL.
Then fix it by LOCKING RING.
3. Join space-groove cutting of the operating part with edge cutting of rotation-axis of the contact part correctly.

Attention : After separated, do not touch the operating handle voluntarily until installation attached to the panel is completed.

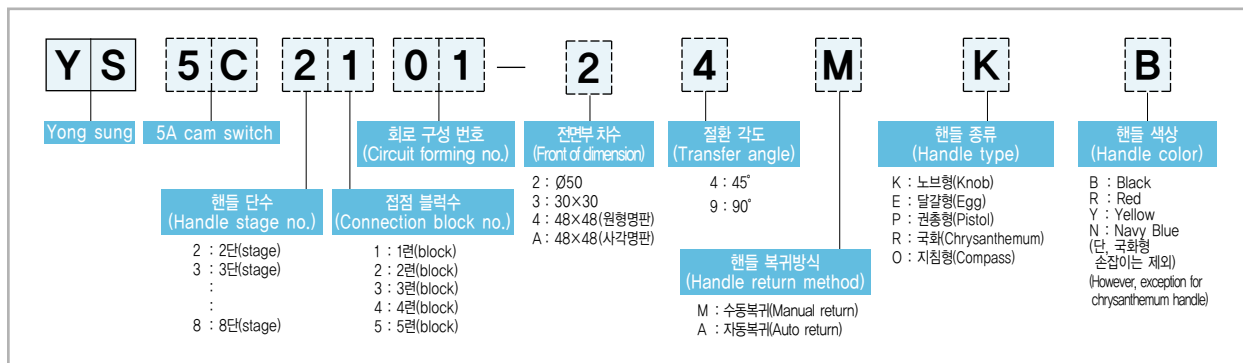
조립 방법 - Type □48 | Assembling Method - Type □48 |



1. 손잡이를 분리합니다.
2. -자 드라이버를 이용하여 부착판 카바를 분리합니다.
3. 부착판 볼트를 풀어 접점부를 판넬에 부착합니다.
(명판과 부착판 홈○이 일치하도록 합니다.)
4. 부착판 카바를 부착판에 조립하고 손잡이를 조립합니다.

1. Disassemble the handle.
2. Disassemble the mounting plate cover with (-) type driver.
3. Attach the contact part on the panel after unfastening bolt of attachment plate.
Do coincide the name plate and the groove (○).
4. Assemble the handle after setting up the mounting plate cover on the mounting plate.

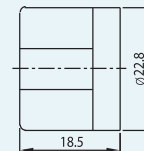
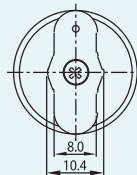
형식 구분도 | Type Classification Diagram



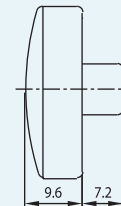
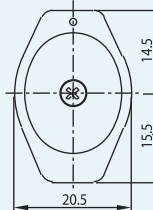
핸들 | Handle

(unit : mm)

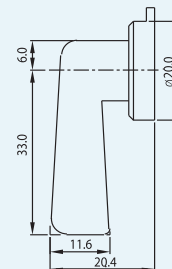
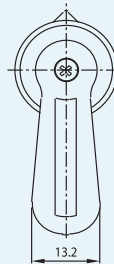
K형 : 노브형 (Knob)



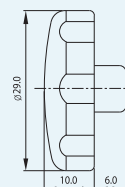
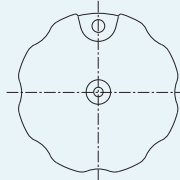
E형 : 달걀형 (Egg)



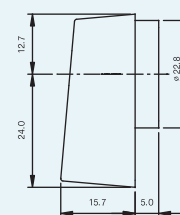
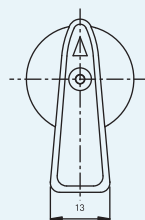
P형 : 권총형 (Pistol)



R형 : 국화형 (Chrysanthemum)



O형 : 지침형 (Compass)



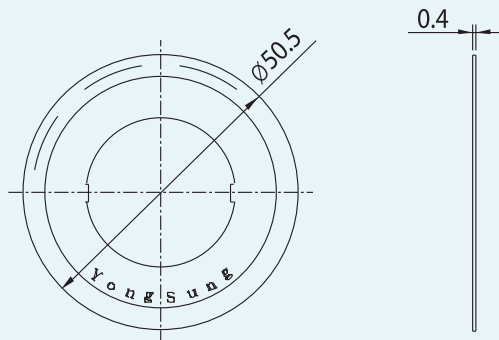
전면판 외형 치수 | Front Shape Dimension |

(unit : mm)

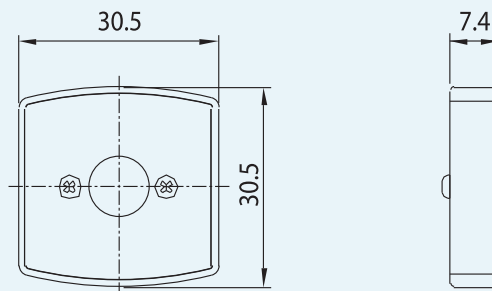
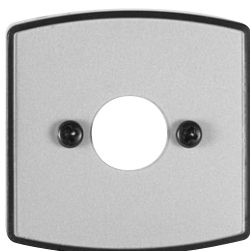
전면판 종류 (Front Plate)

외형 치수 (Shape Dimension)

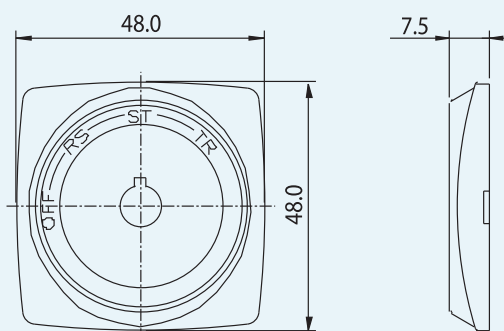
Ø22 (Ø50) TYPE



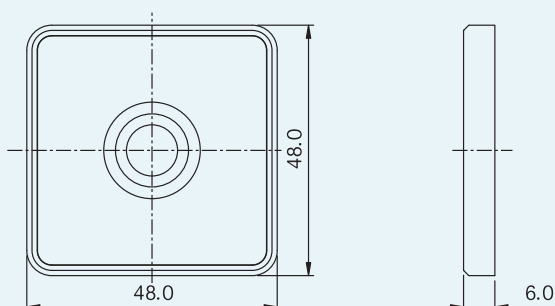
Ø22 (□30) TYPE



□48 TYPE



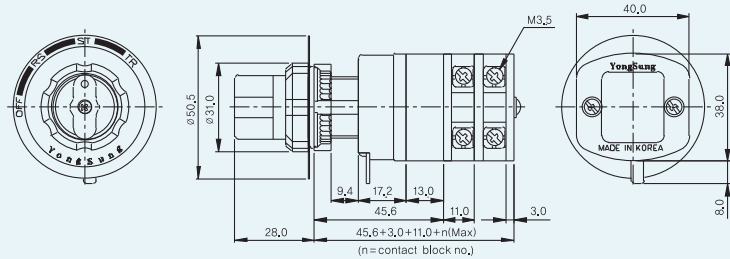
A-TYPE



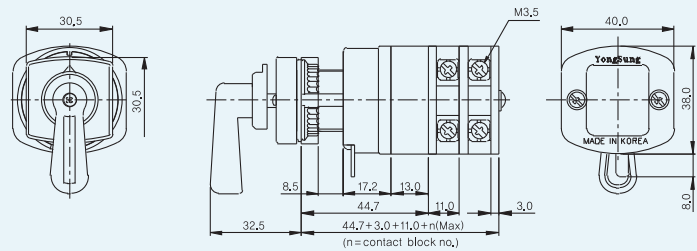
외형 / 치수도 | Shape / Dimension Drawing |

(unit : mm)

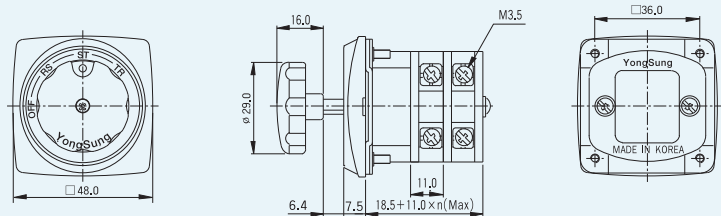
Ø22 (Ø50) TYPE



Ø22 (□30) TYPE



□48 TYPE

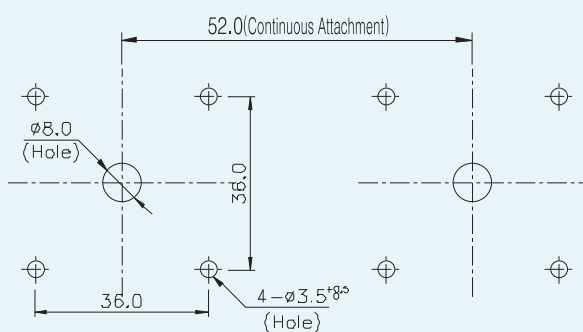


※ 4련 이상 제품은 몸체가 2개로 적용됩니다. (Two body applied if 4 contact block.)

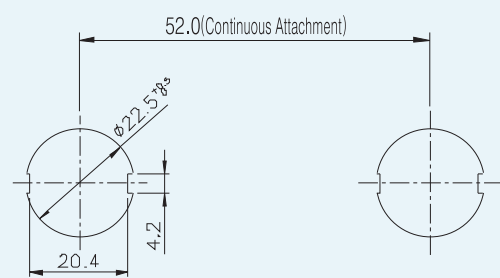
패널 가공 치수 | Cut-out Dimension |

(unit : mm)

□48 TYPE



Ø22 (Ø50, □30) TYPE



부품 재질 | Part Materials |

부 품 (Part)	재 질 (Materials)
몸체 (Body)	ABS내열수지 (Heat Resistance ABS Resin)
접점블럭 (Contact block)	ABS내열 (Heat Resistance ABS Resin)
캠 (Cam)	아세탈수지 (Acetal Resin)
손잡이 (Handle)	ABS수지 (ABS Resin)
고정단자 (Fixed terminal)	황동 (Brass)
유동단자 (Moving terminal)	인청동 (Phosphor bronze)
접점 (Contact)	은 (Silver)

접점 정격 | Contact Rating |

정격전압 (Ue)-(Rating voltage)			24V	110V	220V
접점정격 (Contact rating)	교류 AC	저항부하 (AC12)-Resistive load	7A	7A	5A
		유도부하 (AC15)-Inductive load	7A	2.4A	1.2A
	직류 DC	저항부하 (DC12)-Resistive load	5A	1.4A	0.7A
		유도부하 (DC13)-Inductive load	1.5A	0.5A	0.2A
	통전 전류 (Conductive current)		7A		

폐로차단전류 (Closed breaking current) = 정격전류 (Rating current)×1.1 교류유도부하 (AC Inductive Load) — $\cos\phi = 0.4$

적용규격 (Applied standard) — IEC 60947-5-1, KSC 4519 직류유도부하 (DC Inductive Load) — $T_{0.95} = 300\text{ms}$

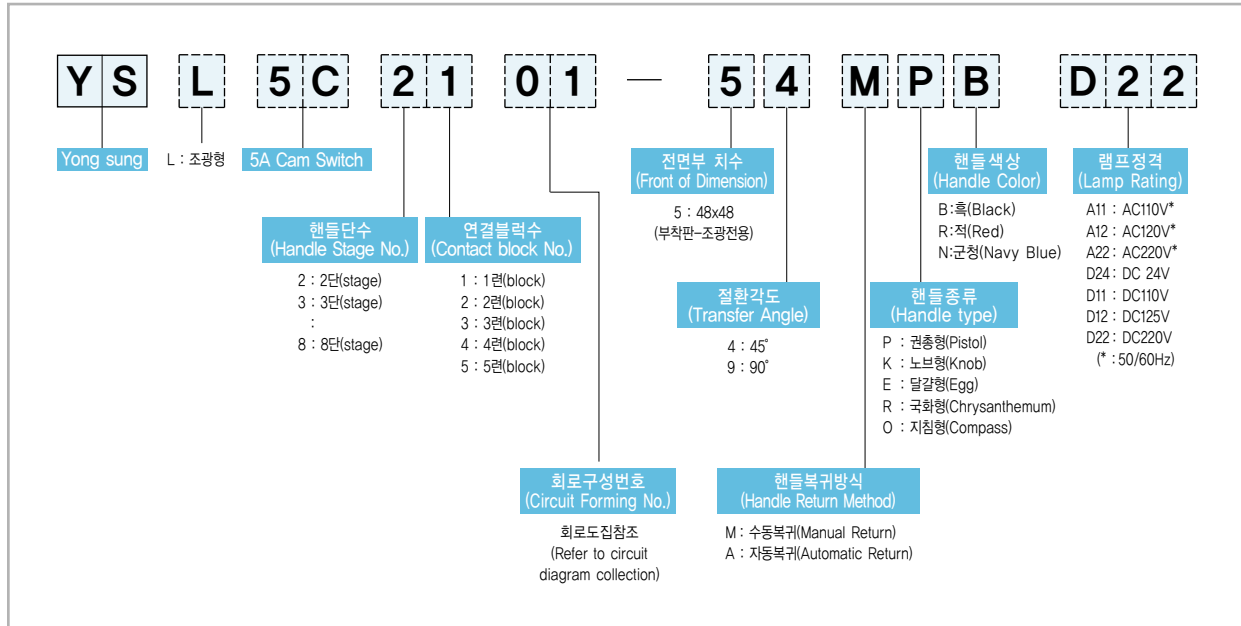
성능 개요 | Performance Summary |

기계적 수명 (Mechanical lifetime)	500,000회 이상 (Above 500,000 times)
전기적 수명 (Electrical lifetime)	100,000회 이상 (Above 100,000 times)
접촉 저항 (Contact resistance)	50mΩ 이하 (초기치) (Below 50mΩ (initial value))
절연 저항 (Insulation resistance)	100MΩ 이상 (Above 100MΩ (DC 500V. Meg))
내전압 (Withstand voltage)	AC2,500V/1min
사용주위온도 (Ambient temperature)	-25 ~ +40℃
상대습도 (Relative humidity)	45 ~ 85%

2-4

조광형 캠 스위치 (5A)
Illuminated Cam Switch (5A)

형식 구분도 | Type Classification Diagram |



특징 | Features |

- LED(적색,녹색)을 사용하여 스위치 동작 상태를 전기적으로 확인 가능.
- 자체 Lamp 장착으로 별도의 Lamp가 필요없음.
- 패널 전면에서 LAMP 탈, 부착 가능.
- Check possibility electrically by using LED(red,green).
- Special lamp does not need due to lamp mounting itself.
- Possible to combine the lamp with front panel.

사용시의 주의사항 | Remarks in Use |

- Lamp용 단자 배선시 LED 색상에 주의하십시오.
- 결선은 램프 접속도에 따라 결선 하십시오.
- LED 점등용으로 무접점 스위치, PLC, 접점 보호 회로 등을 사용 할 경우 누설 전류에 의해 출력 OFF 상태에서도 LED가 반 점등하는 경우가 있습니다. 이 경우는 용성전기(주) 종합 카다로그 기술자료를 참조하여 대책 수립 바랍니다.
- Be careful LED color when wiring terminal of lamp.
- Wirring is incording to lamp connection diagram.
- In lighting LED unit, LED can be done half-illunination due to leakage current by non-contact switch, PLC or contact protective circuit, in even output OFF state. Please refer to the catalogue of YongSung Electric co., Ltd.

부품 재질 | Part Materials |

부 품 (Part)	재 질 (Materials)
PCB 몸체 (PCB Body)	ABS 내열 (Heat resistance ABS) Resin
절연지 (Insulation Sheet)	PET FILM
단자 (Terminal)	황동 (Brass)
볼트 (Bolt)	탄소강 (Carbon Steel)

램프 정격 | Lamp Rating |

정격전압 (1차전압) (Rating Primary Voltage)	DC 24V±10%	AC 110V±10% 50/60Hz AC 120V±10% 50/60Hz DC 110V±10% DC 125V±10%	AC 220V±10% 50/60Hz DC 220V±10%
소비전력 (Power Consumption)	1W 이하 (below 1W)	2.5W 이하 (below 2.5W)	5W 이하 (below 5W)
램프전류 (Lamp Current)	20mA 이하 (below 20mA)		
램프색상 (Lamp Color)	적, 녹 (Red, Green)		

성능 개요 | Performance Summary |

기계적 수명 (Mechanical Lifetime)		500,000회 이상 (above 500,000 times)
전기적 수명 (Electrical Lifetime)		100,000회 이상 (above 100,000 times)
접촉저항 (Contact Resistance)		50mΩ 이하 (초기치) (below 50mΩ) (Initial value)
절연저항 (Insulation Resistance)		100MΩ 이상 (Above 100MΩ (DC500V. Meg))
내전압 (Withstand Voltage)	램프부 (Lamp part)	AC 2,000V/1min
	접점부 (Contact part)	AC 2,500V/1min
사용주위온도 (Ambient Temperature)		-25℃ ~ +45℃
상대습도 (Relative Humidity)		45 ~ 85%

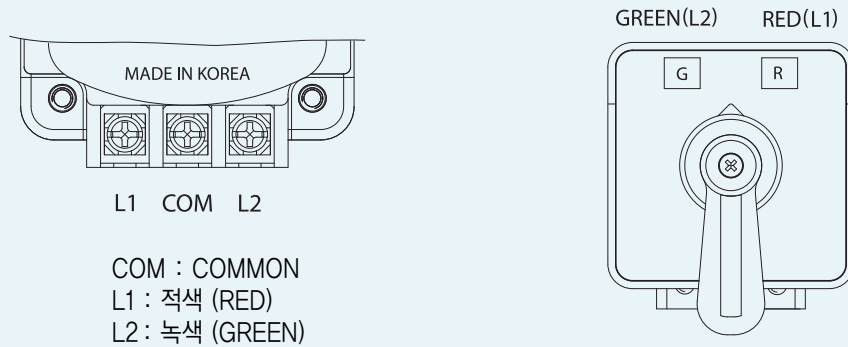
접점 정격 | Contact Rating |

정격전압 (Rating Voltage)			24V	110V	220V
접점정격 (Contact Rating)	교류 (AC)	저항부하 (Resistive Load)	7A	7A	5A
		유도부하 (Inductive Load)	7A	2.4A	1.2A
	직류 (DC)	저항부하 (Resistive Load)	5A	1.4A	0.7A
		유도부하 (Inductive Load)	1.5A	0.5A	0.2A
	통전전류 (Conductive Current)		7A		

적용규격 (Applied standard) ----- IEC 60947-5-1, KSC 4519

교류유도부하 (AC Inductive Load) ----- COSØ = 0.4 직류유도부하 (DC Inductive Load) ----- T_{0.95} = 300ms

램프 접속도 | Lamp Connection Diagram |

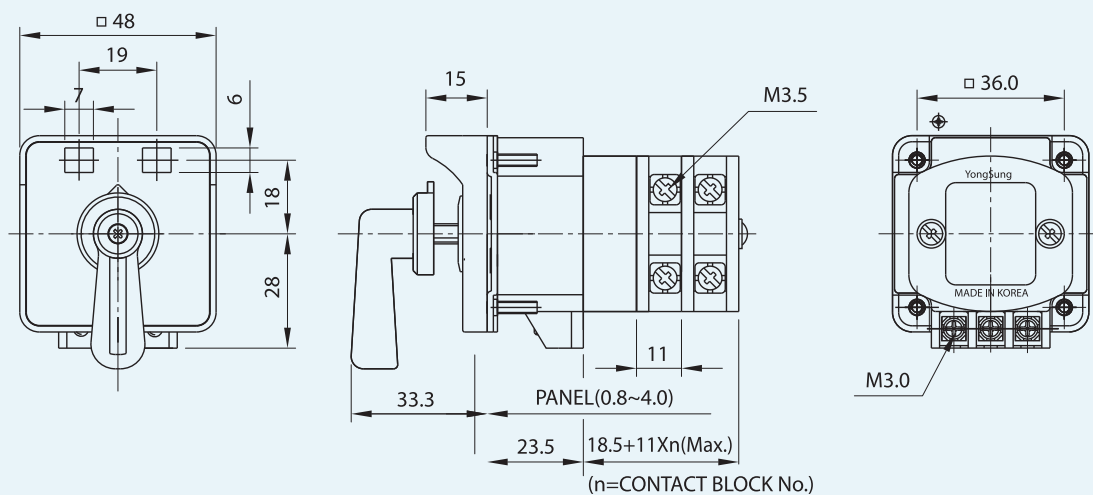


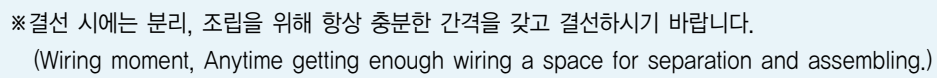
- DC전원의 경우 램프 결선시 COM 단자(극성(+,-))는 무극성임.
- In case of DC power, COM terminal(polarity(+,-)) is nonpolar when lamp connected.

외형 / 치수도 | Shape / Dimension Drawing |

(unit : mm)

조광형 캠 스위치 (5A) / Illuminated Cam Switch (5A)





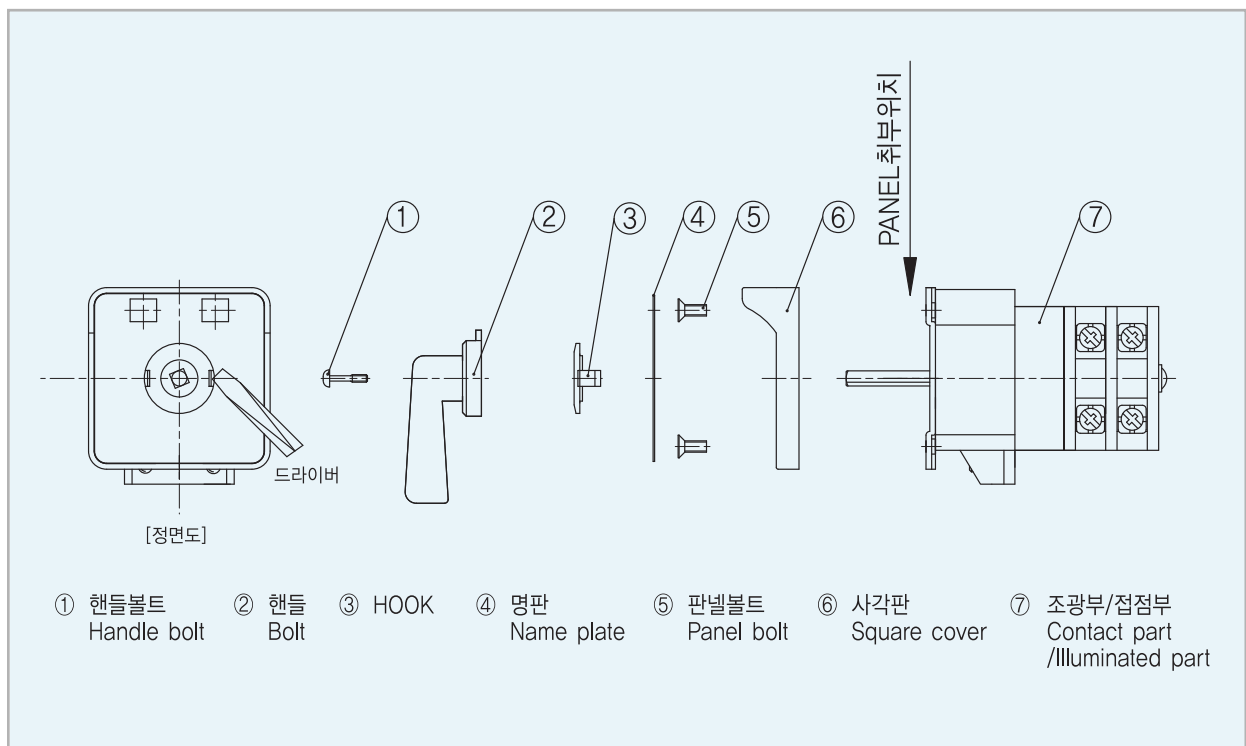
조립 방법 | Assembling Method |

1. 분리 순서 (Disassemble order)

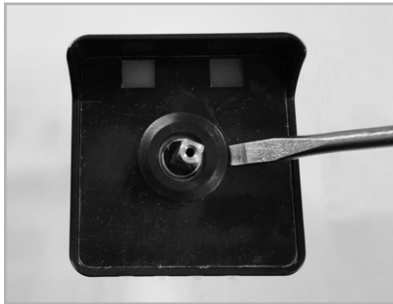
- 1) 핸들 볼트를 분리한다.
Disassemble the handle bolt.
 - 2) 핸들을 분리한다.
disassemble the handle.
 - 3) HOOK를 분리한다. (드라이버를 HOOK 옆의 홈에 끼워 제긴다. (정면도 참조))
Disassemble the HOOK. (Pull it out with screwdriver. Refer to below drawing.)
 - 4) 명판을 분리한다.
Disassemble the name plate.
 - 5) 판넬 볼트를 분리 한다.
Disassemble the panel bolt.
 - 6) 사각판을 분리 한다.
Disassemble the square cover.
- ※ 분리한 부품은 분실 위험이 있으니 보관에 주의하십시오.
Please keep the disassemble part in the safe place it might involve the risk of loss.

2. 조립 순서 (Assemble order)

- 1) 조광부 / 접점부를 판넬 조립 구멍에 끼운 다음
Put it the contact part / illuminated part in the assemble hole.
- 2) 사각판을 판넬 전면에 부착 후 판넬 볼트로 조광부 / 접점부와 조립한다.
Attach the square cover to the front panel, assemble it with the contact part / Illuminated part.
- 3) 명판을 사각판에 부착 후 HOOK을 밀어 넣어 조립한다.
Attach the nameplate to the square cover, put the HOOK in it.
- 4) 핸들을 조립 후 핸들 볼트로 조여 조립한다.
Assemble the handle with the other part, to tighten the handle with handle.



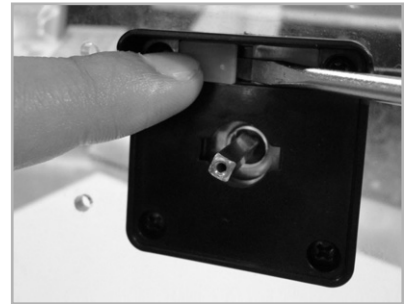
램프 교체 방법 | Lamp Replacement |



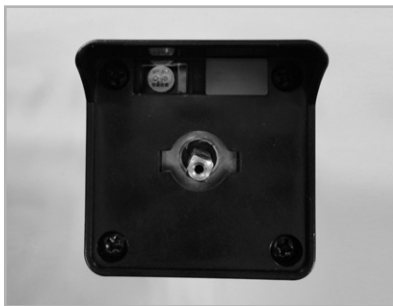
- 1) 핸들제거 후 후크분리
1) Remove the handle, and then disassemble the HOOK.



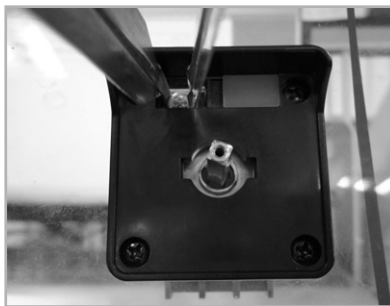
- 2) 명판제거
2) Remove the name plate.



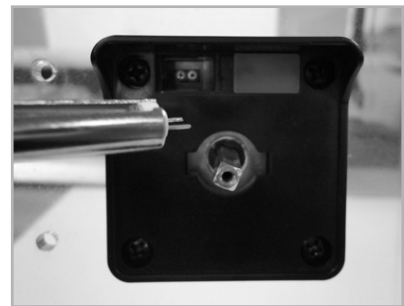
- 3) LED창 안쪽 홈으로 (-)드라이버 이용하여 들어올린다. 이때 LED창 분실 우려가 있으므로 LED창을 고정시킨다.
3) Lift it up with screwdriver (-) type, please be careful with LED window it may involve the risk of loss.



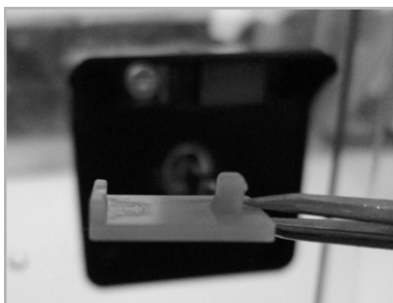
- 4) LED창 분리 후 모습
4) This is after disassembling of LED window



- 5) 16파이 램프 착 탈 공구를 사용해 LAMP 분리한다.
5) Use the remover (for Ø16) to disassemble the LAMP.



- 6) LAMP 분리 후 새로운 LAMP 조립한다.
6) Assemble the new lamp after disassembling previous lamp.



- 7) LED 창 후크방향을 확인하여 사진과 같은 방향으로 (왼쪽일자, 오른쪽 후크) 잡는다.
7) Please check the direction of the HOOK, make it same direction with the above picture ((-) left type, Right Hook) and then hold it.



- 8) LED 창 일자면부터 기대어 놓고 밀어 넣는다. 이때 딸각 소리가 나는지 확인한다.
8) Please push the (-) type part of LED window in the make sure that if you hear "clack", it is perfectly assembled

※ LED 창은 조립, 분리 시 분실우려가 있으니 작업시 주의바랍니다.

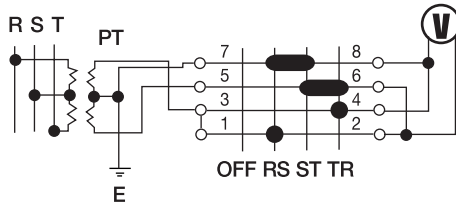
※ Please keep the LED window in the safe place, it might involve the risk of loss.

※ 반대편의 LED도 같은 방법으로 조립, 분리 할 수 있습니다.

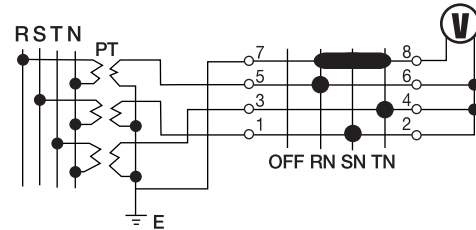
※ Assemble or disassemble the opposite LED with same way.

기본 회로에 (전압계 · 전류계 회로) | Example of Basic Circuit (Voltmeter, amperemeter circuit) |

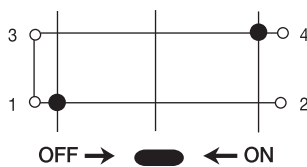
C4210 (voltmeter, 3Ø 2PT circuit)



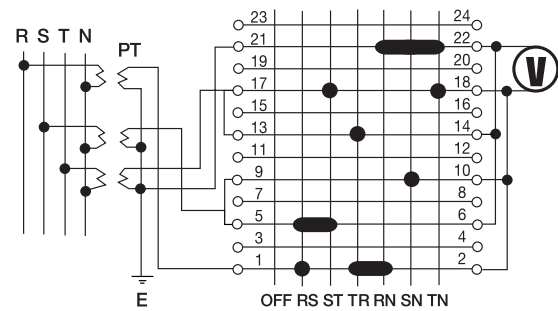
C4211 (voltmeter, 3Ø 3PT circuit)



C3102A, R

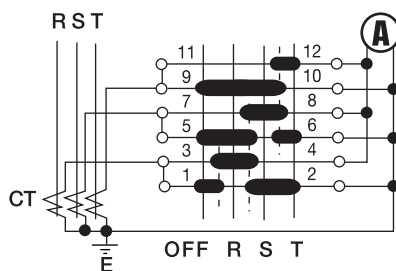


C7602 (voltmeter, 3Ø 3PT) 복합형 (composite type)

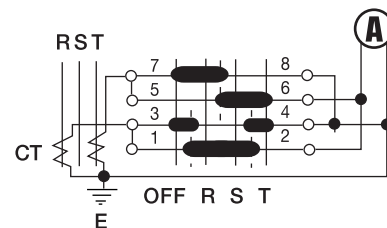


*30도 제작불가 (30 degree does not manufactured.)

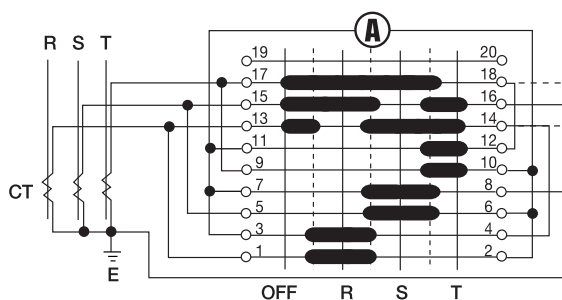
C4307 (amperemeter, 3Ø 3CT circuit)



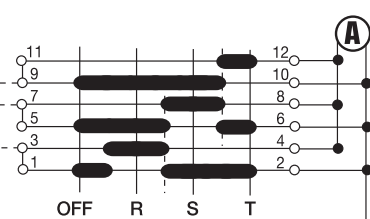
C4213 (amperemeter, 3Ø 2CT circuit)



C4502 (관통형, AS) (penetrating type, AS 3Ø 3CT circuit)

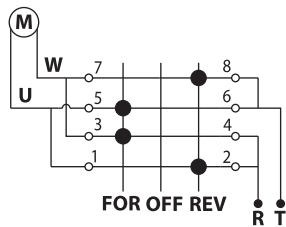


C4307

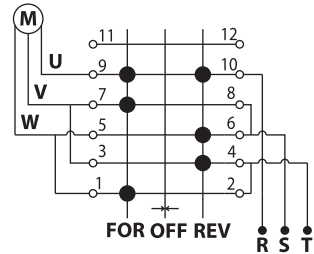


기본 회로에 (모터용 회로) | Example of Basic Circuit (Motor circuit) |

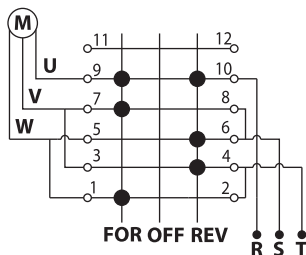
DNC3271 : 단상 모터 가역 회로 (circuit)



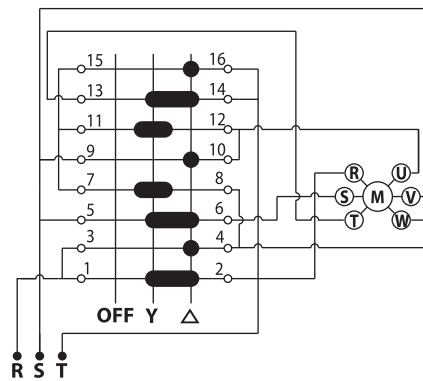
DNC3376A : 3상 모터 가역 회로 (자동복귀) (circuit)



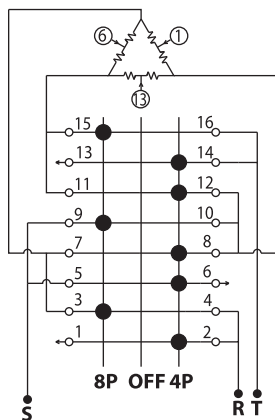
DNC3376 : 3상 모터 가역 회로 (circuit)



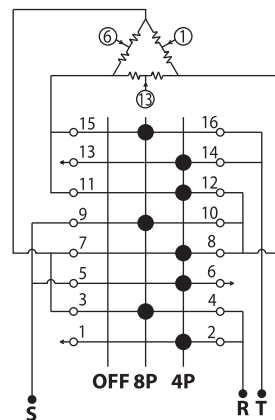
DNC3443 : Y-Δ 회로 (Y-Δ circuit)



DNC3444 : 4극 8극 회로 (circuit)



DNC3445 : 8극 4극 회로 (circuit)



표준 회로집 | Example of Standard Circuit |

주) Position의 표준 절환각도 위배시 contact block 추가됨. Note) When standard transfer angle of position violates, contact block is added.

2-position, 1-contact block

C2101	C2102	C2103	C2104
C2105	C2106	C2107	C2108

2-position, 2-contact block

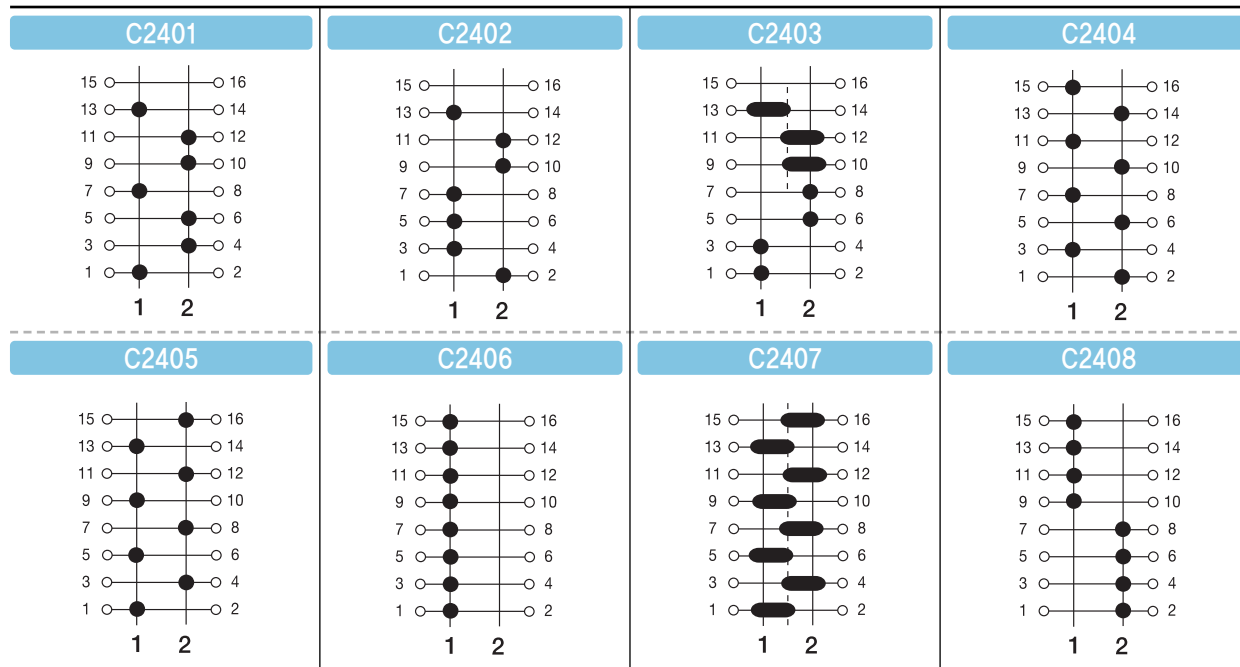
C2201	C2202	C2203	C2204
C2205	C2206	C2207	C2208

2-position, 3-contact block

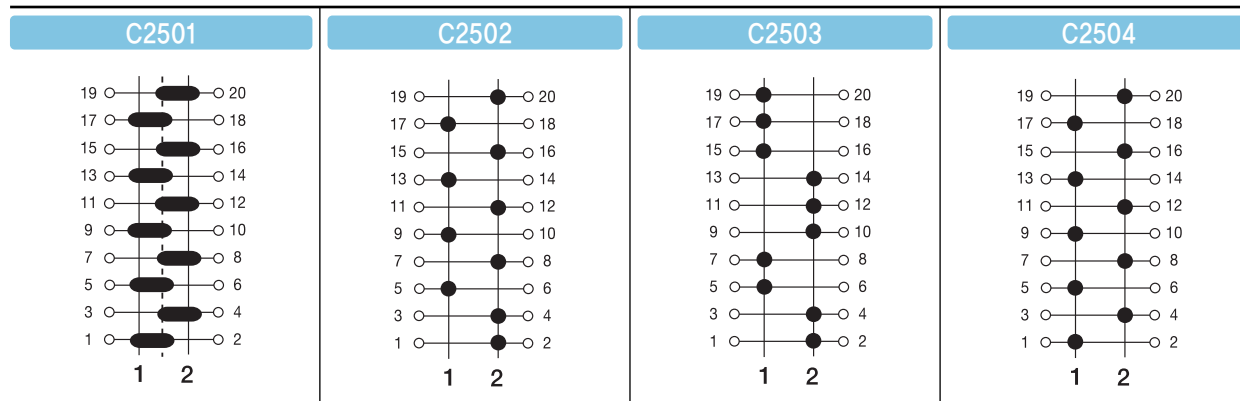
C2301	C2302	C2303	C2304
C2305	C2306	C2307	C2308

표준 회로집 | Example of Standard Circuit

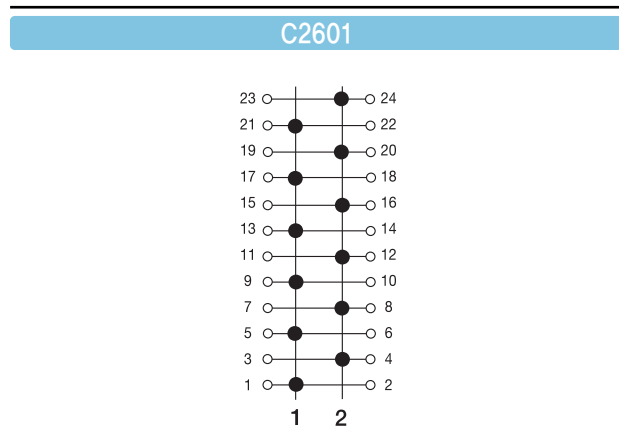
2-position, 4-contact block



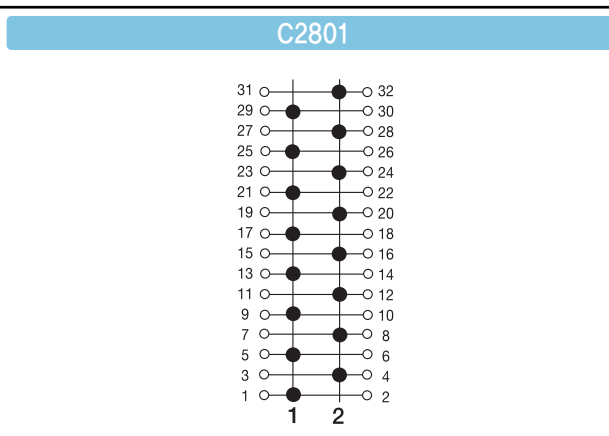
2-position, 5-contact block



2-position, 6-contact block



2-position, 8-contact block



표준 회로집 | Example of Standard Circuit

3-position, 1-contact block

C3102 	C3103 	C3104A 	C3105
C3106 	C3107 	C3108 	C3109
C3110 			

3-position, 2-contact block

C3201A 	C3202 	C3203 	C3204
C3205 	C3206 	C3207 	C3208
C3210 	C3211 	C3212 	C3213A
C3214 	C3215 	C3216 	C3217

표준 회로집 | Example of Standard Circuit

3-position, 2-contact block

C3218 	C3219 	C3220 	C3221
C3222 	C3223 	C3224 	C3225
C3226 	C3227 	C3228 	C3229
C3230 	C3231 	C3232 	C3233
C3234 	C3235 	C3236 	

3-position, 3-contact block

C3301 	C3302 	C3303 	C3304
C3305 	C3306 	C3307 	C3308

표준 회로집 | Example of Standard Circuit

3-position, 3-contact block

C3309	C3310	C3311	C3312
C3313	C3314	C3315	C3316
C3317A	C3318A		

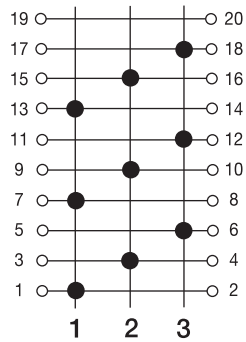
3-position, 4-contact block

C3401	C3402	C3403	C3404

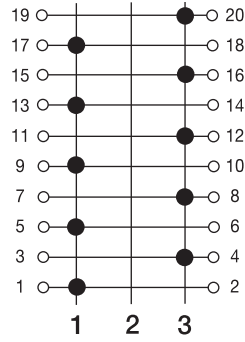
표준 회로집 | Example of Standard Circuit |

3-position, 5-contact block

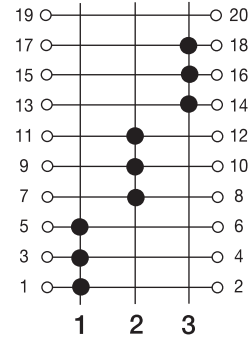
C3501



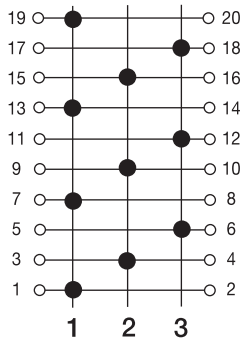
C3502



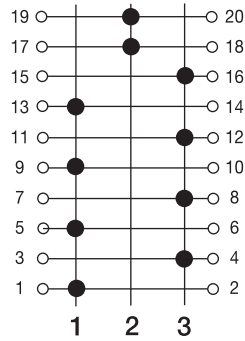
C3503



C3504

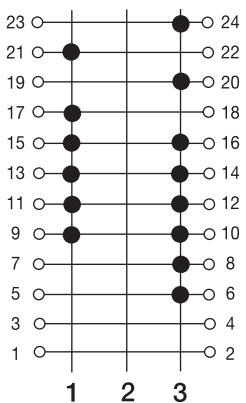


C3505

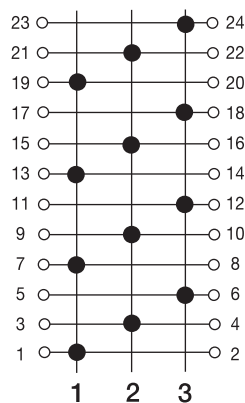


3-position, 6-contact block

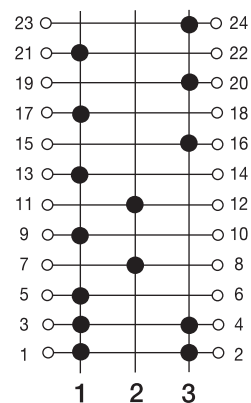
C3601



C3602



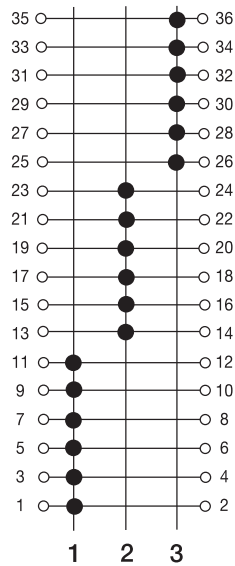
C3603



표준 회로집 | Example of Standard Circuit |

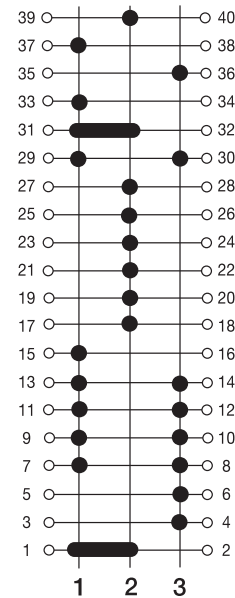
3-position, 9-contact block

C3901



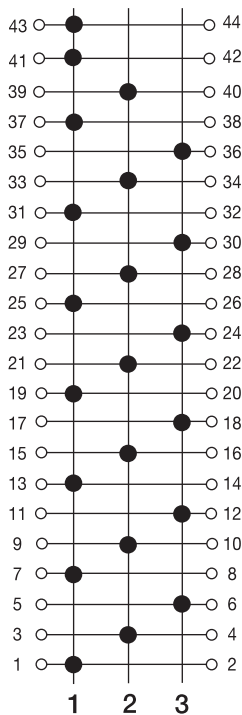
3-position, 10-contact block

C31001 (C3001)

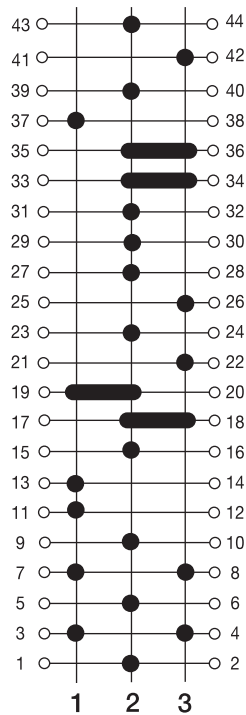


3-position, 11-contact block

C31101 (C3011)

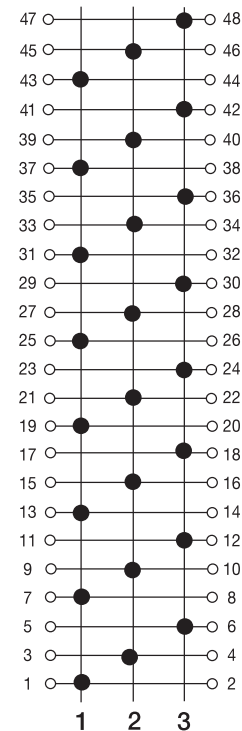


C31103 (C3013)



3-position, 12-contact block

C31201 (C3021)



표준 회로집 | Example of Standard Circuit

4-position, 2-contact block

C4201 	C4202 	C4203 	C4204
C4205 	C4206 	C4207 	C4208
C4209 	C4212 	C4214 	C4215
C4216 	C4217 	C4220 	C4229
C4230 	C4231 	C4241 	

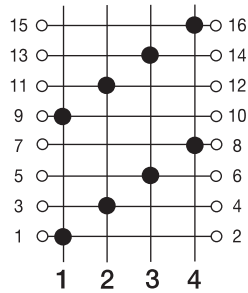
4-position, 3-contact block

C4303 	C4304 	C4305 	C4306
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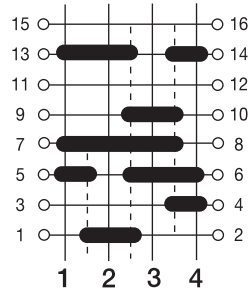
표준 회로집 | Example of Standard Circuit

4-position, 4-contact block

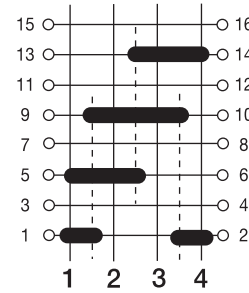
C4403



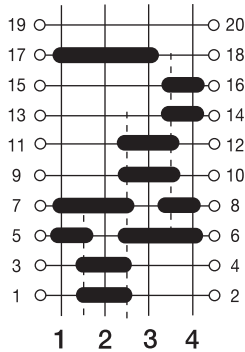
C4404



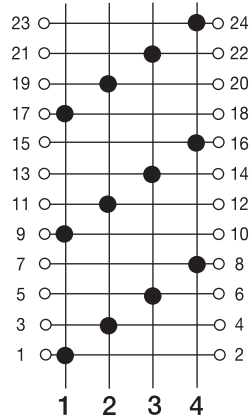
C4405

4-position,
5-contact block

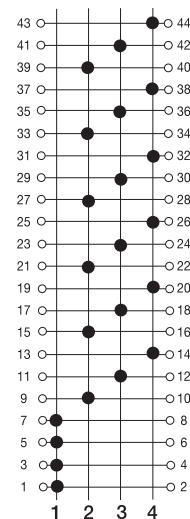
C4501

4-position,
6-contact block

C4602

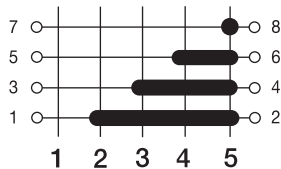
4-position,
11-contact block

C41101 (C4111)

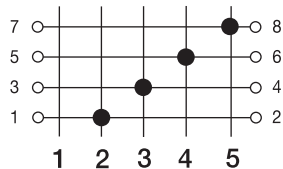


5-position, 2-contact block

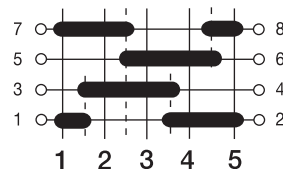
C5201



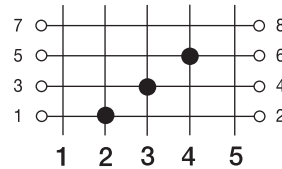
C5202



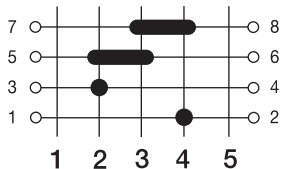
C5203



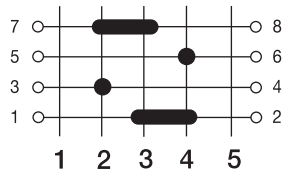
C5204



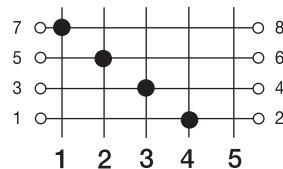
C5205



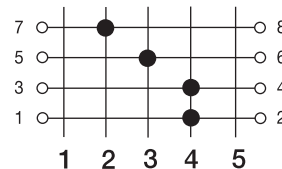
C5206



C5207



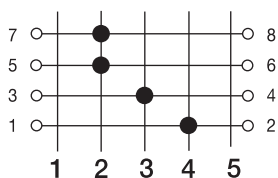
C5208



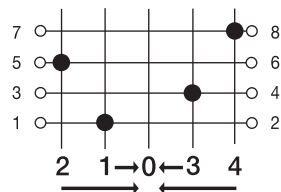
표준 회로집 | Example of Standard Circuit

5-position, 2-contact block

C5209

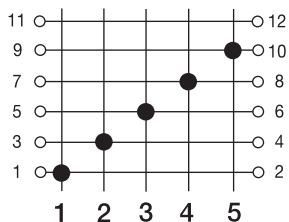


C5210A(30° 전용)

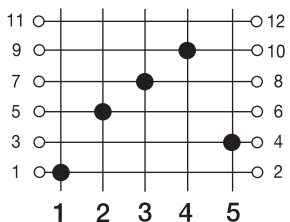


5-position, 3-contact block

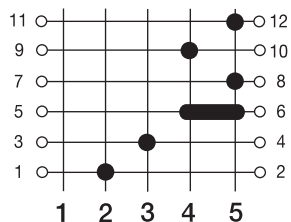
C5301



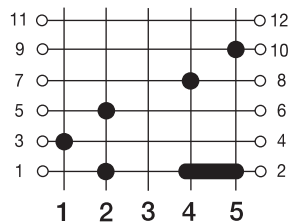
C5302



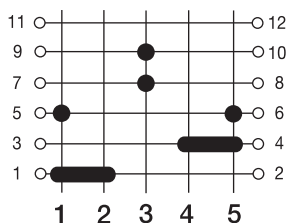
C5303



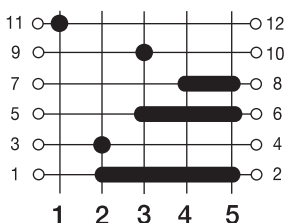
C5304



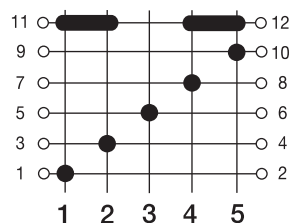
C5305



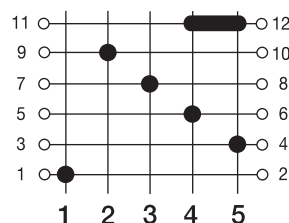
C5306



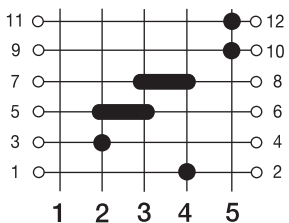
C5309



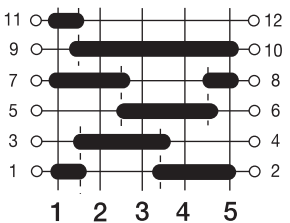
C5310



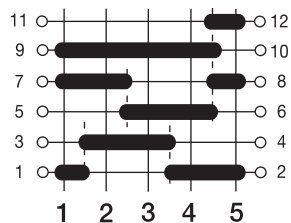
C5311



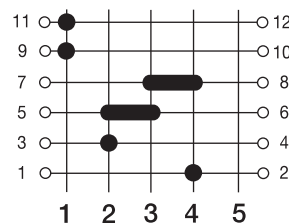
C5312



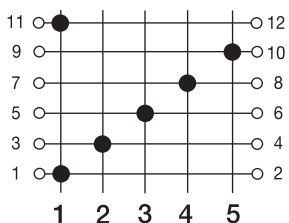
C5313



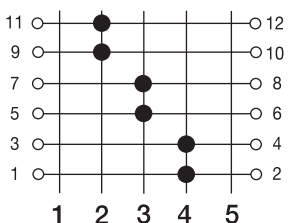
C5314



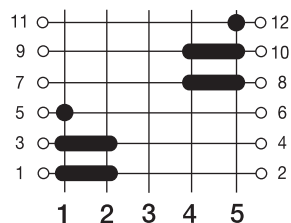
C5315



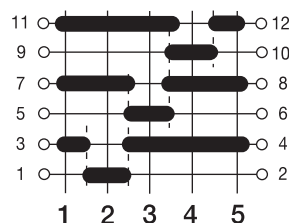
C5316



C5317

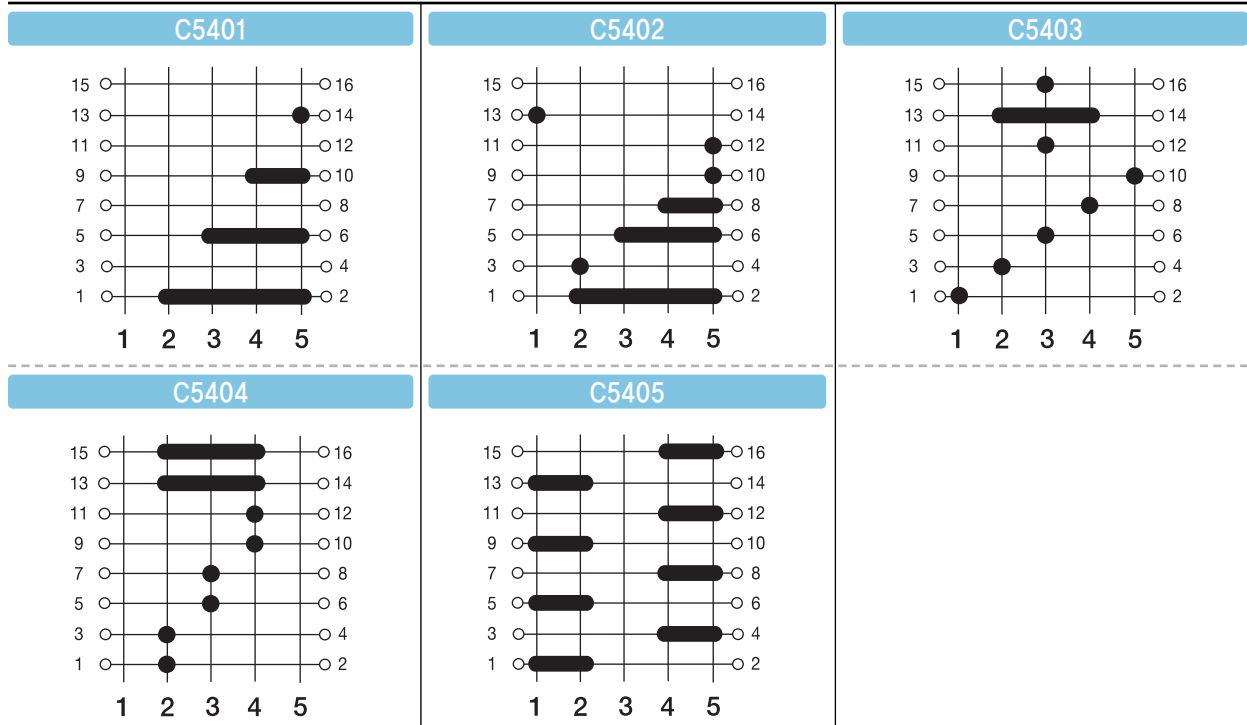


C5318

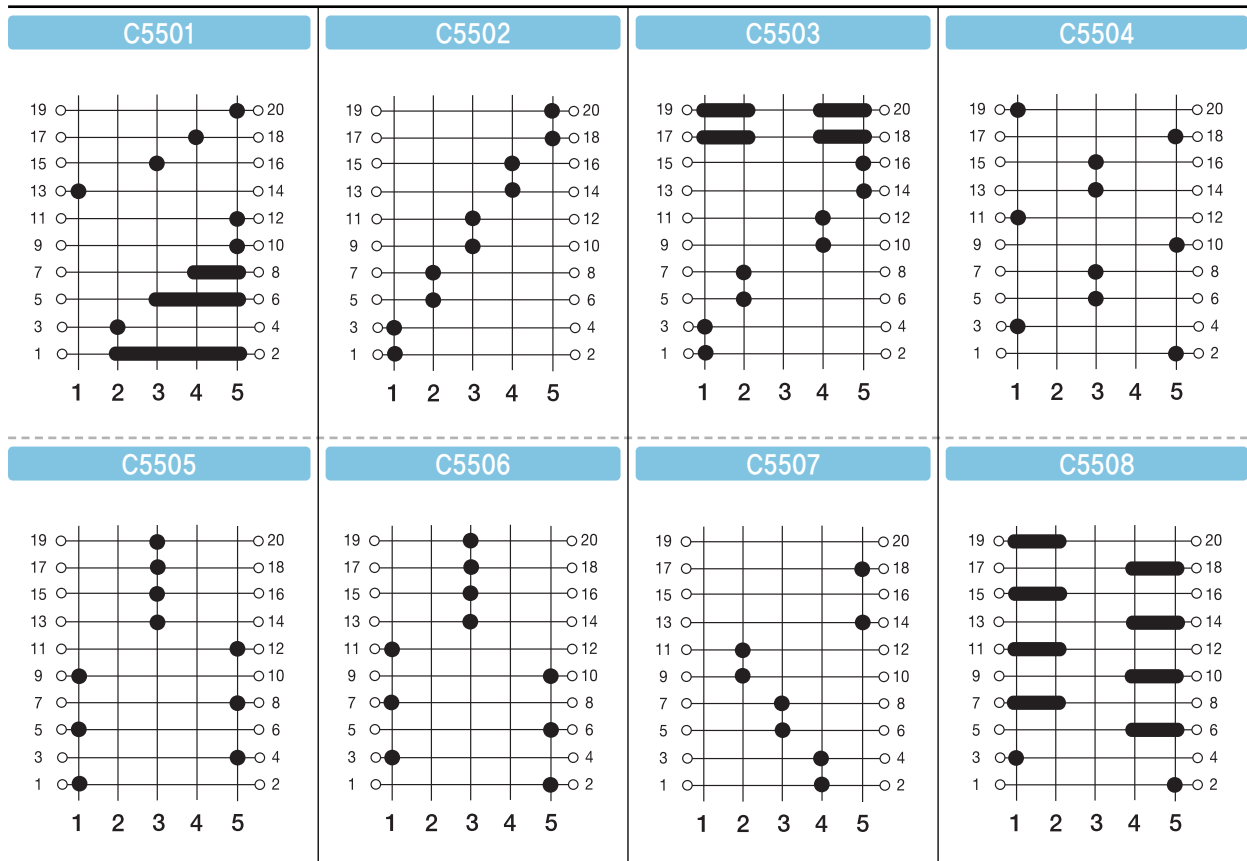


표준 회로집 | Example of Standard Circuit |

5-position, 4-contact block



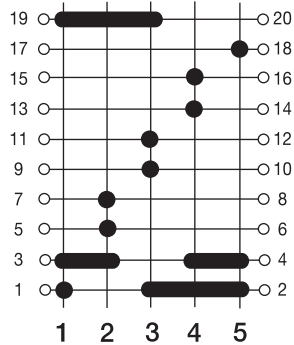
5-position, 5-contact block



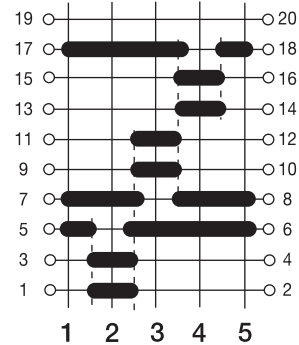
표준 회로집 | Example of Standard Circuit

5-position, 5-contact block

C5509

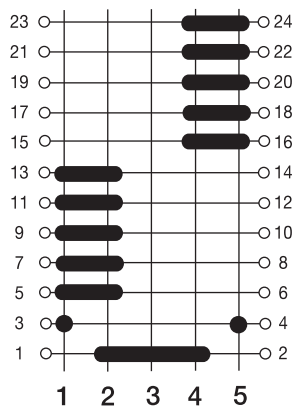


C5510



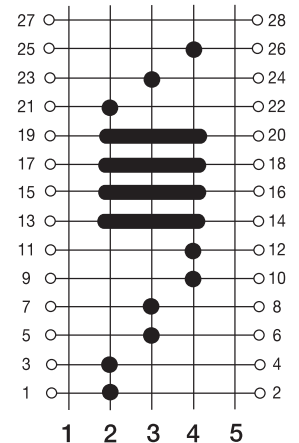
5-position, 6-contact block

C5601



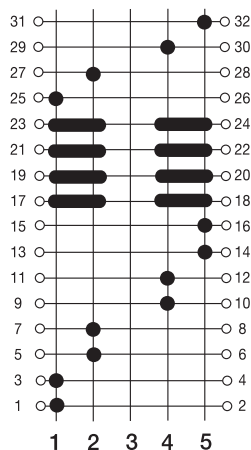
5-position, 7-contact block

C5701

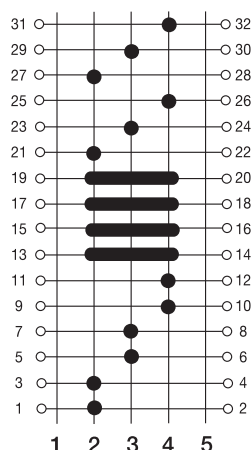


5-position, 8-contact block

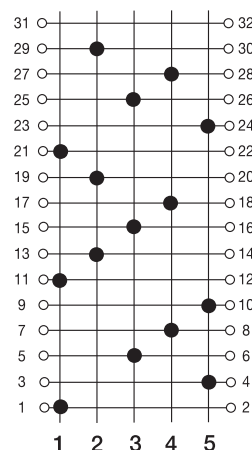
C5801



C5802

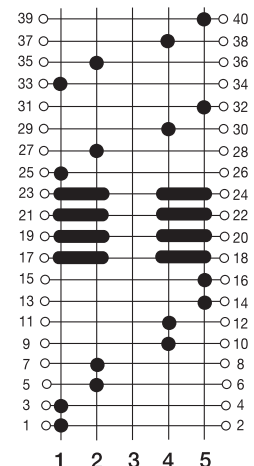


C5803



5-position, 10-contact block

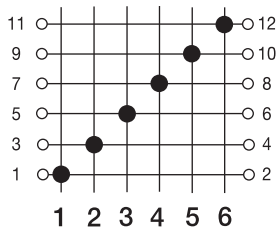
C51001(C5001)



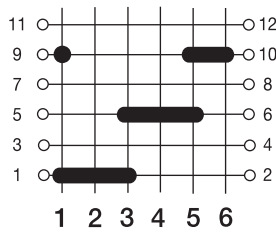
표준 회로집 | Example of Standard Circuit

6-position, 3-contact block

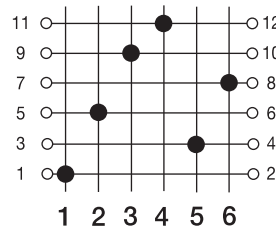
C6301



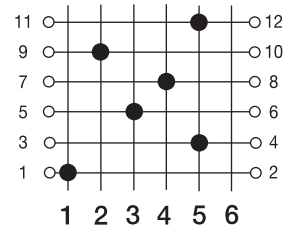
C6302



C6303

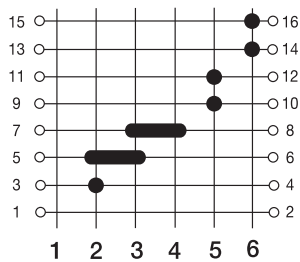


C6304



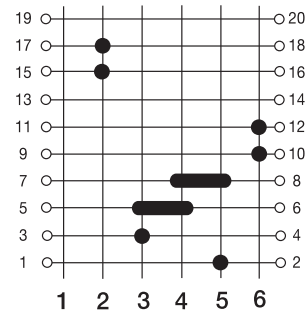
6-position, 4-contact block

C6402



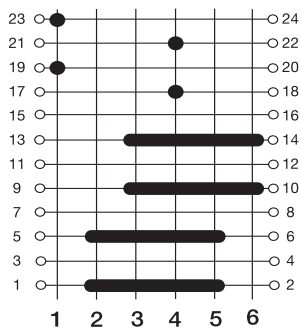
6-position, 5-contact block

C6501

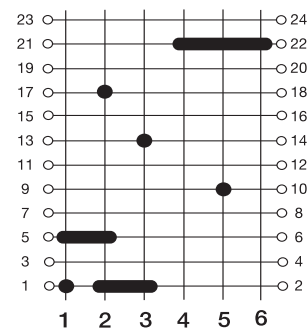


6-position, 6-contact block

C6601



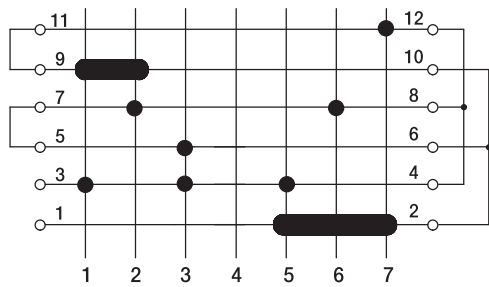
C6602



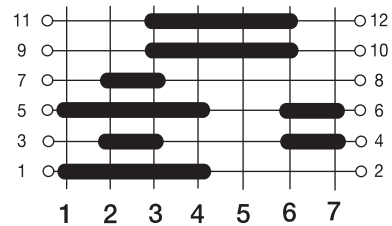
표준 회로집 | Example of Standard Circuit

7-position, 3-contact block

C7301

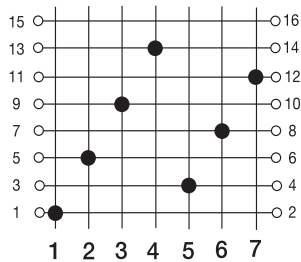


C7302

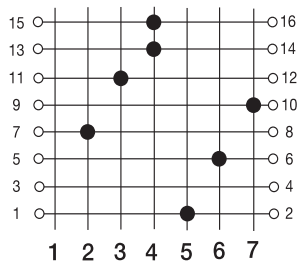


7-position, 4-contact block

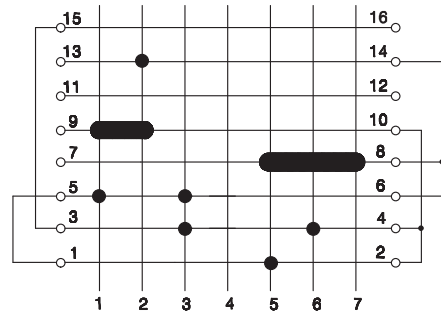
C7401



C7402

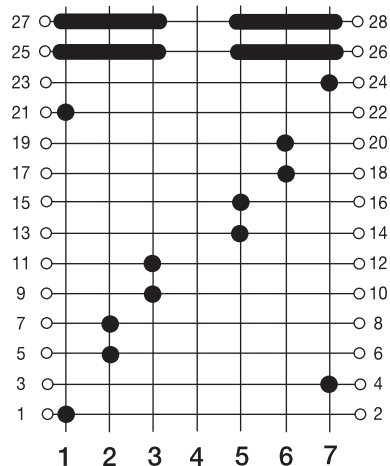


C7403



7-position, 7-contact block

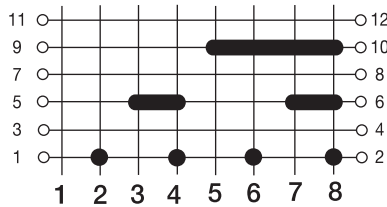
C7701



표준 회로집 | Example of Standard Circuit |

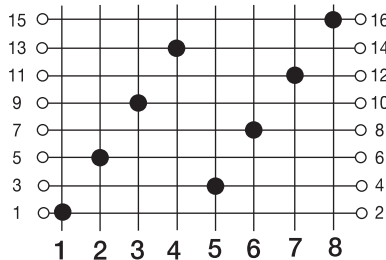
8-position, 3-contact block

C8301

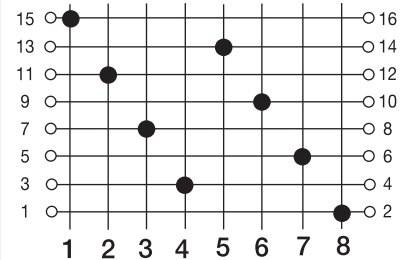


8-position, 4-contact block

C8401

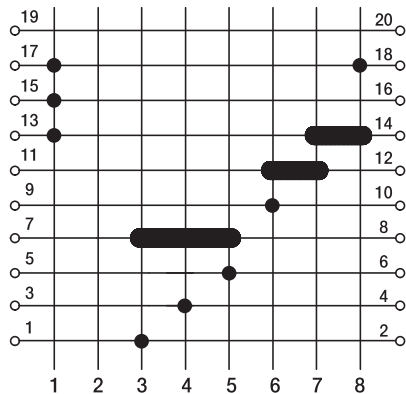


C8402



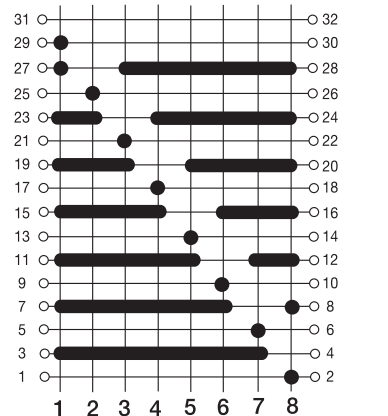
8-position, 5-contact block

C8504



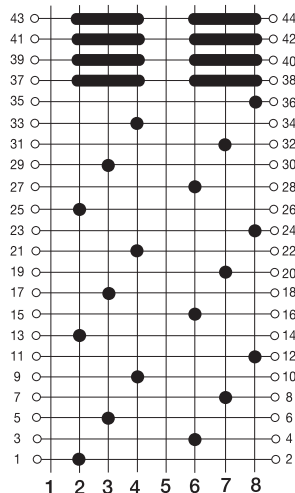
8-position, 8-contact block

C8801



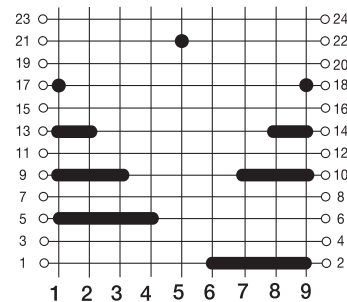
8-position, 11-contact block

C81101 (C8111)



9-position, 6-contact block

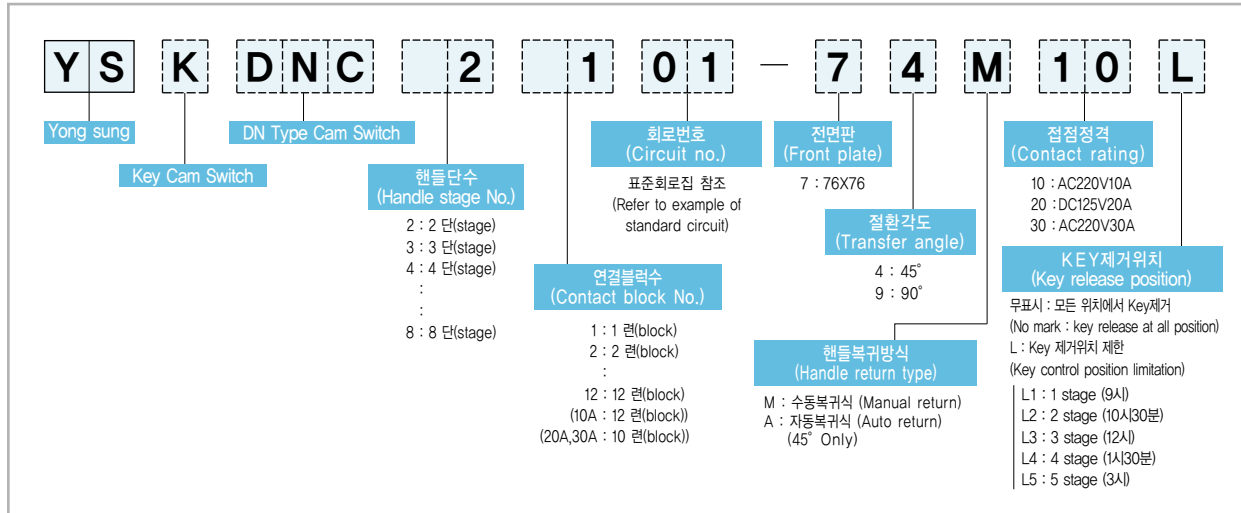
C9601



2-5

키 캠 스위치
Key Cam Switch

형식 구분도 | Type Classification Diagram - KDNC |



특징 | Features |

- 각 단에서 핸들을 고정시킬 수 있습니다.
- 절환 각도 90° 2단, 45° 8단까지 제작 가능합니다.
- Key 뽑는 위치 제한 가능합니다.
- 산업용 설비, 공작기계, 자동 개폐 조작기 등 각종 전기회로의 절환용으로 광범위하게 사용할 수 있습니다.
- Key 종류는 70종입니다.
- Handle can be fixed at each stage.
- Transfer angles can be manufactured 90° 2 stages to 45° 8 stages.
- Key release position can be controlled.
- Various using for transfer of each electrical circuit for in-dustrial equipments, machine tool, auto on-off control machines.
- There are 70 different types of key.

부품 재질 | Part Materials |

부 품 (Part)	재 질 (Materials)
손잡이 (Handle)	아연 합금 (Zinc alloy, Ni plating)
키 (Key)	황동 (Brass, Ni plating)
키 뭉치 (Key ass'y)	아연 합금 (Zinc alloy)
키 몸체 (Key body)	PBT 수지 (PBT Resin)
부착판 (Mounting plate)	아연 합금 (Zinc alloy, Black coating)

※ 스위치부 부품 재질은 기존 캠스위치와 동일합니다. (The part material of switch is same as Cam Switch existed.)

- 성능 및 정격은 Cam Switch를 참조하십시오.
- Refer to Cam Switch for peromance and rating.

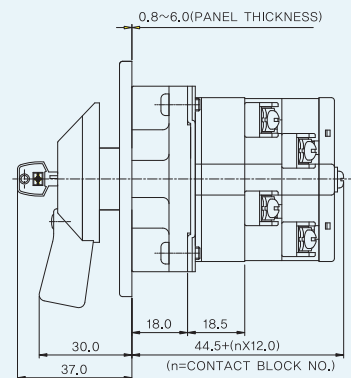
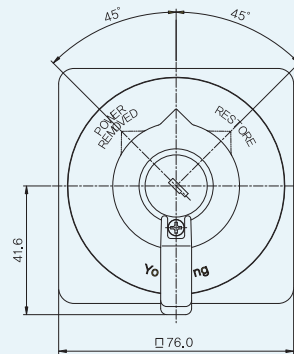
제작 가능 연수 | Possible Manufacturing Number of Connection Block |

정격 (Rating)	10A	20, 30A
핸들복귀 방식 (Handle Return Type)		
수동 복귀식 (Manual Return Type)	12련 (Block)	10련 (Block)

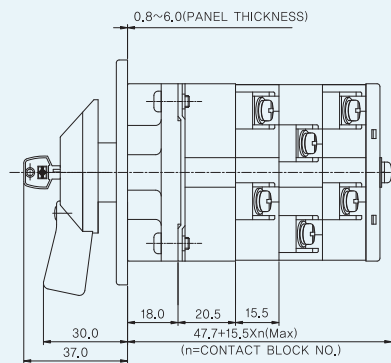
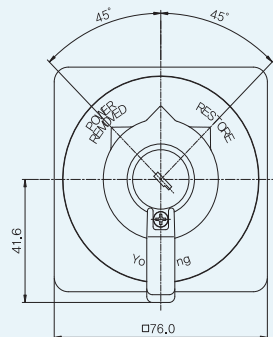
외형 / 치수도 | Shape / Dimension Drawing |

(unit : mm)

10A

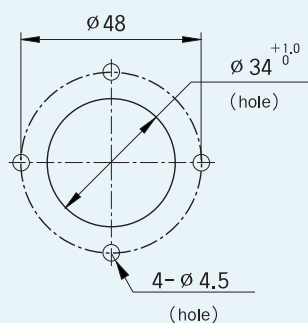


20A / 30A



판넬 가공 치수 | Cut-out Dimension |

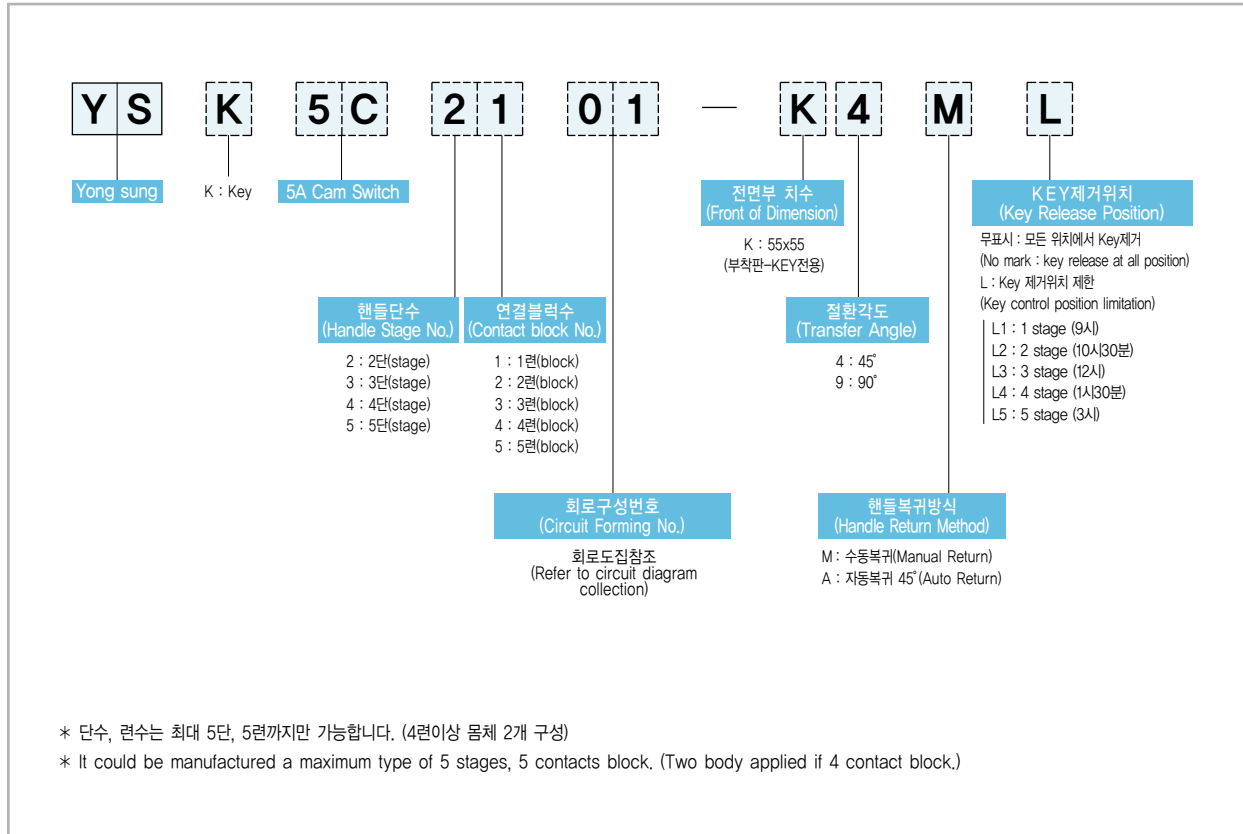
(unit : mm)



2-6

키 캠 스위치 (5A)
Key Cam Switch (5A)

형식 구분도 | Type Classification Diagram |



특징 | Features |

- 각 단에서 핸들을 고정시킬 수 있습니다.
- 전환 각도 90° 2단, 45° 5단까지 제작 가능합니다.
- 산업용 설비, 공작기계, 자동 개폐 조작기 등 각종 전기회로의 전환용으로 광범위하게 사용할 수 있습니다.
- Key 종류는 70종입니다.
- Handle can be fixed at each stage.
- Transfer angles can be manufactured 90° 2stages to 45° 5 stages.
- Various using for transfer of each electrical for industrial equipments, machine tool, auto on-off control machines.
- There are 70 different types of key.

사용시 주의사항 | Remarks in Use |

- 무리한 힘을 가하여 키를 돌리면 부러짐이 발생할 수 있으므로 주의하여 주십시오.
 - 무리한 힘을 가하여 핸들을 돌리면 내부구조 파손의 우려가 있으니 주의하여 주십시오.
 - 핸들을 돌릴 때 작동 각도의 반 이상 돌아가면 자동으로 회전하므로 억지로 돌리지 마십시오.
 - 정격을 확인하여 정격 이외의 사용을 하지 마십시오.
 - 스위치 이외의 목적에는 사용하지 마십시오.
 - 회로 결선시 회로도 확인하여 연결하십시오.
 - 환경조건(온도, 습도)을 확인하여 안전 조치를 취하십시오.(감전 및 쇼트의 원인)
 - CAM SWITCH 안에 내장되어 있는 2접점(4단자)은 캠에 대하여 대칭으로 배치되어 있어서 핸들의 각도가 180도 회전되면 2접점 모두 폐로 또는 개로 상태가 되니 임의 개조하지 마십시오.
 - 배선시 무리하게 비틀거나 힘을 가하지 마십시오.
 - 나사의 조임강도는 8 kgf · cm 이하로 조여 주십시오.
-
- Do not force excessively the key when turning the Key. It might be broken
 - Be careful with internal structure. It might be broken when turning the handle with strong force.
 - It could be automatically turned when user turn the handle from start point to an half of transfer angle.
 - Please double-check the rating of product.
 - It is only allowed to use for switch.
 - Please check with circuit diagram when connecting the circuit.
 - Please check the surrounding condition (Temperature, humidity) to follow safety control (Reason of an electric shock).
 - Do not convert or disassemble.
- 2 contact point (4 terminal points) in CAM SWITCH positioned symmetry point of CAM.
Therefore when handle turns at an angle of 180 degrees, all 2 contacts Point are opened or closed.
- Do not twist or give pressure to them, when wiring.
 - Screw up under 8 kgf · cm.

부품 재질 | Part Materials |

부 품 (Part)	재 질 (Materials)
손잡이 (Handle)	아연 다이캐스팅 (Ni 도금) (Zn diecasting) (Ni plating)
키 (Key)	황동 (Ni 도금) (Brass) (Ni plating)
키 뭉치 (Key Ass'y)	아연 다이캐스팅 (Ni 도금) (Zn diecasting) (Ni plating)
키 몸체 (Key Body)	ABS 내열 Resin (Heat Resistance ABS Resin)
부착판 (Mounting Plate)	ABS Resin

* 스위치부 부품 재질은 기존 캠 스위치(5A)와 동일합니다.

* Raw material used in switching part is same as existing 5A Cam Switch.

성능 개요 | Performance Summary |

기계적 수명 (Mechanical Lifetime)	500,000회 이상 (above 500,000 times)
전기적 수명 (Electrical Lifetime)	100,000회 이상 (above 100,000 times)
접촉저항 (Contact Resistance)	50mΩ 이하 (초기치) (below 50mΩ) (Initial value)
절연저항 (Insulation Resistance)	100MΩ 이상 (Above 100MΩ <DC500V. Meg>)
내전압 (Withstand Voltage)	AC 2,500V/min
사용주위온도 (Ambient Temperature)	-25℃ ~ +45℃
상대습도 (Relative Humidity)	45 ~ 85%

접점 정격 | Contact Rating |

정격절연전압 (Rating Insulation Voltage)			AC250V	
정격통전전류 (Rating Conductive Current)			7A	
정격사용전압 (Rated Voltage)			110V	220V
정격사용전류 (Rated Current)	교류 (AC)	저항부하 (Resistive Load)	7A	5A
		유도부하 (Inductive Load)	2.4A	1.2A
	직류 (DC)	저항부하 (Resistive Load)	1.4A	0.7A
		유도부하 (Inductive Load)	0.5A	0.2A

적용규격 (Applied standard) ----- IEC 60947-5-1, KSC 4519

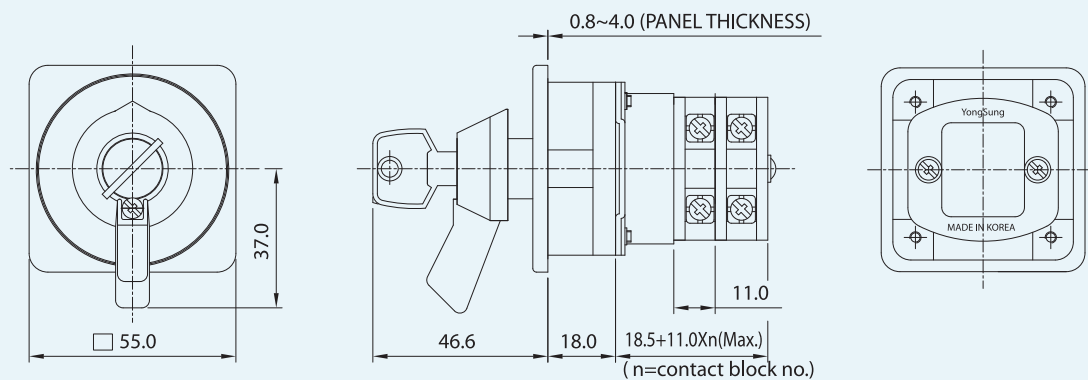
교류유도부하 (AC Inductive Load) ----- COSØ=0.4

직류유도부하 (DC Inductive Load) ----- T_{0.95}=300ms

외형 / 치수도 | Shape / Dimension Drawing |

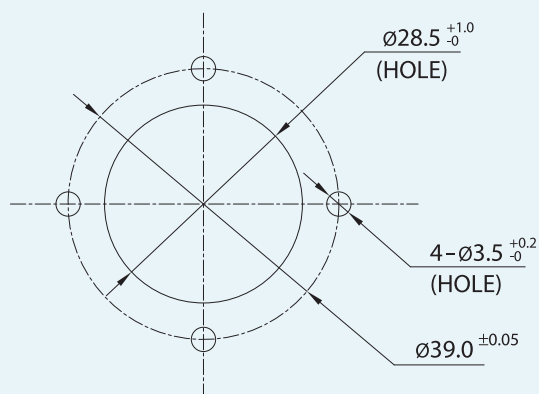
(unit : mm)

키 캠 스위치 (5A) / Key Cam Switch (5A)

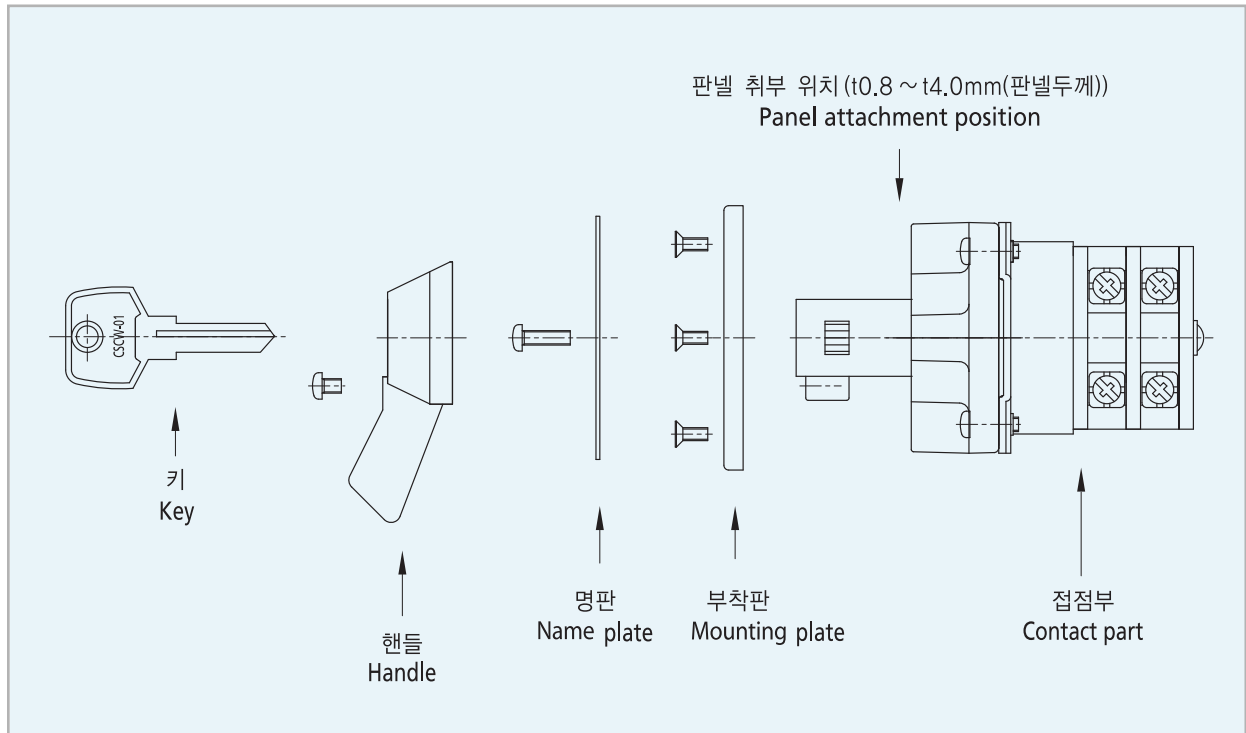


판넬 가공 치수 | Cut-out Dimension |

(unit : mm)



조립 방법 | Assembling Method



1. 분해 순서 (Disassemble procedure)

- 1) 키를 제거위치로 위치시킨 다음 왼쪽으로 돌려 뺀다.
Positioned key at key release position. And then turn it left to pull out from original position.
 - 2) 핸들 볼트(1EA)를 풀고, 핸들을 분해한다.
Undo the handle bolt (1EA). Disassemble the handle.
 - 3) 명판 볼트(2EA)를 풀고, 명판을 분해한다.
Undo the name plate bolt (2EA). Disassemble the marking plate.
 - 4) 부착판 볼트(4EA)를 풀고, 부착판을 분해한다.
Undo the mounting plate bolt (4EA). Disassemble the mounting plate.
- ※ 분리한 부품은 분실 위험이 있으니 보관에 주의하십시오.
(Please keep the disassemble part in the safe place it might involve the risk of loss.)

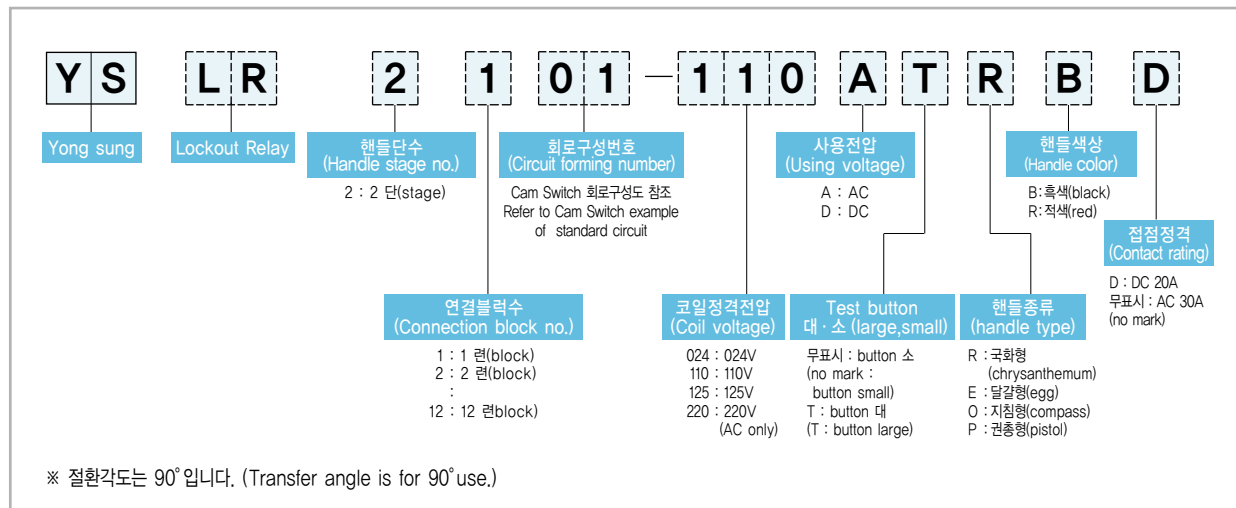
2. 조립 순서 (Assemble procedure)

- 1) 접점부를 패널 부착 위치에 대고, 부착판 볼트홀과 접점부 홀을 일치 시킨다.
Positioned contact part on the panel attachment surface, positioned the bolt hole and the contact hole at the same space to combine.
 - 2) 부착판 볼트(4EA)를 부착판 4홀에 넣고 조여준다.
Moved the mounting plate bolt (4EA) in the mounting plate hole (4 holes). And then, tighten the bolt.
 - 3) 명판을 부착판 홈에 넣는다.
Positioned the name plate in the mounting plate hole.
 - 4) 볼트 홀을 일치 시킨 후 볼트(2EA)를 2홀에 넣고 조여준다.
Positioned the bolt (2EA) and Bolt hole (2EA) at the same space to combine, And then, tighten the bolt.
 - 5) 핸들을 키 몸체에 조립 후 핸들 볼트(1EA)를 조여준다.
Assembled the handle into the body of the key. And then, tighten the handle bolt (1EA).
- ※ 나사의 조임강도는 8 kgf · cm 이하로 조여준다. (Screw up under 8 kgf · cm)

2-7

로크아웃 릴레이 Lockout Relay

형식 구분도 | Type Classification Diagram |



특징 | Features |

- 외부신호에 의한 고속자동 TRIP/수동 RESET형의 보조 Relay
- 동작시 적색 또는 녹색의 TRIP표시장치가 되어 있어 육안으로 식별이 가능하다. (TRIP시 무지개판 색상 구분 필요)
- 하부의 접점은 AC250V 30A와 DC125V 20A의 두종류로써, 높은 용량으로 폭넓게 사용이 가능합니다.
- 핸들은 R형, E형, P형, O형 등 다양하며 외관이 미려합니다.
- 다양한 접점구성이 용이합니다.
- Auxiliary relay of high speed automatic trip/manual operated reset type by external signal.
- Operation state can be verified by naked eyes due to red or green trip display in operation. (When TRIP, it needs to distinguish color of rainbow plate.)
- Block contact, divided by two type AC 250V 30A, and DC 125V 20A has wide-availability with high capacity.
- Handle has various types of R, E, P, O and elegant appearance.
- Easy for various contact composition.

정격 | Rating |

접점부 (Contact part)	교류 (AC)	정격전압 (Rating voltage)	250V	600V
		정격전류 (Rating current)	30A	20A
	직류 (DC)	정격전압 (Rating voltage)	125V	220V
		정격전류 (Rating current)	20A	10A
	정격통전전류 (Rating conductive current)		30A	
코일부 (Coil part)	교류 (AC)		110V/220V 50/60Hz	
	직류 (DC)		24V/110V/125V	

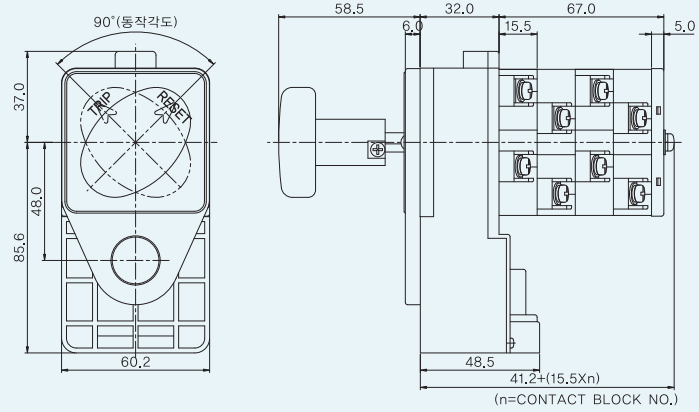
※ 직류 20A용은 영구자석이 부착되어 있습니다. (For DC 20A, permanent magnet is attached.)

※ 부품재질 및 성능개요는 Cam Switch(20A, 30A)를 참조하십시오. (Refer to Cam Switch (20A, 30A) for part materials and performance.)

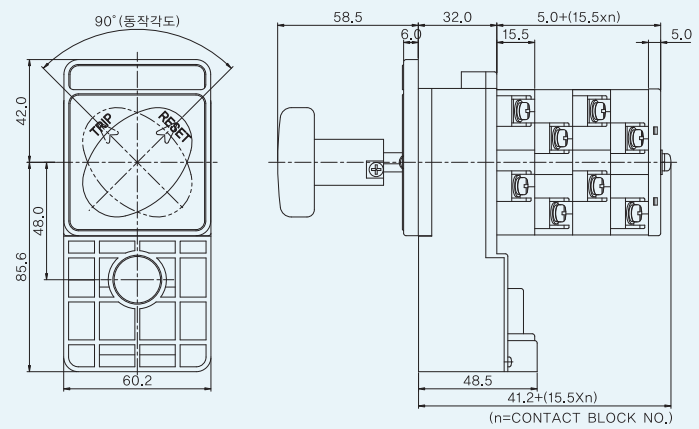
외형 / 치수도 | Shape / Dimension Drawing |

(unit : mm)

버튼 대 (Large Test Button Type)



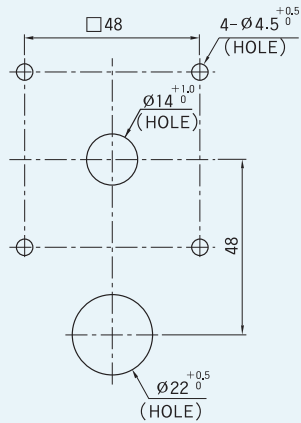
버튼 소 (Small Test Button Type)



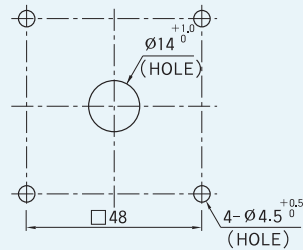
※ 부착시 배선 PVC DUCT 간섭 주의하십시오.
(Beware of interference of wiring PVC DUCT during installation.)

판넬 가공 치수 | Cut-out Dimension |

(unit : mm)

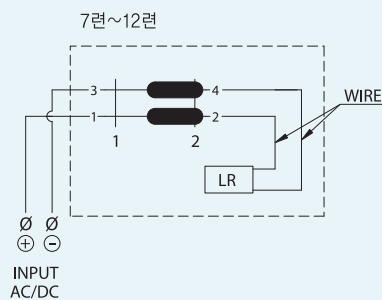
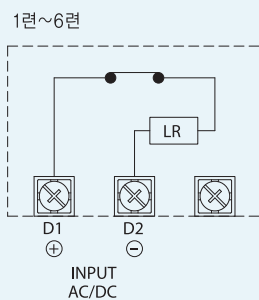


Test Button 대 (Large Test Button)



Test Button 소 (Small Test Button)

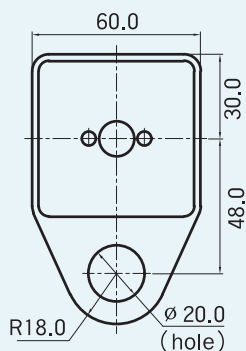
접속 회로도 | Connection Diagram |



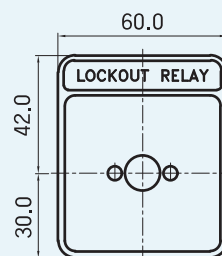
전면판 | Mounting Plate |

(unit : mm)

Test Button 대 (Large Test Button)



Test Button 소 (Small Test Button)



로크아웃 릴레이 동작 원리 | Operation Description of Lockout Relay

- (그림1) Lockout Relay의 핸들이 "TRIP" 위치에 있을 때(회로는 이상없음).
"FC" 접점과 "LR" 접점이 함께 떨어져 있다.
- (그림2) 핸들을 수동으로 "RESET" 위치로 돌렸을 때(정상위치, 회로이상없음)
스위치가 기계적으로 잠겨지므로, 수동으로는 "TRIP" 시킬 수 없다.
이때 "LR" 접점은 붙고, "FC" 접점은 계속 떨어져 있다.
- (그림3) 회로에 이상이 발생했을 때, 즉 "FC" 접점이 붙었을 때, "LR" 접점을 통하여 순간전압이 Coil에 공급되면, 핸들은 자동으로 "TRIP" 위치로 가고, "LR"접점은 떨어진다.
따라서 Coil에는 계속 전압공급이 되지 않으므로, Coil의 과열현상을 방지해 준다. 이 때 스위치의 핸들을 "RESET" 위치로 돌리면, "FC" 와 "LR" 접점을 통하여 Coil에 전압이 공급되므로, 손을 놓으면 핸들은 다시 "TRIP"위치로 돌아온다. 즉, 외부회로의 이상상태에 의해서 접촉되는 접점 "FC" 가 떨어지지 않는 한 핸들은 "RESET" 위치로 돌아올 수 없다. 회로의 이상이 고쳐지면 접점 "FC" 가 떨어지고 다시 그림(1)의 상태로 돌아오게 된다.

(Fig. 1) When the handle of Lockout Relay is in the "TRIP" position(circuit is normal), both "FC" contact and "LR" contact are separated.

(Fig. 2) Since switch stops mechanically if handle is manual operated turned to "RESET" position(circuit is normal), cannot "TRIP" manually.

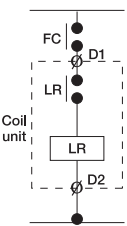
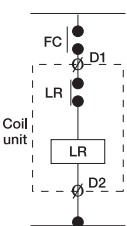
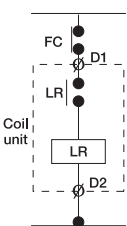
In this case, "LR" contact sticks, "FC" contact is continually separated.

(Fig. 3) When circuit is abnormal state, that is when "FC" contact sticks, if moment voltage is supplied to coil through "LR" contact, handle becomes "TRIP" position automatically and "LR" contact is separated.

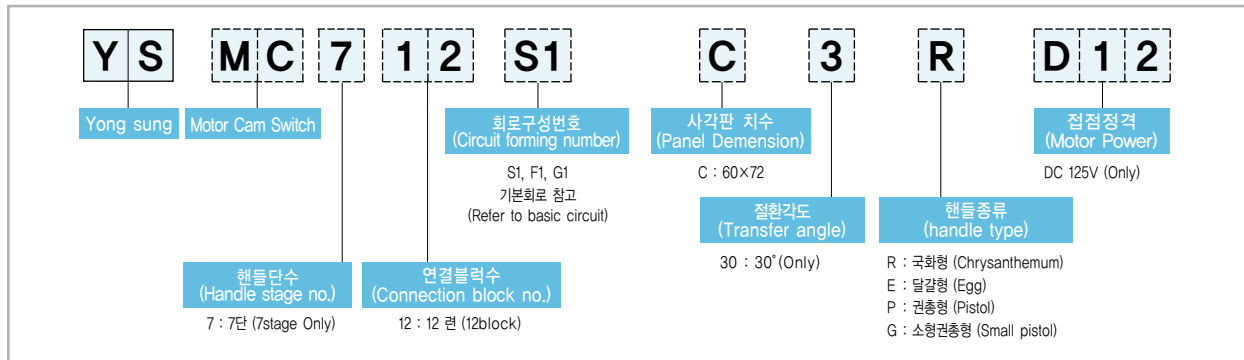
Accordingly, because continuous voltage supply to coil is not occurred overheating of coil is avoided.

Here, if handle of switch is turned to "RESET" position manually, since voltage is supplied to coil through "FC" & "LR" contacts, handle again returns to "TRIP" position when hand released.

That is, unless contact "FC" is separated by abnormal state of external circuit, handle can't return to "RESET" position. If abnormal circuit is corrected, contact "FC" is separated and returns to (Fig.1) state again.

(그림 1) (Fig. 1)	(그림 2) (Fig. 2)	(그림 3) (Fig. 3)
정상회로(circuit is normal.) - "TRIP" 위치 ("TRIP" position) - 접점 "LR" "FC" 떨어져있음 (contact "LR" "FC" separated.)	정상회로(circuit is normal.) - "RESET" 위치 ("RESET" position) - "LR" 접점 붙어있음 (contact "LR" stick) - "FC" 접점 떨어져 있음 (contact "FC" separated.)	이상(고장) 회로 (circuit is abnormal state.) - "TRIP" 위치로 S/P복귀 (S/P return to "TRIP" position) - 접점 "LR" 떨어짐 (contact "LR" separated.) - "FC" 접점 붙어있음 (contact "FC" stick)
		

형식 구분도 | Type Classification Diagram |



제품의 적용 범위 | Applications |

- 본 기기는 변전소 2중모선 구조에서 모선 P.T 2차 전압을 모선(BUS)의 연결 상태에 따라 자동으로 절체 하여 보호계 전기 및 계기용 METER, 기타 제어용 전압 등을 공급하는 장치로, 2차전압을 수동절체 시에 발생할 수 있는 각종 기기의 오동작을 방지 하고 DC 제어용 외부접점을 가지고 자동화 및 무인화(SCADA)를 위한 종합 제어보호 시스템의 효율적 계통 운용의 다양한 요구에 적합함.
- 43PD Motor Cam Switch is equipment to supply electric voltage for control to protection relay, meter ,control power voltage, etc. due to automatic transference of BUS in accordance with connection state of 2nd voltage of BUS P.T in substation double BUS structure. 43PD Moter Cam Switch protects occurring malfunction of equipment in case of manual transference of 2nd voltage.
This equipment applies for auto-control and SCADA of efficient application of total protection control system.

◀ 보호계전기반 적용 장소 ▶

- T/L 선로 보호용 배전반.
- 모선(BUS) 보호용 배전반.
- U.F.R 보호용 배전반.
- P.T 전압이 절체가 요구되는 계통전압.
- M.TR 154/23kv 보호용 배전반.

◀ Applying place of protection relay ▶

- Protection panel for T/L railway line
- Protection panel for BUS
- Protection panel for U.F.R
- System voltage of requiring transference of P.T
- Protection panel for M.TR 154/23Kv

기술 사양 | Technical Specification |

1. 접점 정격 : 250V, 20A
2. 최고 사용 전압 : 600V
3. DC 개폐용량 : DC 125V, 20A (시정수 50ms)
4. 제어전원 : DC 125V (사용전압 범위 : DC94V ~ DC 156V)
5. 동작전류 : 1.0A 이하
6. 절체 속도 : 외부 신호 입력 후 A → B 또는 B→A로, P.T 전압이 완전절체 되는 시간
2.5sec 이내 (정격 제어전압 DC 125V 공급시)
7. 전압절체시간 : 스위치 작동후 A→B 또는 B→A로 P.T전압이 절체 되는 시간
P.T 무전압 시간은 2.5초 이내. (정격제어 전압 DC 125V 공급시)
8. 절연저항 : 50MΩ 이상
9. 기기 수명 : 20만회 이상 (1회 작동 후 5초간 정지 동작)

1. Contact Rating : 250V, 20A
2. Maximum Rating Voltage : 600V
3. DC open-close volume : DC 125V, 20A (50ms)
4. Control power voltage : DC 125V (Range of using voltage : DC94V ~ DC 156V)
5. Operating electric current : below 1.0A
6. Transference speed : After inputting external signal, Bus is changed A→B or B→A
Transference time of P.T voltage perfectly is within 2.5sec.
In case of supplying rating control voltage DC 125V
7. Time of transference current : After operating switch, Bus is changed A→B or B→A
Transference time of no P.T voltage perfectly is within 2.5sec.
In case of supplying rating control voltage DC 125V
8. Insulation resistance : Above 50MΩ
9. Mechanical life time : Above 200,000 times (After operating 1 time, Equipment is stopped 5 seconds)

43PD 운전회로 설명 | Explanation for Control Circuit of 43PD |

▶ 수동운전 (Manual Control)

1. 현장 시험 또는 수동동작이 요구될 경우 전면 손잡이를 앞으로 당겨서 PULL-OUT상태 (수동조작 위치)에서 인위적인 조작이 이루어짐.
2. 원방 신호의 유,무 및 자동조작을 위한 관련 Aux-S/W 접점 위치에 관계없이 수동 동작됨.
3. 수동동작 위치 표시용 LED 녹색램프 점등.
4. 전면 손잡이를 앞으로 밀어 PULL-IN 상태 (자동조작위치)가 되면 LED 램프는 적색 점등으로 바뀌고 자동운전 조건에 따라 작동됨.
1. In case of field test or Manual operation requested, pull the handle at PULL-OUT position (manual operation position) then enable to operate manually.
2. Enable to do manual control regardless of contact position of related Aux-S/W for remote signal.
3. Lighting green LED lamp using for indicating manual operating position.
4. Pushing the handle forward at PULL-IN position (automatic operating position) then LED lamp is changed to red lighting and operated as automatic control.

▶ 자동운전 (Automatic Control)

1. 43PD 결선도면(그림1)과 같이 모선 Aux-S/W 접점을 연결하여 사용.
2. 모선 Aux-S/W 절체가 이루어지면 (A-B모선) 해당모선(B모선)으로 자동절체.
3. 모선 Aux-S/W가 동시에 투입되어 있는 브리지(BRIDGE) 상태에서는 작동하지 않고 모선 Aux-S/W 절체가 끝나는 시점에 작동됨.
4. 전면 손잡이를 앞으로 밀어 PULL-IN 상태 (자동위치조작)에서만 자동 작동되며 전면 LED 램프는 적색 점등됨.
1. Using it connected with BUS Aux-S/W contact as below 43PD connection diagram (Drawing1).
2. When BUS Aux-S/W is transferred then transferred automatically to (A-B BUS) appropriate BUS (B BUS).
3. Unable to operate at BRIDGE position where BUS Aux-S/W putted into simultaneously and enable to operate as BUS Aux-S/W transference completed.
4. Operated automatically only at PULL-IN position (automatic operating position) pushing front handle forward.

▶ 원방조작운전 (Remote Control)

1. 43PD 결선도면 (그림2)과 같이 원방조작 접점을 결선하여 사용.
2. 원방조작 신호는 A-BUS, B-BUS, OFF 3가지 접점을 사용함.
3. 자동조작 상태(PULL-IN상태)에서만 작동하고 수동조작 상태 (PULL-OUT 상태)에서는 작동되지 않음.
1. Using contact of remote control after connecting as below 43PD connection diagram (Drawing2).
2. Remote control signal uses three contacts such as A-BUS, B-BUS, OFF.
3. Enable to operate at automatic control position (PULL-IN position) and Unable to operate at manual control position (PULL-OUT position).

▶ 자동/원방조작운전 (Automatic / Remote Control)

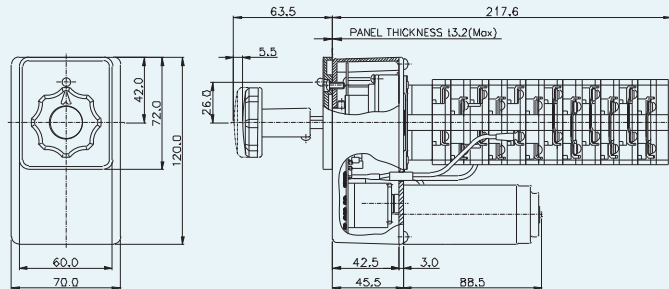
1. 43PD 결선도면(그림3)과 같이 결선하여 사용.
2. 동작은 자동 운전이나 원방조작 운전 시와 동일.
1. Using it connected as below 43PD connection diagram (Drawing3).
2. Motion form of automatic control is same as motion form of remote control.

▶ 기기 자체원방 운전방법 (Built-in remote control method)

1. 캠 스위치 손잡이를 FULL-IN하고 19번, 20번 단자에 제어전원 DC 125V 공급, 이때 LED 녹색으로 점등 확인 손잡이를 밀어 넣어 LED가 적색으로 변하는지 확인.
2. 손잡이를 중앙 OFF에 위치하여 밀어 넣어 원방조작을 체크한다.
3. 캠 스위치 5번 단자에 DC+를 공급할 때 스위치 손잡이가 B-BUS 쪽으로 들어가는지 확인.
4. 캠 스위치 7번 단자에 DC+를 공급할 때 스위치 손잡이가 A-BUS 쪽으로 들어가는지 확인.
5. 캠 스위치 9번 단자에 DC+를 공급할 때 스위치 손잡이가 중앙의(OFF)쪽으로 들어가는지 확인.
1. Pull in the cam switch handle then supply control power voltage to 19 and 20 terminal. At this moment, check whether green color of LED is changed to red color of LED pushing handle out after lighting confirmed.
2. Check remote control pushing handle in center as OFF position.
3. Check whether the switch handle moves into B-BUS when supplying DC+ to NO.5 terminal block of cam switch.
4. Check whether the switch handle moves into A-BUS when supplying DC+ to NO.7 terminal of cam switch.
5. Check whether the switch handle moves into Center position (OFF) when supplying DC+ to NO.9 terminal of cam switch.

외형 / 치수도 | Shape / Dimension Drawing |

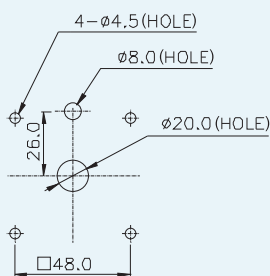
(unit : mm)



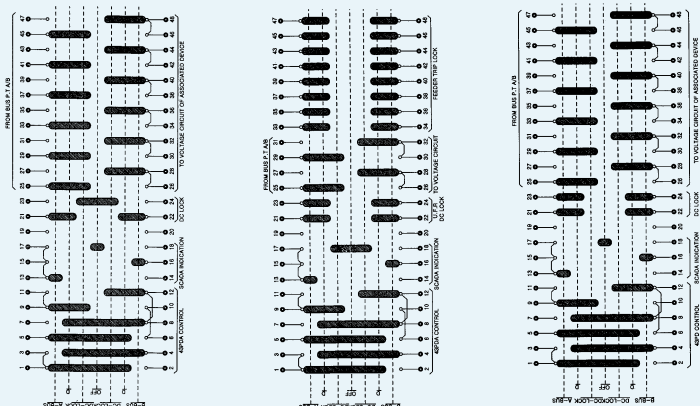
판넬 가공 치수

| Cut-out Dimension |

(unit : mm)



기본 회로도 (YSMC 7121) | Basic Circuit |



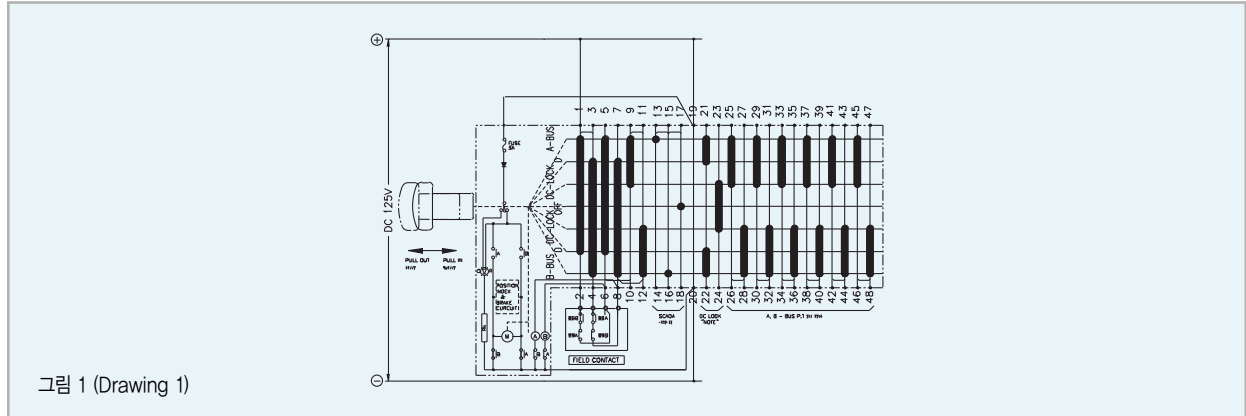
S1

F1

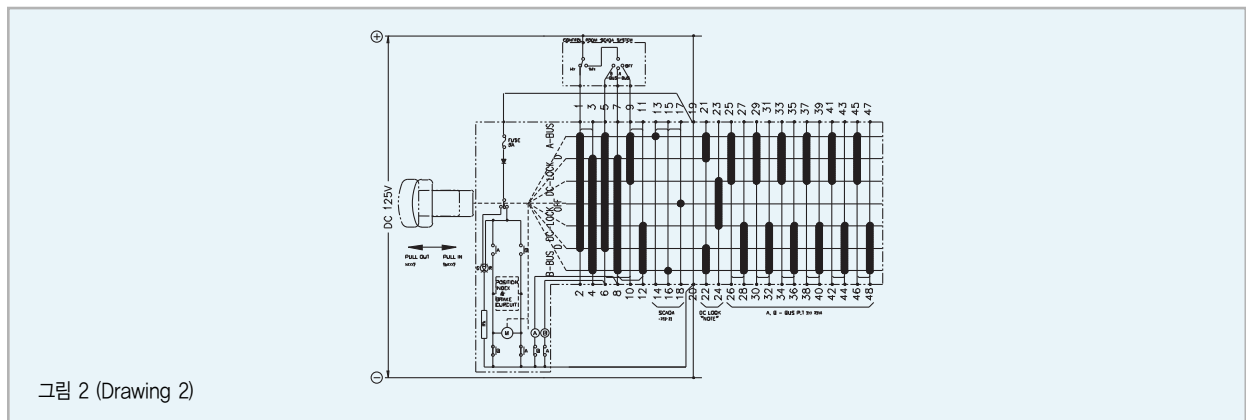
G1

43PD 결선 도면 | 43PD Connection Diagram |

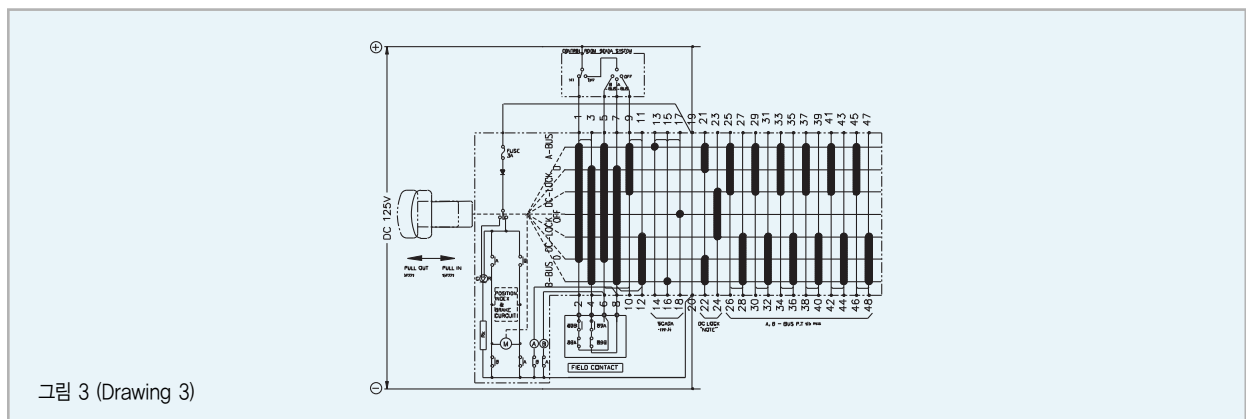
▶ A, B 모션 자동 운전시 (In case of operating automatic control A, B BUS)



▶ A, B 모션 원방 운전시 (In case of operating remote control A, B BUS)



▶ A, B 모션 자동 및 원방 운전시 (In case of operating automatic & remote controlling A, B BUS)



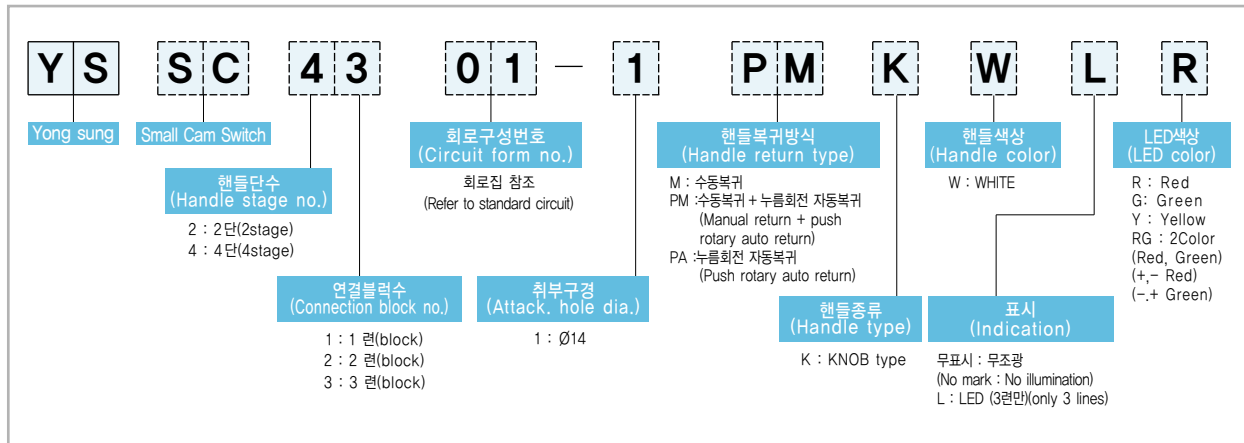
〈Note〉

1. DC LOCK 접점 구성은 43PD MODEL에 따라 차이가 있을 수 있음.
2. 43PD 접점 구성은 기본 접점 구성도 임.
3. 수동 조작 및 현장에서의 시험은 43PD의 전면 핸들을 앞으로 당겼을 때에만 조작이 가능함.
1. Contact composition of DC LOCK is possible to be different according to 43PD MODEL.
2. 43PD contact composition is basic contact composition.
3. It is able to operate manual control and field test only in case of pulling front handle out.

2-9

모자이크용 캠 스위치 (AC250V, 5A) Discrepancy Cam Switch (AC250V, 5A)

형식 구분도 | Type Classification Diagram |



특징 | Features |

- 모자이크 판넬 취부가 편리합니다.
- LED조광형, 무조광형으로 구분되어 있습니다. (조광형 제작은 3연만 가능)
- 복귀방법은 수동복귀, 수동복귀 + 누름회전 자동복귀 두종류로 되어 있습니다.
- 좁은 공간에, 밀집 부착에 매우 적합합니다.
- Convenient attachment for discrepancy panel.
- Separation of LED illuminated type and non-illuminated type.
(Only possibility of 3 lines for manufacturing of illuminated type)
- Return methods are consist of two types for manual return and manual return+push rotation auto return.
- Very suitability for narrow space and dense attachment.

사용시의 주의사항 | Remarks in Use |

- Lamp용 단자 배선시 극성에 주의하십시오.
- DC 정격전압은 완전직류치를 표시한 것입니다.
- Notice polarity when wiring terminal for lamp.
- DC rating voltage indicates direct current (DC) value.

부품 재질 | Part Materials |

부 품 (Part)	재 질 (Materials)
홀 다 (Holder)	아 연 (Zinc)
하 부 (Unit block)	폴리카보네이트수지 (Polycarbonate resin)
손잡이 (Handle)	66나이론수지 (66nylon resin)
단 자 (Terminal)	황 동 (Brass)
접 점 (Contact)	은 (Silver)

정격 | Rating |

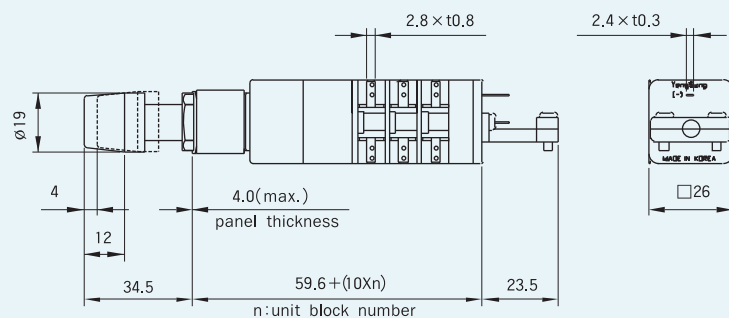
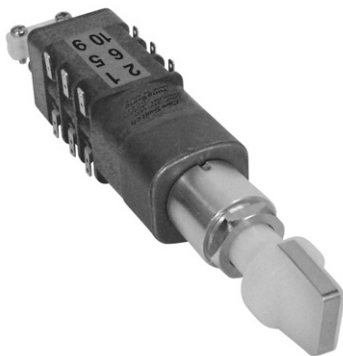
접점 정격 (Contact rating)	교류 (AC)	AC 220V 5A
	직류 (DC)	DC 24V 5A, DC 110V 2A
	통전전류 (Conductive current)	10A
LED 정격 (LED rating)		DC 24V 20mA

성능 개요 | Performance Summary |

기계적 수명 (Mechanical lifetime)	500,000회 이상 (above 500,000 times)
전기적 수명 (Electrical lifetime)	100,000회 이하 (above 100,000 times)
접촉 저항 (Contact resistance)	50mΩ 이하 (초기치) (below 20mΩ <initial value>)
절연 저항 (Insulation resistance)	100MΩ 이상 (above 100MΩ <DC 500V. Meg>)
내전압 (Withstand voltage)	AC 2,000V/min
사용주의온도 (Ambient temperature)	-25℃ ~ +40℃
상대습도 (Relative humidity)	45 ~ 85%

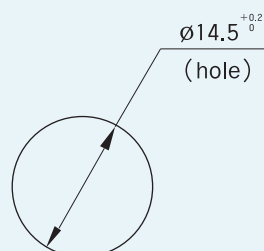
외형 / 치수도 | Shape / Dimension Drawing |

(unit : mm)

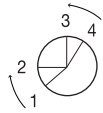


판넬 가공 치수 | Cut-out Dimension |

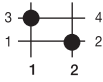
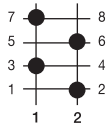
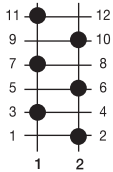
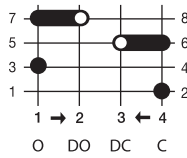
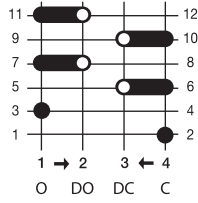
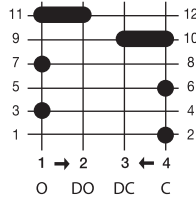
(unit : mm)



표준 핸들 위치도 | Standard Handle Position Diagram

복귀방법 (Return method)	절환각도 (Transfer angle)	2단 (2stages)	4단 (4stages)
M : 수동복귀식 (Manual return)	90°		
PM : 수동복귀 + 눌러서 돌리고 자동복귀 (Manual return push rotation and automatic return)	90° + 35°		
PA : 눌러서 돌리고 자동복귀 (Push rotation and automatic return)	35°		

표준 회로도 | Standard Circuit Diagram

2단 1련 (2position 1contact block)	2단 2련 (2position 2contact block)
SC 2101 	SC 2201 
2단 3련 (2position 3contact block)	4단 2련 (4position 2contact block)
SC 2301 	SC 4201 
4단 3련 (4position 3contact block)	
SC 4301 	C 4302 

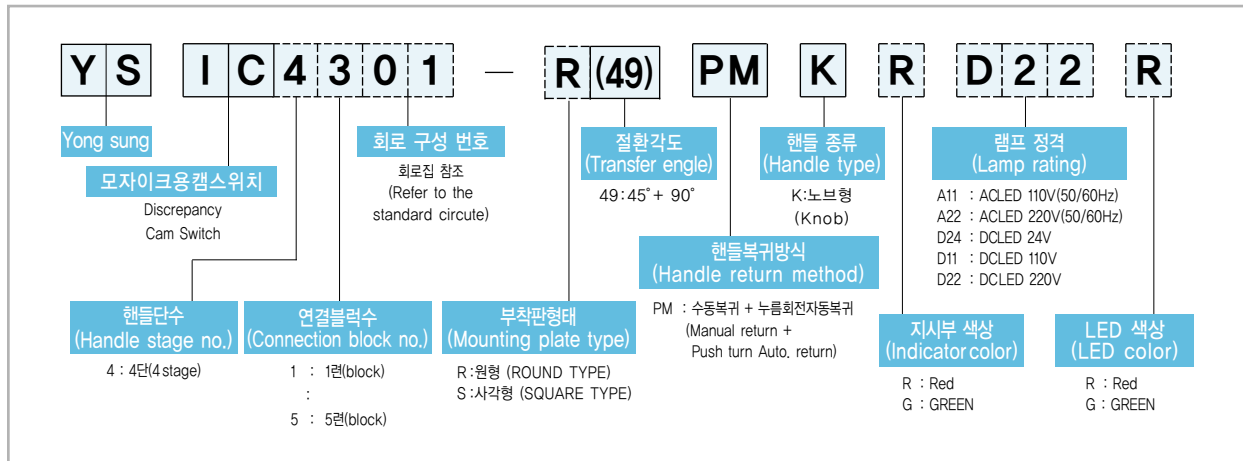
※ C : Closing / DC : Dressed To Close / DO : Dressed To Open / O : Open

2-10

모자이크용 캠 스위치 (AC250V, 10A)

Discrepancy Cam Switch (AC250V, 10A)

형식 구분도 | Type Classification Diagram |



특징 | Features |

- LED를 사용하여 램프 수명이 반영구적임. (정격에서 약 100,000시간)
- 다양한 접점 구성이 가능합니다.
- Lamp life is semi-permanent by using LED. (about 100,000 hours at rating voltage)
- Various circuit diagram is possible.

사용시의 주의사항 | Remarks in Use |

- LAMP용 단자 배선시 극성에 주의하십시오.
- 과전압 또는 과전류에 의한 LED 소손이 발생할 수 있으므로, 대책수립 바랍니다.
- LED접점용으로 무접점 스위치, PLC, 접점 보호 회로등을 사용할 경우 누설 전류에 의해 출력 OFF 상태에서도 LED가 반 점등하는 경우가 있습니다. 이 경우는 용성전기(주) 종합카탈로그 기술자료를 참조하여 대책 수립 바랍니다.
- Please be careful of polarity when a terminal is wired.
- Please be noted, there might be possibility for LED to be damaged by over voltage and current.
- Semi lighting is occurred sometimes eventhough power-off in case of using non-contact switch, PLC, or protecting curcuit of a point of contact, please refer to the catalogue of Yong Sung Eletric Co.,Ltd.

부품 재질 | Part Materials |

부 품 (Part)	재 질 (Materials)
케이스 (Case)	내열성 ABS수지 (Heat Resistance ABS resin)
홀 더 (Holder)	내열성 ABS수지 (Heat Resistance ABS resin)
손잡이 (handle)	6나일론 수지 (6NYLON resin)
베이스 (Base)	폴리카보네이트 수지 (PC resin)
너 트 (Nut)	황동 (Brass)
단 자 (Terminal)	황동 (Brass)

램프 정격 | Lamp Rating |

정격전압 (Rating voltage)	DC 24V	AC110V 50/60Hz DC110V	AC220V 50/60Hz DC220V
소비전력 (Power consumption)	0.5W 이하 (below 0.5W)	2.2VA/2.2W 이하 (below 2.2VA/2.2W)	4.4VA/4.4W 이하 (below 4.4VA/4.4W)
정격전류 (Rating current)	20mA 이하 (below 20mA)	20mA 이하(below 20mA)	
LAMP 색상 (Lamp color)	적(RED), 녹(GREEN)		

- 스위치 정격은 기존 캠스위치(10A)와 동일합니다.
- 정격전압의 허용범위는 $\pm 10\%$ 입니다.

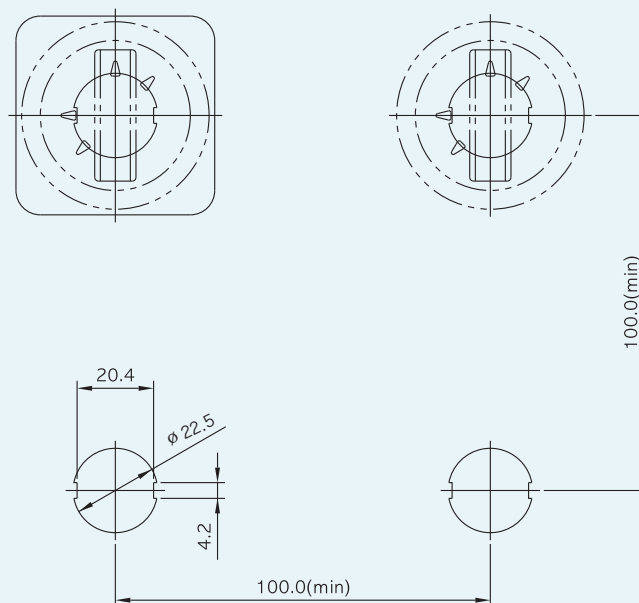
- Contact rating is same as existing cam switch(10A).
- A permitted limit of rating voltage is $\pm 10\%$.

성능 개요 | Performance Summary |

절연 저항 (Insulation resistance)	100M Ω 이상 (Above 100M Ω (DC 500V. Meg))
내전압 (Withstand voltage)	AC 2,500V/1min
사용주위온도 (Ambient temperature)	-25 ~ +40°C
상대습도 (Relative humidity)	45 ~ 85%

판넬 가공 치수 | Cut-out Dimension |

(unit : mm)



- 너트 조임공구는 27mm용 스패너 사용 가능합니다.
- Fastening tools for a nut is possible to use a wrench.

접점 정격 | Contact Rating - 10A |

정격절연전압 (Ui) (Rating insulation voltage)			AC 600V, DC 250V		
정격통전전류 (Ith) (Rating conductive current)			20A		
정격전압 (Ue) (Rating voltage)			110V	220V	440V
정격전류 (Ie) (Rating current)	교류(AC)	저항부하 (AC12) Resistive load	15A	10A	3A
		유도부하 (AC15) Inductive load	5A	3A	1A
	직류(DC)	저항부하 (DC12) Resistive load	5A	2.5A	-
		유도부하 (DC13) Inductive load	1A	0.45A	-

폐로차단전류 (Closed breaking current) = 정격전류 (Rating current) × 1.1

교류유도부하 (AC Inductive Load) ---- $\cos\phi = 0.4$

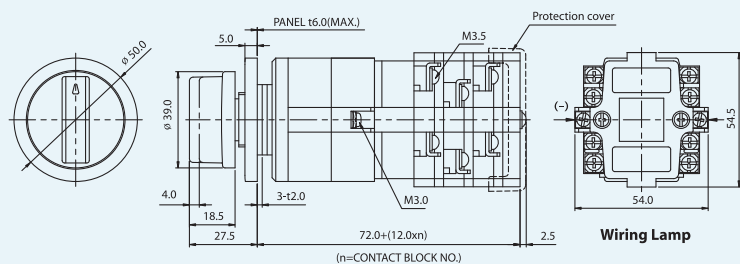
적용규격 (Applied standard) ---- IEC 60947-5-1, KSC 4519

직류유도부하 (DC Inductive Load) ---- $T_{0.95} = 300\text{ms}$

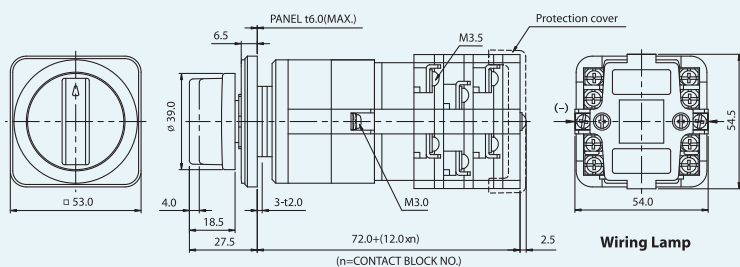
외형 / 치수도 | Shape / Dimension Drawing |

(unit : mm)

YSIC-R TYPE (원형 부착판 형식)



YSIC-S TYPE (사각형 부착판 형식)

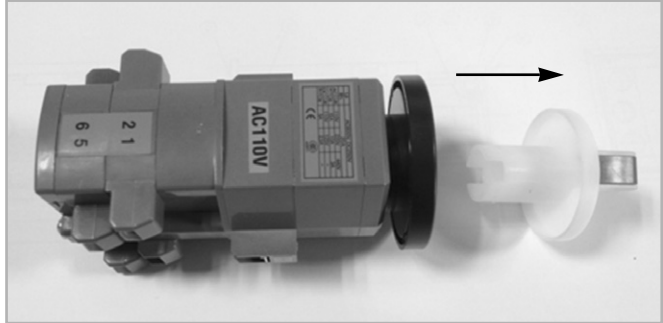


설치 | Installation

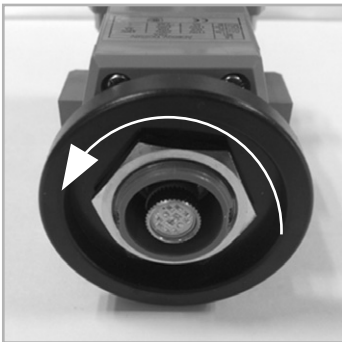
▶ 모자이크 캠 스위치 (10A) 설치 (Installation of Discrepancy Cam Switch (10A))



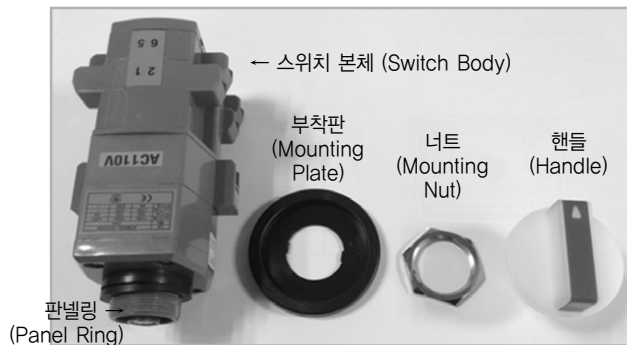
(1) 포장박스에서 제품 분리
(Separating product from packing box.)



(2) 화살표 방향으로 핸들 잡아당겨 핸들 분리
(Separating handle by pulling handle in arrow direction)



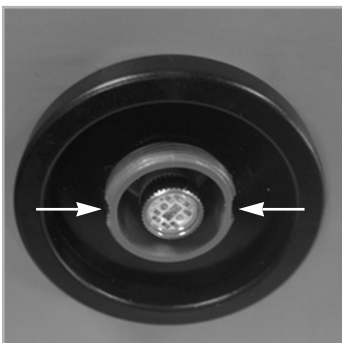
(3) 화살표 방향으로 돌려 부착너트 분리 (27mm용 스패너 사용)
(Separating the mounting nut by turning in arrow direction.)
(27mm wrench used)



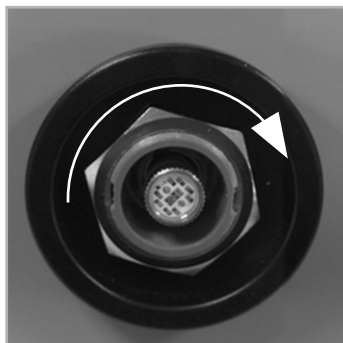
(4) 패널 두께에 따라 패널링 제거
(Removing panel ring by depending on the panel thickness.)



(5) 패널 뒤에서 부착
(Attaching product behind panel.)



(6) 화살표 방향으로 돌려 부착너트 분리
(Inserting mounting plate in groove of arrow.)



(7) 화살표 방향으로 돌려 부착너트 조립 (27mm용 스패너 사용)
(Assembling the mounting nut by turning in arrow direction.)
(27mm wrench used)



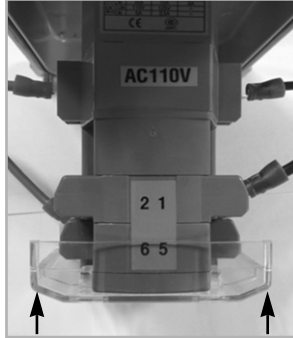
(8) 핸들을 밀어 넣어 부착
(Attaching handle by pushing.)

▶ 모자이크 캠 스위치 (10A) 보호카바 설치

(Installation of Protection Cover of Discrepancy Cam Switch (10A))



(1) LAMP 극성 확인 후 결선
및 회로에 따라 배선
(Wiring by circuit after
check LAMP polarity.)



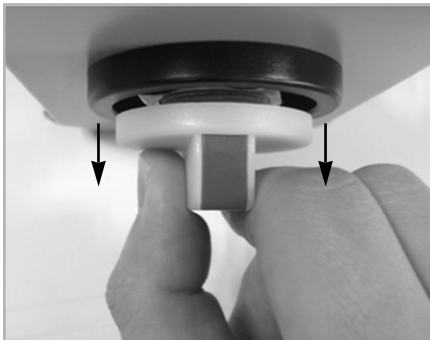
(2) 화살표 방향으로 후면에서
보호카바를 밀어 끼운다
(Put in protection cover
from backside in arrow
direction.)



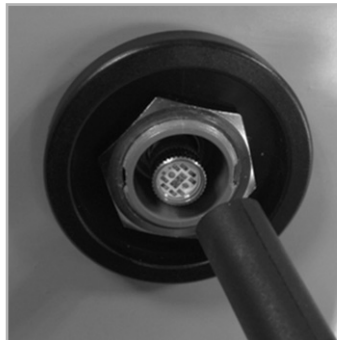
(3) 보호카바 부착된 모습
(Completion of protection cover
attached.)

LAMP 교체 | LAMP Replacement |

(unit : mm)



(1) 전면에서 핸들을 잡고 화살표 방향으로
잡아당겨 핸들 제거
(Grip handle on the front then remove
handle by pulling in arrow direction.)



(2) 전구 착탈 공구를 사용하여
LAMP에 삽입
(Inserting assembly tool for
LAMP into LAMP.)



(3) 화살표 방향으로 회전시켜
LAMP 분리
(Separate LAMP by push and
rotating in arrow direction.)

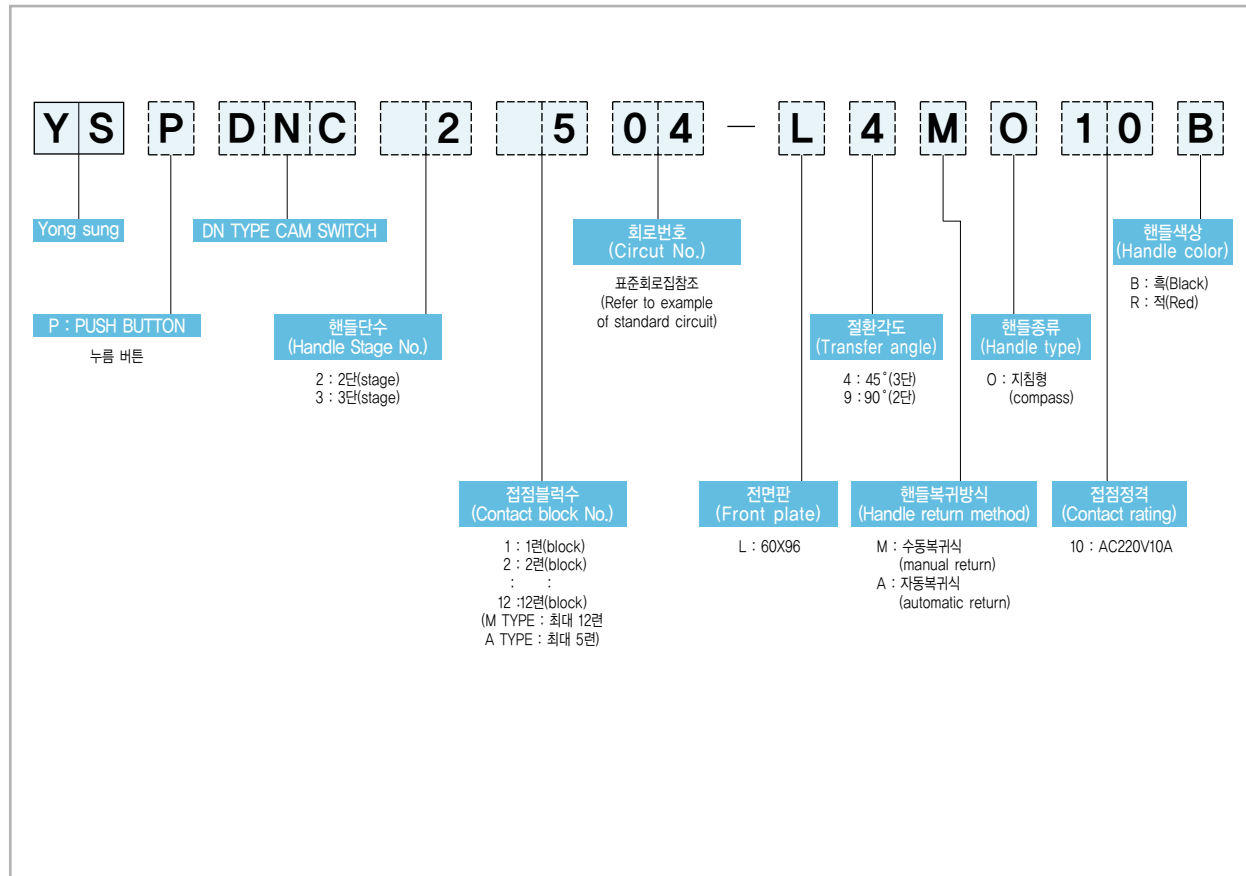


(4) LAMP 교체 후 분리 역순으로 조립
(Assembling in reverse order of separation after LAMP replacement.)

2-11

누름 버튼 캠 스위치 (10A) Push Button Cam Switch (10A)

형식 구분도 | Type Classification Diagram - PDNC 10A |



접점 정격 | Contact Rating |

정격절연전압(Ui) (Rating insulation voltage)			AC 600V, DC 250V		
정격통전전류(Ith) (Rating conductive current)			20A		
AC	정격사용전압 (Rated votage)		110~120V	220~240V	380~440V
	정격사용전류(Ie) (Rated current)	저항부하(AC12) (Resistive load)	20A	10A	6A
		유도부하(AC15) (Inductive load)	6.6A	3.3A	1.65A
DC	정격사용전압 (Rated votage)		110V	125V	220V
	정격사용전류(Ie) (Rated current)	저항부하(DC12) (Resistive load)	5A	4.4A	2.5A
		유도부하(DC13) (Inductive load)	1A	0.9A	0.5A

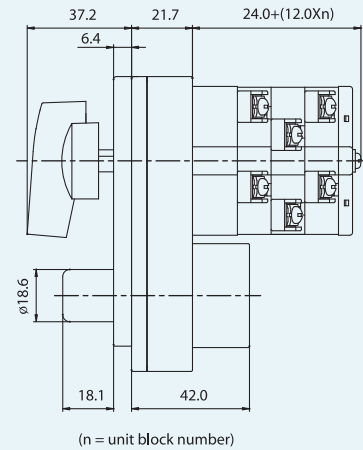
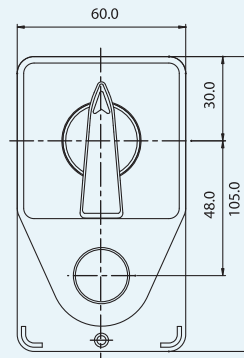
유도부하 (Inductive load) ----- COSØ=0.4, T_{0.95} = 300ms

적용규격 (Applied standard) ----- KSC 4519, IEC 60947-5-1

외형 / 치수도 | Shape / Dimension Drawing

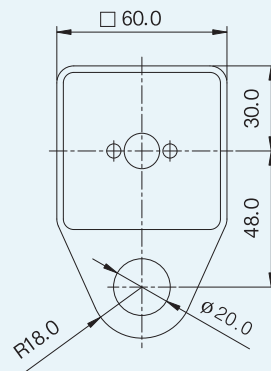
(unit : mm)

Push Button Cam Switch



전면판 | Mounting Plate

(unit : mm)



패널 가공 치수 | Cut-out Dimension

(unit : mm)

