About switch single item model No.

The single item Model No. of the switch is as follows.

SW – Switch Model No.

For the lead wire outlet direction, straight type (H) and L-shaped type (V) are available.

Cylinder Switch

CONTENTS

Cylinder Switch

Solid state switch

	M Series				R Series					T Series											K Series					F Series						
														Improved Water Resistance	For Cutting Oil			For Cutting Oil	For AC Magnetic Field												
																																
Sub-item	M2	M2WV	M3	M3WV	R1	R2	R2Y	R3	R3Y	T1	T2	T2J	T2W	T2WL	T2YL	T3	T3P	T3W	T3YL	T2YD	K2	K2Y	K3	K3P	K3Y	F2	F2Y	F2S	F3	F3Y	F3P	F3S
Grommet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Terminal box					●	●	●	●	●																							
Connector											○		○	○	○	○	○	○		○		○					○					
2-wire	●	●			●	●	●			●	●	●	●	●	●					●	●	●				●	●	●				
3-wire			●	●				●	●							●	●	●	●				●	●	●				●	●	●	●
LED	Red	Red/Green	Red	Red/Green	Red	Red	Red/Green	Red	Red/Green	Red	Red	Red	Red/Green	Red/Green	Red/Green	Red	Yellow	Red/Green	Red/Green	Red/Green	Red	Red/Green	Red	Yellow	Red/Green	Yellow	Red/Green	Red	Yellow	Red/Green	Yellow	Red
Neon lamp (Lights up when OFF)																															
No indicator etc.																															
2-color indicator type		●		●			●		●				●	●	●					●		●			●				●			
5 VDC			●					●	●														●	●							
10 VDC to 30 VDC (28 V)	●	●		●		●	●				●	●			●	●	●	●	●						●		●	●	●		●	
24 VDC													●	●						●						●						
30 VDC or less			●	●				●	●						●	●	●	●					●	●	●				●	●	●	●
100 VAC/110 V					●					●																						
200 VAC/220 V					●					●																						
Programmable Controller	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
IC circuit			●	●				●	●														●	●	●				●	●	●	●
Relay			●	●	●			●	●							●	●	●	●				●	●	●				●	●	●	●
Large capacity relay																																

Reed switch

	M Series		R Series				T Series				K Series		F Series	H Series		E Series		V Series
										For magnetized environment				For strong magnetic field		Heat resistant		For small magnetic field
																		
Main item	Sub-item	M0	M5	R0	R4	R5	R6	T0	T5	T8	TOY	K0	K5	F0	H0	H0Y	E0	ET0	V0
Wiring method	Grommet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
	Terminal box			●	●	●	●										●		
	Connector							○			○				○	○			○
Number of wires	2-wire	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3-wire																		
With indicator lamp	LED	Red		Red			Red	Red		Red	Red/Green	Red		Yellow	Green	Red/Green	Red	Yellow	Red
	Neon lamp (Lights up when OFF)				●														
	No indicator etc.		●			●			●				●						
	2-color indicator type										●					●			
Operating voltage *1	5 VDC		●			●			●				●						
	10 VDC to 30 VDC (28 V)																		
	24 VDC	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
	30 VDC or less																		
	100 VAC/110 V	●	●	●	●	●		●	●	●		●	●		●		●	●	●
	200 VAC/220 V			●	●	●				●							●		
Applications	Programmable controller	●	●	●		●	●	●	●	●	●	●	●	●	●		●	●	●
	IC circuit		●			●			●				●						
	Relay	●	●	●		●		●	●	●		●	●		●		●	●	●
	Large capacity relay				●														

●: Standard Product ○: Custom specification product (Selectable connector types vary depending on the model, so check the catalog for details.)

About switch single item model No.

Model No.notation Notation Example: SW-T2H5

SW - T2 H 5

① Switch model No. ③ Lead wire length

② Lead wire extraction direction

① Switch model No.

M2	M2WV	M3	M3WV	R1	R2	R2Y	R3	R3Y	T1	T2	T2J	T2W	T2WL	T2YL	T3	T3P	T3W	T3YL	T2YD	K2	K2Y
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Note) Please refer to the table above.

② Lead wire extraction direction

Code	H	V	V, S
Outlet direction	Straight	L-shape	L-shape
Appearance			 F*S, T2WLV only

③ Lead wire length

Blank (1 m), **3** (3 m), 5 (5 m)

* The selectable length varies depending on the model, so please check the catalog specifications for details.

Cylinder switch (Cylinder system with switch)

Solid state switch

Reed switch

Cylinder Model		Bore size	Mounting method: Band	Mounting method: Tie Rod	Mounting method: Rail	Presence / absence of magnet in main body: Standard equipment	Presence / absence of magnet in main body: Option	M Series: M0	M Series: M5	R Series: R0	R Series: R4	R Series: R5	R Series: R6	T Series: T0	T Series: T5	T Series: T8	T Series: T0Y (For magnetized environment)	K Series: K0	K Series: K5	F Series: F0	H Series: H0 (For strong magnetic field)	H Series: H0Y (For strong magnetic field)	E Series: E0 (Heat resistant)	E Series: ET0 (Heat resistant)	M Series: M2	M Series: M2WV	M Series: M3	M Series: M3WV	R Series: R1	R Series: R2	R Series: R2Y	R Series: R3	R Series: R3Y	T Series: T1	T Series: T2	T Series: T2J	T Series: T2W	T Series: T2WL (Improved Water Resistance)	T Series: T2YL (For Cutting Oil)	T Series: T3	T Series: T3P	T Series: T3W	T Series: T3YL (For Cutting Oil)	T Series: T2YD (For AC Magnetic Field)	K Series: K2	K Series: K2Y	K Series: K3	K Series: K3P	K Series: K3Y	F Series: F2	F Series: F2Y	F Series: F2S	F Series: F3	F Series: F3Y	F Series: F3P	F Series: F3S
General Type	SCP□3	ø6 to ø16	●				●							●	●																		●		●	●	●		●	●	●																
	CMK2	ø20 to ø40	●			●								●	●	●	▲														●	●	●	●	●	▲	●	●	●	▲																
	CMA2	ø20 to ø40	●			●								●	●	●															●	●	●	●	●		●	●	●	▲																
	SCM	ø20 to ø100	●		●	●								●	●	●	▲														●	●	●	●	●	▲	●	●	●	▲	●															
	SCG	ø40 to ø100		●		●								●	●	●	▲														●	●	●	●	●	▲	●	●	●	▲	●															
	SCA2	ø40 to ø100		●		●								●	●	●	▲				▲	▲	▲								●	●	●	●	●	▲	●	●	●	▲	●															
	SCA2-V	ø40 to ø100		●		●								●	●																●	●	●	●	●		●	●	●		●															
	SCS2	ø125 to ø250		●			●							●	●	●	▲														●	●	●	●	●	▲	●	●	●	▲	●															
Space-saving Type	SSD2	ø12 to ø200			●		●							●	●	●	▲						▲								●	●	●	●	●	▲	●	●	●	▲	●															
	SSG	ø12 to ø100			●		●							●	●	●	▲														●	●	●	●	●	▲	●	●	●	▲	●															
	SSD	ø12 to ø160			●		●							●	●	●	▲														●	●	●	●	●	▲	●	●	●	▲	●															
	MDC2	ø4 to ø10			●		●													●											●	●	●	●	●	▲	●	●	●	▲	●															
	SMG	ø6 to ø32			●		●											●	●												●	●	●	●	●	▲	●	●	●	▲	●															
	MSD	ø6 to ø16			●		●													●											●	●	●	●	●	▲	●	●	●	▲	●															
	FC□	ø25 to ø63			●		●	●	●																						●	●	●	●	●	▲	●	●	●	▲	●															
With Linear Guide	LCM	ø4.5 to ø8			●		●																								●	●	●	●	●	▲	●	●	●	▲	●															
	LCR	ø6 to ø25			●	●								●	●																●	●	●	●	●	▲	●	●	●	▲	●															
	LCG	ø6 to ø25			●	●								●	●																●	●	●	●	●	▲	●	●	●	▲	●															
	LCW	ø12 to ø20			●	●								●	●																●	●	●	●	●	▲	●	●	●	▲	●															
	LCX	ø25 to ø32			●	●								●	●																●	●	●	●	●	▲	●	●	●	▲	●															
	MSDG-L	ø6 to ø16			●	●														●											●	●	●	●	●	▲	●	●	●	▲	●															
Guided	STM	ø6 to ø10			●	●																									●	●	●	●	●	▲	●	●	●	▲	●															
	STG	ø12 to ø100			●	●								●	●	●	▲														●	●	●	●	●	▲	●	●	●	▲	●															
	STS/L	ø8 to ø100			●	●								●	●	●	▲														●	●	●	●	●	▲	●	●	●	▲	●															
	STR2	ø6 to ø32			●	●												●	●												●	●	●	●	●	▲	●	●	●	▲	●															
	UCA2	ø10 to ø32			●		●							●	●																●	●	●	●	●	▲	●	●	●	▲	●															
Rodless Type	SRL3	ø10 to ø100			●	●		●	●																						●	●	●	●	●	▲	●	●	●	▲	●															
	SRG3	ø12 to ø25			●		●	●	●																						●	●	●	●	●	▲	●	●	●	▲	●															
	SRM3	ø25 to ø63			●		●							●	●	●															●	●	●	●	●	▲	●	●	●	▲	●															
	SRT3	ø32 to ø63			●	●		●	●																						●	●	●	●	●	▲	●	●	●	▲	●															
	MRL2	ø6 to ø20			●		●																								●	●	●	●	●	▲	●	●	●	▲	●															
	MRG2	ø10 to ø25			●	●								●	●																●	●	●	●	●	▲	●	●	●	▲	●															

●: Standard Product ▲: Mountable depending on conditions
Varies depending on conditions such as variation and tube inner diameter. Please check the product specifications for details.

Cylinder switch (Cylinder system with switch)

Solid state switch

Cylinder Model		Bore size	Mounting method: Band	Mounting method: Tie Rod	Mounting method: Rail	Presence / absence of magnet in main body: Standard equipment	Presence / absence of magnet in main body: Option	M Series: M2	M2WV	M3	M3WV	R Series: R1	R2	R2Y	R3	R3Y	T Series: T1	T2	T2J	T2W	T2WL	T2YL	T3	T3P	T3W	T3YL	T2YD	K Series: K2	K2Y	K3	K3P	K3Y	F Series: F2	F2Y	F2S	F3	F3Y	F3P	F3S
With Brake	ULK	ø20 to ø40	●			●											●	●	●	●	●		●	●	●														
	JSK2	ø20 to ø40	●			●											●	●	●	●	●		●	●	●														
	JSM2	ø20 to ø40	●			●											●	●	●	●	●		●	●	●														
	JSG	ø40 to ø100		●		●											●		●	●	●		●	●	●		●												
	JSC3	ø40 to ø100		●		●											●		●	●	●		●	●	●		●												
	JSC4	ø125 to ø100		●			●										●	●	●	●	●		●	●	●		●												
With lock	USSD	ø20 to ø100			●		●										●	●	●	●	●		●	●	●		●												
	UFCD-KL	ø25 to ø63			●	●		●	●	●	●																												
	USC	ø40 to ø100		●		●											●	●	●	●	●		●	●	●		●												
With Valve	CKV2	ø20 to ø40	●			●											●	●	●	●	●		●	●	●														
	CAV2, COV2	ø50 to ø100		●		●											●	●	●	●	●		●	●	●		●												
Clamp Cylinder	CAC4	ø40 to ø80	●	●		●											●	●	●	●	●		●	●	●		●												
	UCAC2	ø50, ø63	●	●		●											●	●	●	●			●	●	●		●												
	CAC-N	ø32, ø40	●	●		●											●	●	●	●	●		●	●	●		●												
	UCAC-N	ø32, ø40, ø63	●	●		●											●	●	●	●			●	●	●		●												
	RCS2	ø12 to ø63			●	●											●	●	●	●	●		●	●	●		●					●	●	●	●	●	●	●	
	RCC2	ø16 to ø63			●	●												●	●	●	●		●	●	●		●					●	●	●	●	●	●	●	
Special cylinder	MVC	ø6, ø10			●	●																										●	●	●	●	●	●	●	
	STK	ø20 to ø50			●	●											●	●	●	●	●		●	●	●		●												
	MCP	Actual thrust For 2t, 5t		●	●	●											●	●	●	●			●	●	●														
	GLC	ø40 to ø100		●		●						●	●		●																								
High Speed Type	HCM	ø20 to ø63			●	●											●	●	●	●	●		●	●	●		●												
	HCA	ø20 to ø100	●			●						●	●	●	●	●																								
Swinging/Rotating Type	RRC	Size 8, 32, 63			●	●											●	●	●	●	●		●	●	●		●												
	GRC	Size 5 to 80			●	●											●	●	●	●	●		●	●	●		●												
	RV3□	Size 50 to 800					●	●		●							●				●																		
Gripper / Chuck			Catalog name [No]					Refer to Pneumatic Cylinder ⑤ [RJ-006AA].																																		

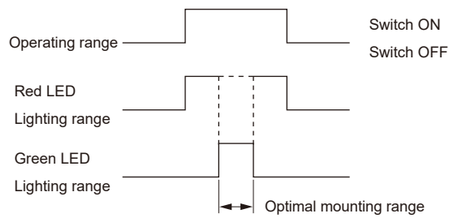
Reed switch

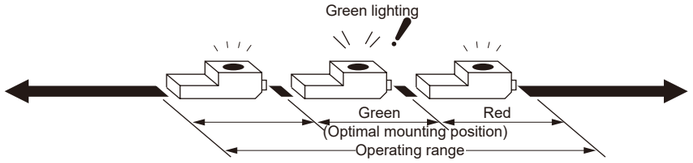
Cylinder Model		Bore size	Mounting method: Band	Mounting method: Tie Rod	Mounting method: Rail	Presence / absence of magnet in main body: Standard equipment	Presence / absence of magnet in main body: Option	M Series: M0	M5	R Series: R0	R4	R5	R6	T Series: T0	T5	T8	T0Y	K Series: K0	K5	F Series: F0	H Series: H0	H0Y	E Series: E0	ET0
With Brake	ULK	ø20 to ø40	●			●								●	●	●								
	JSK2	ø20 to ø40	●			●								●	●	●								
	JSM2	ø20 to ø40	●			●								●	●	●								
	JSG	ø40 to ø100		●		●								●	●	●	▲							
	JSC3	ø40 to ø100		●		●								●	●	●	▲				▲	▲		
	JSC4	ø125 to ø100		●			●							●	●	●	▲							
With lock	USSD	ø20 to ø100			●		●							●	●	●	▲							
	UFCD-KL	ø25 to ø63			●	●																		
	USC	ø40 to ø100		●		●								●	●	●					▲	▲		
With Valve	CKV2	ø20 to ø40	●			●								●	●	●								
	CAV2, COV2	ø50 to ø100		●		●								●	●	●								
Clamp Cylinder	CAC4	ø40 to ø80	●	●		●								●	●	●	▲				▲			
	UCAC2	ø50, ø63	●	●		●								●	●	●	▲				▲	▲		
	CAC-N	ø32, ø40	●	●		●								●	●	●	▲							
	UCAC-N	ø32, ø40, ø63	●	●		●								●	●	●	▲							
	RCS2	ø12 to ø63			●	●								●	●	●	▲							
	RCC2	ø16 to ø63			●	●								●	●		▲							
Special cylinder	MVC	ø6, ø10			●	●														●				
	STK	ø20 to ø50			●	●								●	●	●	▲							
	MCP	Actual thrust For 2t, 5t		●	●	●								●	●	●								
	GLC	ø40 to ø100		●		●				●	●	●	●								▲			
High Speed Type	HCM	ø20 to ø63			●	●								●	●	●	●							
	HCA	ø20 to ø100	●			●				●	●	●	●											
Swinging/Rotating Type	RRC	Size 8, 32, 63			●	●								●	●	●								
	GRC	Size 5 to 80			●	●																		
	RV3□	Size 50 to 800					●	●	●															
Gripper / Chuck			Catalog name [No]					Refer to Pneumatic Cylinder ⑤ [RJ-006AA].																

●: Standard Product ▲: Mountable depending on conditions
Varies depending on conditions such as variation and tube inner diameter. Please check the product specifications for details.

2-Color Indicator Solid State Cylinder Switch

● Lamp Display





Overview

Conventionally, position detection switches for pneumatic cylinders required troublesome mounting and adjustment work due to their operating range and hysteresis. The 2-color indicator type solid state cylinder switch lights up green at the optimal mounting position and red in the normal operating range, instantly displaying the optimal mounting position. Therefore, it not only eliminates the time and hassle involved in switch adjustment, but also reduces setting errors to zero, allowing for the construction of highly reliable equipment.

Main features

● Easy to mount and adjust

Since the green display position is the optimal mounting position, mounting and adjusting the switch is extremely easy.

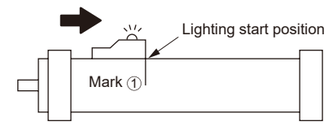
● Highly reliable

This is an extremely reliable switch due to the adoption of a unique hybrid IC equipped with a magnetoresistive element.

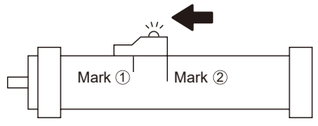
● Cylinder / Switch Setting Comparison

[Conventional] → [2-color indicator type switch]

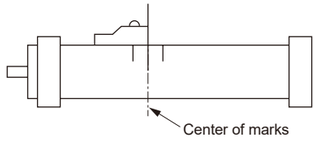
① Move the switch from one direction and mark the lighting start position.



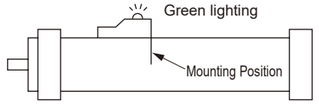
② Similarly move from the opposite direction and mark the lighting start position.



③ Align the end face of the switch with the center of the two marks and fix it.



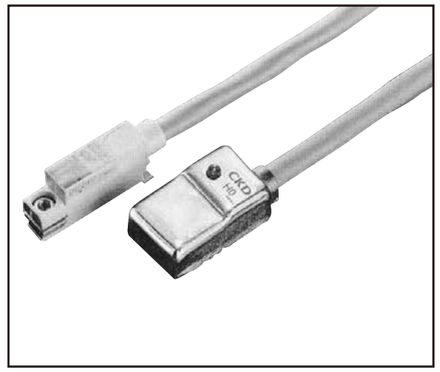
① Move the switch in one direction only and fix it at the position where it lights up green.



2-color indicator type switch is
① Quick mounting
② Easy mounting
③ No setting errors

Cylinder Switch

Strong magnetic field resistant cylinder switch



Overview

This is a cylinder switch that can be used in environments where strong magnetic fields are generated, such as around spot welding machines and magnetizing equipment in automobile factories.

Main features

● Easy to mount/position (V0, T2YD)

Adopts rail mounting method. Can be mounted with a single screw, and position adjustment is also easy.

● Uses heat-resistant material

The main body is made of metal (H0, H0Y) and self-extinguishing resin UL94-V0 (V0, T2YD), and flame-retardant lead wires are used (optional for T2YD). Prevents combustion and melting of the main body and lead wires due to spatter.

● No polarity (H0, T2YD, H0Y)

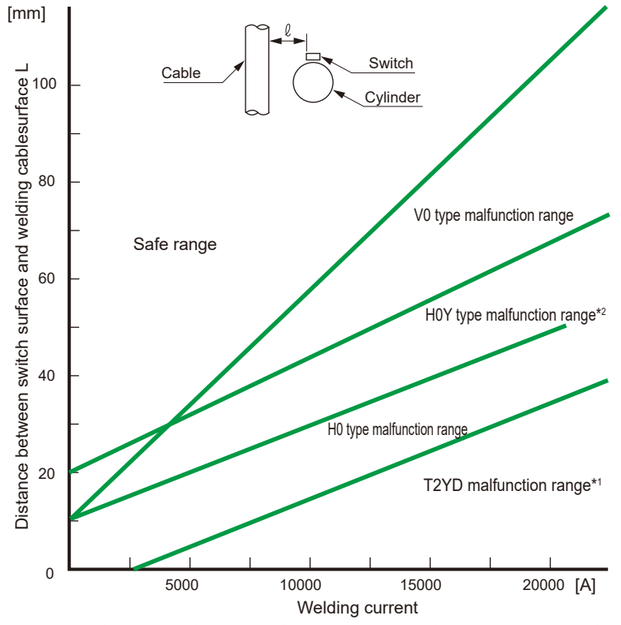
Non-polarity achieved with built-in diode bridge. Eliminates the hassle of checking positive and negative polarity, preventing connection errors.

● Easy to adjust with 2-color indicator (T2YD, H0Y)

Since the green display is the optimal mounting position, mounting and adjusting the switch is extremely easy.

Caution

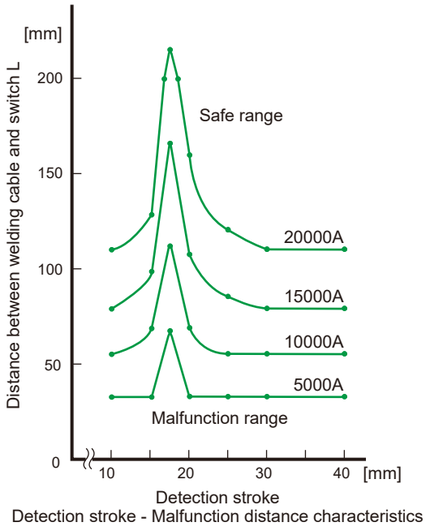
① Spot welding current - Malfunction distance characteristics
(For V0 switch with detection stroke of 30 mm or more)



The above external magnetic field resistance performance is the performance when the switch is mounted within the range of "maximum sensitivity position ±1 mm" for H0, "maximum sensitivity position ±1.5 mm" for V0, and "optimal mounting range" for H0Y, so be sure to mount the switch within this range. Do not pass welding current while the cylinder piston is moving.
If there are two or more welding cables and they are energized simultaneously, the magnetic flux will increase due to the synergistic effect of the cables, so please consult us. Also, it cannot be used if the switch enters the loop of the cable.

*1: Indicates malfunctions caused by demagnetization of the cylinder's piston magnet due to the welding magnetic field.
*2: Malfunction of H0Y refers to output malfunction.
*3: T2YD is a switch exclusively for AC magnetic fields.

② SSD detection stroke - Malfunction distance characteristics (V0 Switch)



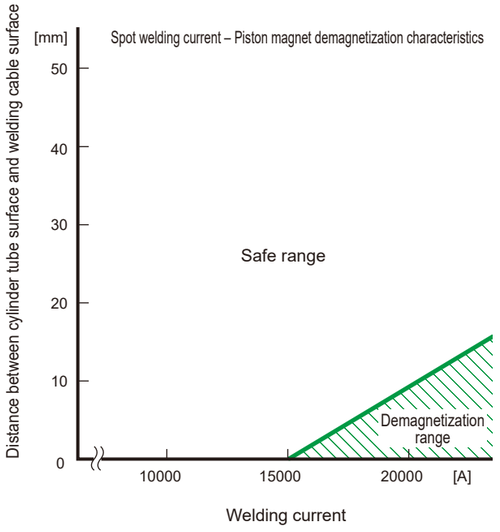
Detection stroke - Malfunction distance characteristics

If used with a detection stroke of less than 30 mm, please maintain the distance shown in the figure above between the welding cable and the switch.

Cylinder Switch

③ H type cylinder switch

Magnet performance near spot welding



Demagnetization occurs when an AC magnetic field is applied to the magnet. The magnet of the H-type switch equipped cylinder has countermeasures and will not demagnetize up to 15,000A, but if it exceeds 15,000A, please maintain the distance shown in the figure above between the cylinder tube surface and the welding cable surface.

MEMO

Cylinder Switch

M Series	Applicable Cylinder	FC□, RV3□, SRL3, SRG3, SRT3, UFCD

M□V

M□H

Specifications

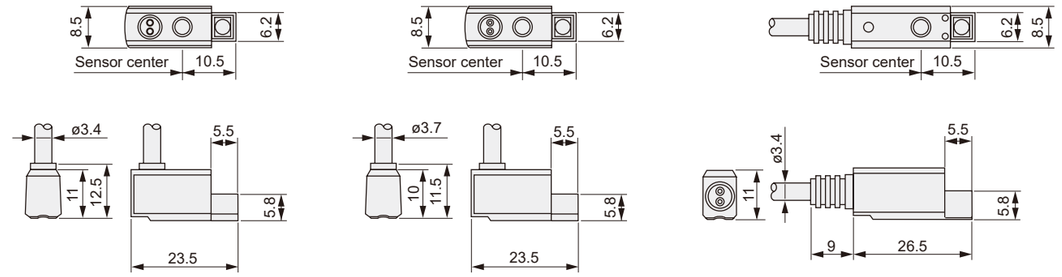
Item	Solid state 2-wire type		Solid state 3-wire type		
	M2V, M2H	M2WV (2-color indicator type)	M3H/V (NPN output type)	M3PH/V (PNP output type)	M3WV (2-color indicator type)
Applications	For programmable controller only		For programmable controller, relay, IC circuit, small solenoid valve		
Output method	–		NPN output	PNP output	NPN output
Power supply voltage	–		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less		
Current consumption	–		10 mA or less at 24 VDC	10 mA or less at 24 VDC	15 mA or less at 24 VDC
Internal voltage drop	4 V or less		0.5 V or less		
Indicator LED	Red LED (Lights up when ON)	Red/Green LED (Lights up when ON)	Red LED (Lights up when ON)	Yellow LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less		10 μA or less	0.05 mA or less	10 μA or less
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)		1 m (Oil-resistant vinyl cabtyre cord 3-core 0.15 mm²)		
Shock resistance	980 m/s²				
Insulation resistance	100 MΩ or more with 500 VDC megger				
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute				
Ambient Temperature	-10 to +60°C				
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)				
Weight	1 m: 22 g 3 m: 57 g 5 m: 93 g		1 m: 22 g 3 m: 57 g 5 m: 93 g		

Item	Reed 2-wire type			
	M0V, M0H		M5V, M5H	
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator light), series connection	
Power supply voltage	–			
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Current consumption	–			
Internal voltage drop	3 V or less (In case of DC, when load current is 30 mA)		0.1 V or less (*4)	
Indicator LED	Red LED (Lights up when ON)		No Indicator LED	
Leakage current	0 mA			
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)			
Shock resistance	294 m/s²			
Insulation resistance	100 MΩ or more with 500 VDC megger			
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute			
Ambient Temperature	-10 to +60°C			
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)			
Contact protection circuit *5	None			
Weight	1 m: 22 g 3 m: 57 g 5 m: 93 g			

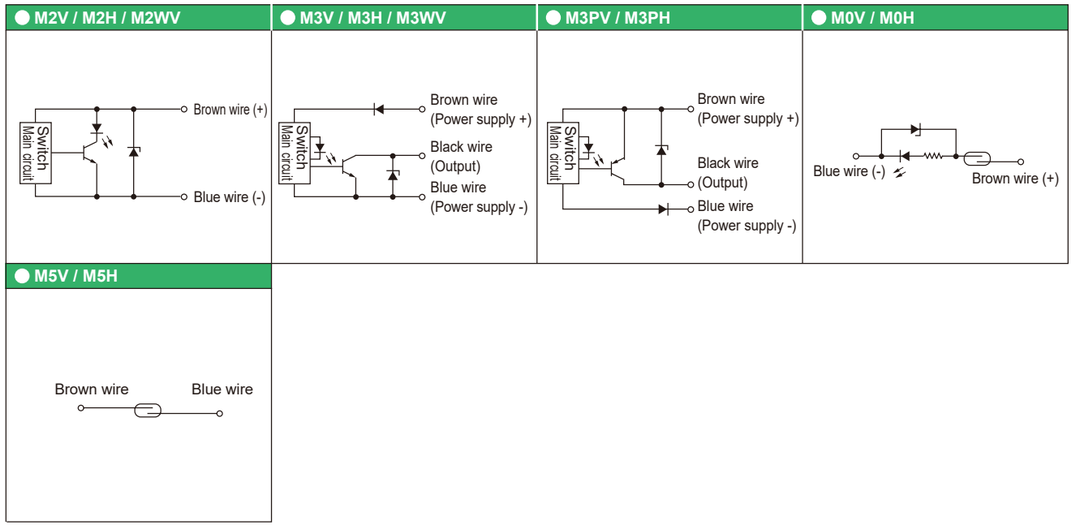
*1: M□H can be used for SRL3, SRG3, SRT3.
*2: For switch model Nos. that can be mounted on the cylinder, please refer to the P. for each cylinder model.
*3: Please consult us separately for cylinder switches with connectors.
*4: Internal resistance 0.5 Ω or less
***5: For contact protection measures, see P. 783.**

Outline Dimension Drawing

● M□V Series (L-shaped lead wire type) ● M□W series (2-color indicator type, L-shaped lead wire type) ● M□H Series (Straight lead wire type)



Switch internal circuit diagram



R Series	Applicable Cylinder	GLC, HCA, MFC, SHC

(Excluding R1, R4)

R□, R□Y

R□B

Specifications

Item	Solid state 2-wire type			Solid state 3-wire type	
	R1, R1K	R2, R2K	R2Y, R2YK (2-color indicator type)	R3, R3K	R3Y, R3YK (2-color indicator type)
Applications	Programmable controller, Relay, Small solenoid valve	For programmable controller only		For programmable controller, relay, IC circuit, solenoid valve	
Output method	–			NPN output	
Power supply voltage	–	–		4.5 to 28 VDC	
Load voltage	85 to 265 VAC	10 to 30 VDC		30 VDC or less	30 VDC or less
Load current	5 to 100 mA	5 to 30 mA		200 mA or less	100 mA or less
Current consumption	–	–		At 24 VDC (When ON)	
				10 mA or less	16 mA or less
Internal voltage drop	10% or less of load voltage	4 V or less		0.5 V or less at 150 mA	0.5 V or less
Indicator LED	Red LED (Lights up when ON)		Red/Green LED (Lights up when ON)	Red LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less at 100 VAC, 2 mA or less at 200 VAC	1 mA or less		10 μA or less	
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.3 mm²)			1 m (Oil-resistant vinyl cabtyre cord 3-core 0.2 mm²)	
Shock resistance	980 m/s²				
Insulation resistance	20 MΩ or more with 500 VDC megger				
Dielectric strength	1500 VAC, 1 minute No abnormality upon application	No abnormality when 1000 VAC is applied for 1 minute			
Ambient Temperature	-10 to +60°C				
Protection structure	Grommet type is IEC standard IP67, JIS C0920 (Immersible type)				
Option	With terminal box R*B (Not waterproof)				
Weight	1 m: 42 g 3 m: 100 g 5 m: 158 g		1 m: 56 g 3 m: 114 g 5 m: 172 g	1 m: 42 g 3 m: 100 g 5 m: 158 g	1 m: 56 g 3 m: 114 g 5 m: 172 g

Item	Reed 2-wire type								
	R0			R4		R5			R6
Applications	For relay, programmable controller			For high capacity relay, solenoid valve		For programmable controller, relay, IC circuit (no indicator light), series connection			For programmable controller only (With DC self-holding function)
Power supply voltage	–			–		–			–
Load voltage	12/24 VDC	110 VAC	220 VAC	110 VAC	220 VAC	5/12/24 VDC	110 VAC	220 VAC	24 VDC ±10%
Load current	5 to 50 mA	7 to 20 mA	7 to 10 mA	20 to 200 mA	10 to 200 mA	50 mA or less	20 mA or less	10 mA or less	5 to 50 mA
Current consumption	–			–		–			–
Internal voltage drop	3.0 V or less			2 V or less		0.5 V or less (*1)			5 V or less
Indicator LED	Red LED (Lights up when ON)			Neon lamp OFF (Lights up when OFF)		None			Red LED (Lights up when ON)
Leakage current	0 mA			1 mA or less		0 mA			0.1 mA or less
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.3 mm²)								
Shock resistance	294 m/s²								
Insulation resistance	20 MΩ or more with 500 VDC megger								
Dielectric strength	No abnormality when 1500 VAC is applied for 1 minute								
Ambient Temperature	-10 to +60°C								
Protection structure	Grommet type is IEC standard IP67, JIS C0920 (Immersible type)								
Contact protection circuit *2	Yes								None
Option	With terminal box R□B (Not waterproof)								
Weight	1 m: 42 g 3 m: 100 g 5 m: 158 g								

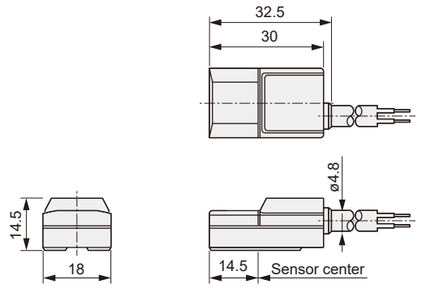
*1: Internal resistance 10Ω or less

*2: For contact protection measures, see P. 783.

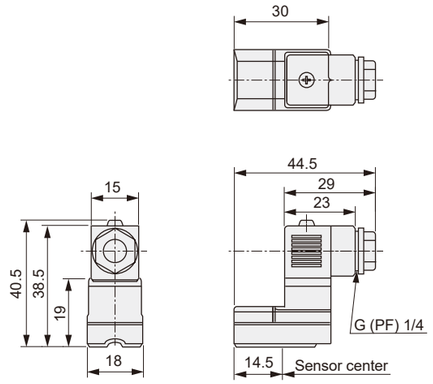
External dimension diagram / Switch internal circuit diagram

Outline Dimension Drawing

● R Series (Grommet Type)

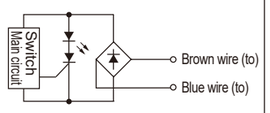


● R Series (Terminal box R□B type)

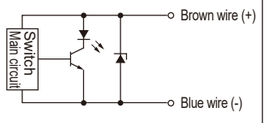


Switch internal circuit diagram

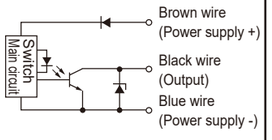
● R1



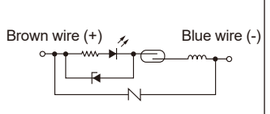
● R2 / R2Y



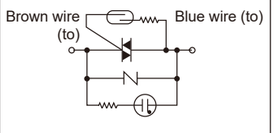
● R3 / R3Y



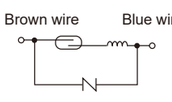
● R0



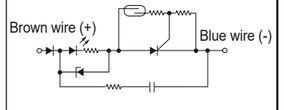
● R4



● R5

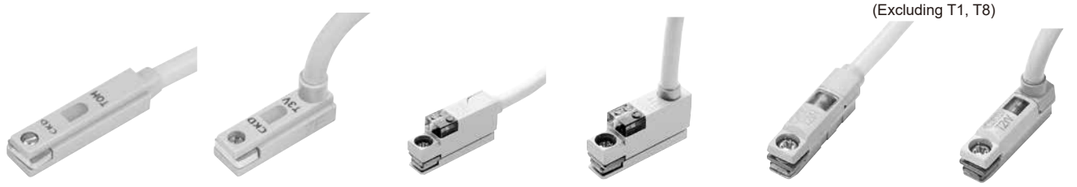


● R6



T Series	Applicable Cylinder	CAC4 CKV2 CMA2 CMK2 HCM JSC3 JSC4 JSG JSK2 JSM2 LCG LCR LCW LCX MRG2 MRL2 RCS2 RCC2 RRC SCA2 SCG SCM SCP□3 SCS2 SRM3 SSD SSD2 SSG STG STS/STL STK UCA2 UCAC2 ULK Gripper Check Valve

(Excluding T1, T8)



T□H / T□WH　T□V / T□WV　T1H　T1V　T8H / T2JH　T8V / T2JV

Specifications

Item	Solid state 2-wire type					Solid state 3-wire type		
	T1H, T1 V	T2H, T2V	T2HR3, T2VR3 (Flexible lead wire type)	T2JH, T2JV (Off-delay type)	T2WH, T2WV (2-color indicator type)	T3H, T3V	T3PH, T3PV (PNP output type)	T3WH, T3WV (2-color indicator type)
Applications	For programmable controller, relay, small solenoid valve	For programmable controller only				For programmable controller, relay		
Output method	–					NPN output	PNP output	NPN output
Power supply voltage	–					10 to 28 VDC		
Load voltage	85 to 265 VAC	10 to 30 VDC			24 VDC ±10%	30 VDC or less		
Load current	5 to 100 mA	5 to 20 mA (*1)				100 mA or less		50 mA or less
Current consumption	–	–				10 mA or less at 24 VDC	10 mA or less at 24 VDC	10 mA or less at 24 VDC
Internal voltage drop	10% or less of load voltage	4 V or less				0.5 V or less		
Off-delay time	–			200 ±50 ms	–	–		
Indicator LED	Red LED (Lights up when ON)				Red/Green LED (Lights up when ON)	Red LED (Lights up when ON)	Yellow LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less at 100 VAC, 2 mA or less at 200 VAC	1 mA or less				10 μA or less		
Lead wire length *6	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.3 mm²)	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)	3 m (Flexible, oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.3 mm²)	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)	1 m (Oil-resistant vinyl cabtyre cord 3-core 0.2 mm²)		1 m (Oil-resistant vinyl cabtyre cord 3-core 0.2 mm²)
Shock resistance	980 m/s²							
Insulation resistance	100 MΩ or more with 500 VDC megger	20 MΩ or more with 500 VDC megger		100 MΩ or more with 500 VDC megger	20 MΩ or more with 500 VDC megger	20 MΩ or more with 500 VDC megger		20 MΩ or more with 500 VDC megger
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute	No abnormality when 1000 VAC is applied for 1 minute						
Ambient Temperature	-10 to +60°C							
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)							
Weight	1 m: 33 g 3 m: 87 g 5 m: 142 g	1 m: 18 g 3 m: 49 g 5 m: 80 g		1 m: 33 g 3 m: 87 g 5 m: 142 g	1 m: 18 g 3 m: 49 g 5 m: 80 g	1 m: 18 g 3 m: 49 g 5 m: 80 g		1 m: 18 g 3 m: 49 g 5 m: 80 g

Item	Reed 2-wire type						
	T0H, T0V		T5H, T5V		T8H, T8V		
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator light), series connection		For programmable controller, relay		
Power supply voltage	–						
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	12/24 VDC	110 VAC	220 VAC
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less	5 to 50 mA	7 to 20 mA	7 to 10 mA
Current consumption	–						
Internal voltage drop	3 V or less (In case of DC, when load current is 30 mA)		0.1 V or less (*4)		4 V or less		
Indicator LED	Red LED (Lights up when ON)		No Indicator LED		Red LED (Lights up when ON)		
Leakage current	0 mA						
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)				1 m (Oil-resistant vinyl cabtyre cord 2-core 0.3 mm²)		
Shock resistance	294 m/s²						
Insulation resistance	20 MΩ or more with 500 VDC megger				100 MΩ or more with 500 VDC megger		
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute				No abnormality when 1500 VAC is applied for 1 minute		
Ambient Temperature	-10 to +60°C						
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)						
Contact protection circuit *5	None				Yes		
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g				1 m: 33 g 3 m: 87 g 5 m: 142 g		

*1: Maximum load current for T2H, T2V, T2HR3, T2VR3: 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*2: For T2JH and T2JV switches, when mounting on SRL3 (ø32 to ø100), MRL2, LCR, UCAC2, or gripper/chuck, it will be handled as a custom product.
*3: Some cylinders have limited mountable switches. Please refer to the P. for each cylinder for details.
*4: Internal resistance 0.5 Ω or less.　*5: For contact protection measures, see P. 783.

Cylinder Switch

T Series	For AC Magnetic Field	Applicable Cylinder	CAC4 JSC3 JSC4 JSG RCC2 RCS2 SCA2 SCG SCM SCS2 SRG3 SRL3 SRM3 SRT3 SSD SSD2 SSG STG STS / STL UCAC2 USC USSD

(Excluding T1, T8)

T2YD

Specifications

Item	Solid state 2-wire type		
	T2YD	T2YDT	T2YDU (Custom Products)
Applications	For programmable controller only		
Indicator LED	Red/Green LED (Lights up when ON)		
Load voltage	24 VDC ±10%		
Load current	5 to 20 mA		
Internal voltage drop	6 V or less		
Leakage current	1.0 mA or less		
Output delay time *1 (ON-delay, OFF-delay)	60 ms or less		
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord ø6, 0.5 mm² x 2 cores) *2	1 m (Flame-retardant cabtyre cord ø6, 0.5 mm² x 2 cores) *2	0.3 m (Flame-retardant vinyl cabtyre cord with M12 cable connector, AWG20, 2-core)
Insulation resistance	100 MΩ or more with 500 VDC megger		
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute		
Shock resistance	980 m/s²		
Ambient Temperature	-10 to +60°C		
Protection structure	JIS C0920 (Immersible type), IEC standard IP67		
Weight	1 m: 61 g 3 m: 166 g 5 m: 272 g		35

*1: Indicates the time from when the magnetic sensor detects the piston magnet until the switch output occurs.
*2: 3 m and 5 m lead wire lengths are available as options.
*3: Since AC magnetic field switches (T2YD□) are for AC welding machines, the strong magnetic field resistance performance cannot be obtained with DC welding machines.

T Series	For Cutting Oil	Applicable Cylinder	CMK2-G2 / 3 HRL-G2 / 3 SCA2-G2 / 3 SCG-G2 / 3 SSD-G2 / 3 SSD2-G2 / 3 STG-G2 / 3 STS/STL-G2 / 3

T□YLH

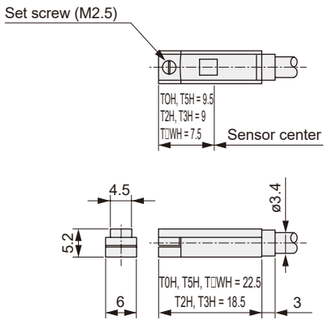
Specifications

Item	Solid state 2-wire type	Solid state 3-wire type
	T2YLH, T2YLV	T3YLH, T3YLV
Applications	For programmable controller only	Programmable controller, Relay
Output method	–	NPN output
Power supply voltage	–	10 to 28 VDC
Load voltage	10 to 30 VDC	30 VDC or less
Load current	5 to 20 mA	50 mA or less
Current consumption	–	10 mA or less at 24 VDC (When ON)
Internal voltage drop	4 V or less	0.5 V or less
Leakage current	1 mA or less	10 μA or less
Indicator LED	Red/Green LED (Lights up when ON)	
Lead Wire	Oil-resistant vinyl cabtyre cord 0.3 mm², 2-core 1 m	Oil-resistant vinyl cabtyre cord 0.2 mm², 3-core 1 m
Insulation resistance	100 MΩ or more with 500 VDC megger	
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute	
Shock resistance	980 m/s²	
Hysteresis	1.5 mm or less	
Ambient Temperature	-10 to +60°C	
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant (PCB coating)	
Weight	1 m: 33 g 3 m: 87 g 5 m: 142 g	

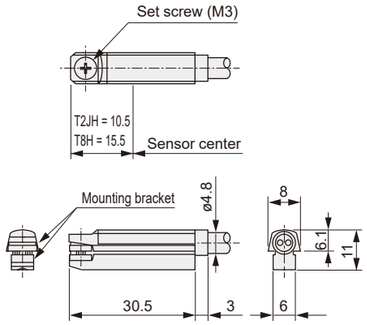
Cylinder Switch

Outline Dimension Drawing

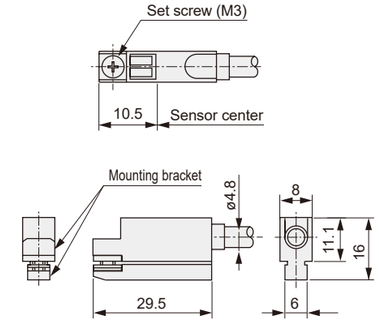
● T□H, T□WH Series
(Straight lead wire type)



● T2JH, T8H Series4
(Straight lead wire type)



● T1H Series
(Straight lead wire type)



● T□V, T□WV Series
(L-shaped lead wire type)

● T2JV, T8V Series
(L-shaped lead wire type)

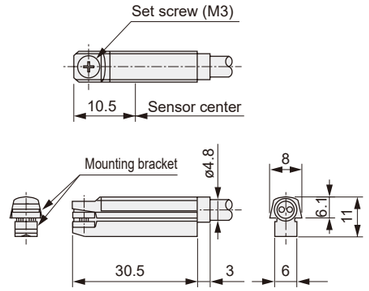
● T1 V Series
(L-shaped lead wire type)

● T2YD (AC magnetic field switch)

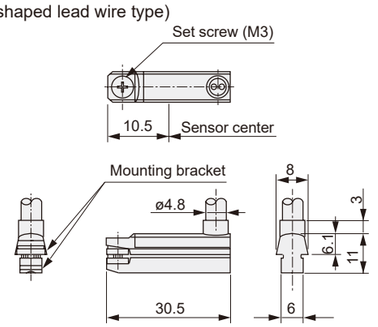
● T2YDU (Switch for AC magnetic field with M12 cable connector)

Outline Dimension Drawing

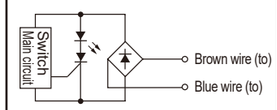
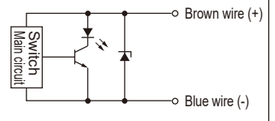
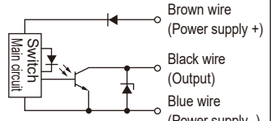
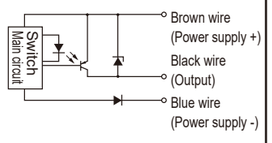
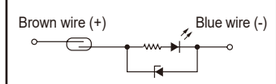
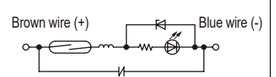
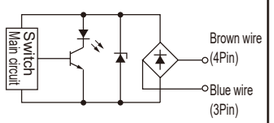
● T□YLH Series
(Straight lead wire type)



● T□YLV Series
(L-shaped lead wire type)



Switch internal circuit diagram

● T1H / T1V	● T2H / T2V, T2WH / T2WV / T2JH / T2JV / T2YLH / T2YLV	● T3H / T3V / T3WH / T3WV / T3YLH / T3YLV	● T3PH / T3PV
			
● T0H / T0V	● T5H / T5V	● T8H / T8V	● T2YD / T2YDT / T2YDU
			

This switch has no polarity.
Values in ( ) are pin assignments for T2YDU.
However, Pin 1 and Pin 2 are N.C. (Not Connected).

T Series	Improved Water Resistance	Applicable Cylinder										
			SCP□3	CMK2	CMA2	SCM	SCG	SCA2	SCS2	CKV2	COV□2	CAV2	SSD2
			SSG	SSD	STK	SRL3	SRG3	SRM3	SRT3	MRL2	MRG2	LCR	LCG
			LCX	STG	STS/L	HCM	CAC4	CAC-N	RCS2	RCC2	MCP	RRC	GRC

T2WLH

T2WLV

Specifications

Item	Solid state 2-wire type	
	T2WLH, T2WLV	T2WLHW, T2WLVW
Applications	For programmable controller only	
Load voltage	24 VDC ±10%	
Load current	5 to 20 mA	
Internal voltage drop	4 V or less	
Leakage current	1 mA or less	
Indicator LED	Red/Green LED (Lights up when ON)	
Lead wire length	1 m (PUR cord 2-core 0.2 mm²)	0.3 m (PUR cord with M8 connector)
Insulation resistance	20 MΩ or more with 500 VDC megger	
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute	
Shock resistance	980 m/s²	
Ambient Temperature	-10 to +60°C	
Protection structure	IEC standard IP67 JIS C0920 (Immersible type)	
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g	11 g

*1: Cannot be mounted on drop prevention type.
*2: For switch mountability, refer to the next page.

Model No. Notation Method

● Water-resistant Cylinder Switch

SW - T2WL H W

1 Lead Wire Extraction Direction

2 Lead wire length, connector specification

1 Lead Wire Extraction Direction

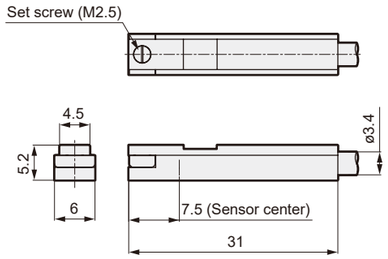
Code	Content
H	Straight lead wire type
V	L-shaped lead wire type

2 Lead wire length, connector specification

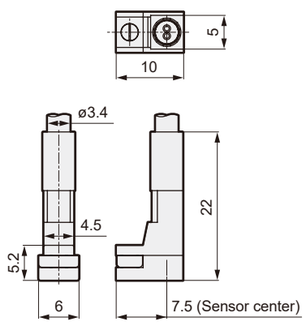
Code	Content
Blank	1 m lead wire
3	3 m lead wire
5	5 m lead wire
W	M8 connector, 1PIN (+) 4PIN (-)

Outline Dimension Drawing

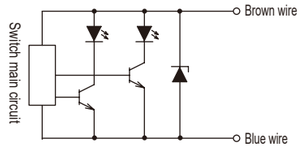
● T2WLH Series (Straight lead wire type)



● T2WLV Series (L-shaped lead wire type)



Switch internal circuit diagram



Switch applicable model list

Applicable Model		Bore size
Pencil Shaped Cylinder	SCP□3	ø6 to 16
Tight Cylinder	CMK2	ø20 to 40
Small Bore Size Cylinder	CMA2	ø20 to 40
Round shaped cylinder	SCM	ø20 to 100
Tie Rod Cylinder	SCG	ø32 to 100
Medium Bore Size Cylinder	SCA2	ø40 to 100
Large Bore Size Cylinder	SCS2	ø125 to 250
Compact cylinder with valve	CKV2	ø20 to 40
Cell Cylinder	COV□2	ø50 to 100
Cell Cylinder	CAV2	ø50 to 100
Compact Cylinder	SSD2	ø12 to 100
Guided Compact Cylinder	SSG	ø12 to 100
Compact Cylinder	SSD	ø12 to 160
Stopper Cylinder	STK	ø20 to 50
Rodless Cylinder	SRL3	ø12 to 100
Rodless Cylinder with High-Precision Guide	SRG3	ø12 to 25
Rodless Cylinder with High-Precision Guide	SRM3	ø25 to 63
Rodless Cylinder with Brake	SRT3	ø12 to 63
Super rodless cylinder with magnet	MRL2	ø6 to 32
Super rodless cylinder with magnet, high precision guide type	MRG2	ø50 to 700
Linear Slide Cylinder	LCR	ø16 to 25
Linear Slide Cylinder	LCG	ø16
Low Profile Linear Slide Cylinder	LCX	ø25, 32
Guided Cylinder	STG	ø12 to 100
Guided Cylinder	STS/L	ø8 to 100
High Energy Absorption Cylinder	HCM	ø20 to 63
Clamp Cylinder	CAC4	ø40 to 80
Lightweight Clamp Cylinder	CAC-N	N32, N40
Rotary Clamp Cylinder	RCS2	ø12 to 63
Rotary Clamp Cylinder	RCC2	ø16 to 63
Mechanical Power Cylinder	MCP	Size 2t, 5t
Selex Rotary	RRC	Size 8 to 63
Table Type Rotary Actuator	GRC	Size 5 to 80

T Series	Magnetized environment	Applicable Cylinder							
			CMK2	SCM	SCG	SCA2	SCS2	SSD2	SSG	SSD
			STK	STG	STS/L	JSG	JSC3	JSC4	USSD	HCM
			CAC4	UCAC2	CAC-N	UCAC-N32		RCS2	RCC2	PCC

TOY

Specifications

Item	Reed 2-wire type		
	T0Y	T0YL	T0YT
Applications	For programmable controller only		
Switch polarity	No polarity		
Load voltage	24 VDC ±10%		
Load current	5 to 20 mA		
Internal voltage drop	4.5 V or less		
Leakage current	0.5 mA or less		
Indicator LED	Red/Green LED (Lights up when ON)		
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)	1 m (Flame-retardant cabtyre cord 2-core 0.2 mm²) UL certified wire	1 m (Flame-retardant vinyl cabtyre cord 2-core 0.2 mm²)
Insulation resistance	20 MΩ or more with 500 VDC megger		
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute		
Shock resistance	294 m/s²		
Ambient Temperature	-10 to +60°C		
Protection structure	IEC standard IP67 JIS C0920 (Immersible type)		
Contact protection circuit	None		
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g		
Weight of connector only	M12: Connector code B/M: 10 g M8: Connector code F: 4 g		

Note) For switch mountability, please refer to the next page.

Model No. Notation Method

● Magnetic Field Resistant Cylinder Switch

SW- T0Y L M K

❶ Lead wire type
❷ Lead wire length, connector specification
❸ Option

❶ Lead wire type

Code	Content
Blank	Oil-resistant vinyl cabtyre cord
L	UL wire
T	Spatter-resistant wire

❷ Lead wire length, connector specification

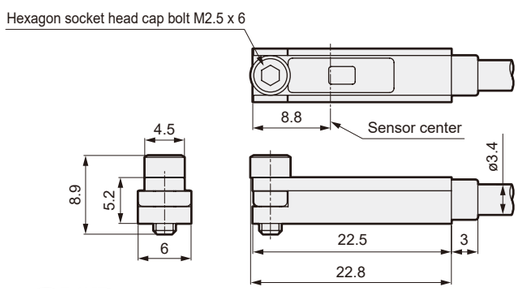
Code	Content
Blank	1 m lead wire
3	3 m lead wire
5	5 m lead wire
B	M12 connector (4PIN specification), 3-4PIN no polarity, 0.3 m lead wire
M	M12 connector (4PIN specification), 1-4PIN no polarity, 0.3 m lead wire
* F	M8 connector (3PIN specification), 1-4PIN no polarity, 0.3 m lead wire

*: For connector specification "F", only lead wire type "L" can be selected.

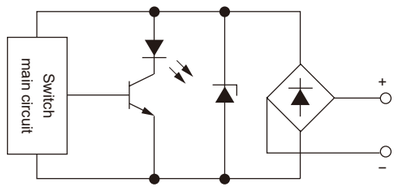
❸ Option

Code	Content
Blank	No option
K	With spatter adhesion prevention cover

Outline Dimension Drawing



Switch internal circuit diagram



Switch applicable model list

Applicable Model		Bore size
Small bore size cylinder	CMK2	ø32, ø40
Round shaped cylinder	SCM	ø32 to 100
Tie Rod Cylinder	SCG	ø40 to 100
Medium Bore Size Cylinder	SCA2	ø40 to 100
Large Bore Size Cylinder	SCS2	ø125 to 250
Compact Cylinder	SSD2	ø32 to 200
Guided Compact Cylinder	SSG	ø32 to 100
Compact Cylinder	SSD	ø32 to 160
Stopper Cylinder	STK	ø32 to 50
Guided Cylinder	STG	ø32 to 80
Guided Cylinder	STS/L	ø32 to 100
Tie Rod Cylinder with Brake	JSG	ø40 to 100
Cell top cylinder (Medium bore)	JSC3	ø40 to 100
Cell top cylinder (Large bore)	JSC4	ø125 to 180
Compact Cylinder with Drop Prevention	USSD	ø40 to 63
High Energy Absorption Cylinder	HCM	ø32 to 63
Clamp Cylinder	CAC4	ø40 to 80
Clamp Cylinder with Fall Prevention	UCAC2	ø50, ø63
Lightweight Clamp Cylinder	CAC-N	ø32, ø40
Lightweight Clamp Cylinder	UCAC-N32	ø32, ø40
Rotary Clamp Cylinder	RCS2	ø32 to 63
Rotary Clamp Cylinder	RCC2	ø32 to 63
Pin Clamp Cylinder	PCC	(ø50)

K Series	Applicable Cylinder	SMG STR2

K□H
K3PH

K□V
K3PV

K□YH

K□YV

Specifications

Item	Solid state 2-wire type		Solid state 3-wire type		
	K2H, K2 V	K2YH, K2YV	K3H/V (NPN output type)	K3PH/V (PNP output type)	K3YH/V (2-color indicator type)
Applications	For programmable controller only		For programmable controller, relay		
Output method	–		NPN output	PNP output	NPN output
Power supply voltage	–		10 to 28 VDC		
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 20 mA (*1)		50 mA or less		
Current consumption	–		10 mA or less at 24 VDC	10 mA or less at 24 VDC	10 mA or less at 24 VDC
Internal voltage drop	4 V or less		0.5 V or less		
Indicator LED	Red LED (Lights up when ON)	Red/Green LED (Lights up when ON)	Red LED (Lights up when ON)	Yellow LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less		10 μA or less		
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.3 mm²)	1 m (Oil-resistant vinyl cabtyre cord 3-core 0.2 mm²)		1 m (Oil-resistant vinyl cabtyre cord 3-core 0.2 mm²)
Shock resistance	980 m/s²				
Insulation resistance	20 MΩ or more with 500 VDC megger	100 MΩ or more with 500 VDC megger	20 MΩ or more with 500 VDC megger		100 MΩ or more with 500 VDC megger
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute				
Ambient Temperature	-10 to +60°C				
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)				
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g	1 m: 31 g 3 m: 85 g 5 m: 139 g	1 m: 18 g 3 m: 49 g 5 m: 80 g		1 m: 31 g 3 m: 85 g 5 m: 142 g

Item	Reed 2-wire type			
	K0H, K0 V		K5H, K5 V	
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator light), series connection	
Power supply voltage	–			
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Current consumption	–			
Internal voltage drop	3 V or less (In case of DC, when load current is 30 mA)		0.1 V or less (*2)	
Indicator LED	Red LED (Lights up when ON)		–	
Leakage current	0 mA			
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)			
Shock resistance	294 m/s²			
Insulation resistance	20 MΩ or more with 500 VDC megger			
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute			
Ambient Temperature	-10 to +60°C			
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)			
Contact protection circuit *3	None			
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g			

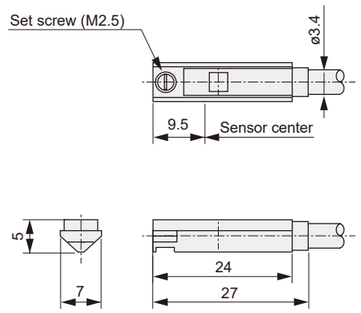
*1: Max. load current of K2H, K2V: 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*2: Internal resistance 0.5Ω or less
*3: For contact protection measures, see P. 783.

Cylinder Switch

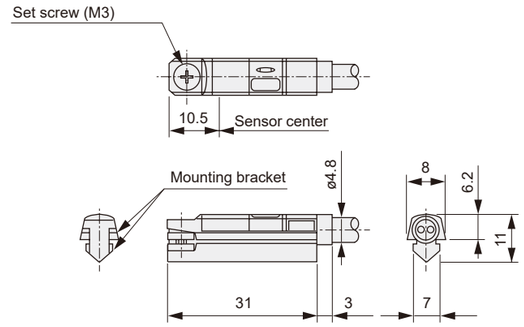
External dimension diagram / Switch internal circuit diagram

Outline Dimension Drawing

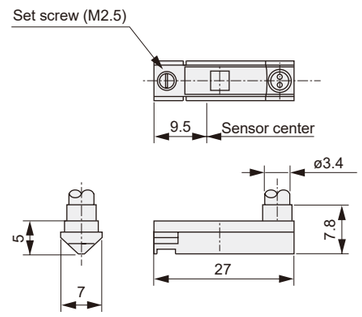
● K□H Series (Straight lead wire type)



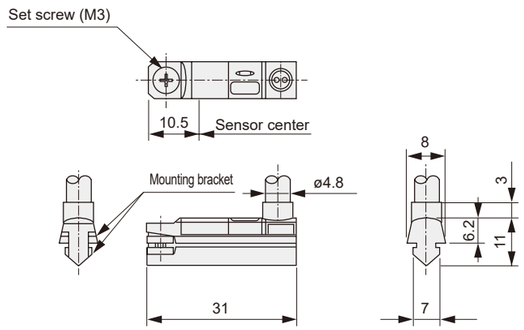
● K□YH Series
(2-color indicator type, Straight lead wire type)



● K□V Series (L-shaped lead wire type)

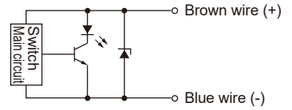


● K□YV Series
(2-color indicator type, L-shaped lead wire type)

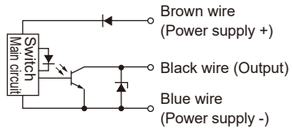


Switch internal circuit diagram

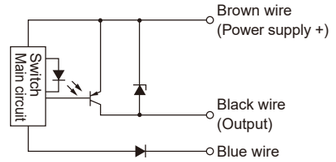
● K2H / K2V / K2YH / K2YV



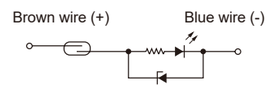
● K3H / K3V / K3YH / K3YV



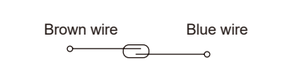
● K3PH / K3PV



● K0H / K0V



● K5H / K5V



Cylinder Switch

F Series	Application Cylinder	CKL2, LCG, LCM, LCR, MDC2, MSD, MSDG-L, MVC, RCS2, SSD2, STM, Gripper (LSH, BSA2, LHA)

Flexible lead wires are used as standard.

* Some bore sizes cannot be combined.

F□S

F□V

F□H

F□YV
F3PV

F□YH
F3PH

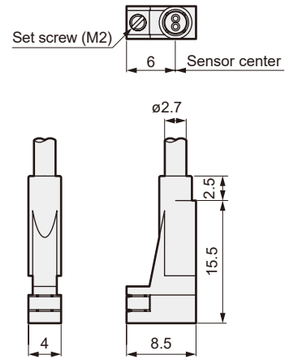
Specifications

Item	Reed 2-wire type	Solid state 2-wire type		Solid state 3-wire type		
	F0H/V	F2H/V, F2S	F2YH, F2YV	F3H/V, F3S	F3PH/V	F3YH, F3YV
Applications	For programmable controller only			For programmable controller, relay		
Output method	–			NPN output	PNP output	NPN output
Power supply voltage	–			10 to 28 VDC	4.5 to 28 VDC	10 to 28 VDC
Load voltage	24 VDC ±10%	10 to 30 VDC	24 VDC ±10%	30 VDC or less		
Load current	5 to 20 mA (*1)			50 mA or less		
Current consumption	–			10 mA or less at 24 VDC		
Internal voltage drop	4 V or less			0.5 V or less	0.5 V or less at 30 mA	0.5 V or less
Indicator LED	Yellow LED (Lights up when ON) *3		Red/Green LED (Lights up when ON)	Yellow LED *3 (Lights up when ON)	Yellow LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less			10 μA or less		
Lead wire length	1 m (Flexible, oil-resistant vinyl cabtyre cord 2-core 0.15 mm²)			1 m (Flexible, oil-resistant vinyl cabtyre cord 3-core 0.15 mm²)		
Shock resistance	294 m/s²	980 m/s²				
Insulation resistance	20 MΩ or more with 500 VDC megger					
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute					
Ambient Temperature	-10 to +60°C					
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)					
Contact protection circuit *4	None	–				
Weight	1 m: 10 g 3 m: 29 g		1 m: 10 g 3 m: 29 g			

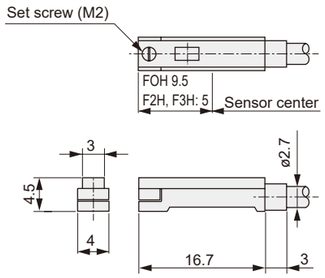
*1: The maximum load current for F2H and F2 V is 20 mA at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*2: For F2S and F3S, when mounting two switches in one groove for both-end detection, please mount them so that the set screw parts of each switch face outward.
*3: The indicator light for F2S and F3S is red.
*4: For contact protection measures, see P. 783.
*5: Flexible lead wires are used.

Outline Dimension Drawing

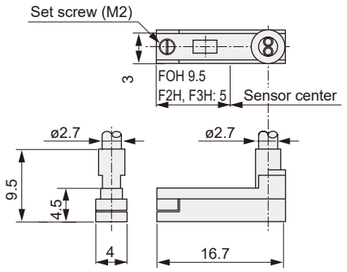
● F□S series (Lead wire vertical extraction short stroke detection type)



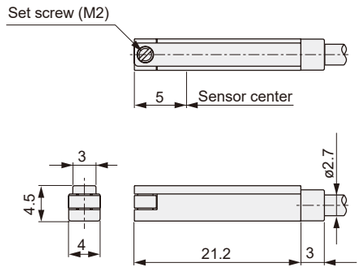
● F□H series (Straight lead wire type)



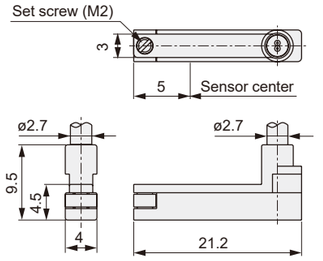
● F□V series (L-shaped lead wire type)



●F□YH / F3PH series (Straight lead wire type)

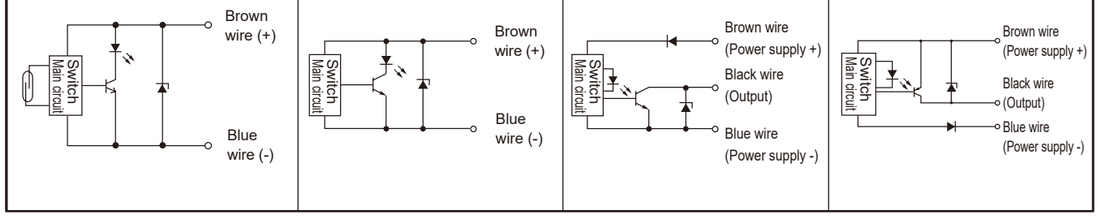


●F□YV / F3PV series (L-shaped lead wire type)



Switch internal circuit diagram

● F0H / F0V	● F2S / F2H / F2V / F2YH / F2YV	● F3S / F3H / F3V / F3YH / F3YV	● F3PH / F3PV



H Series	For strong magnetic field	Applicable Cylinder	CAC4-L2, GLC-L2, JSC3-L2, SCA2-L2, SHC-L2, UCAC2-L2, USC-L2

H0

H0Y

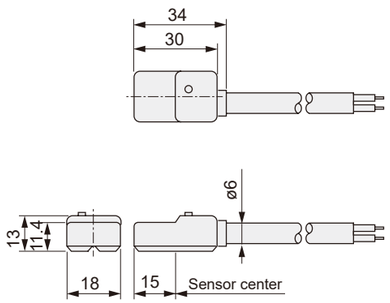
Specifications

Item	Reed 2-wire type		
	H0		H0Y (2-color indicator type)
Applications	For programmable controller, relay		For programmable controller only
Load voltage	12/24 VDC	110 VAC	24 VDC ±10%
Load current	5 to 50 mA	7 to 20 mA	5 to 20 mA
Internal voltage drop	5 V or less		6 V or less
Indicator LED	Green LED (Lights up when ON)		Red/Green LED (Lights up when ON)
Leakage current	0 mA		10 μA or less
Lead wire length	1 m (Flame-retardant cabtyre cord 2-core 0.5 mm²)		
Insulation resistance	100 MΩ or more with 500 VDC megger		
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute		
Shock resistance	294 m/s²		
Ambient temperature range	-10 to +60°C		
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant		
Contact protection circuit *1	None		
Weight	1 m: 76 g 3 m: 181 g 5 m: 289 g		

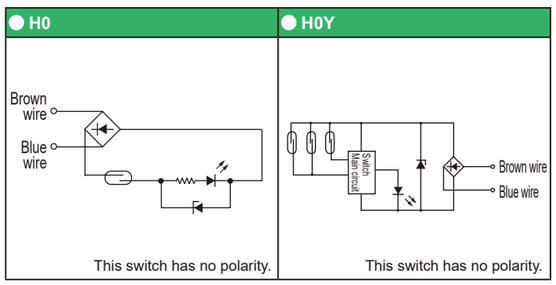
*1: For contact protection measures, see P. 783.

Outline Dimension Drawing

● H series (For strong magnetic field resistance)



Switch internal circuit diagram



Specifications / External dimension diagram / Switch internal circuit diagram

V Series	For small strong magnetic field resistance	Application Cylinder	SSD-L4, SSD2-L4, USSD-L4

VO

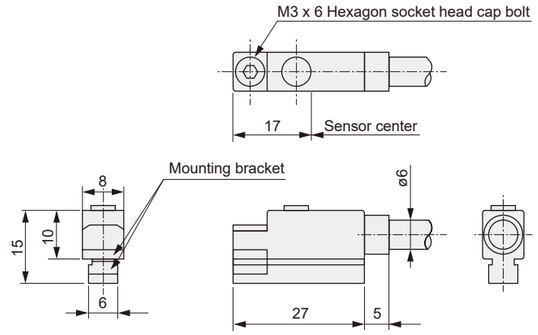
Specifications

Item	Reed 2-wire type	
	V0	
Applications	For relay, programmable controller	
Load voltage	24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA
Internal voltage drop	3.0 V or less (When load current is 40 mA)	
Indicator LED	LED (Lights up when ON)	
Leakage current	0 mA	
Lead wire length	1 m (Flame-retardant cabtyre cord 2-core 0.5 mm²)	
Insulation resistance	100 MΩ or more with 500 VDC megger	
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute	
Shock resistance	294 m/s²	
Ambient Temperature	-10 to +60°C	
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant	
Contact protection circuit *1	None	
Weight	1 m: 63 g 3 m: 170 g 5 m: 277 m	

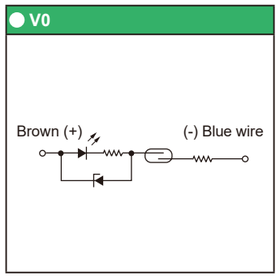
*1: For contact protection measures, see P. 783.

Outline Dimension Drawing

● V series (For strong magnetic field resistance)



Switch internal circuit diagram



E Series	Heat resistant	Application Cylinder	SCA2-L2T (E0) SSD-T1L (ET0) SSD2-T1L (ET0)

EO

ETO

(EO is not subject to CE, UKCA)

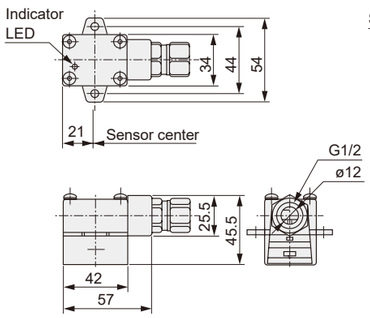
Specifications

Item	Reed 2-wire type				
	E0			ET0	
Applications	For relay, programmable controller				
Load voltage	12/24 VDC	110 VAC	220 VAC	12/24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA	7 to 10 mA	5 to 50 mA	7 to 20 mA
Internal voltage drop	4 V or less			3.0 V or less	
Leakage current	0 mA				
Indicator LED	Red LED (Lights up when ON)			Yellow LED (Lights up when ON)	
Conduit thread	G1/2			–	
Lead wire length	–			1 m (Heat-resistant fluorine insulated cabtyre cord 2-core 0.5 mm²)	
Insulation resistance	100 MΩ or more with 500 VDC megger				
Dielectric strength	No abnormality when 1500 VAC is applied for 1 minute			No abnormality when 1000 VAC is applied for 1 minute	
Shock resistance	294 m/s²				
Ambient Temperature	-10 to +120°C			-10 to +150°C	
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant				
Contact protection circuit *	None				
Weight	164 g			44 g	

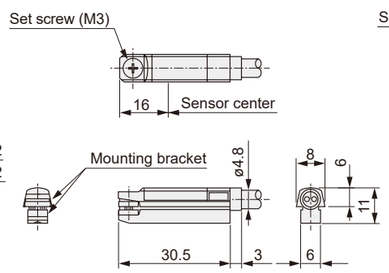
*: For contact protection measures, refer to P. 783.

Outline Dimension Drawing

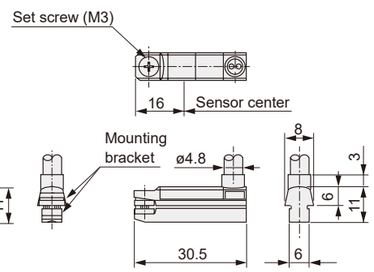
● E Series



● ET0H Series (Straight lead wire type)

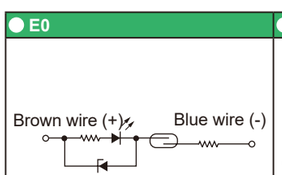


● ET0V Series (L-shaped lead wire type)

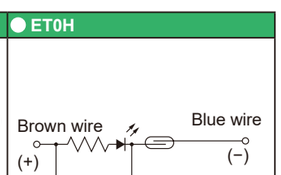


Switch internal circuit diagram

● E0



● ET0H



Cylinder Switch

Contact Protection Circuit Box	SKAC, SKDC

Specifications

Item	For AC circuit		For DC circuit
	SKAC		SKDC
Load voltage	100/110 VAC	200/220 VAC	24 VDC
Load current	20 mA or less	10 mA or less	50 mA or less
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core, 0.2 mm²)		
Shock resistance	980 m/s²		
Insulation resistance	100 MΩ or more with 500 VDC megger		
Dielectric strength	No abnormality when 1500 VAC is applied for 1 minute		
Ambient Temperature	-10 to +60°C		
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant		

Model No. Notation Method

SW-SKAC

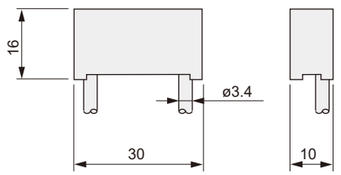
❶ Contact protection circuit

❶ Contact protection circuit

Code	Content
SKAC	For AC circuit
SKDC	For DC circuit

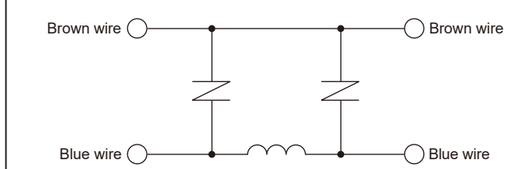
Outline Dimension Drawing

● SKAC / SKDC Series



Internal circuit diagram

● SKAC / SKDC

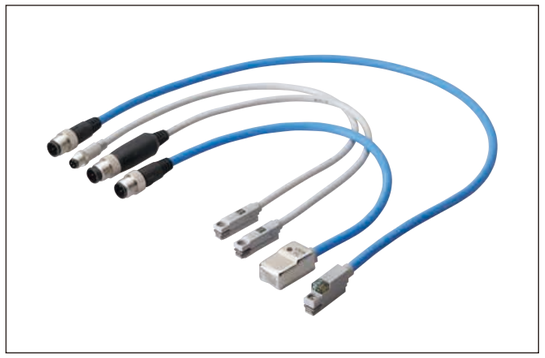


*: There is no polarity on the input or output side, and either can be connected to the switch side.

Note) SKAC is exclusively for AC circuits, and SKDC is exclusively for DC circuits.

Cylinder Switch

Cylinder Switch with Connector



Adopts highly versatile M8 and M12 connectors

- Compliant with Standard No. NECA4202, IEC947-5-2
- Reduction of wiring man-hours, Easy maintenance
- Protection structure is IP67
- Spatter adhesion prevention protective cover available

● For T0H

● For T2YD

Model No. Notation Method

* This is a custom order product.

● 2-wire Cylinder Switch

SW - T0 (1) H (2) F (3) K (4)

❶ Model	❷ Lead Wire Extraction Direction		❸ Connector Type, PIN Layout		Lead wire length		❹ Option *3	
T0	H	Straight type	F	M8 connector 4PIN (+) 3PIN (-) *1	Blank	0.3 m	K	Spatter adhesion prevention protective cover
T2	V	L-shaped type	M	M12 connector 1PIN (+) 4PIN (-)				
T2W			U	M12 connector 3,4PIN no polarity *2				
T2YL								
K2Y								
F2Y								

*1: Compatible only with T0, T2, T2W
*2: T2YL is not compatible. Please note that the "internal voltage drop" will be 1 V higher than the specification value described in the catalog.
*3: Applicable only to T0H□□

● 3-wire Cylinder Switch

SW - T3 (1) H (2) F (3)

❶ Model	❷ Lead Wire Extraction Direction		❸ Connector Type		Lead wire length	
T3	H	Straight type	F	M8 1PIN(+) 3PIN(-) 4PIN: (OUT)	Blank	0.3 m
T3P	V	L-shaped type				
T3W						

● Cylinder switch for strong magnetic fields

SW - H0 (1) M (2)

❶ Model	❷ Connector Type		Lead wire length	
H0	M	M12 connector 1,4PIN no polarity *4	Blank	0.3 m
H0Y	U	M12 connector 3,4PIN no polarity *5		
V0				

*4: Compatible only with H0, H0Y
*5: V0 only 4PIN (+) 3-pin (-)

● AC Magnetic Field Specific Cylinder Switch

SW - T2YD (1) G (2) K (3)

❶ Model	❷ Connector Type		Lead wire length		❸ Option	
T2YD	G	Spatter-resistant lead wire M12 connector 1,4PIN no polarity	Blank	0.3 m	K	Spatter adhesion prevention protective cover
	B	Spatter-resistant lead wire M12 connector 3,4PIN no polarity				
	U	Flame-retardant lead wire UL wire M12 connector 3,4PIN non-polar				
	W	Flame-retardant lead wire UL wire M12 connector 1,4PIN non-polar				

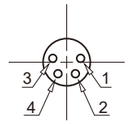
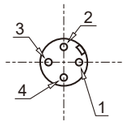
*6: The switch specifications for the cylinder are the same as the lead wire type. For details, please refer to P. 768 to 782.

Connector pin assignment

Series	Connector pin assignment					
	Code	Connector type	1PIN	2PIN	3PIN	4PIN
2-wire type	F	M8	-	-	(−)	(+)
	M	M12	(+)	-	-	(−)
	U		-	-	(±)	(±)
For strong magnetic field	M, G, W		(±)	-	-	(±)
Exclusively for AC magnetic fields	U, B *1		-	-	(±)	(±)
3-wire type	F	M8	(+)	-	(−)	(OUT)

*1: Only SW-V0U has polarity (4PIN (+), 3PIN (-)).

Connector specifications

Item	M8	M12
Pin assignment		
Shock resistance	294 m/s²	
Protection structure	IP67	
Insulation resistance	100 MΩ with 500 VDC megger	
Dielectric strength	1000 VAC for 1 minute (Between contacts and between contact housing) Leakage current 1 mA or less	

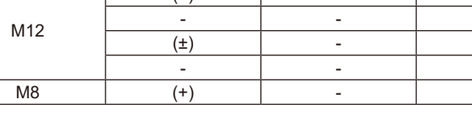
Outline Dimension Drawing

① M12 connector (Only for 2-wire cylinder switch connector type, PIN assignment code "U")

Standard for external shape of connector part: IEC64076-2-101

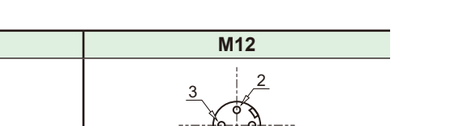
② M12 connector (M12 connectors other than ①)

Standard for external shape of connector part: IEC64076-2-101



③ M8 connector (Applicable to all models)

Standard for external shape of connector part: IEC64076-2-104



* For external dimensions diagrams of cylinder switches, please refer to P. 768 to 782.

T-type cylinder switch with off-delay timer
T2JH / T2JV

Overview

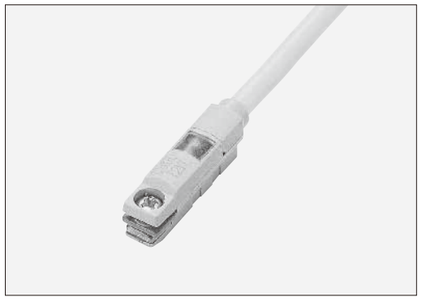
Optimal for high-speed intermediate detection of cylinders.
Ensures reliable PC input by providing an off-delay timer.

Features

- Eliminates PC input problems that tend to occur during high-speed intermediate detection of cylinders.
- Off-delay timer is 200 ±50 ms
- Can be mounted on Rodless Cylinder SRL3.
- Wide variety of mountable cylinders.

* If ordered with cylinder mounting, it will be a custom order product.
* Some cylinders have limited mountable switches. Please refer to the P. for each cylinder for details.

T-type cylinder switch for cutting oil resistance
T2YLH/V, T3YLH/V



Overview

This is a cylinder switch designed to prevent cutting oil used for machine tools in machining sites, etc., from entering the inside of the switch.

Features

- Oil resistance improved by applying a coating agent to the board. Can be used even in environments where cutting oil splashes.
- Wide variety of mountable cylinders

* If ordered with cylinder mounting, it will be a custom order product.

Water-resistant Cylinder Switch
T2WLH/V

Features

Product with improved water (coolant) resistance

- Water (coolant) resistance performance: 6 times or more compared to conventional products
- Space saving (70% down compared to conventional), Lightweight (46% down compared to conventional)
- Compatible with existing switch SW-T2YL
- Reduction of wiring space (Can be stored in T-slot)
- Protection structure IP67

Magnetic Field Resistant Cylinder Switch
TOY

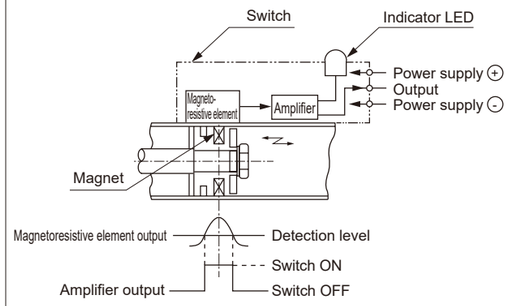
Features

Product with improved reliability in magnetized environments (Optimal for DC welding processes)

- Space saving (70% down compared to conventional products)
- Power saving (50% down compared to conventional products)
- Compatible with existing switch SW-T2YD (excluding some models and bores)
- Wide range of variations (cable material, connectors, spatter adhesion prevention cover)
- Protection structure IP67

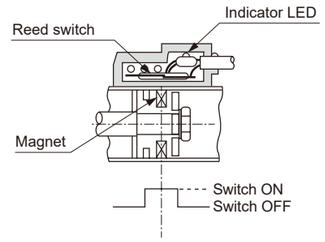
Operating Principle

Solid state switch



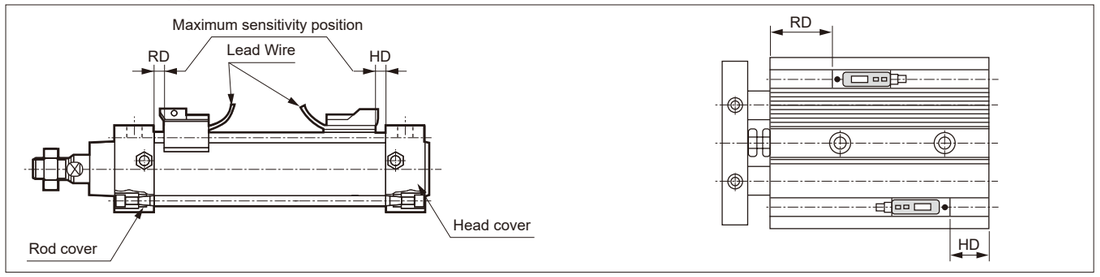
When the piston magnet approaches, a change occurs in the magnetic field, and the output voltage of the magnetoresistive element changes as shown in the figure. By amplifying this signal, a switching output as shown in the figure can be obtained.

Reed switch



When the piston magnet approaches, a magnetic field is generated, the opposing contacts of the reed switch are magnetized, an attractive force is generated, and the contacts close.

Switch mounting position



● When mounting at stroke end

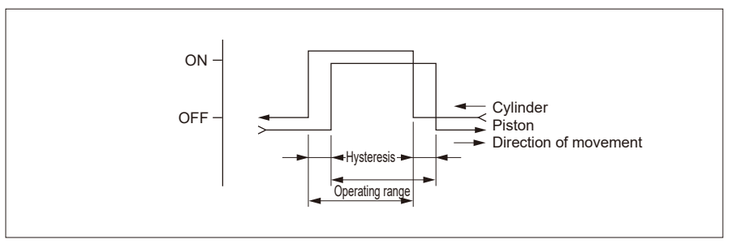
To operate the switch at the maximum sensitivity position, please mount it at the RD dimension on the rod side and the HD dimension on the head side, respectively.
Note that the HD and RD dimensions vary depending on the cylinder. Please refer to the external dimension diagram for each cylinder.
Also, please mount the switch with the lead wire facing inward as shown in the figure above.

● When mounting at intermediate stroke position

When detecting in the middle of the stroke, fix the piston at the stopping position and move the switch back and forth over the piston to find the position where the switch first turns ON. The midpoint between those two positions is the maximum sensitivity position at that piston position, and becomes the mounting position.

● About circumferential direction mounting

Varies depending on the mounting bracket. The band method has no restrictions in the circumferential direction.
For the tie-rod method, rotation in 90° increments is possible. For rail type, circumferential rotation is not possible.



Hysteresis

●This is the distance from the position where the piston moves and the switch turns ON, to when it moves in the reverse direction and turns OFF. If the piston stops during this time, the switch operation becomes unstable and susceptible to external influences. Please be careful.

Operating range

● This refers to the range from when the piston moves and the switch turns ON, to when it moves further in the same direction and turns OFF.
The center of the operating range is the maximum sensitivity position. If this position is set as the piston stop position, it will be less susceptible to disturbances and the switch operation will also be stable.

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Pencil Shaped Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□), Reed switches (T0□,T5□)						
SCP□3	ø6	1.5 to 4	2.5 to 5	1.5 or less	1.0 or less	4 to 6	3 or less
	ø10	1.5 to 5.5	2.5 to 6			3.5 to 7	
	ø16	2 to 6	2.5 to 6			3.5 to 7.5	
Small bore size cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
CMK2	ø20	2.5 to 5.5	3.5 to 7.5	1.5 or less	1.0 or less	6.5 to 11	3 or less
	ø25	2.5 to 5.5	3.5 to 7.5			7.5 to 12	
	ø32	2.5 to 6	3.5 to 8			6.5 to 11.5	
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Small Bore Size Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
CMA2	ø20	3 to 6	5 to 6.5	1.5 or less	1.0 or less	8.5 to 12	3 or less
	ø30	3 to 5.5	6 to 7			8 to 13	
	ø40	2.5 to 5.5	5.5 to 7.5			8.5 to 12.5	
Round shaped cylinder	● Applicable Switch: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SCM	ø20	3 to 8	4.5 to 9	1.5 or less	1.0 or less	6 to 14	3 or less
	ø25	3 to 9	5 to 9			5 to 14	
	ø32	3 to 8	5 to 9			5 to 12	
	ø40	3 to 9	5.5 to 9.5			6 to 14	
	ø50	3 to 9	6 to 10			6 to 14	
	ø63	3 to 9	6 to 10.5			7 to 15	
	ø80	4 to 10	6.5 to 11			7 to 15	
	ø100	4 to 10	7 to 11.5			9 to 15	
Tie Rod Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SCG	ø32	2 to 7	6 to 9	1.5 or less	1.0 or less	6 to 11	3 or less
	ø40	2 to 7	6.5 to 9			7 to 12	
	ø50	2 to 7	7 to 10			7.5 to 12	
	ø63	2 to 7.5	7 to 10			8.5 to 13	
	ø80	2.5 to 8	7.5 to 10.5			9 to 13.5	
	ø100	2.5 to 8	8 to 11			9 to 14	
Medium Bore Size Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SCA2	ø40	2 to 7	3 to 10	1.5 or less	1.0 or less	5 to 12.5	3 or less
	ø50	2 to 7.5	3 to 10			5.5 to 13.5	
	ø63	2.5 to 7.5	3.5 to 10.5			5.5 to 14	
	ø80	3 to 8	4 to 11.5			6.5 to 14.5	
	ø100	3 to 8.5	4 to 11.5			6.5 to 15.5	
Medium Bore Size Cylinder	● Applicable Switch: Reed switch for strong magnetic field (H0□)					* ( ) indicates HOY value.	
SCA2-L2	ø40	-		-	-	4 to 7.5 (10.5 to 13.5)	3 or less
	ø50					4 to 7.5 (11 to 14)	
	ø63					5 to 8 (11.5 to 14.5)	
	ø80					5 to 8 (10.5 to 14.5)	
	ø100					5 to 8 (10.5 to 14.5)	
Large Bore Size Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SCS2	ø125	7.5 to 14	14 to 21	1.5 or less	1.0 or less	11 to 16	3 or less
	ø140	7.5 to 14	18 to 26				
	ø160	7.5 to 14	18 to 26				
	ø180	7.5 to 14	18 to 26				
	ø200	7.5 to 14	18 to 26				

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Tie Rod Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
CKV2	ø20	2.5 to 5.5	3.5 to 7.5	1.5 or less	1.0 or less	6.5 to 11	3 or less
	ø25	2.5 to 5.5	3.5 to 7.5			7.5 to 12	
	ø32	2.5 to 6	3.5 to 8			6.5 to 11.5	
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Tie Rod Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
CAV2-L **COVP2-L** **COVN2-L**	ø50	3.8 to 6.7	4 to 6	0.8 or less	0.7 or less	7.7 to 8.3	1 or less
	ø75	3.8 to 6.7	4 to 6			7.7 to 8.3	
	ø100	3.8 to 6.7	4 to 6			7.7 to 8.3	
Compact Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SSD2	ø12	1.5 to 5.5	3 to 6	1.5 or less	1.0 or less	5 to 8	3 or less
	ø16	1.5 to 4.5	3 to 7			4 to 9	
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
	ø80	4 to 10	6 to 10			7 to 15	
	ø100	4 to 10	6 to 10			9 to 15	
	ø125	4 to 10	8 to 10			9 to 15	
	ø140	4 to 10	8 to 10			9 to 15	
	ø160	4 to 10	8 to 10			9 to 15	
Compact Cylinder	● Applicable switches: Reed switch (ET0□)						
SSD2-T1L	ø16	-		-	-	8 to 11.5	3 or less
	ø20					9 to 13.5	
	ø25					9.5 to 14	
	ø32					9 to 13	
	ø40					9 to 14	
	ø50					11 to 16	
	ø63					13 to 18	
Compact Cylinder	● Applicable Switch: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SSG	ø12	1.5 to 5.5	3 to 6	1.5 or less	1.0 or less	5 to 8	3 or less
	ø16	1.5 to 4.5	3 to 7			4 to 9	
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			7 to 15	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
	ø80	4 to 10	6 to 10			9 to 15	
	ø100	4 to 10	6 to 10			9 to 15	

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Compact Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SSD	ø12	1.5 to 5.5	3 to 6	1.5 or less	1.0 or less	5 to 8	3 or less
	ø16	1.5 to 4.5	3 to 7			4 to 9	
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
	ø80	4 to 10	6 to 10			7 to 15	
	ø100	4 to 10	6 to 10			9 to 15	
	ø125	4 to 10	8 to 10			9 to 15	
	ø140	4 to 10	8 to 10			9 to 15	
	ø160	4 to 10	8 to 10			9 to 15	
Compact Cylinder	● Applicable switches: Reed switch (ET0□)						
SSD-T1L	ø16	-		-	-	8 to 11.5	3 or less
	ø20					9 to 13.5	
	ø25					9.5 to 14	
	ø32					9 to 13	
	ø40					9 to 14	
	ø50					11 to 16	
	ø63					13 to 18	
Compact Direct Cylinder	● Applicable switches: Solid state switches (F2□, F3□), Reed switch (F0□)						
MDC2	ø6	1.5 to 3.5	-	1.0 or less	-	3.5 to 6.0	1.0 or less
	ø8						
	ø10						
MDC2-X	ø6	2.0 to 3.5	-	1.0 or less	-	5.5 to 7.5	1.0 or less
	ø8						
	ø10						
MDC2-Y	ø6	1.5 to 3.5	-	1.0 or less	-	4.5 to 6.0	1.0 or less
	ø8						
	ø10						
Compact direct cylinder with vacuum pad	● Applicable switches: Solid state switches (F2□, F3□), Reed switch (F0□)						
MVC	ø6	1.5 to 3.5	-	1.0 or less	-	3.5 to 6.0	1.0 or less
	ø10					4.5 to 6.0	
Compact cylinder	● Applicable switches: Solid state switches (K2□, K3□, K3P□, K2Y□, K3Y□), Reed switches (K0□, K5□)						
SMG	ø6	1.5 to 7	3.5 to 7.5	2 or less	1.5 or less	3 to 9.5	3 or less
	ø10	1.5 to 7	3.5 to 7.5			3.5 to 9.5	
	ø16	1.5 to 7	4.5 to 8.5			4 to 11	
	ø20	2.5 to 9	5 to 9			5 to 12.5	
	ø25	3.5 to 11	5.5 to 9.5			6.5 to 14	
	ø32	3.5 to 11.5	1.5 to 10.5			5.5 to 14	
Compact Cylinder	● Applicable switches: Solid state switches (F2□, F3□), Reed switch (F0□)						
MSD-□L **MSDG-L**	ø6	1.5 to 3.0	-	1.0 or less	-	5 to 6	1.0 or less
	ø8	1.5 to 3.5	-			5.5 to 6.5	
	ø12	1.5 to 3.5	-			5.5 to 7.5	
	ø16	1.5 to 3.5	-			4.5 to 7	

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Flat Cylinder Compact Demi	● Applicable switches: Applicable switches: Solid state switches (M2V,M3V,M3PV,M2WV,M3WV), Reed switches (M0V,M5V)						
FCS-L	ø25	9 to 12	6 to 11	1.5 or less	1.0 or less	7 to 8.5	3 or less
	ø32	9 to 12	6 to 11			7 to 8.5	
	ø40	8.5 to 12	6 to 11			7 to 8.5	
	ø50	8 to 12	6 to 11			6.5 to 8.5	
	ø63	8 to 12	6 to 11			6.5 to 8.5	
FCH-L **FCD-L** **FCD-DL** **FCD-KL**	ø25	6 to 12	5 to 11	1.5 or less	1.0 or less	7 to 12	3 or less
	ø32	6 to 12	5 to 11			7 to 12	
	ø40	6 to 12	5 to 11			7 to 12	
	ø50	6 to 12	5 to 11			7 to 12	
	ø63	6 to 12	5 to 11			7 to 12	
Stopper Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
STK	ø20	3 to 8	4.5 to 8	1.5 or less	1.5 or less	6 to 14	3 or less
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
ULK	ø20	2.5 to 5.5	3.5 to 7.5	1.5 or less	1.0 or less	6.5 to 11	3 or less
	ø25	2.5 to 5.5	3.5 to 7.5			7.5 to 12	
	ø32	2.5 to 6	3.5 to 8			6.5 to 11.5	
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
JSK2	ø20	2.5 to 5.5	3.5 to 7.5	1.5 or less	1.0 or less	6.5 to 11	3 or less
	ø25	2.5 to 5.5	3.5 to 7.5			7.5 to 12	
	ø32	2.5 to 6	3.5 to 8			6.5 to 11.5	
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
JSM2	ø20	3 to 6	5 to 6.5	1.5 or less	1.0 or less	8.5 to 12	3 or less
	ø30	3 to 5.5	6 to 7			8 to 13	
	ø40	2.5 to 5.5	5.5 to 7.5			8.5 to 12.5	
Tie Rod Cylinder with Brake	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
JSG	ø32	2 to 7	6 to 9	1.5 or less	1.0 or less	6 to 11	3 or less
	ø40	2 to 7	6.5 to 9			7 to 12	
	ø50	2 to 7	7 to 10			7.5 to 12	
	ø63	2 to 7.5	7 to 10			8.5 to 13	
	ø80	2.5 to 8	7.5 to 10.5			9 to 13.5	
	ø100	2.5 to 8	8 to 11			9 to 14	

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
JSC3 (Medium bore)	ø40	2 to 7	3 to 10	1.5 or less	1.0 or less	5 to 12.5	3 or less
	ø50	2 to 7.5	3 to 10			5.5 to 13.5	
	ø63	2.5 to 7.5	3.5 to 10.5			5.5 to 14	
	ø80	3 to 8	4 to 11.5			6.5 to 14.5	
	ø100	3 to 8.5	4 to 11.5			6.5 to 15.5	
Brake Cylinder	● Applicable switches: Reed switch for strong magnetic field (H0□)					* ( ) indicates H0Y value.	
JSC3-L2 (Medium bore)	ø40	-		-		4 to 7.5 (10.5 to 13.5)	3 or less
	ø50					4 to 7.5 (11 to 14)	
	ø63					5 to 8 (11.5 to 14.5)	
	ø80					5 to 8 (10.5 to 14.5)	
	ø100					5 to 8 (10.5 to 14.5)	
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
JSC4 (Large bore)	ø125	7.5 to 14	14 to 21	1.5 or less	1.0 or less	11 to 16	3 or less
	ø140	7.5 to 14	18 to 26			11 to 16	
	ø160	7.5 to 14	18 to 26			11 to 16	
	ø200	7.5 to 14	18 to 26			11 to 16	
Compact Cylinder with Drop Prevention	● Applicable Switch: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□, T5□, T8□)						
USSD	ø20	3 to 8	4.5 to 8	1.5 or less	1.0 or less	6 to 14	3 or less
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
Flat Cylinder with Free Position Drop Prevention	● Applicable Switch: Solid state switches (M2□, M3□, M3P□, M2W□, M3W□), Reed switches (M0□, M5□)						
UFCD	ø25	6 to 12	5 to 11	1.5 or less	1.0 or less	7 to 12	3 or less
	ø32	6 to 12	5 to 11			7 to 12	
	ø40	6 to 12	5 to 11			7 to 12	
	ø50	6 to 12	5 to 11			7 to 12	
	ø63	6 to 12	5 to 11			7 to 12	
Medium Bore Size Cylinder with Free Position Fall Prevention	● Applicable Switch: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□, T5□, T8□)						
USC	ø40	2 to 7	3 to 10	1.5 or less	1.0 or less	5 to 12.5	3 or less
	ø50	2 to 7.5	3 to 10			5.5 to 13.5	
	ø63	2.5 to 7.5	3.5 to 10.5			5.5 to 14	
	ø80	3 to 8	4 to 11.5			6.5 to 14.5	
	ø100	3 to 8.5	4 to 11.5			6.5 to 15.5	
Medium Bore Size Cylinder with Free Position Fall Prevention	● Applicable Switch: Reed switch for strong magnetic field (H0□)					* ( ) indicates H0Y value.	
USC-L2	ø40	-		-	-	4 to 7.5 (10.5 to 13.5)	3 or less
	ø50					4 to 7.5 (11 to 14)	
	ø63					5 to 8 (11.5 to 14.5)	
	ø80					5 to 8 (10.5 to 14.5)	
	ø100					5 to 8 (10.5 to 14.5)	
Guided Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
STM	ø10	2.5 to 4.5	2.5 to 5.5	1.5 or less	1.5 or less	-	-
	ø16	2.5 to 4.5	2.5 to 5.5				

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Guided Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
STG	ø12	1.5 to 4.5	4 to 6	1.5 or less	1.5 or less	6 to 10	3 or less
	ø16	1.5 to 4.5	4 to 6			4 to 9	
	ø20	3 to 8	5 to 8.5			6 to 14	
	ø25	3 to 9	5 to 8.5			5 to 14	
	ø32	3 to 9	5 to 9			5 to 12	
	ø40	3 to 9	6 to 10			6 to 14	
	ø50	3 to 9	6 to 10			6 to 14	
	ø63	3 to 9	6 to 10			7 to 15	
	ø80	4 to 10	7 to 10			7 to 15	
Guided Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
STS/L	ø8	1.5 to 3.5	4 to 6	1.5 or less	1.5 or less	5 to 9	3 or less
	ø12	1.5 to 4.5	4 to 6			6 to 10	
	ø16	1.5 to 4.5	4 to 6			4 to 9	
	ø20	3 to 8	5 to 8.5			6 to 14	
	ø25	3 to 9	5 to 8.5			5 to 14	
	ø32	3 to 8	5 to 9			5 to 12	
	ø40	3 to 9	6 to 10			6 to 14	
	ø50	3 to 9	6 to 10			6 to 14	
	ø63	3 to 9	6 to 10			7 to 15	
	ø80	4 to 10	7 to 10			7 to 15	
	ø100	2 to 9	7 to 10			7 to 15	
Linear Slide Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
LCW	ø12	3.5 to 6.5	4.5 to 6.5	1.0 or less	1.0 or less	-	-
Linear Slide Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□), Reed switches (T0□,T5□)						
LCW	ø16	3 to 5	4 to 5.5	1.0 or less	1.0 or less	6.5 to 9.5	3.0 or less
	ø20	4.5 to 6.5	5.5 to 6.5			8 to 12	
Linear Slide Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
LCR	ø6	2 to 4	2.5 to 5.5	1.0 or less	1.0 or less	-	-
	ø8		3.5 to 6				
	ø12		3 to 4.5				
Linear Slide Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T3P□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□,T5□)						
LCR	ø16	2 to 4	3 to 4.5	1.0 or less	1.0 or less	5 to 9	1.0 or less
	ø20	2 to 5.5	4 to 5.5			6.5 to 11	
	ø25	2.5 to 6	3.5 to 6			8 to 12	
Linear Slide Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
LCG	ø6	2 to 4	2.5 to 5.5	1.0 or less	1.0 or less	-	-
	ø8		3.5 to 6				
	ø12		3 to 4.5				
Linear Slide Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T3P□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□,T5□)						
LCG	ø16	2 to 4	3 to 4.5	1.0 or less	1.0 or less	5 to 9	1.0 or less
	ø20	2 to 5.5	4 to 5.5			6.5 to 11	
	ø25	2.5 to 6	3.5 to 6			8 to 12	
Linear Slide Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T3P□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□,T5□)						
LCX	ø25	0.5 to 6	1.0 to 5.5	2 or less	2 or less	2 to 10.5	3.5 or less
	ø32	1.0 to 5.5	0.5 to 5.0			1 to 11	

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Linear Slide Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
LCM	ø4.5	1 to 3	2 to 4	1.0 or less	1.0 or less	-	-
	ø6						
	ø8						
Twin Rod Cylinder	● Applicable switches: Solid state switches (K2□, K3□, K3P□, K2Y□, K3Y□), Reed switches (K0□, K5□)						
STR2	ø6	1 to 6	4 to 7.5	2.0 or less	1.5 or less	4 to 9 (STR2-M)	3.0 or less
	ø10	1 to 5.5	4 to 7.5			4 to 9 (STR2-M)	
	ø16	1.5 to 7.5	4.5 to 9			5 to 12.5	
	ø20	3 to 9	5.5 to 10			6.5 to 14.5	
	ø25	3.5 to 10.5	6.5 to 10.5			8 to 14.5	
	ø32	-	-			-	
Unit Cylinder	● Applicable switches: Solid state switches (T2□,T3□), Reed switches (T0□,T5□)						
UCA2-□L	ø10	1.5 to 4	-	1.5 or less	-	4.5 to 8	3.0 or less
	ø16						
	ø25						
	ø32						
High Energy Absorption Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
HCM	ø20	3 to 8	4.5 to 9	1.5 or less	1.0 or less	6 to 14	3 or less
	ø25	3 to 9	5 to 9			5 to 14	
	ø32	3 to 8	5 to 9			5 to 12	
	ø40	3 to 9	5.5 to 9.5			6 to 14	
	ø50	3 to 9	6 to 10			6 to 14	
	ø63	3 to 9	6 to 10.5			7 to 15	
High Speed Cylinder	● Applicable switches: Solid state switches (R1, R2, R3, R2Y, R3Y), Reed switches (R0, R4, R5, R6)						
HCA	ø20	6 to 14	11 to 18	1.5 or less	1.0 or less	7 to 14	3.0 or less
	ø25	6 to 14	11 to 18			8 to 13	
	ø32	6 to 14	11 to 18			9 to 14	
	ø50	6 to 14	11 to 18			9 to 14	
Rodless Cylinder	● Applicable switches: Solid state switches (M2□, M3□, M3P□, M2WV, M3WV), Reed switches (M0□, M5□)						
SRL3	ø12	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	3.0 or less
	ø16	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	
	ø20	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	
	ø25	9.5 to 15.5	9 to 14	2.0 or less	1.5 or less	8.5 to 13.5	3.5 or less
	ø32	7.5 to 15	8 to 14	2.0 or less	1.5 or less	7 to 13.5	
	ø40	11.5 to 17.5	10 to 16.5	2.0 or less	1.5 or less	10 to 16	
	ø50	11 to 24	17 to 27	2.5 or less	1.5 or less	17 to 27	3.0 or less
	ø63	11 to 24	17 to 27	2.5 or less	1.5 or less	17 to 27	
	ø80	26.5 to 45.5	16.5 to 40	5.0 or less	3.0 or less	20.5 to 41	
	ø100	25.5 to 40.5	21.5 to 36	3.0 or less	2.5 or less	24 to 37	
Rodless Cylinder	● Applicable switches: Proximity switch (T2W□, T3W□, T2WL□, T2YD)						
SRL3	ø12	-	2 to 7	-	1.0 or less	-	-
	ø16	-	2 to 7				
	ø20	-	3 to 8	-	1.5 or less		
	ø25	-	3 to 10				
	ø32	-	3 to 10				
	ø40	-	4 to 11				
	ø50	-	9 to 16				
	ø63	-	9 to 16				
	ø80	-	10 to 24	-	2.0 or less		
	ø100	-	10 to 24				

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Rodless Cylinder with High-Precision Guide	● Applicable Switch: Solid state switches (M2□, M3□, M3P□, M2WV, M3WV), Reed switches (M0□, M5□)						
SRG3	ø12	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	3.0 or less
	ø16	4 to 13	4 to 12			3 to 11	
	ø20	9.5 to 15.5	9 to 14	2.0 or less	1.5 or less	3 to 11	
	ø25	9.5 to 15.5	9 to 14			8.5 to 13.5	3.5 or less
Rodless Cylinder with High-Precision Guide	● Applicable switches: Proximity switch (T2W□, T3W□, T2WL□, T2YD)						
SRG3	ø12	-	2 to 7	-	1.0 or less	-	-
	ø16	-	2 to 7				
	ø20	-	3 to 8	-	1.5 or less		
	ø25	-	3 to 10				
Rodless Cylinder with High-Precision Guide	● Applicable Switch: Solid state switches (T2WL□, T2W□, T3W□, T2YD), Reed switch (T0□, T5□, T8□)						
SRM3	ø25	-	6 to 9	-	1.0 or less	5.5 to 11	2.0 or less
	ø32	-	6.5 to 9			5.5 to 10	
	ø40	-	7.5 to 10.5			5.5 to 9	
	ø63	-	8 to 11			5.5 to 10	
Rodless Cylinder with Brake	● Applicable switches: Solid state switches (M2□, M3□, M3P□, M2WV, M3WV), Reed switches (M0□, M5□)						
SRT3	ø12	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	3.0 or less
	ø16	4 to 13	4 to 12			3 to 11	
	ø20	4 to 13	4 to 12			3 to 11	
	ø25	9.5 to 15.5	9 to 14	2.0 or less	1.5 or less	8.5 to 13.5	3.5 or less
	ø32	7.5 to 15	8 to 14			7 to 13.5	
	ø40	11.5 to 17.5	10 to 16.5			10 to 16	
	ø50	16.5 to 24	14 to 21			14.5 to 21.5	
	ø63	16 to 24	14 to 21			14 to 21.5	
Rodless Cylinder	● Applicable switches: Proximity switch (T2W□, T3W□, T2WL□, T2YD)						
SRT3	ø12	-	2 to 7	-	1.0 or less	-	-
	ø16	-	2 to 7				
	ø20	-	3 to 8	-	1.5 or less		
	ø25	-	3 to 10				
	ø32	-	3 to 10				
	ø40	-	4 to 11				
	ø50	-	9 to 16				
	ø63	-	9 to 16				
Magnet Type Rodless Cylinder	● Applicable switches: Solid State Switch (T2□, T3□, T3P□, T2W□, T3W□, T2WL□, T1□)						
MRL2	ø6	2 to 5	5.5 to 6.5	1.0 or less	1.0 or less	-	-
	ø10	2.5 to 5.5	6 to 7.5				
	ø16	2 to 5	5.5 to 7				
	ø20	2 to 5	6 to 5.5				
	ø25	2 to 5	6 to 5.5				
	ø32	2 to 4.5	5.5 to 6.5				
Magnet type super rodless cylinder high precision guide	● Applicable switches: Solid state switches (T2□,T3□,T3P□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□,T5□)						
MRG2	ø10	2 to 4.5	5.5 to 7	0.5 or less	0.5 or less	6.5 to 7.5	1 or less
	ø16	2 to 5	6 to 7.5			7 to 8	2 or less
	ø25	2 to 5	6 to 7			7.5 to 8	2 or less

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Clamp Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
CAC4	ø40	2 to 6.5	5.7 to 6.5	1.5 or less	1.0 or less	6.7 to 10.8	3 or less
	ø50	2.5 to 6.0	5.9 to 6.8			7.8 to 11.3	
	ø63	2.5 to 6	6.1 to 6.8			8.2 to 11.4	
	ø80	3 to 7	7.7 to 8.5			9 to 10.9	
Clamp Cylinder	● Applicable switches: Reed switch for strong magnetic field (H0□)						
CAC4-L2	ø40	-		-	-	6.7 to 10.8	3 or less
	ø50					7.8 to 11.3	
	ø63					8.2 to 11.4	
	ø80					6.6 to 7.5	
Clamp Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
UCAC2	ø50	2.5 to 6.0	5.9 to 6.8	1.5 or less	1.0 or less	7.8 to 11.3	3 or less
	ø63	2.5 to 6.5	6.1 to 6.8			8.2 to 11.4	
Clamp Cylinder	● Applicable switches: Reed switch for strong magnetic field (H0□)						
UCAC2-L2	ø50	-		-	-	7.8 to 11.3	3 or less
	ø63					8.2 to 11.4	
Lightweight Clamp Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
CAC	ø32	2.5 to 6	3.5 to 8	1.5 or less	1.0 or less	6.5 to 11.5	3 or less
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Lightweight clamp cylinder with fall prevention	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
UCAC	ø32	2.5 to 6	3.5 to 8	1.5 or less	1.0 or less	6.5 to 11.5	3 or less
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Rotary Clamp Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
RCS2	ø12	1.5 to 5.5	3 to 6	1.5 or less	1.0 or less	5 to 8	3 or less
	ø16	1.5 to 4.5	3 to 7			4 to 9	
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
Rotary Clamp Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T3P□,T2W□,T3W□,T2WL□,T2YD), Reed switches (T0□,T5□)						
RCC2	ø16	2 to 5	3 to 7	1.5 or less	1.0 or less	4 to 9	3 or less
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
Rotary Clamp Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□), Reed switches (T0□,T5□)						
RCS	ø16	2 to 5	3 to 7	1.5 or less	1.0 or less	4 to 9	3 or less

Operating range and hysteresis of each cylinder model with switch

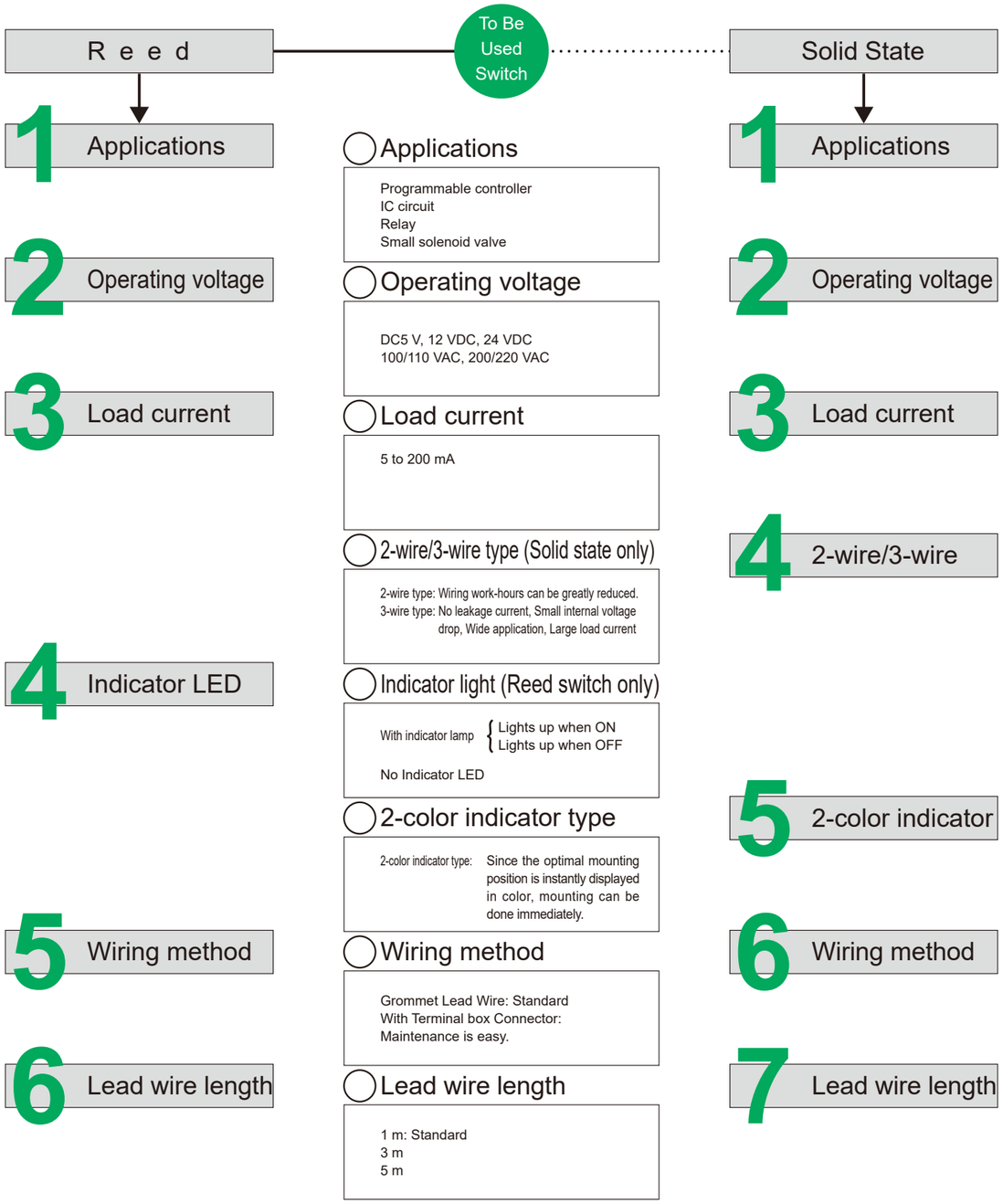
Model No.	Bore size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Mechanical Power Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
MCP-S	2t	4 to 10	6 to 10	1.5 or less	1.0 or less	7 to 15	3 or less
	5t	4 to 10	8 to 10			9 to 15	
MCP-W (Fast feed part)	2t	3.5 to 6.0	4.6 to 9.2	1.5 or less	1.0 or less	7.6 to 12.8	3 or less
	5t	4.0 to 8	5.5 to 11.9			8.9 to 14.1	
Guideless Cylinder	● Applicable switches: Solid state switches (R1, R2, R3, R2Y, R3Y), Reed switches (R0, R4, R5, R6)						
GLC	ø40	7 to 17		1.5 or less		11.5 to 16.5	3.0 or less
	ø50	9 to 17				13 to 18	
	ø63	10 to 18				15 to 20	
	ø80	8 to 19				15 to 20	
	ø100	11 to 20.5				13.5 to 19	
Guideless Cylinder	● Applicable switches: Reed switch (H0)						
GLC-L2	ø40	-		-		4 to 9	3.0 or less
	ø50					4 to 9	
	ø63					4 to 10	
	ø80					5 to 11	
	ø100					5 to 11	
Selex Rotary	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□, T5□, T8□)						
RRC	8	15° to 60°	20° to 70°	-	-	70° to 90°	-
	32	10° to 30°	10° to 30°			30° to 40°	
	63	10° to 30°	10° to 30°			30° to 40°	
Table Type Rotary Actuator	● Applicable switches: Proximity switch (T2□,T3□,T2W□,T3W□,T2WL□,T1□)						
GRC	5	10° to 35°	30° to 40°	-	-	-	-
	10	5° to 30°	20° to 30°				
	20	10° to 35°	25° to 35°				
	30	5° to 25°	15° to 25°				
	50	5° to 25°	15° to 25°				
	80	5° to 25°	15° to 25°				
Compact Selex Rotary	● Applicable switches: Solid state switch (SR-□)						
RV3□	3	15° ±7°	-	3° or less	-	-	-
	10	15° ±7°	-				
	20	15° ±7°	-				
	30	15° ±7°	-				
Compact Selex Rotary	● Applicable switches: Proximity switch (FR-□)						
RV3□	3	23° ±7°	-	2° or less	-	-	-
	10	23° ±7°	-				
	20	23° ±7°	-				
	30	23° ±7°	-				
Large Selex Rotary	● Applicable switches: Solid state switches (M2V,M3V,M3PV), Reed switches (M0V,M5V)						
RV3□	50	Approx. 40°	-		-	Approx. 25°	-
	150	Approx. 25°	-			Approx. 15°	
	300	Approx. 25°	-			Approx. 15°	
	800	Approx. 25°	-			Approx. 15°	

Cylinder Switch

Selection method

When selecting a cylinder switch, first check whether it is a reed type or solid state type, and then select the appropriate switch according to the order of the selection chart below.

Cylinder switch selection chart



MEMO

Cylinder Switch

Troubleshooting and countermeasures in case of failure [Cylinder switch] ①

Malfunction phenomenon	Cause	Factor	Countermeasure
Remains ON, remains outputting * Load ・Programmable Controller ・Relay ・Other	Load was short-circuited	Internal circuit damage of the switch	① Replace the cylinder switch and reselect one where the maximum rating of the cylinder switch matches the rating of the load
	Load current exceeding the catalog value was applied		
	Load voltage or power supply voltage exceeding the catalog value was applied		
	Wiring is incorrect	Malfunction due to incorrect wiring	① Correct the wiring
		Internal circuit damage due to incorrect wiring (AC, DC, polarity, etc.)	① Replace the cylinder switch and correct the wiring
	Wiring length is long (Refer to catalog P. 808)	Internal circuit damage of the switch	① Replace the cylinder switch and wire the protection circuit (Refer to catalog P. 808, P. 810)
	Surge voltage is generated due to connection of inductive load (relay, solenoid valve)	Internal circuit damage of the switch	① Replace the cylinder switch and wire the protection circuit (Refer to catalog P. 808, P. 810)
	In solid state switches, there are noise sources such as servo motors or robots in the same facility	Noise is being applied	① Add a noise filter or replace with a reed switch
	Power lines and signal lines are wired together		② Separate power lines and signal lines
	Using the same power supply as the noise source		③ Separate power supplies
	The mounting position of the cylinder switch does not match the piston stop position	Position adjustment is incorrect	① Readjust the position
		Mounting position is misaligned due to loose screws	① Tighten within the specified tightening torque range
		Cylinder switch mounting direction is reversed	① Correct to the normal orientation
	Ambient temperature is -10°C or less	The magnetic force of the piston magnet built into the cylinder has become stronger	① Raise the ambient temperature to -10°C or higher
	Water, oil, etc. splashed on the cylinder switch	Water or oil infiltrated the cylinder switch, causing internal circuit destruction	① Replace the standard cylinder switch with a cutting oil resistant specification T□YL (T-type switch only) ② Replace the cylinder switch and install a shielding plate, etc. to prevent excessive splashing of water or oil
	Water or oil has entered the lead wire junction box Water or oil has splashed onto the load terminal part	Malfunction due to infiltration of water/oil	① Install a shielding plate to prevent water or oil from splashing on the junction box, or place it inside a waterproof box
	There are objects that generate magnetic fields in the vicinity ・Spot welder ・Magnetizing equipment, etc.	Cylinder switch is reacting to external magnetic field	① Change to a strong magnetic field cylinder switch (Cylinder body also needs to be changed for strong magnetic field) ② Prevent magnetic field from being applied a Move the source of the magnetic field away b Install a shielding plate made of magnetic material between the source of the magnetic field ③ Apply magnetic shielding
	There are magnetic materials in the vicinity	There are iron bolts in the vicinity	① Replace with stainless steel bolts ② Move the cylinder switch to a mounting surface away from iron bolts
		There are magnetic materials around the cylinder switch	① Move the cylinder switch away from the magnetic material to the catalog recommended distance ② Move the cylinder switch to a mounting surface away from magnetic materials ③ Change the material of the magnetic body to a non-magnetic material such as stainless steel, aluminum, or copper
		Iron powder has accumulated around the cylinder switch	① Remove iron powder
	External force was applied to the cylinder switch	Internal circuit damage of the switch	① Replace the cylinder switch and prevent external force from being applied to the cylinder switch

Cylinder Switch

Cylinder Switch

Troubleshooting and countermeasures in case of failure [Cylinder switch] ②

Malfunction phenomenon	Cause	Factor	Countermeasure
Cylinder switch turns ON-OFF, but the load remains ON	The relationship between the leakage current of the cylinder switch and the input specification of the load is Leakage current > OFF current.	Load is reacting to leakage current	① Change the cylinder switch from ☐2 type to ☐0 type or ☐ type 3 ② Change to a load with a larger OFF current value ③ Wire a bleeder resistor
		Leakage current is increasing due to parallel connection (Refer to catalog P. 809)	
Output turns ON-OFF normally, but the indicator light does not turn on	Wiring polarity (plus, minus) is reversed (Only when using reed switch ☐0 with DC)	Malfunction due to incorrect wiring	① Correct to normal wiring

* Does not malfunction due to leakage current of solid state switch
Please select a programmable controller, relay, etc.
* For the input specifications of the load, please check the Model No.and contact each manufacturer or our company.

Troubleshooting and countermeasures in case of failure [Cylinder switch] ②

Malfunction phenomenon	Cause	Factor	Countermeasure
Cylinder switch does not turn ON **Does not output Load does not respond** * Load ・Programmable Controller ・Relay ・Other	Applied voltage is incorrect	Internal circuit damage of the switch	① Replace the cylinder switch and change to the regular voltage ② Replace with a cylinder switch of the regular voltage
	Load was short-circuited	Internal circuit damage of the switch	① Replace the cylinder switch and reselect one where the maximum rating of the cylinder switch matches the rating of the load
	Load current exceeding the catalog value was applied		
	Load voltage or power supply voltage exceeding the catalog value was applied		
	Wiring is incorrect	Switch is not operating due to incorrect wiring	① Correct the wiring
		Internal circuit damage due to incorrect wiring (AC, DC, polarity, etc.)	① Replace the cylinder switch and correct the wiring
	Excessive bending was applied to the lead wire	Lead wire breakage	① Replace the cylinder switch and ensure a sufficient bending radius (9 mm or more) for the lead wire to prevent excessive bending at one point ② Change the cylinder switch to T2□R with flexible cable specification (T-type switch only)
	Excessive pulling force was applied to the lead wire	Lead wire breakage	① Replace the cylinder switch and take measures to prevent excessive pulling force
	Wiring length is long (Refer to catalog P. 808)	Internal circuit damage of the switch	① Replace the cylinder switch and wire the protection circuit (Refer to catalog P. 808, P. 810)
	Surge voltage is generated due to connection of inductive load (relay, valve)	Internal circuit damage of the switch	① Replace the cylinder switch and wire the protection circuit (Refer to catalog P. 808, P. 810)
	In solid state switches, there are noise sources such as servo motors or robots in the same facility	Noise is being applied	① Add a noise filter or replace with a reed switch
	Power lines and signal lines are wired together		② Separate power lines and signal lines
	Using the same power supply as the noise source		③ Separate power supplies
	The mounting position of the cylinder switch does not match the piston stop position	Position adjustment is incorrect	① Readjust the position
		Mounting position is misaligned due to loose screws	① Tighten within the specified tightening torque range
		Cylinder switch mounting direction is reversed	① Correct to the normal orientation
	Ambient temperature exceeds 60°C	The magnetic force of the piston magnet built into the cylinder has weakened	① Lower the ambient temperature to 60°C or less ② Replace with a heat-resistant cylinder switch (Limited models: Refer to catalog)
	Water, oil, etc. splashed on the cylinder switch	Water or oil infiltrated the cylinder switch, causing internal circuit destruction	① Replace the standard cylinder switch with a cutting oil resistant specification T□YL (T-type switch only) ② Replace the cylinder switch and install a shielding plate, etc. to prevent excessive splashing of water or oil
	Water or oil has entered the lead wire junction box Water or oil has splashed onto the load terminal part	Internal circuit abnormality due to infiltration of water/oil	① Install a shielding plate to prevent water or oil from splashing on the junction box, or place it inside a waterproof box
	There are objects that generate magnetic fields in the vicinity ● Spot welder ● Magnetizing equipment, etc.	Cylinder switch does not react due to the influence of the surrounding magnetic field	① Change to a strong magnetic field cylinder switch (Cylinder body also needs to be changed for strong magnetic field) ② Prevent magnetic field from being applied a Move the source of the magnetic field away b Install a shielding plate made of magnetic material between the source of the magnetic field ③ Apply magnetic shielding
	There are magnetic materials in the vicinity	There are iron bolts in the vicinity	① Replace with stainless steel bolts ② Move the cylinder switch to a mounting surface away from iron bolts
		There are magnetic materials around the cylinder switch	① Move the cylinder switch away from the magnetic material to the catalog recommended distance ② Move the cylinder switch to a mounting surface away from magnetic materials ③ Change the material of the magnetic body to a non-magnetic material such as stainless steel, aluminum, or copper
		Iron powder has accumulated around the cylinder switch	① Remove iron powder
	External force was applied to the cylinder switch	Internal circuit damage of the switch	① Replace the cylinder switch and prevent external force from being applied to the cylinder switch

Cylinder Switch

Troubleshooting and countermeasures in case of failure [Cylinder switch] ④

Malfunction phenomenon	Cause	Factor	Countermeasure
The cylinder switch indicator light turns ON, but the load does not operate	The relationship between the voltage drop of the cylinder SW and the input specification of the load is (Power supply voltage - Internal voltage drop) < Minimum operating voltage.	Load and cylinder switch do not match	① Replace the cylinder switch with a model with a smaller internal voltage drop value ☐2 type → ☐0 type → ☐3 type → ☐5 type ② Replace the load with one that has a smaller minimum operating voltage
		Generation of internal voltage drop due to series connection (Refer to catalog P. 809)	
	In the case of 3-wire type, the input specifications (source input, sink input) of the programmable controller (PLC) do not match	Does not accept cylinder switch signal	① Source input —— Select NPN output ☐3 type (NPN output is standard type) ② Sink input ——— Select PNP output ☐3P type (Only for T, K, M, F type switches) ③ Change the cylinder switch to a 2-wire type
	The output of the cylinder switch is used in the middle of the air cylinder stroke	Cylinder speed is fast and load does not react	① Change to T2J with OFF-delay specification (T-type switch only) ② Connect multiple cylinder switches in parallel to widen the operating range. ③ Connect a sensor controller, etc. between the cylinder SW and the load and change to a signal time suitable for the load performance Example: Omron S3D2 ④ Slow down the cylinder speed

Cylinder Switch

To Use This Product Safely

Be sure to read this before use.

Individual Precautions: Cylinder Switch

During Design / Selection

⚠Warning

■ Use outside the specified range of application, load current, voltage, temperature, impact, environment, etc., can cause destruction or malfunction, so please use correctly within the specified range.

■ Never use in an explosive gas atmosphere. The cylinder switch does not have an explosion-proof structure. If used in an explosive gas atmosphere, it may cause an explosion disaster, so never use it.

⚠Caution

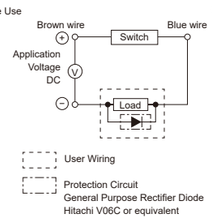
■ Be careful when using for interlock circuits.
When using a cylinder switch for an interlock signal that requires high reliability, please implement a double interlock system, such as providing a mechanical protection function in case of failure, or using another switch (sensor) in addition to the cylinder switch. Also, inspect regularly and confirm that it operates normally.

■ Pay attention to contact capacity.
Do not use a load that exceeds the voltage and current of the switch specifications. This will cause a malfunction.

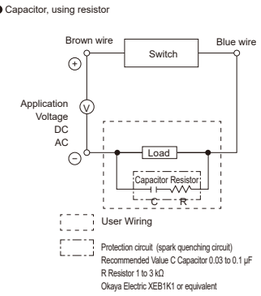
■ Pay attention to the contact protection circuit. (Reed switch)

● When connecting and using an inductive load (relay, solenoid valve, etc.), a surge voltage will occur when the switch is turned OFF, so be sure to provide a contact protection circuit.

● Diode Use



● Capacitor, using resistor



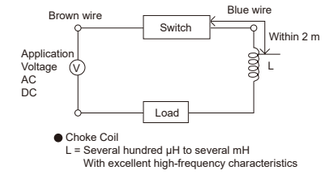
● When connecting and using a capacitive load (capacitor), an inrush current will occur when the switch is ON, so be sure to provide a contact protection circuit.

● If the wiring becomes long, it becomes wiring capacity, inrush current occurs, and switch damage or life reduction occurs, so if the wiring length exceeds Table 1, provide a contact protection circuit. When T8 is used with 200 VAC, the usable wiring length will be shorter, so please consult us.

Switch	Voltage	Wiring length
M, T, K, H, V, F, ETO type	DC	50 m
M, T, K, H, V, ETO type	AC	10 m
RO, 5, 6, EO type	DC	100 m
RO, 5, EO type	AC	10 m
R4 type	AC	50 m

Table 1

● Choke Coil Use



● Choke Coil
L = Several hundred μH to several mH
With excellent high-frequency characteristics

● Resistor Use

● Inrush Current Limiting Resistor
R = Resistance as large as the load circuit allows

For specifications of the contact protection circuit, see P. 783.

■ Avoid use in environments where water, etc., is constantly present.

● May cause malfunction due to insulation failure, etc.

■ Avoid use in environments with oil or chemicals.

● Use in environments with various oils, coolant, cleaning fluids, or chemicals may adversely affect the cylinder switch (insulation failure, malfunction due to swelling of filling resin, hardening of lead wire coating, etc.), so please consult us.

● For cutting oil resistant cylinder switches, a separate "Cutting Oil Compatible Pneumatic Component Guide" (No. CC-N-375) is available, so please refer to it.

■ Do not use in environments with large impacts.
For reed switches, if a large impact (294 m/s² or more) is applied during use, there is a possibility of malfunction where the contact momentarily (1 ms or less) connects or disconnects. It may also be necessary to use a solid state switch depending on the operating environment, so please consult us.

■ Do not use in places where surge generation sources are present.
If there is equipment that generates large surges (electromagnetic lifters, high-frequency induction furnaces, motors, etc.) around the cylinder with a solid state switch, it may cause deterioration or damage to the switch internal circuit elements, so consider surge countermeasures at the source.

■ Pay attention to accumulation of iron powder and close proximity of magnetic materials.
If a large amount of iron powder such as cutting chips or welding spatter accumulates around a cylinder with a cylinder switch, or if a magnetic material (something attracted to a magnet) is in close contact, the magnetic force within the cylinder may be lost, potentially causing the cylinder switch to stop operating. Please be careful.

■ Pay attention to the proximity of cylinders to each other, etc.

● When using two or more cylinders with switches in parallel and close to each other, use them with the cylinder tube spacing at the value indicated for the allowable spacing for each cylinder series. The switches may malfunction due to mutual magnetic interference.

■ Pay attention to the magnetic environment.

● In environments with strong magnetic fields, or large currents (large magnets, spot welders, etc.), use a strong magnetic field resistant switch. (HO, HOY, T2YD) If a magnetic body moves very close to the cylinder, they may interfere with each other and affect detection accuracy.

■ At stroke intermediate positions, pay attention to the cylinder switch ON time.

● If the cylinder switch is set to a stroke intermediate position and the load is driven when the piston passes, if the speed is too high, the cylinder switch will operate, but the operating time will be short, and the load may not be able to respond fully, so please be careful.
The maximum detectable piston speed is

$$V\ (\text{mm/s}) = \frac{\text{Cylinder Switch Operating Range (mm)}}{\text{Load Operating Time (s)}}$$

If the piston speed is high, please use an off-delay output type cylinder switch T2JH/V (limited to compatible models).

■ Pay attention to how to use series connection.

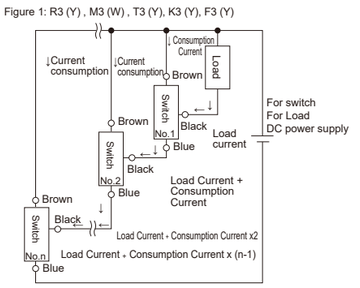
● When using multiple 2-wire switches connected in series, the voltage drop across the switches will be the sum of the voltage drops of all connected switches. The voltage applied to the load side will be the power supply voltage minus the voltage drop across the switches. Check the load specifications before deciding on the number of units to connect.

● Using 2-wire solid state switches connected in series may cause malfunction, so please contact us. Use with reed switches is recommended.

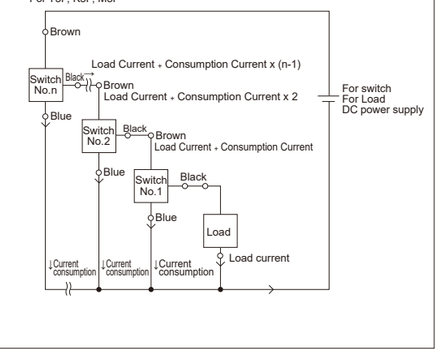
● When using multiple 3-wire solid state switches connected in series, the voltage drop at the switches will be the sum of the voltage drops of all connected switches, similar to the 2-wire type above. Also, the current flowing through the switches will be the sum of the current consumption of the connected switches and the load current, as shown in the upper right diagram. Check the load specifications to ensure the maximum load current of the switch is not exceeded before deciding on the number of units to connect.

● The indicator lamp will only light up when all switches are ON.

Figure 1: R3 (Y) , M3 (W) , T3 (Y), K3 (Y), F3 (Y)



For T3P, K3P, M3P



■ Pay attention to how to use parallel connection.

● When using multiple 2-wire switches connected in parallel, the leakage current will increase by the number of connected units. Therefore, check the load specifications and determine the number of connected units.

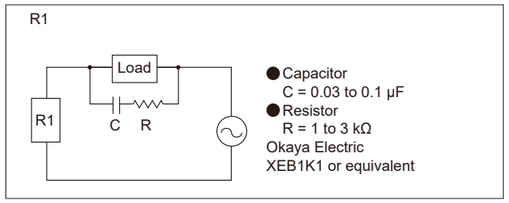
● For 2-wire solid state switches, from when one switch turns ON until it turns OFF, the voltage across the parallel-connected switches drops to the internal voltage drop value when the switch is ON, falling below the load voltage range, so other switches will no longer turn ON. Therefore, check the input specifications of the connected load, such as a programmable controller, before use.

● Since 3-wire solid state switches have a very small leakage current value (10 μA or less), there are usually no problems in normal use.

● The switch indicator light may dim or not light up.

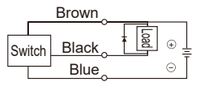
■ Output Circuit Protection (Solid State Switch)

● When connecting and using an inductive load (relay, solenoid valve, etc.), a surge voltage will occur when the switch is turned OFF, so be sure to provide a protection circuit as shown in the diagram below.



● Capacitor
C = 0.03 to 0.1 μF
● Resistor
R = 1 to 3 kΩ
Okaya Electric
XEB1K1 or equivalent

R3 (Y), M3 (W), T3 (Y), K3 (Y), F3 (Y)

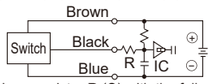


● Diode
D = Hitachi
V06C or equivalent

Example of using a surge absorber with an inductive load.

● When connecting and using a capacitive load (capacitor), an inrush current will occur when the switch is turned ON, so be sure to provide a protection circuit as shown in the diagram below.

R3 (Y), M3 (W), T3 (Y), K3 (Y), F3 (Y)



Use a resistor R (Ω) with the following formula or more at this time.

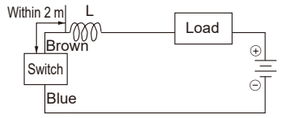
$\frac{V}{0.15}$ =R (Ω) (R3 (Y), M3 (W))

$\frac{V}{0.05}$ =R (Ω) (T3 (Y), K3 (Y), F3 (Y))

● If the lead wire length exceeds 10 m, be sure to provide a protection circuit as shown in the diagram below.

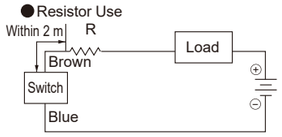
R1, R2 (Y), M2 (W), T2 (Y/J), K2 (Y), F2

●Choke Coil Use



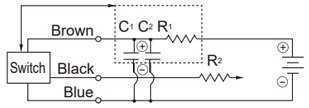
● Choke Coil
L = Several hundred μH to several mH
With excellent high-frequency characteristics

●Resistor Use



● Inrush Current Limiting Resistor
R = Resistance as large as the load circuit allows

●Resistor Use
Within 2 m



Power Supply Noise Absorption Circuit
C_1 = 20 to 50μF
Electrolytic capacitor (withstand voltage 50 V or more)
C_2 = 0.01 to 0.1μF
Ceramic capacitor
Inrush current limiting resistor
R_1 = 20 to 30Ω
R_2 = Use a resistor as large as the load side circuit allows.

■ Take care regarding the service life of the reed switch.

● The service life of a reed switch varies depending on the usage conditions, but it is generally about several million cycles.The contact service life is reached sooner if the device is used continuously or operated at a high frequency. In this case, use a proximity switch with no contact.

During Use

⚠ Caution

■ Do not drop or strike.

When handling, do not drop, strike, or apply excessive impact (reed switch 294m/s² or more, solid state switch 980m/s² or more). Even if the switch case body is not damaged, the switch internals may be damaged, potentially leading to malfunction.

■ Do not carry the cylinder by the switch lead wires.

This can not only cause lead wire breakage, but also apply stress to the inside of the switch, potentially damaging internal switch elements. Absolutely do not do this.

■ Do not wire with power lines or high-voltage lines.

Avoid parallel wiring or using the same conduit as power lines/high-voltage lines; use separate wiring. Control circuits including cylinder switches may malfunction due to noise.

■ Do not short-circuit the load.

If turned ON in a load short-circuited state, overcurrent will flow and the switch will be instantaneously damaged.

■ Pay attention to lead wire connection.

Turn off the power to the equipment on the connected electrical circuit side before performing wiring work. Working with the power on can cause electric shock or accidents due to unexpected operation.

● Reed Switch

Do not connect the switch lead wires directly to the power supply; always connect a load in series. Also, for RO, MO, TO, KO, EO, FO, ETO, please also pay attention to ① and ② below.

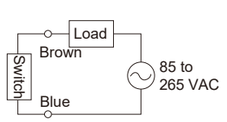
① When using for DC, connect so that the brown wire is the + side and the blue wire is the - side.
If connected in reverse, the switch will operate, but the indicator light will not turn on. (HO has no polarity.)

② When connecting to an AC relay or programmable controller input, if those circuits perform half-wave rectification, the indicator light may not light up. In that case, reversing the polarity of the switch lead wire connection will turn on the indicator light.

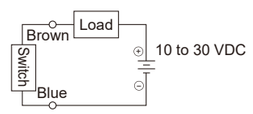
● Solid State Switch

Connect correctly according to the lead wire color coding in the diagram on the right. Incorrect wiring may cause damage. Please be careful.

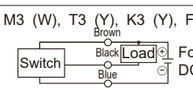
●R1



●R2 (Y), M2 (W), T2 (Y), T2J, K2 (Y), F2 (T2YD has no polarity)

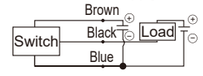


●R3 (Y), M3 (W), T3 (Y), K3 (Y), F3



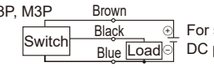
For switch, For load
DC power supply

DC Power Supply for Switch



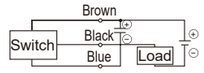
DC Power Supply for Load
30 VDC or less

●T3P, K3P, M3P



For switch, For load
DC power supply

DC Power Supply for Switch

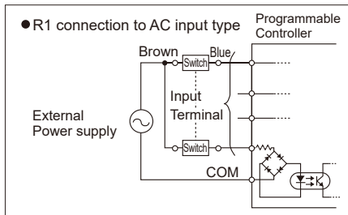


For Load
DC power supply

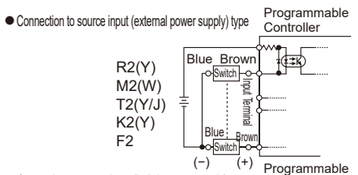
(Connection to Programmable Logic Controller (PLC))

● Connection method varies depending on the programmable controller type. Connect according to the input specifications.

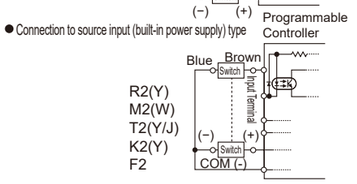
●R1 connection to AC input type



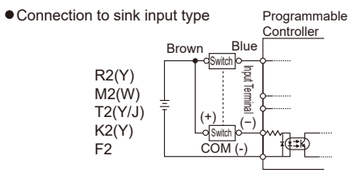
●Connection to source input (external power supply) type



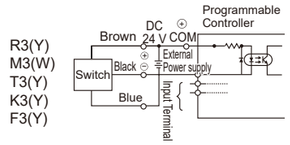
●Connection to source input (built-in power supply) type



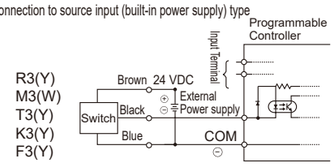
●Connection to sink input type



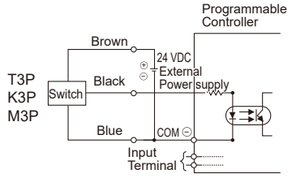
● Connection to source input (external power supply) type



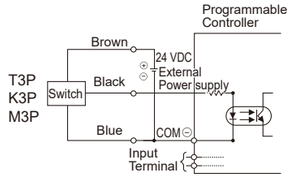
● Connection to source input (built-in power supply) type



● Example of connection to sink input (external power supply) type



● Example of connection to sink input (internal power supply) type



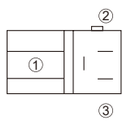
■ Set the switch to the center of the operating range.

Adjust the mounting position of the cylinder switch so that the piston stops at the center of the operating range (the range where it is ON). (The mounting position described in the catalog indicates the optimal position at the stroke end.) If set to the end of the operating range (near the ON/OFF boundary line), operation may become unstable.

■ Mount the switch observing the tightening torque.

If tightened beyond the maximum tightening torque, the set screw, mounting bracket, switch, etc., may be damaged. Also, if tightened below the minimum tightening torque, the switch mounting position may shift. (For switch mounting method, moving method, tightening torque, etc., please refer to P. 814 to P. 816.)

■ Pay attention to wiring for terminal box types.



Model \ Terminal	①	②	③
R0 (DC), R2, R2Y, R6		+	−
R0 (AC), R1, R4, R5		±	±
R3, R3Y	OUT	+	−

■ Lead Wire Protection

The minimum bending radius of the lead wire should be 9 mm or more (when fixed). Ensure that repeated bending stress and tensile force are not applied to the lead wire during wiring. For moving parts, please connect and use T2H/VR3 cylinder switch with flex-resistant lead wire specification for higher flexibility (limited to compatible models).

■ Relay

Use the following equivalent relays.

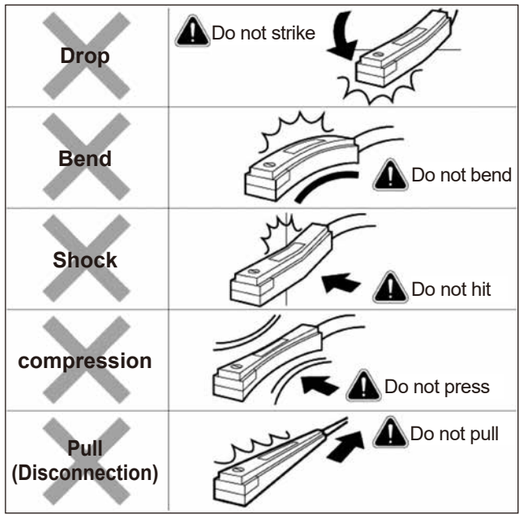
○ Omron ..... MY type
○ Fuji Electric ..... HH5 type
○ Tokyo Denki ..... MPM type
○ Panasonic ..... HC type

1. Notes on "External Force"

⚠ Caution

■ Especially for reed types, the reed switch (glass tube) may break or its sensitivity may decrease.

Example: T0□ T5□ T8□ type

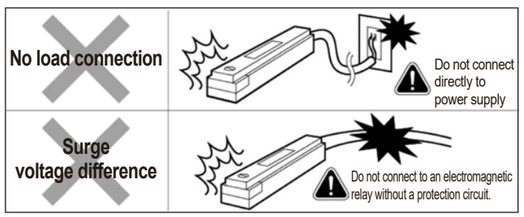


2. Notes on "Overcurrent / Overvoltage"

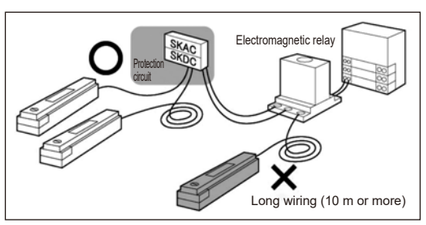
⚠ Caution

■ Do not connect directly to the power supply.

■ Do not connect to an electromagnetic relay without a protection circuit.



■ For electromagnetic relays and long wiring, install a "protection circuit."



During Use

⚠ Warning

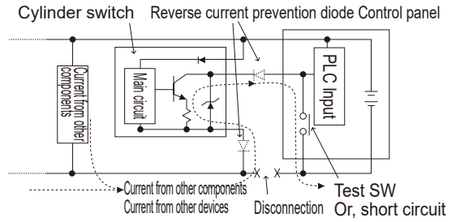
■ Do not allow overcurrent to flow.

If overcurrent flows through the cylinder switch due to a load short circuit, etc., not only will the cylinder switch be damaged, but there is also a risk of fire. If necessary, install an overcurrent protection circuit such as a fuse on the output and power lines.

⚠ Caution

■ Pay attention to reverse current due to disconnection/wiring resistance.

● If other equipment, including the cylinder switch, is connected to the same power supply as the cylinder switch, shorting the output line and the power supply - side, or disconnection of the power supply - side, to check the operation of the control panel's input device may cause reverse current to flow into the cylinder switch's output circuit, resulting in damage.

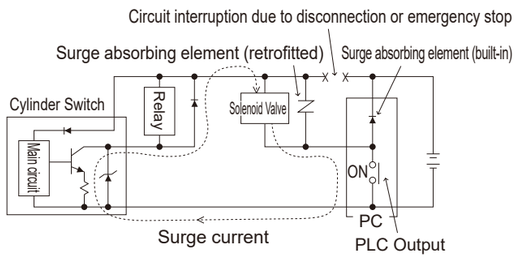


● To prevent damage due to reverse current, take the following measures.

① Avoid concentrating current on the power lines, especially the - side power line, and make the wiring as thick as possible.
② Limit the equipment connected to the same power supply as the cylinder switch.
③ Insert a diode in series with the cylinder switch output line to prevent reverse current flow.
④ Insert a diode in series on the negative side of the cylinder switch's power wire to prevent reverse current.

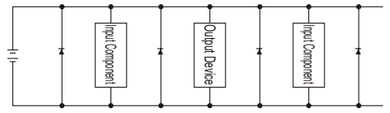
■ Pay attention to surge current sneak paths.

● If the power supply is shared between the cylinder switch and an inductive load that generates surges, such as a solenoid valve or relay, and the circuit is interrupted while the inductive load is operating, surge current may flow into the output circuit and cause damage, depending on the mounting position of the surge absorbing element.



● To prevent damage due to surge current sneak paths, take the following measures.

① Separate the power supplies for the output system with inductive loads such as solenoid valves and relays, and the input system such as cylinder switches.
② If separate power supplies cannot be used, directly install surge absorbing elements for all inductive loads. Consider surge absorbing elements connected to PLCs, etc., as protecting only that equipment.
③ Furthermore, connect surge absorbing elements at various points in the power supply wiring as shown in the diagram below to prepare for disconnection at unspecified locations.



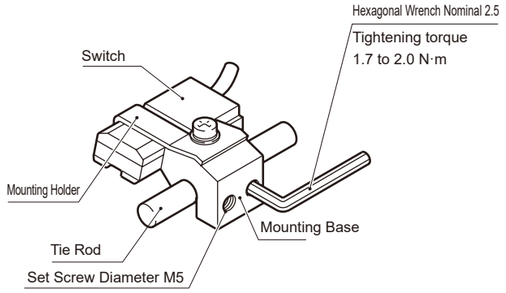
Furthermore, if equipment is connected with connectors, disconnecting the connector while power is on may cause the output circuit to be damaged due to the above phenomenon. Always turn off the power before connecting or disconnecting connectors.

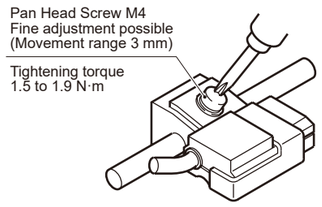
⚠Caution: Switch Mounting Method

Tie Rod Mount Type

Loosening the set screws (2 screws) for fixing the mounting base by 1/2 to 3/4 turn allows axial movement without detachment. For fixing after adjustment, lightly press the holder so that the switch is fixed to the tube, and then tighten the set screws. Tightening torque is 1.7 to 2.0 N·m. As a guide, it is sufficient if the hex wrench begins to deflect.

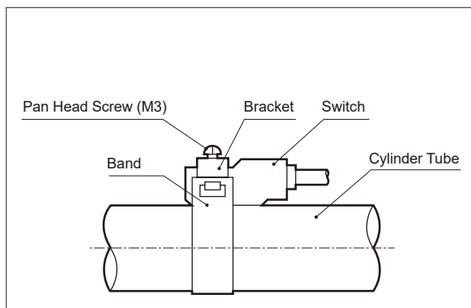
● Movement and tightening diagram





Band Mount Type

Loosen the tightening screw (pan head screw), move the switch body and band along the cylinder tube, and tighten at the specified position. For fine adjustment, fix the band position and move only the switch body. Tightening torque is 0.5 to 0.7 N·m. The tightening torque for HCA ø80, ø100 is 1.0 to 1.5 N·m.

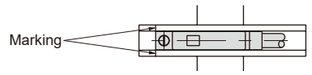


Band Mount Type

① When moving the switch position in the stroke direction

● The 1-color indicator switch can be finely adjusted by about ±3 mm from the mounting position at the time of shipment. If the adjustment range exceeds ±3 mm, or when finely adjusting the position of the 2-color indicator switch, move the band position.

● The switch rail has a marking 4 mm from the end face of the rail. Use this as a guide for the mounting position when replacing the switch. The marking on the switch rail is set to the switch's highest sensitivity position at the time of factory shipment. If the type of switch changes or if the band is moved, the maximum sensitivity position will change, so adjust the position each time.

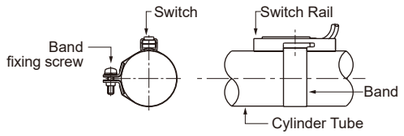


② When moving the switch position in the circumferential direction

● Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position. Tightening torque is 0.8 to 1.0 N·m.

③ When moving the band position

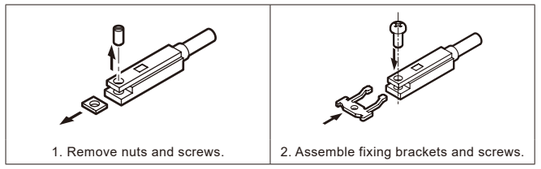
● Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. Tightening torque is 0.8 to 1.0 N·m.



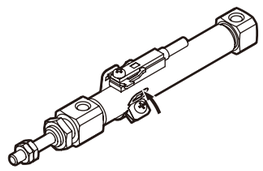
Band Mount Type

Install T-type switches as shown in the diagram below.

When using standard T-type switch (SW-T□)



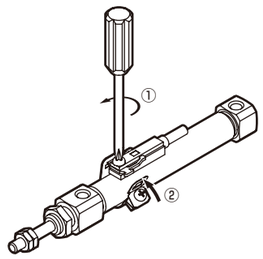
① Insert the square hole of the band into the fixing bracket and attach it to the cylinder.



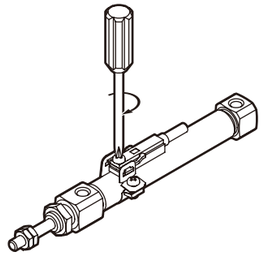
● If it is difficult to install, follow the steps below.

① Loosen the screw on the switch side.

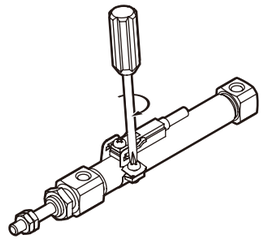
② Insert the square hole of the band into the fixing bracket.



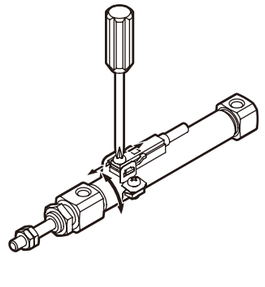
② Tighten the screw on the switch side.
Tightening torque: 0.1 to 0.15 N·m



③ Tighten the screw on the band side.
Tightening torque: 0.1 to 0.15 N·m



④ For switch mounting position adjustment
Loosen the screw on the switch side, adjust the position, and tighten the screw to fix it at the optimal position.
Tightening torque: 0.1 to 0.15 N·m



Switch Groove Mount Type

Loosen the tightening screw (set screw), move the switch body along the switch groove, and tighten at the specified position.

For T2, T2W, T3, T3W, T0, T5, K2, K3, K0, K5, use a flat-blade screwdriver (watchmaker's screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip width of 2.4 mm or less, and thickness of 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m.

For T□C, T2J, T2Y, T3Y, K2Y, K3Y, T2YD, T1, T8, T2YL, T3YL, ET0, tighten with a torque of 0.5 to 0.7 N·m.

For F2□, F3□, F2Y□, F3Y□, tighten with a torque of 0.03 to 0.08 N·m.

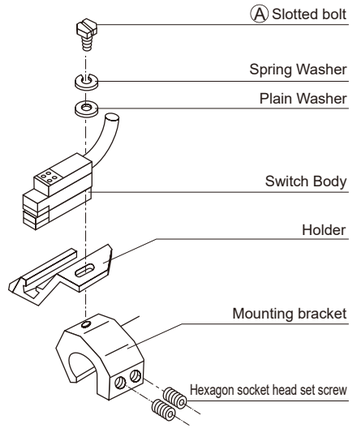
T2YD Tie Rod Mount Type

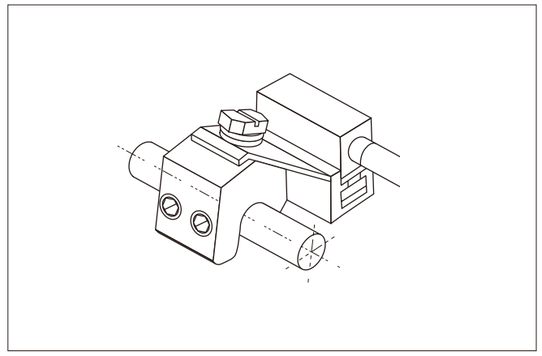
① Fine adjustment

Loosen the slotted hex bolt Ⓐ, move only the switch body, and tighten it at the specified position. Tightening torque is 0.5 to 0.7 N·m.

② Coarse adjustment

Loosen all slotted bolts Ⓐ and set screws, move the entire mounting bracket to the specified position, and then tighten the slotted bolt Ⓐ. Tightening torque is 0.5 to 0.7 N·m. Then tighten the set screws. Tightening torque is 1.7 to 2.0 N·m.





Caution

Contact protection circuit (SKAC, SKDC)

If you are using a reed switch and the circuit configuration with the load falls under the following, the contact life may be reduced (may remain ON). Connect a contact protection circuit within 2 m of the switch.

- When the operating load is an inductive load (relays, valves, etc. (coil-driven loads)) or a capacitive load (programmable controllers, etc. (loads containing capacitors))
- When the lead wire wiring length is as follows
  - 12 VDC : 100m or more
  - 24 VDC : 50m or more
  - 100 VAC : 20m or more
  - 200 VAC : 10m or more
- When there are other factors that cause overvoltage or overcurrent

For details on the contact protection circuit, refer to P. 783.

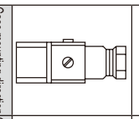
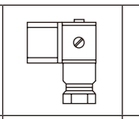
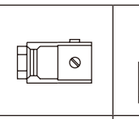
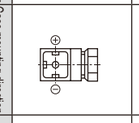
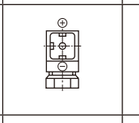
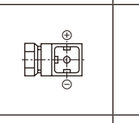
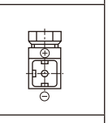
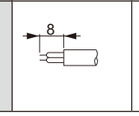
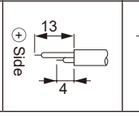
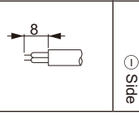
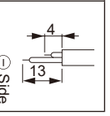
Mounting method to R□B terminal box

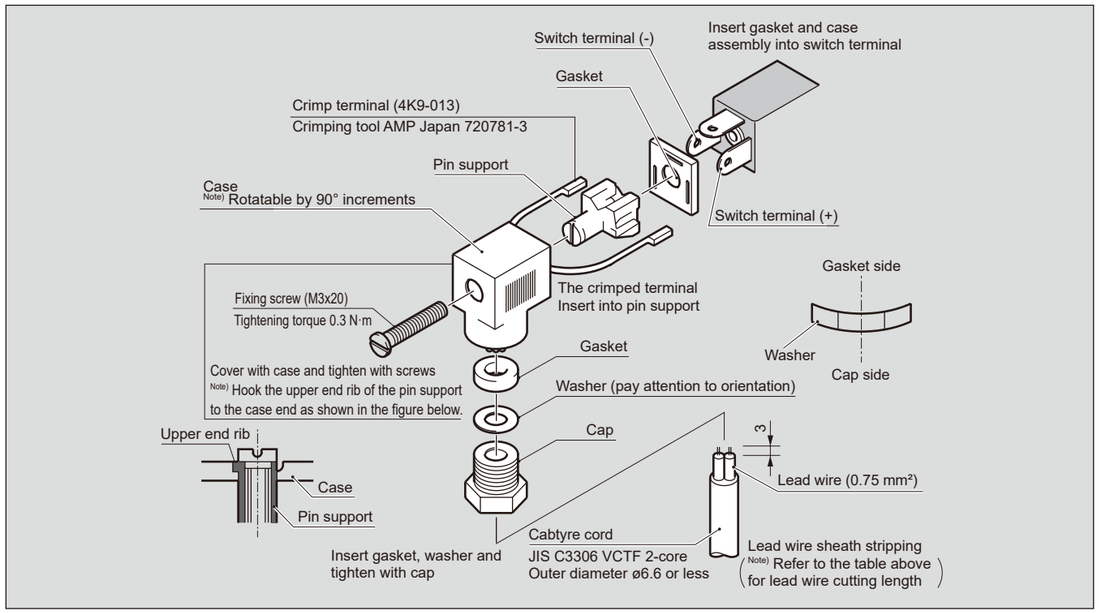
Connection to the R□B terminal box should be done according to the following procedure, referring to the diagram below.

① After completely removing the fixing screws, pull the terminal box out from the switch.
② From the top of the case, push out the pin support to separate the case and pin support.
③ Remove the cap, and take out the washer and gasket.
④ Determine the lead wire exit direction of the terminal box.
⑤ Referring to the top view of the case mounting direction, cut the lead wire to match the exit direction, and strip the seal/sheath.
⑥ Crimp the included terminal.
⑦ Pass the lead wire through the cap, washer, gasket, and case in that order, paying attention to the orientation. Pass the lead wire through the case and pull it out with needle-nose pliers.
⑧ While inserting the terminal into the pin support, push it into the case, paying attention to the orientation. Push until the upper end rib of the pin support comes out to the top surface of the case.
⑨ Insert the fixing screws into the case/pin support.
⑩ Insert the gasket and washer into the case and tighten with the cap.
⑪ Insert the case into the switch terminal and fix it with the fixing screws.

● Lead wire cutting length

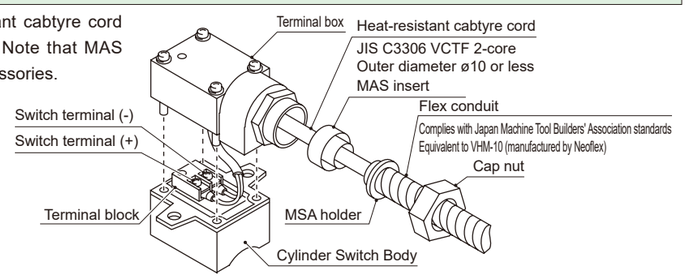
The lead wire cutting length varies depending on the case mounting direction. Please refer to the table below. For 3-wire type, please consult us.

Case mounting direction Top View				
Case mounting direction Bottom View				
Lead wire length				



Mounting method to E0 terminal box

For wiring to the terminal box, prepare heat-resistant cabtyre cord and flex conduit, and refer to the diagram below. Note that MAS insert, MAS holder, and cap nut are included as accessories.



For precautions regarding mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual