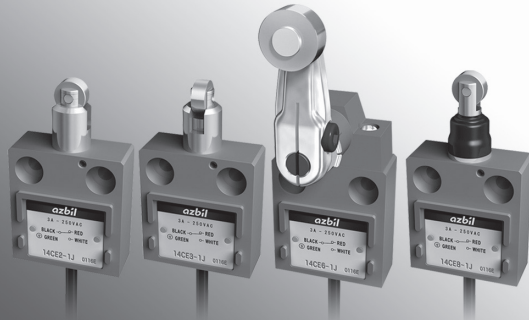


Miniature Pre-Leaded Vertical Enclosed Switches

14CE Series

Miniature enclosed switches with outstanding harsh environment resistance, ideal for compact machinery and equipment.



- Easy mounting by tightening two M5 screws.
- Superior seal
(JIS: oil-resistant, immersion-proof type, IEC: IP67)
- AC-DC model with LED that can be seen from any direction is also available.
- Standard load and low current load types available.
- Suitable for high-density gang mounting.
- Optimum overtravel can be set by the setting position indication.
- CE/GB (ccc marking) approved models are available (excluding some models)

*Certificate number: 2008010305284257

PERFORMANCE

	Item	Details
Standards	Compliance	NECA C4508
Structure	Contact form *4	Single-pole double-throw (SPDT).
	Contact type	Standard load: pure silver rivet Low current load: gold alloy cross point
	Terminal type	Preleaded and connector
	Protective structure	IP67 (IEC60529, JIS C 0920)
Electrical performance	Electrical rating	See table.
	Dielectric strength	Between non-live terminals 600 Vac, 50/60 Hz for 1 minute
		Between each terminal and ground: 1,500 Vac, 50/60 Hz for 1 minute
		Between each terminal and non-conducting metal part: 1,500 Vac, 50/60 Hz for 1 minute
	Insulation resistance	100 MΩ Max.(by 500 Vdc megger)
	Initial contact resistance *1	Standard load type: 50 mΩ Max. (6 to 8 Vdc-1A, voltage drop method) Low current load type: 100 mΩ Max. (6 to 8 Vdc-0.1A, voltage drop method) Connector section: 40 mΩ Max.
	Recommended min. voltage/current	Standard load type: 24V-10 mA Low current load type: 5V-10 mA
Mechanical performance	Actuator strength	Withstands load 5 times O.F. (operating direction for 1 minute)
	Cable tensile strength	Min. 100 N
	Impact resistance (malfunction) *2	14CE2/3/8/10 : 500 m/s ² , contact opening for 1 ms max. in free position and total travel positions (NECA C 4508) 14CE6 : 300 m/s ² , contact opening for 1 ms max. in free position and total travel positions 14CE9 :500 m/s ² , contact opening for 1 ms max. in the total travel positions
	Vibration resistance (malfunction)	Frequency 10 to 55 Hz, 1.5 mm peak-to-peak amplitude for 2 continuous hours Contact opening for 1 ms max. in free position and total travel position (NECA C 4508)
	Allowable operating speed *2	0.02 mm/s to 0.5 m/s Min. speed: Unstable state of contacts 0.1 s max. Max. speed: Actuator damage not allowed
	Operating frequency	Max. 120 operations/minute (L type: 60 operations / minute)
Life	Mechanical	Min. 5 million operations. Overtravel (O.T.) is 70 to 100% of standard value. (L type max. 1 million operations)
	Electrical	Standard load type: Min. 200,000 operations (250 Vac-3A resistive load) Low current load type: Min. 2 million operations (125 Vac-0.1A, 30 Vdc-0.1A resistive load)
Ambient operating conditions	Temperature	-10 to +70°C (freezing not allowed)
	Humidity	Max. 98%RH *3
Recommended tightening torque	Body	5 to 6 N-m (M5 hexagon socket head bolt)
	Roller lever	4 to 5.2 N-m (M5 hexagon socket head bolt)
	Connector	0.4 to 0.6 N-m (Tighten firmly by hand without using a tool.)

*1: In the case of the preleaded type, add 50 mΩ per 1 m of cable.

*2: This is the value for the representative 14CE2 model (roller plunger type).

*3: Max. 95%RH for connector and preleaded connector types.

*4: Refer to the circuit configuration diagram.

● Electrical rating, circuit configuration and lead color

Preleaded type

Item	Contact material	Electrical rating					
		Without indicator lamp	With indicator lamp				
			E1 lamp (lit during standby)	E2 lamp (lit during operation)	E5 lamp (lit during standby)		E8 lamp (lit during operation)
Standard load type	Silver	AC 250V-3A DC 30V-1A	AC 100V-3A	AC 100V-3A	AC 24V-3A DC 24V-1A	AC 24V-3A DC 24V-1A	
Low current load type	Class 1 alloy cross point	AC 125V-0.1A DC 30V-0.1A	AC 100V-0.1A	AC 100V-0.1A	AC/DC 24V-0.1A	AC/DC 24V-0.1A	
Circuit configuration and lead color	—						

Connector/preleaded connector

Note that the ratings of connector type switches are determined by the ratings of both the switch and the connector.

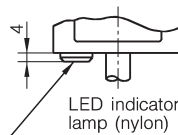
Item	Contact material	Electrical rating			Connector type	Contact pin positions (male contact)
		Without indicator lamp	With indicator lamp			
			E1 lamp (lit during standby)	E5 lamp (lit during standby)		
Standard load type	Silver	AC 250V-3A DC 30V-1A	AC 100V-3A	AC 24V-3A DC 24V-1A	-PA -PA03	
Low current load type	Class 1 alloy cross point	AC 125V-0.1A DC 30V-0.1A	AC 100V-0.1A	AC/DC 24V-0.1A		
Standard load type	Silver	AC 125V-3A DC 30V-1A	AC 100V-3A	DC 24V-1A	-PD -PD03	
Low current load type	Class 1 alloy cross point	AC 125V-0.1A DC 30V-0.1A	AC/DC 24V-0.1A	AC/DC 24V-0.1A		
Circuit configuration	—				—	
Connector lead colors	—	Contact 1: Brown, Contact 2: White, Contact 3: Blue, Contact 4: Black				(Female side) For AC: For DC:

The contact assignments of limit switches comply with NIPPON Electric Control Equipment Industries Association standards (NECA 4202).

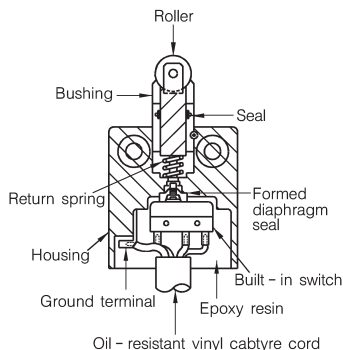
● With LED indicator lamp

(For details on catalog listings, see the Order Guide.)

On the AC/DC model, two LEDs light when AC power is used, and only one when DC is used.









STRUCTURE





ORDER GUIDE

● Pre-leaded

Actuator		Basic catalog listing	Options				
			Low current load K	100 Vac/dc LED lit during standby (N.O.) E1	100 Vac/dc LED lit during standby (N.O.) + low current load KE1	100 Vac/dc LED lit during operation (N.C.) E2	100 Vac/dc LED lit during operation (N.C.) + low current load KE2
Name/appearance	Cable length						
Roller plunger 	1 m	14CE2-1J	14CE2-1JK	14CE2-1JE1	14CE2-1JKE1	14CE2-1JE2	14CE2-1JKE2
	3 m	14CE2-3J	14CE2-3JK	14CE2-3JE1	14CE2-3JKE1	14CE2-3JE2	14CE2-3JKE2
	5 m	14CE2-5J	14CE2-5JK	14CE2-5JE1	14CE2-5JKE1	14CE2-5JE2	14CE2-5JKE2
Cross roller plunger 	1 m	14CE3-1J	14CE3-1JK	14CE3-1JE1	14CE3-1JKE1	14CE3-1JE2	14CE3-1JKE2
	3 m	14CE3-3J	14CE3-3JK	14CE3-3JE1	14CE3-3JKE1	14CE3-3JE2	14CE3-3JKE2
	5 m	14CE3-5J	14CE3-5JK	14CE3-5JE1	14CE3-5JKE1	14CE3-5JE2	14CE3-5JKE2
Roller lever 	1 m	14CE6-1J	14CE6-1JK	14CE6-1JE1	14CE6-1JKE1	14CE6-1JE2	14CE6-1JKE2
	3 m	14CE6-3J	14CE6-3JK	14CE6-3JE1	14CE6-3JKE1	14CE6-3JE2	14CE6-3JKE2
	5 m	14CE6-5J	14CE6-5JK	14CE6-5JE1	14CE6-5JKE1	14CE6-5JE2	14CE6-5JKE2
Boot seal roller plunger 	1 m	14CE8-1J	14CE8-1JK	14CE8-1JE1	14CE8-1JKE1	14CE8-1JE2	14CE8-1JKE2
	3 m	14CE8-3J	14CE8-3JK	14CE8-3JE1	14CE8-3JKE1	14CE8-3JE2	14CE8-3JKE2
	5 m	14CE8-5J	14CE8-5JK	14CE8-5JE1	14CE8-5JKE1	14CE8-5JE2	14CE8-5JKE2
Wire spring nondirectional operation 	1 m	14CE9-1J	14CE9-1JK	14CE9-1JE1	14CE9-1JKE1	14CE9-1JE2	14CE9-1JKE2
	3 m	14CE9-3J	14CE9-3JK	14CE9-3JE1	14CE9-3JKE1	14CE9-3JE2	14CE9-3JKE2
	5 m	14CE9-5J	14CE9-5JK	14CE9-5JE1	14CE9-5JKE1	14CE9-5JE2	14CE9-5JKE2
Boot seal cross roller plunger 	1 m	14CE10-1J	14CE10-1JK	14CE10-1JE1	14CE10-1JKE1	14CE10-1JE2	14CE10-1JKE2
	3 m	14CE10-3J	14CE10-3JK	14CE10-3JE1	14CE10-3JKE1	14CE10-3JE2	14CE10-3JKE2
	5 m	14CE10-5J	14CE10-5JK	14CE10-5JE1	14CE10-5JKE1	14CE10-5JE2	14CE10-5JKE2

Options					
24 Vac/dc LED lit during standby (N.O.) E5	24 Vac/dc LED lit during standby (N.O.) + low current load KE5	24 Vac/dc LED lit during operation (N.C.) E8	24 Vac/dc LED lit during operation (N.C.) + low current load KE8	Cold-resistant L	Cold-resistant + low current load KL
14CE2-1JE5	14CE2-1JKE5	14CE2-1JE8	—	—	—
14CE2-3JE5	14CE2-3JKE5	14CE2-3JE8	14CE2-3JKE8	—	—
14CE2-5JE5	14CE2-5JKE5	14CE2-5JE8	14CE2-5JKE8	—	—
14CE3-1JE5	14CE3-1JKE5	14CE3-1JE8	14CE3-1JKE8	—	—
14CE3-3JE5	14CE3-3JKE5	14CE3-3JE8	14CE3-3JKE8	—	—
14CE3-5JE5	14CE3-5JKE5	14CE3-5JE8	14CE3-5JKE8	—	—
14CE6-1JE5	14CE6-1JKE5	14CE6-1JE8	—	—	—
14CE6-3JE5	14CE6-3JKE5	14CE6-3JE8	14CE6-3JKE8	14CE6-3JL	14CE6-3JKL
14CE6-5JE5	14CE6-5JKE5	14CE6-5JE8	14CE6-5JKE8	14CE6-5JL	14CE6-5JKL
14CE8-1JE5	14CE8-1JKE5	14CE8-1JE8	14CE8-1JKE8	14CE8-1JL	—
14CE8-3JE5	14CE8-3JKE5	14CE8-3JE8	14CE8-3JKE8	14CE8-3JL	14CE8-3JKL
14CE8-5JE5	14CE8-5JKE5	14CE8-5JE8	14CE8-5JKE8	14CE8-5JL	14CE8-5JKL
14CE9-1JE5	14CE9-1JKE5	14CE9-1JE8	14CE9-1JKE8	—	—
14CE9-3JE5	14CE9-3JKE5	14CE9-3JE8	14CE9-3JKE8	—	—
14CE9-5JE5	14CE9-5JKE5	14CE9-5JE8	14CE9-5JKE8	—	—
14CE10-1JE5	14CE10-1JKE5	14CE10-1JE8	14CE10-1JKE8	—	—
14CE10-3JE5	14CE10-3JKE5	14CE10-3JE8	14CE10-3JKE8	14CE10-3JL	—
14CE10-5JE5	14CE10-5JKE5	14CE10-5JE8	14CE10-5JKE8	—	—

● Connector/prelead connector

Actuator		Basic catalog listing	Options				
			Low current load K	100 Vac/dc LED lit during standby (N.O.) E1	100 Vac/dc LED lit during standby (N.O.) + low current load KE1	24 Vac/dc LED lit during standby (N.O.) E5	24 Vac/dc LED lit during standby (N.O.) + low current load KE5
Name/appearance	Connector type						
Roller plunger 	AC connector	14CE2-J-PA	14CE2-JK-PA	14CE2-JE1-PA	14CE2-JKE1-PA	—	—
	AC prelead connector	14CE2-J-PA03	14CE2-JK-PA03	14CE2-JE1-PA03	—	—	—
	DC connector	14CE2-J-PD	14CE2-JK-PD	—	—	14CE2-JE5-PD	14CE2-JKE5-PD
	DC prelead connector	14CE2-J-PD03	14CE2-JK-PD03	—	—	14CE2-JE5-PD03	14CE2-JKE5-PD03
Roller lever 	AC connector	14CE6-J-PA	14CE6-JK-PA	14CE6-JE1-PA	—	—	—
	AC prelead connector	14CE6-J-PA03	14CE6-JK-PA03	14CE6-JE1-PA03	—	—	—
	DC connector	14CE6-J-PD	14CE6-JK-PD	—	—	14CE6-JE5-PD	14CE6-JKE5-PD
	DC prelead connector	14CE6-J-PD03	14CE6-JK-PD03	—	—	14CE6-JE5-PD03	14CE6-JKE5-PD03

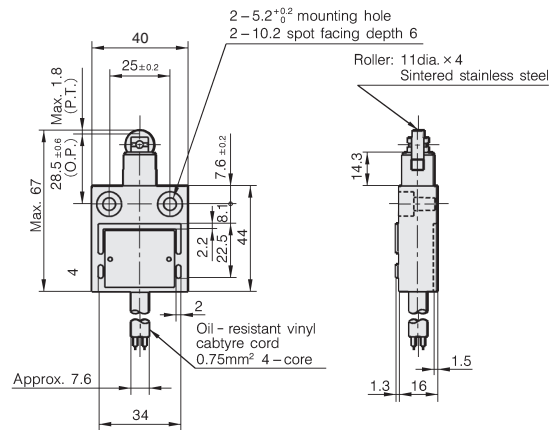
APPEARANCE, OPERATING CHARACTERISTICS AND EXTERNAL DIMENSIONS

(unit: mm)

● Preleaded type Roller plunger type



Catalog listing		14CE2-□J□□
O.F.	(N max.)	11.8
R.F.	(N min.)	4.4
P.T.	(mm max.)	1.8
O.T.	(mm min.)	3
M.D.	(mm max.)	0.15

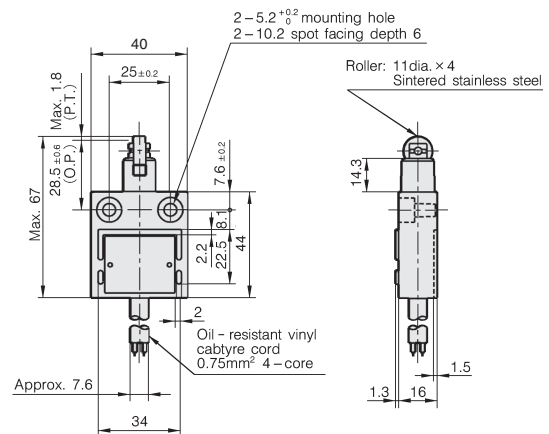


*Dimensional tolerance is ±0.4 unless otherwise specified.

Cross roller plunger type



Catalog listing		14CE3-□J□□
O.F.	(N max.)	11.8
R.F.	(N min.)	4.4
P.T.	(mm max.)	1.8
O.T.	(mm min.)	3
M.D.	(mm max.)	0.15

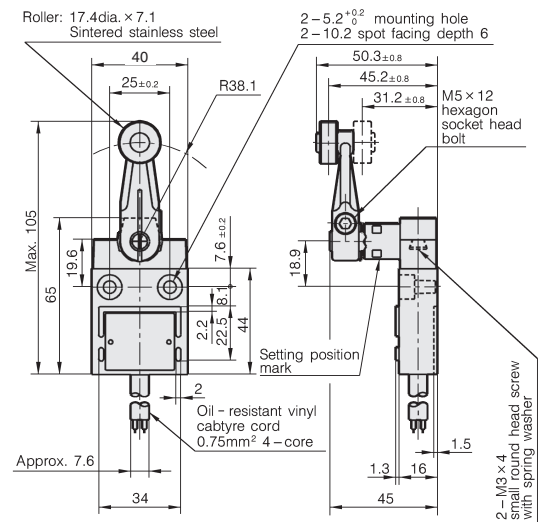


*Dimensional tolerance is ±0.4 unless otherwise specified.

Roller lever type



Roller lever type		14CE6-□J□□
O.F.	(N max.)	8.9
R.F.	(N min.)	1.4
P.T.	(° max.)	10±3.0
O.T.	(° min.)	50
M.D.	(° max.)	3



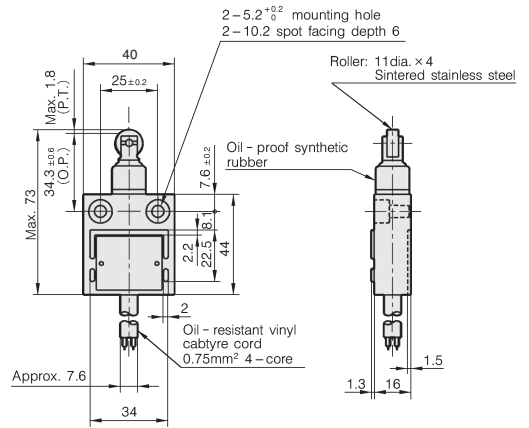
*Dimensional tolerance is ±0.4 unless otherwise specified.

Boot roller plunger type

(unit: mm)



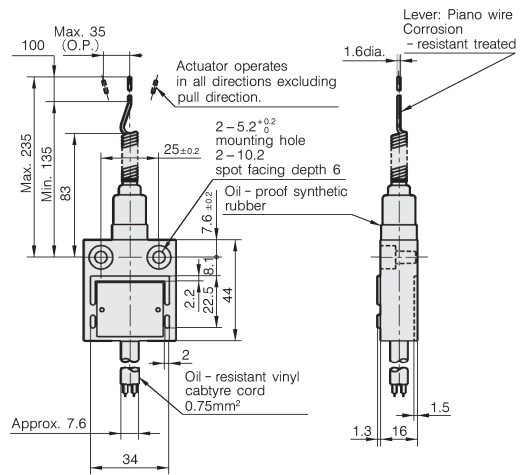
Catalog listing		14CE8-□J□□
O.F.	(N max.)	17.7
R.F.	(N min.)	4.4
P.T.	(mm max.)	1.8
O.T.	(mm min.)	3
M.D.	(mm max.)	0.15



*Dimensional tolerance is ±0.4 unless otherwise specified.

Wire spring non-directional operation type

Catalog listing		14CE9-□J□□
O.F.	(N max.)	0.49
R.F.	(N min.)	0.09
P.T.	(* max.)	35
O.T.	(min.)	—
M.D.	(max.)	—

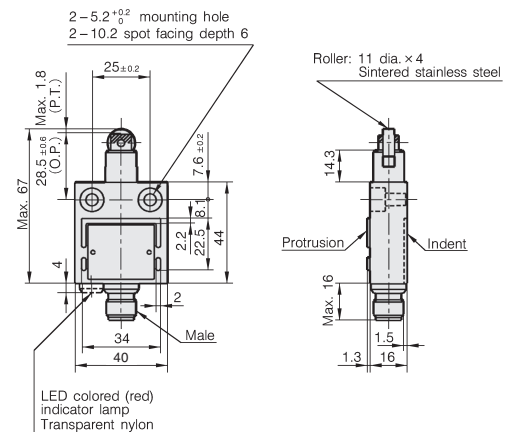


*Dimensional tolerance is ±0.4 unless otherwise specified.

● Connector type

Roller plunger type

Catalog listing	DC type	14CE2-J□□-PD
	AC type	14CE2-J□□-PA
O.F.	(N max.)	11.8
R.F.	(N min.)	4.4
P.T.	(mm max.)	1.8
O.T.	(mm min.)	3
M.D.	(mm max.)	0.15

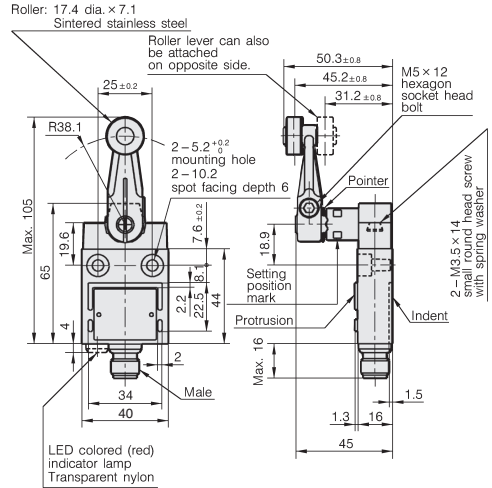


*Dimensional tolerance is ±0.4 unless otherwise specified.

Roller lever type

(unit: mm)

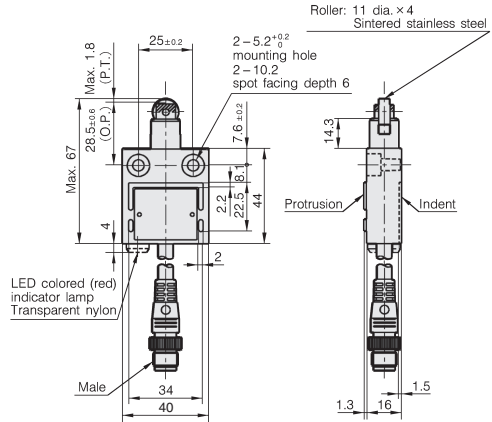
Catalog listing	DC type	14CE6-J□□-PD
	AC type	14CE6-J□□-PA
O.F.	(N max.)	8.9
R.F.	(N min.)	1.4
P.T.	(° max.)	10±3
O.T.	(° min.)	50
M.D.	(° max.)	3



●Preloaded connector type

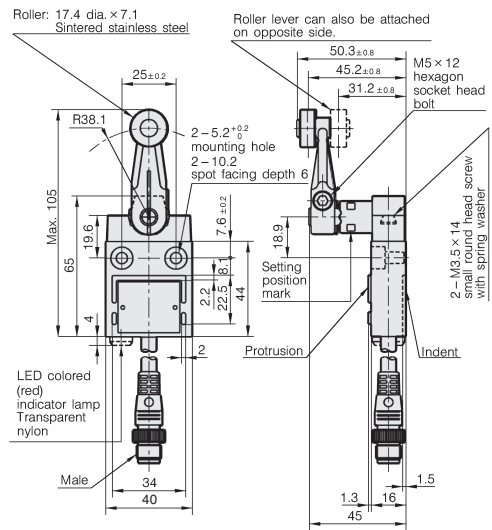
Roller plunger type

Catalog listing	DC type	14CE2-J□□-PD03
	AC type	14CE2-J□□-PA03
O.F.	(N max.)	11.8
R.F.	(N min.)	4.4
P.T.	(mm max.)	1.8
O.T.	(mm min.)	3
M.D.	(mm max.)	0.15




Roller lever type

Catalog listing	DC type	14CE6-J□□-PD03
	AC type	14CE6-J□□-PA03
O.F.	(N max.)	8.9
R.F.	(N min.)	1.4
P.T.	(° max.)	10±3
O.T.	(° min.)	50
M.D.	(° max.)	3



COMBINED PA5 SERIES CONNECTOR WITH CABLE

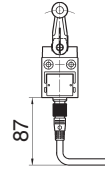
Shape	Power supply	Cord properties	Cord length	Catalog listing	Lead colors
	DC	Vinyl-insulated cord with high resistance to oil and vibration (UL/NFPA79 CM, CL3)	2 m	PA5-4ISX2SK	1: brown, 2: white, 3: blue, 4: black
			5 m	PA5-4ISX5SK	1: brown, 2: white, 3: blue, 4: black
	AC		2 m	PA5-4JSX2SK	1: brown, 2: white, 3: blue, 4: black
			5 m	PA5-4JSX5SK	1: brown, 2: white, 3: blue, 4: black

ASSEMBLY METHOD FOR CONNECTOR TYPE SWITCHES

(unit: mm)

(The below dimension is the dimension when the connector is assembled.)
 (Add the insertion/removal (approx. 15 mm) space during actual fitting.)

● Example connector type limit switch and straight type PA5



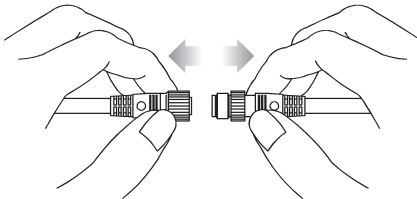
PRECAUTIONS FOR USE

1. Tightening the fixing cap ring and outside screw locking

- When the screw of the mating part is made of resin, the threads may be damaged when the connector is first tightened. When assembling the connector, align the center of the cores, push in as far as possible, and tighten.
- The recommended tightening torque is 0.4 to 0.6 N-m. Use of a tightening tool may damage the connector.
- Also, if the connector is not tightened firmly, IP67 protection may become insufficient, or may result in the connector becoming loose.

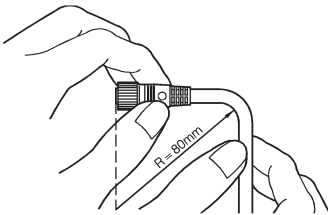
2. Inserting and Removing Connectors

- Before inserting and removing connectors, be sure to turn the power OFF.
- When removing connectors, do not pull the cord.
- Be sure to hold the connector by its body when removing.



3. Cautions when folding and bending cords

- The minimum bending radius (R) of the cord is 80 mm.
- Provide sufficient margin when bending cords.



4. Protective structure

- IP67 protection does not assure watertightness (complete waterproofing). Avoid use accompanied by constant contact with water.
- Avoid use in a state where external force is applied at all times on the connector connecting section.
- The body is a resin integrated formed part. Do not use the body as a step or place heavy objects on the body.

5. Cautions during replacement

- When removing connectors to replace the switch or cord, fully wipe the connector and the surrounding area to remove any water. After removing the connector, prevent the connector from being immersed in chemicals or in powder, or being dropped.
- If the connector is immersed in a fluid, allow the connector to fully dry before connecting again.
- If the connector is dropped in powder, fully wipe off any powder before connecting again. Failure to observe the above may result in short circuits or prevent the connector from being connected.

6. Installing the switch

- Tighten each part of the limit switch to the appropriate tightening torque as described in the product specification. Overtightening will damage the threads or other parts. Insufficient tightening degrades the seal and other characteristics.
- Do not let the activating object strike the lever arm or the switch head. If it does, the actuator may become bent and the switch may not be able to return properly.
- Do not use leads with silicone rubber insulation, or silicone filler, or grease or oil containing silicone. They can cause contacts to fail to conduct electricity.

7. Wiring

- Do not wire with the power ON. There is a danger of injury by electrical shock or unexpected mechanical movement.

8. Adjusting the switch

- Do not apply excessive force (5 times the O.F. or more) to the actuator beyond the travel limit position. Doing so may damage the switch.
- Set overtravel between 1/3 and 2/3 of the rated value or, if there is a position marked on the switch, set the overtravel to that mark. With a small overtravel, vibration or shock may cause the contacts to rattle or to make poor contact.

9. Environment

- Do not use the switch in an environment where strong acid or alkali is directly splashed onto it.

Before use, thoroughly read the "Precautions for use" and "Precautions for handling" in the Technical Guide on pages D-111 to D-122 as well as the instruction manual and product specification for this switch.