

# 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/CCC-approved models are available



## PERFORMANCE

	Item	Details
Standards	Compliance	JIS C4508/JIS C8201-5-1
Structure	Contact form	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 600Vac, 50/60Hz for 1 minute
		Between each terminal and ground: 1,500Vac, 50/60Hz for 1 minute
		Between each terminal and non-conducting metal part: 1,500Vac, 50/60Hz for 1 minute
	Insulation resistance	100MΩ Max.(by 500Vdc megger)
	Initial contact resistance Note 1	Standard load type: 50mΩ Max. (6 to 8Vdc-1A, voltage drop method) Low current load type: 100mΩ Max. (6 to 8Vdc-0.1A, voltage drop method) Connector section: 40mΩ Max.
Recommended min. voltage/current	Standard load type: 24V-10mA Low current load type: 5V-10mA	
Mechanical performance	Actuator strength	Withstands load 5 times O.F. (operating direction for 1 minute)
	Cable tensile strength	Min. 100N
	Impact resistance (malfunction) Note 2	500m/s <sup>2</sup> , contact opening for 1ms max. in free position and total travel positions
	Vibration resistance (malfunction)	Frequency 10 to 55Hz, 1.5mm peak-to-peak amplitude for 2 continuous hours Contact opening for 1ms max. in free position and total travel position
	Allowable operating speed Note 2	0.02mm/s to 0.5m/s Min. speed: Unstable state of contacts 0.1s max. Max. speed: Actuator damage not allowed
	Operating frequency	Max. 120 operations/minute
Life	Mechanical	Min. 5 million operations. Overtravel (O.T.) is 70 to 100% of standard value.
	Electrical	Standard load type: Min. 200,000 operations (250Vac-3A resistive load) Low current load type: Min. 2 million operations (125Vac-0.1A, 30Vdc-0.1A resistive load)
Ambient operating conditions	Temperature	-10 to +70°C (freezing not allowed)
	Humidity	Max. 98%RH Note 3
Recommended tightening torque	Body	5 to 6N-m (M5 hexagon socket head bolt)
	Roller lever	4 to 5.2N-m (M5 hexagon socket head bolt)
	Connector	0.4 to 0.6N-m (Tighten firmly by hand without using a tool.)

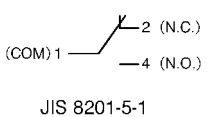
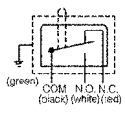
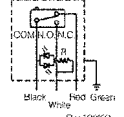
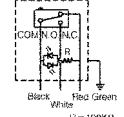
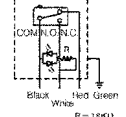
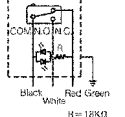
Note 1: In the case of the preleaded type, add 50mΩ per 1m of cable.

Note 2: This is the value for the representative 14CE2model (roller plunger type).

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

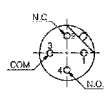
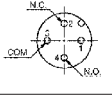
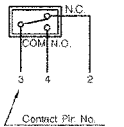
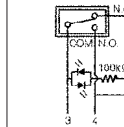
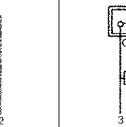


## ● Electrical rating, circuit configuration and lead color

### Preleaded type

Item	Contact material	Electrical rating					 JIS 8201-5-1
		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.

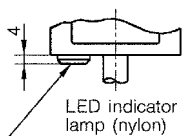
Item	Contact material	Electrical rating			Connector type	Contact pin positions (male contact)
		Without indicator lamp	With indicator lamp			
			E1 lamp (lit during standby)	E5 lamp (lit during standby)		
Standard load type	Silver	AC 250V-3A DC 30V-1A	AC 100V-3A	AC 24V-3A DC 24V-1A	-PA -PA03	
Low current load type	Class 1 alloy cross point	AC 125V-0.1A DC 30V-0.1A	AC 100V-0.1A	AC/DC 24V-0.1A	For AC	
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	For DC	
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).

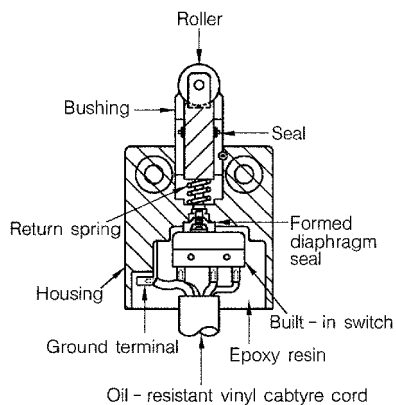
### ● With LED indicator lamp

(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

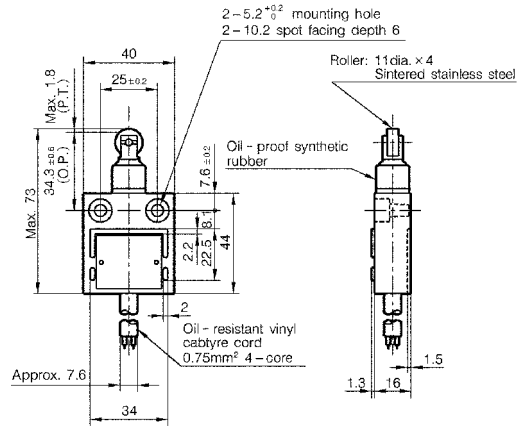
Actuator		Basic catalog listing	Options				
Name/appearance	Cable length		Low current load	100Vac/dc LED lit during standby (N.O.)	100Vac/dc LED lit during standby (N.O.) + low current load	100Vac/dc LED lit during operation (N.C.)	100Vac/dc LED lit during operation (N.C.) + low current load
			K	E1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

Options					
24Vac/dc LED lit during standby (N.O.) E5	24Vac/dc LED lit during standby (N.O.) + low current load KE5	24Vac/dc LED lit during operation (N.C.) E8	24Vac/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/preleaded connector

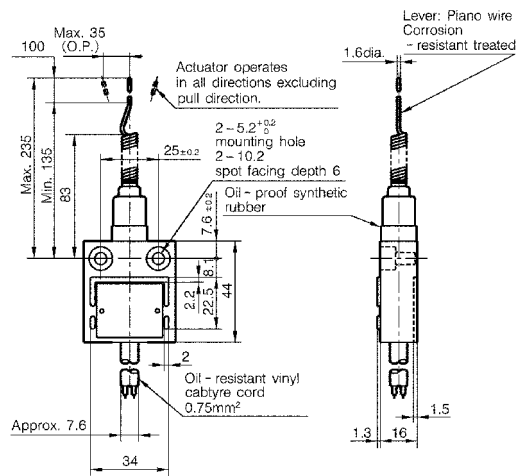
Actuator		Basic catalog listing	Options				
			Low current load K	100Vac/dc LED lit during standby (N.O.) E1	100Vac/dc LED lit during standby (N.O.) + low current load KE1	24Vac/dc LED lit during standby (N.O.) E5	24Vac/dc LED lit during standby (N.O.) + low current load KE5
Name/appearance	Connector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





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

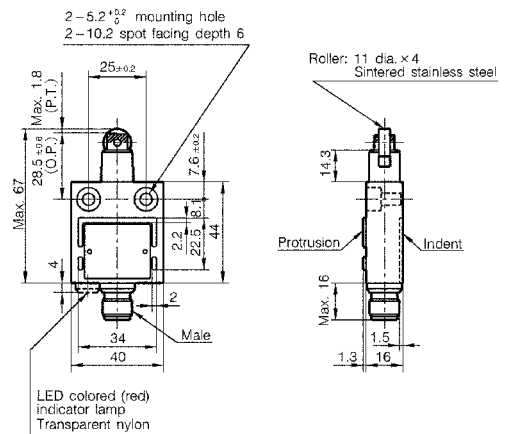
Wire spring non-directional operation type



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

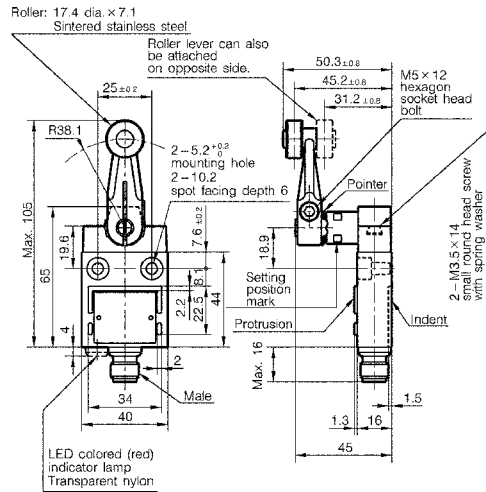
● Connector type

Roller plunger type



<b>Catalog listing</b>	<b>DC type</b>	<b>14CE2-J□□-PD</b>
	<b>AC type</b>	<b>14CE2-J□□-PA</b>
<b>O.F.</b>	(N max.)	11.8
<b>R.F.</b>	(N min.)	14.4
<b>P.T.</b>	(mm max.)	11.8
<b>O.T.</b>	(mm min.)	3
<b>M.D.</b>	(mm max.)	0.15

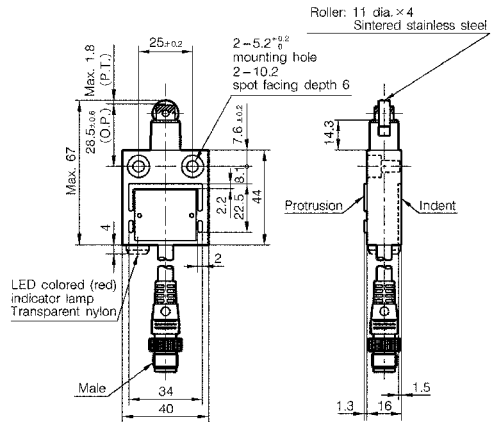
Catalog listing	DC type	14CE6-J□□-PD
	AC type	14CE6-J□□-PA
O.F.	(N max.)	8.9
R.F.	(N min.)	1.4
P.T.	(° max.)	10±3
O.T.	(° min.)	50
M.D.	(° max.)	3



● Preloaded connector type

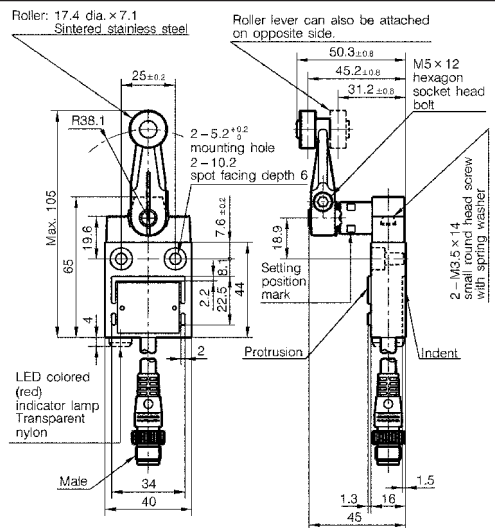
Roller plunger type

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



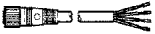
Roller lever type

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 CABLE WITH CONNECTOR

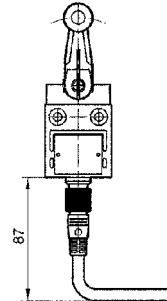
Shape	Power supply	Cable features	Cable length	Catalog listing	Lead color
	DC	Oil-resistant, flexible UL2464 flame-resistant cable EN-approved	2m	PA5-4ISX2MK-E	1-Brown, 2-White, 3-Blue, 4-Black
			5m	PA5-4ISX5MK-E	1-Brown, 2-White, 3-Blue, 4-Black
	AC		2m	PA5-4JSX2MK-E	1-Brown, 2-White, 3-Blue, 4-Black
			5m	PA5-4JSX5MK-E	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. 15mm) space during actual fitting. )

### ● Example connector type limit switch and straight type PA5



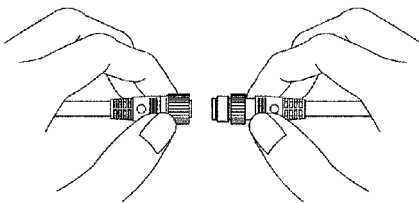
## PRECAUTIONS FOR USE

### 1.1 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 0.6N·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.

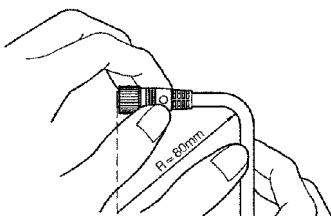
### 1.2 Inserting and Removing Connectors

- 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.



### 1.3 Cautions when folding and bending cords

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



### 1.4 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.

### 1.5 Cautions during replacement

- When removing connectors to replace the sensor 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.