

# Miniature Limit Switch

## D4CC

### Many Models Including Roller Lever Switches are Only 16-mm Thick with Connector

- New center roller lever models that enable ganged mounting of up to 6 Switches.
- Cable connectors for easy Switch replacement.
- Triple-seal construction for plungers to provide IEC IP67, UL, and CSA (type 3, 4, 13) degree of protection.
- Operation indicators available for easy monitoring (standard indicator is lit when Switch is not operating).



## Model Number Structure

### ■ Model Number Legend

D4CC- 0  

1      2

#### 1. Rated Load

(These codes are different from suffix codes of the D4C)

- 1: 1 A at 125 VAC
- 2: 1 A at 125 VAC (with LED indicator)
- 3: 1 A at 30 VDC
- 4: 1 A at 30 VDC (with LED indicator)

#### 2. Actuator

- 01: Pin plunger
- 02: Roller plunger
- 03: Crossroller plunger
- 10: Bevel plunger
- 24: Roller lever
- 31: Sealed pin plunger
- 32: Sealed roller plunger
- 33: Sealed crossroller plunger
- 41: Panel mount pin plunger
- 42: Panel mount roller plunger
- 43: Panel mount crossroller plunger
- 50: Plastic rod
- 60: Center roller lever

**Note:** With standard models, the operation indicator turns OFF when the switch operates. If models with operation indicators that turn ON when the switch operates are required, add "-B" to the end of the model number.

# Ordering Information

## List of Models

### Limit Switches

| Actuator                                                                                                            | 1 A at 125 VAC    |                | 1 A at 30 VDC     |                |
|---------------------------------------------------------------------------------------------------------------------|-------------------|----------------|-------------------|----------------|
|                                                                                                                     | Without indicator | With indicator | Without indicator | With indicator |
| Pin plunger                        | D4CC-1001         | D4CC-2001      | D4CC-3001         | D4CC-4001      |
| Roller plunger                     | D4CC-1002         | D4CC-2002      | D4CC-3002         | D4CC-4002      |
| Crossroller plunger                | D4CC-1003         | D4CC-2003      | D4CC-3003         | D4CC-4003      |
| Bevel plunger                      | D4CC-1010         | D4CC-2010      | D4CC-3010         | D4CC-4010      |
| High-sensitivity roller lever      | D4CC-1024         | D4CC-2024      | D4CC-3024         | D4CC-4024      |
| Sealed pin plunger                 | D4CC-1031         | D4CC-2031      | D4CC-3031         | D4CC-4031      |
| Sealed roller plunger              | D4CC-1032         | D4CC-2032      | D4CC-3032         | D4CC-4032      |
| Sealed crossroller plunger         | D4CC-1033         | ---            | D4CC-3033         | D4CC-4033      |
| Panel mount pin plunger            | D4CC-1041         | D4CC-2041      | D4CC-3041         | D4CC-4041      |
| Panel mount roller plunger        | D4CC-1042         | D4CC-2042      | D4CC-3042         | D4CC-4042      |
| Panel mount crossroller plunger  | D4CC-1043         | ---            | D4CC-3043         | D4CC-4043      |
| Plastic rod                      | D4CC-1050         | D4CC-2050      | D4CC-3050         | D4CC-4050      |
| Center roller lever              | D4CC-1060         | D4CC-2060      | D4CC-3060         | D4CC-4060      |

**Note:** 1. The meaning of suffix codes in the D4CC model numbers is different from that in the D4C model numbers.  
2. Refer to the following table for cable plugs.

### Accessories (Order Separately)

#### Plugs

| Type | Appearance                                                                                      | No. of conductors | Cable length | Model           |
|------|-------------------------------------------------------------------------------------------------|-------------------|--------------|-----------------|
| VAC  | Straight<br> | 4                 | 1 m          | XS2F-A421-C90-A |
|      |                                                                                                 |                   | 2 m          | XS2F-A421-D90-A |
|      |                                                                                                 |                   | 5 m          | XS2F-A421-G90-A |
|      |                                                                                                 |                   | 10 m         | XS2F-A421-J90-A |
| VDC  |                                                                                                 |                   | 1 m          | XS2F-D421-C80-A |
|      |                                                                                                 |                   | 2 m          | XS2F-D421-D80-A |
|      |                                                                                                 |                   | 5 m          | XS2F-D421-G80-A |
|      |                                                                                                 |                   | 10 m         | XS2F-D421-J80-A |

**Note:** Please contact your local OMRON sales office for details.

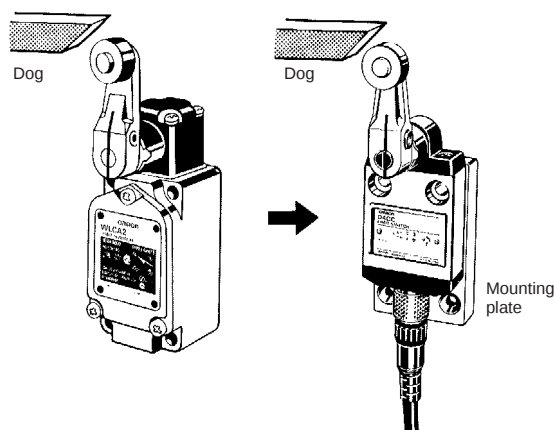
## Special Mounting Plate

It is possible to replace an WL Limit Switch with a D4CC Limit Switch mounted on this plate without changing the position of the dog or cam.

The following is the conversion table:

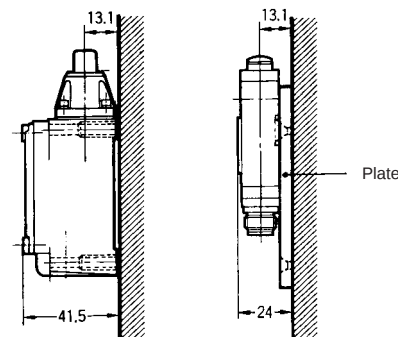
| WL                          | D4C                          | Plate model |
|-----------------------------|------------------------------|-------------|
| Top plunger:<br>WLD         | Plunger: D4CC-□001           | D4C-P001    |
| Top roller plunger:<br>WLD2 | Roller plunger:<br>D4CC-□002 | D4C-P002    |
| Roller lever:<br>WLG2       | Roller lever:<br>D4CC-□024   | D4C-P020    |

## Example



## Remarks

There is no difference in mounting pitch between the Mounting Plate and the WL. The mounting depth of the D4CC with the Mounting Plate attached is, however, shorter than that of the panel-mounted WL.



## Specifications

### Approved Standards

| Agency | Standard         | File No. |
|--------|------------------|----------|
| UL     | UL508            | E76675   |
| CSA    | CSA C22.2 No. 14 | LR45746  |

### Approved Standard Ratings

#### UL-CSA

#### D4CC-1, D4CC-2 D150

| Rated voltage | Carry current | Current |       | Volt-amperes |       |
|---------------|---------------|---------|-------|--------------|-------|
|               |               | Make    | Break | Make         | Break |
| 120 VAC       | 1.0 A         | 3.6 A   | 0.6 A | 432 VA       | 72 VA |

### Ratings

| Rated voltage | Non-inductive load |     |           |       | Inductive load |     |            |     |
|---------------|--------------------|-----|-----------|-------|----------------|-----|------------|-----|
|               | Resistive load     |     | Lamp load |       | Inductive load |     | Motor load |     |
|               | NC                 | NO  | NC        | NO    | NC             | NO  | NC         | NO  |
| 125 VAC       | 1 A                | 1 A | 1 A       | 0.7 A | 1 A            | 1 A | 1 A        | 1 A |
| 30 VDC        | 1 A                | 1 A | 1 A       | 1 A   | 1 A            | 1 A | 1 A        | 1 A |

- Note:**
- The above current ratings are for steady-state current.
  - Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
  - Lamp loads have an inrush current of 10 times the steady-state current.
  - Motor loads have an inrush current of 6 times the steady-state current.

### D4CC-3, D4CC-4, 1 A at 30 VDC

|                |    |            |
|----------------|----|------------|
| Inrush current | NC | 5 A max.   |
|                | NO | 2.5 A max. |

## ■ Characteristics

|                              |                                                                                                                                                                                                                  |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Degree of protection         | IP67                                                                                                                                                                                                             |
| Durability (see note 2)      | Mechanical: 10,000,000 operations min.<br>Electrical: 200,000 operations min. (1 A at 125 VAC, resistive load)                                                                                                   |
| Operating speed              | Plunger: 0.1 mm to 0.5 m/s<br>Roller lever: 1 mm to 1 m/s                                                                                                                                                        |
| Operating frequency          | Mechanical: 120 operations/min<br>Electrical: 30 operations/min                                                                                                                                                  |
| Rated frequency              | 50/60 Hz                                                                                                                                                                                                         |
| Insulation resistance        | 100 MΩ min. (at 500 VDC)                                                                                                                                                                                         |
| Contact resistance (initial) | 100 mΩ max.                                                                                                                                                                                                      |
| Dielectric strength          | 1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity<br>1,500 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal part |
| Vibration resistance         | Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (see note 3)                                                                                                                                                   |
| Shock resistance             | Destruction: 1,000 m/s <sup>2</sup> min.<br>Malfunction: 500 m/s <sup>2</sup> min.                                                                                                                               |
| Ambient temperature          | Operating: -10°C to 70°C (with no icing)                                                                                                                                                                         |
| Ambient humidity             | Operating: 95% max.                                                                                                                                                                                              |
| Weight                       | Approx. 120 g (in the case of D4CC-1002)                                                                                                                                                                         |

**Note:** 1. The above figures are initial values.

2. The values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.
3. Excluding plastic rod models.

## Leakage Current (for Switches with Indicators)

The leakage current and resistance of Switches with indicators are as follows:

| Item            | D4CC-2□□□ | D4CC-4□□□ |
|-----------------|-----------|-----------|
| Voltage         | 125 VAC   | 30 VDC    |
| Leakage current | 1.0 mA    | 1.0 mA    |
| Resistive value | 150 kΩ    | 30 kΩ     |

## ■ Operating Characteristics

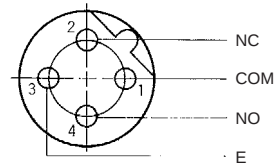
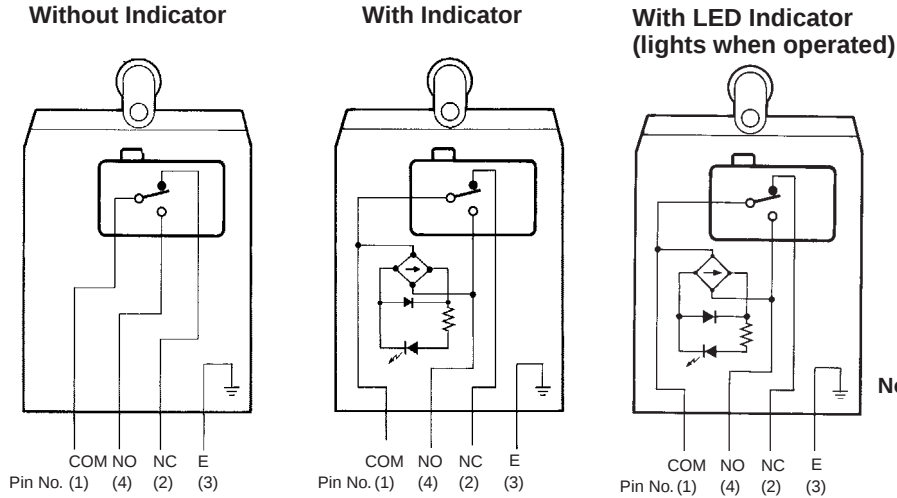
| Model   | D4CC-□001 | D4CC-□002 | D4CC-□003 | D4CC-□010 | D4CC-□024 |
|---------|-----------|-----------|-----------|-----------|-----------|
| OF max. | 11.77 N   | 11.77 N   | 11.77 N   | 11.77 N   | 5.69 N    |
| RF min. | 4.41 N    | 4.41 N    | 4.41 N    | 4.41 N    | 1.47 N    |
| PT max. | 1.8 mm    | 1.8 mm    | 1.8 mm    | 1.8 mm    | 10±3°     |
| OT min. | 3 mm      | 3 mm      | 3 mm      | 3 mm      | 50°       |
| MD max. | 0.2 mm    | 0.2 mm    | 0.2 mm    | 0.2 mm    | 3°        |
| OP      | 15.7±1 mm | 28.5±1 mm | 28.5±1 mm | 28.5±1 mm | ---       |

| Model                | D4CC-□031 | D4CC-□032 | D4CC-□033 | D4CC-□041 | D4CC-□042 | D4CC-□043 |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| OF max.              | 17.65 N   | 17.65 N   | 17.65 N   | 11.77 N   | 11.77 N   | 11.77 N   |
| RF min.              | 4.41 N    | 4.41 N    | 4.41 N    | 4.41 N    | 4.41 N    | 4.41 N    |
| PT max.              | 1.8 mm    | 1.8 mm    | 1.8 mm    | 1.8 mm    | 1.8 mm    | 1.8 mm    |
| OT min.              | 3 mm      | 3 mm      | 3 mm      | 3 mm      | 3 mm      | 3 mm      |
| MD max.              | 0.2 mm    | 0.2 mm    | 0.2 mm    | 0.2 mm    | 0.2 mm    | 0.2 mm    |
| OP                   | 24.9±1 mm | 34.3±1 mm | 34.3±1 mm | 31.2±1 mm | 36.8±1 mm | 36.8±1 mm |
| TT (reference value) | (5) mm    | (5) mm    | (5) mm    | (5) mm    | (5) mm    | (5) mm    |

| Model   | D4CC-□050 | D4CC-□060 |
|---------|-----------|-----------|
| OF max. | 1.47 N    | 6.67 N    |
| RF min. | ---       | 1.47 N    |
| PT max. | 15°       | 10±3°     |
| OT min. | ---       | 50°       |
| MD max. | ---       | 3°        |

## ■ Contact Form

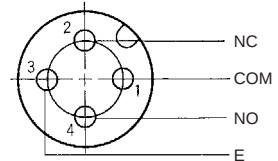
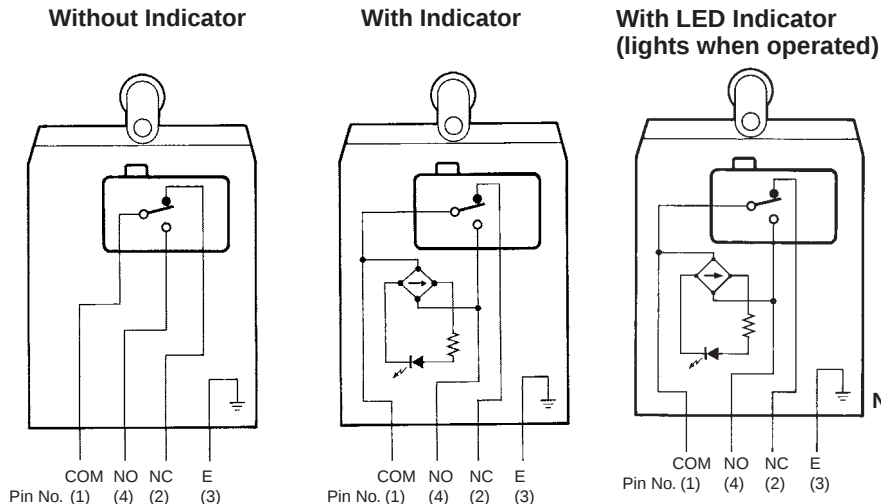
### AC Switches (D4CC-10□□, 20□□)



**Note:** The indicators of these models are lit when the Switches are not actuated. When the Switches are actuated, the indicator are off.

- Note 1.** "Lights when operated" means that when the actuator is turned or pushed and the Limit Switch contact leaves the NC side, the indicator lights.
- 2.** "Lights when not in operation" means that when the actuator is in the free position, the indicator is lit, and when the actuator is turned or pushed and the contact comes into contact with the NO side, the indicator turns OFF.

### DC Switches (D4CC-30□□, 40□□)

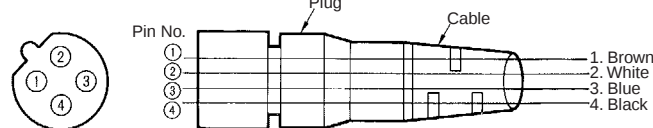


**Note:** The indicators of these models are lit when the Switches are not actuated. When the Switches are actuated, the indicator are off.

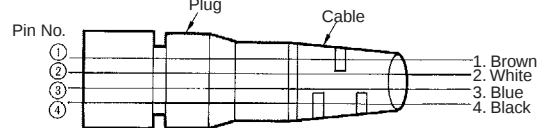
- Note 1.** "Lights when operated" means that when the actuator is turned or pushed and the Limit Switch contact leaves the NC side, the indicator lights.
- 2.** "Lights when not in operation" means that when the actuator is in the free position, the indicator is lit, and when the actuator is turned or pushed and the contact comes into contact with the NO side, the indicator turns OFF.

## Plugs

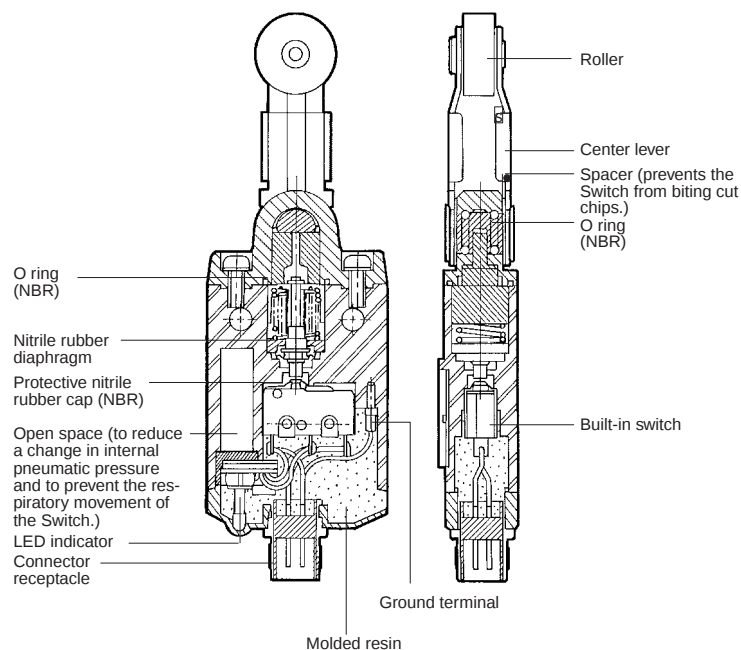
### AC Type



### DC Type



# Nomenclature



# Dimensions

**Note:** 1. All units are in millimeters unless otherwise indicated.

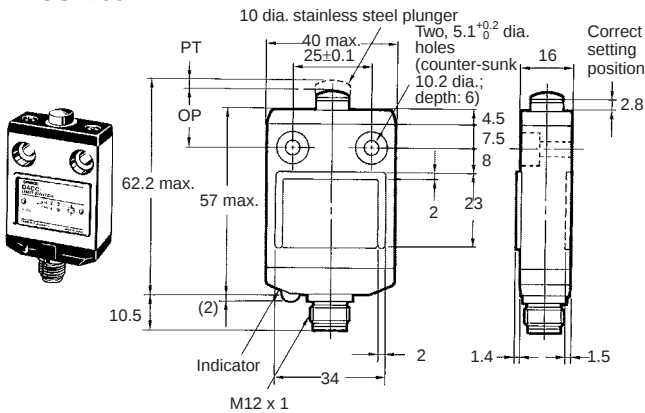
2. The □ in each model number is replaced with the code expressing the rated load of the model. Refer to *Ordering Information*.

3. Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

## Limit Switches

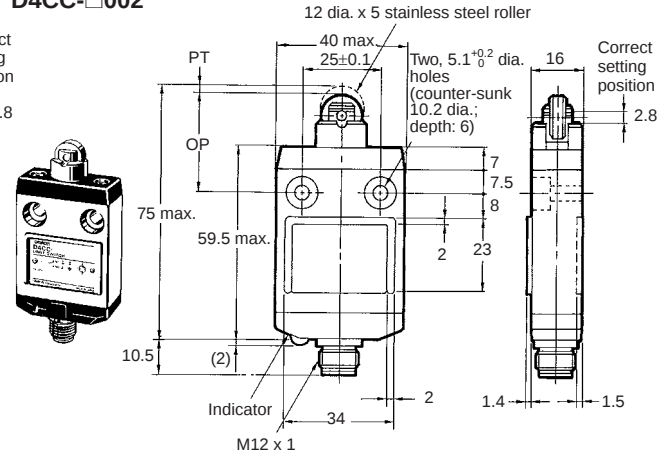
### Pin Plunger

D4CC-□001



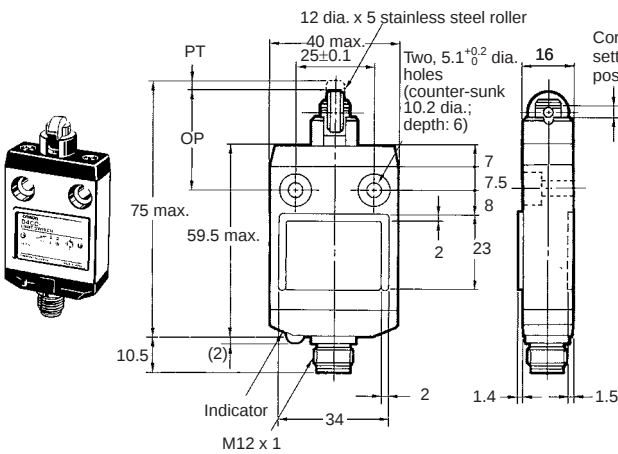
### Roller Plunger

D4CC-□002



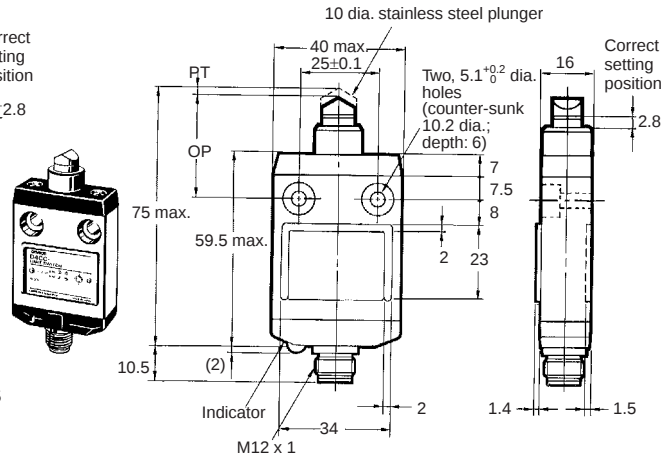
### Crossroller Plunger

D4CC-□003



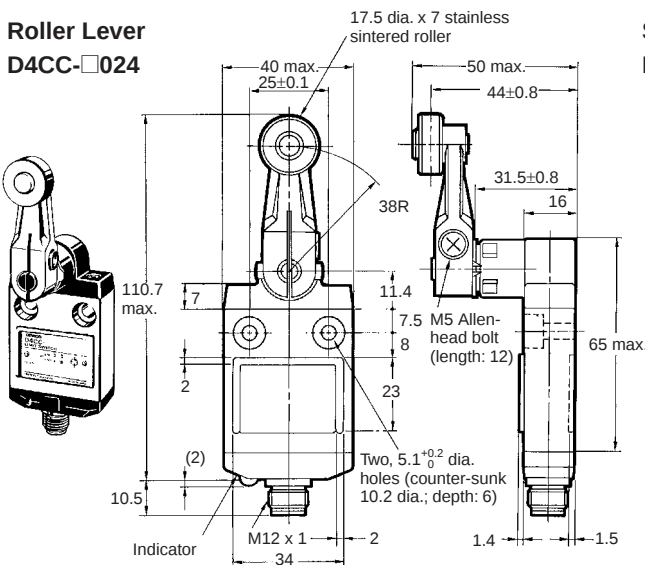
### Bevel Plunger

D4CC-□010



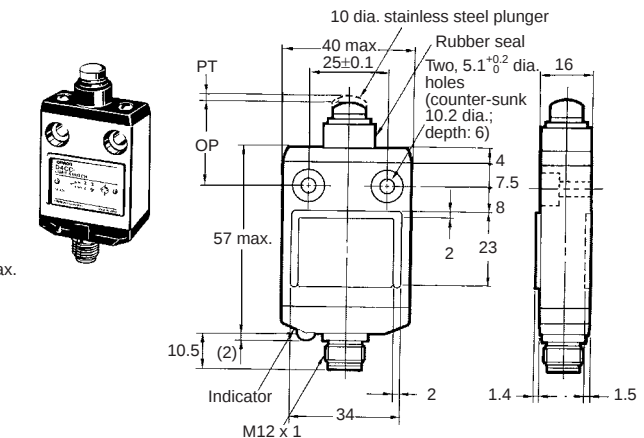
### Roller Lever

D4CC-□024

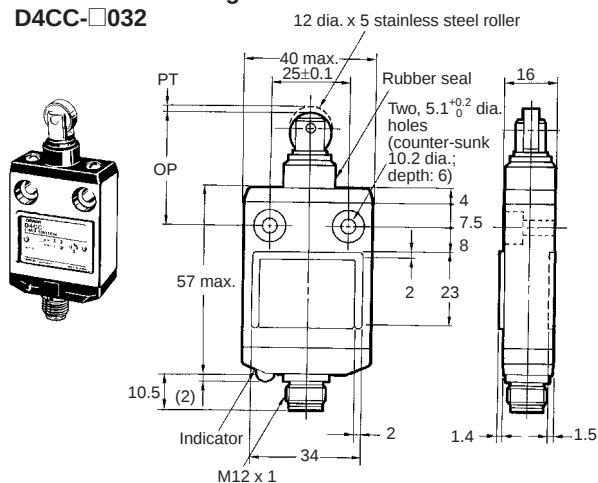


### Sealed Pin Plunger

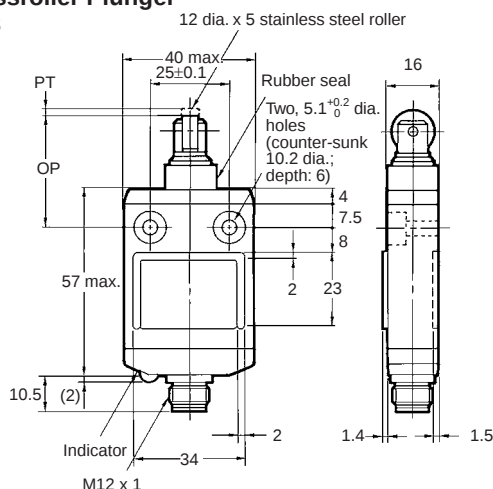
D4CC-□031



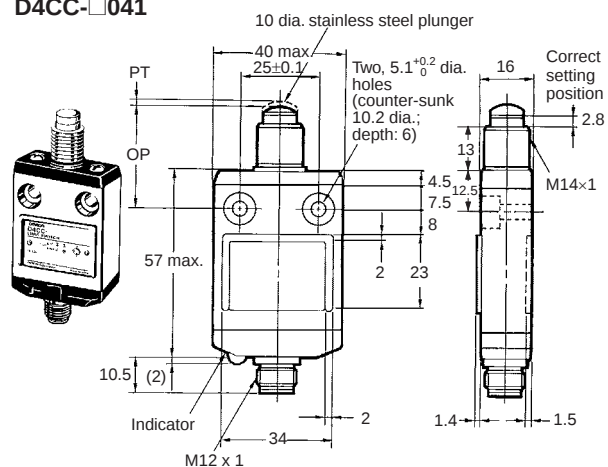
### Sealed Roller Plunger D4CC-□032



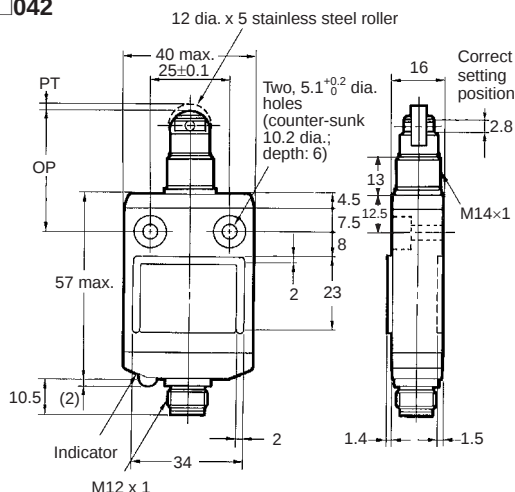
### Sealed Crossroller Plunger D4CC-□033



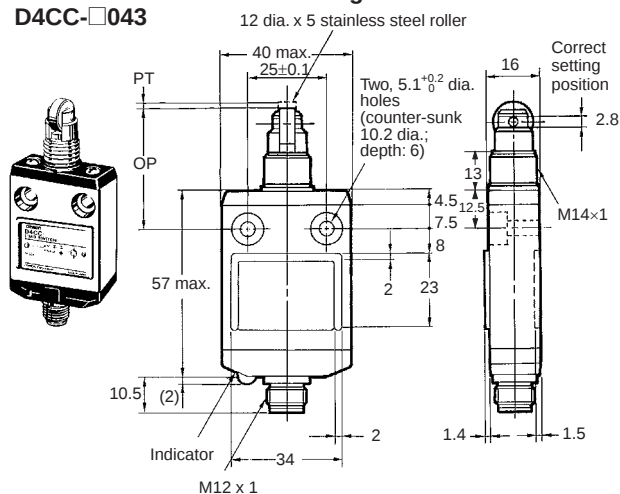
### Panel Mount Pin Plunger D4CC-□041



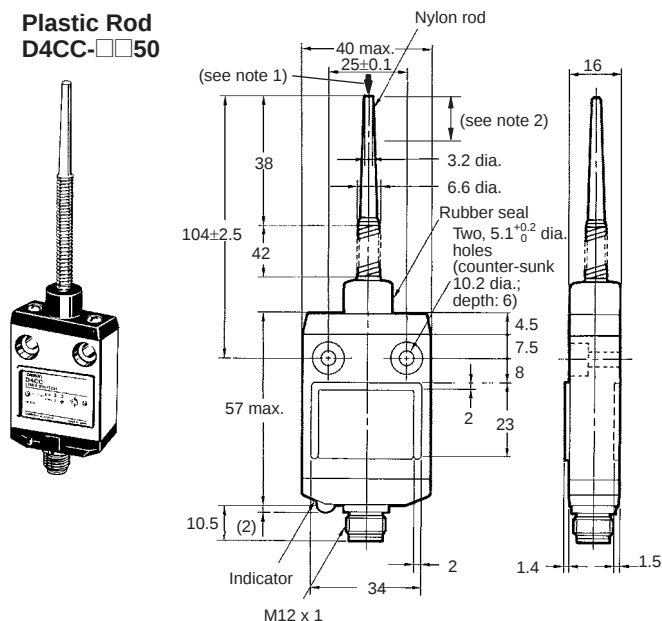
### Panel Mount Roller Plunger D4CC-□042



### Panel Mount Crossroller Plunger D4CC-□043

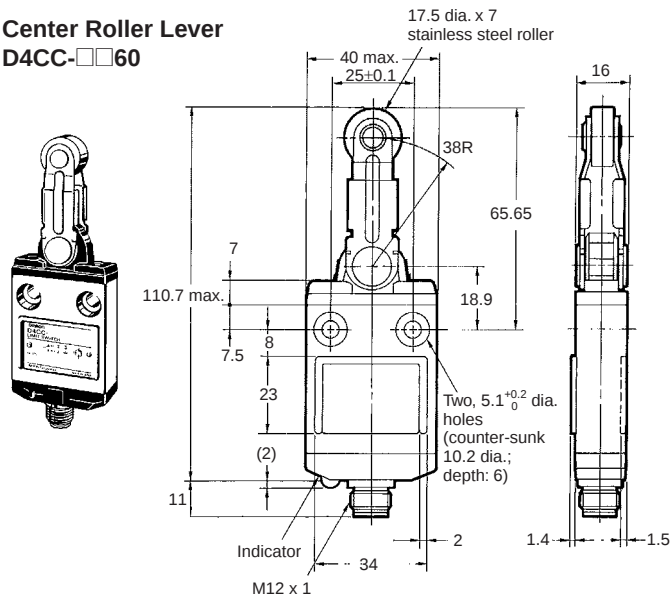


### Plastic Rod D4CC-□□50



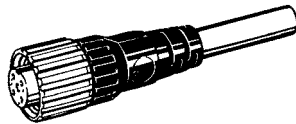
**Note:** 1. Operation is possible in any direction except parallel to the axis ↓.  
2. The ideal range for operation is between the tip of the rod and 1/3 of the length of the actuator.

**Center Roller Lever**  
**D4CC-□□60**

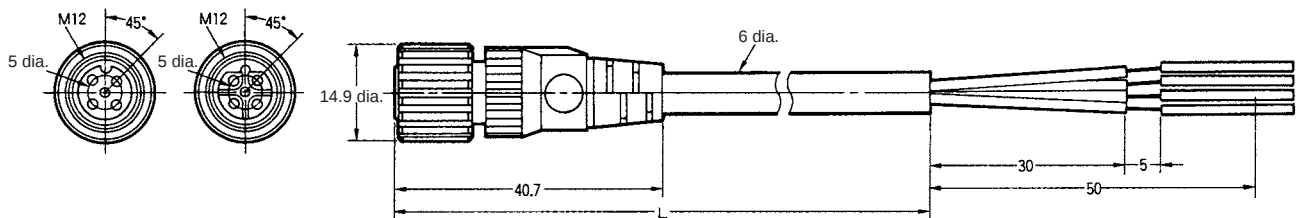


**Plugs**

**XS2F-D421-□80-A (DC)**  
**XS2F-A421-□90-A (AC)**  
**(Straight Type)**



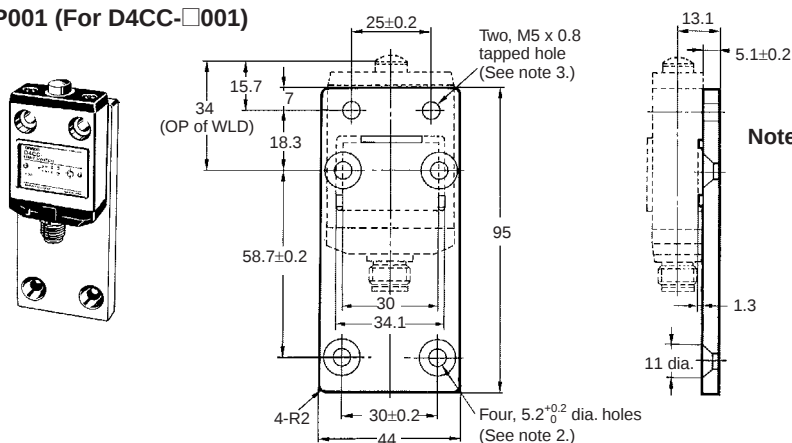
| Model          | Cable length (L) |
|----------------|------------------|
| XS2F-D421-C□-A | 1 m              |
| XS2F-D421-D□-A | 2 m              |
| XS2F-D421-G□-A | 5 m              |
| XS2F-D421-J□-A | 10 m             |



# Special Mounting Plates

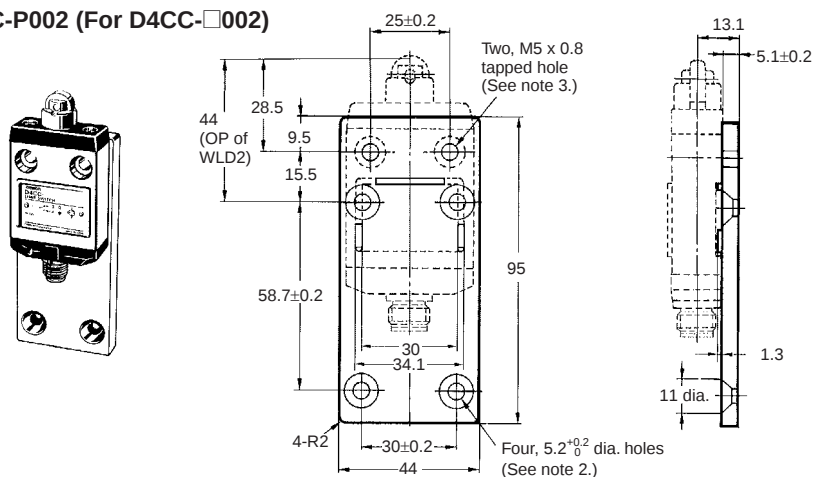
(Limit Switches are not attached to the Plates.)

D4C-P001 (For D4CC-□001)



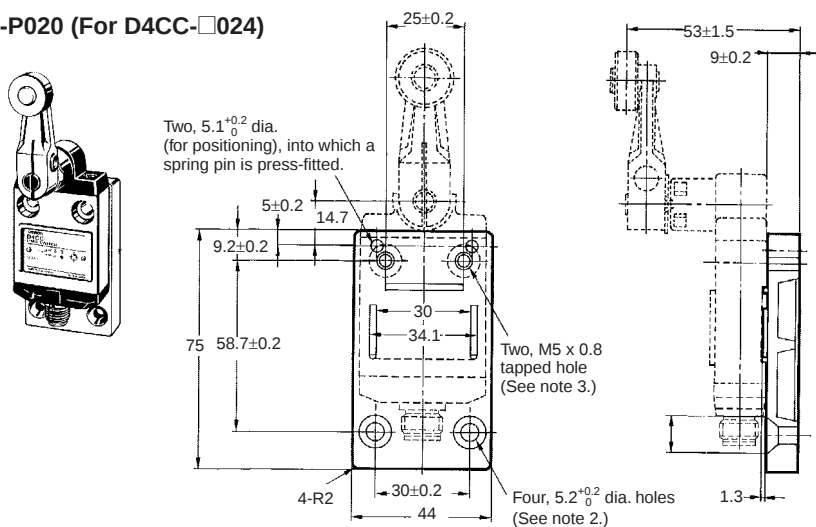
- Note 1.** Four hexagonal flat head bolts (M5 x 0.8, length: 10) and two Allen-head bolts (M5 x 0.8, length: 15) are included.
- Note 2.** All the holes with 5.2<sup>+0.2</sup>/<sub>0</sub> dia. must be used with M5 x 10 Allen-head bolts.
- Note 3.** All the M5-tapped holes must be used with M5 hexagonal flat head bolts.

D4C-P002 (For D4CC-□002)



- Note 1.** Four hexagonal flat head bolts (M5 x 0.8, length: 10) and two Allen-head bolts (M5 x 0.8, length: 15) are included.
- Note 2.** All the holes with 5.2<sup>+0.2</sup>/<sub>0</sub> dia. must be used with M5 x 10 Allen-head bolts.
- Note 3.** All the M5-tapped holes must be used with M5 hexagonal flat head bolts.

D4C-P020 (For D4CC-□024)



- Note 1.** Four hexagonal flat head bolts (M5 x 0.8, length: 10), two Allen-head bolts (M5 x 0.8, length: 15), and two spring pins (4 x 14) are included.
- Note 2.** All the holes with 5.2<sup>+0.2</sup>/<sub>0</sub> dia. must be used with M5 x 10 Allen-head bolts.
- Note 3.** All the M5-tapped holes must be used with M5 hexagonal flat head bolts.

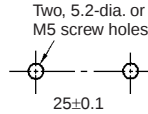
# Precautions

## Correct Use

### Mounting

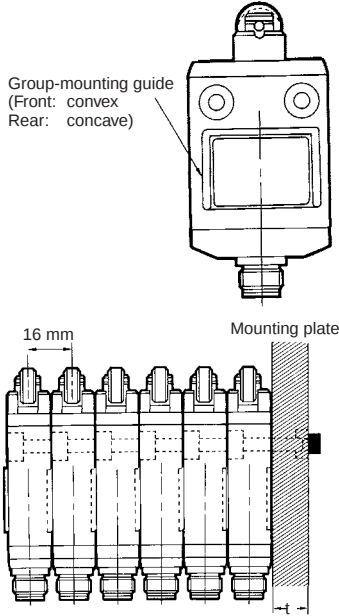
Make sure that the plate to which the D4CC is mounted is flat. If the plate is warped or has protruding parts, the D4CC may not malfunction.

### Mounting Holes



A maximum of 6 Switches may be group-mounted. In this case, pay attention to the mounting direction so that the convex part of the group-mounting guide on one Switch fits into the concave part of the guide on the other Switch as shown in the figure below. For group mounting, the mounting panel must have a thickness (t) of 6 mm min.

### Group Mounting

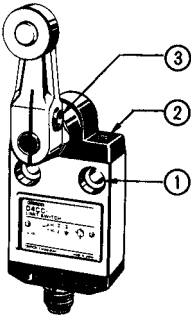


### Tightening Torque

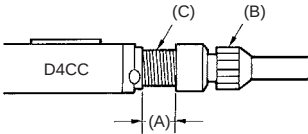
Be sure to tighten each screw to the proper tightening torque as shown in the table.

| No. | Type                     | Torque           |
|-----|--------------------------|------------------|
| 1   | M5 Allen-head bolt       | 4.90 to 5.88 N·m |
| 2   | M3.5 head mounting screw | 0.78 to 0.88 N·m |
| 3   | M5 Allen-head bolt       | 4.90 to 5.88 N·m |

**Note:** By removing the two screws from the head, the head direction can be rotated 180°. After changing the head direction, re-tighten to the torque specified above. Be careful not to allow any foreign substance to enter the Switch.

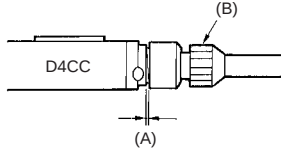


### Plug Tightening



Connect the plug connector (B) to the connector threads of the D4CC. Then firmly turn the plug connector by hand so that the connector threaded portion (C) will be completely covered by the plug connector (B) so that space (A) will be almost 0. Do not use any tools, such as pliers, to tighten the plug connector, otherwise the plug connector may become damaged. Make sure, however, that the plug connector is tightened securely, otherwise the rated degree of protection of the D4CC may not be maintained. Furthermore, the plug connector may be loosened by vibration.

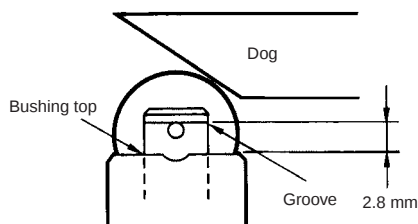
### Properly Tightened Connector



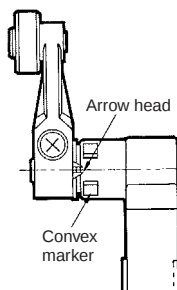
## Operation

Operation method, shapes of cam and dog, operating frequency, and overtravel have a significant effect on the service life and precision of a Limit Switch. For this reason, the dog angle must be 30° max., the surface roughness of the dog must be 6.3S min. and hardness must be Hv400 to 500.

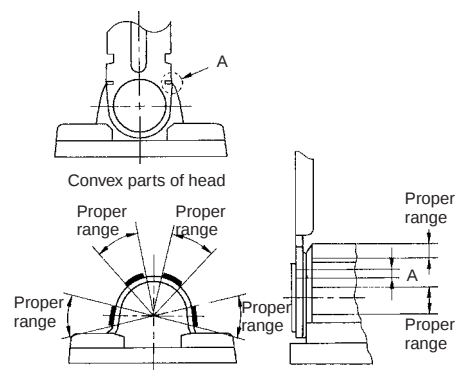
To allow the plunger-type actuator to travel properly, adjust the dog and cam so that the plunger groove fits the bushing top.



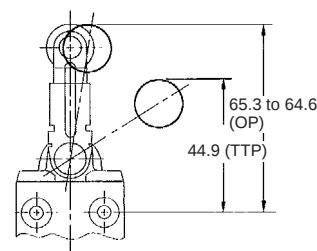
To allow the roller lever-type actuator to travel properly, adjust the dog and cam so that the arrow head is positioned between the two convex markers as shown below.



Properly adjust the stroke of the center roller lever along with the dog or cam so that the concave part (A) of the head is located between the convex parts of the head as shown below when the center roller lever is pressed by the dog or cam.



Refer to the following to adjust the stroke of the lever based on the mounting hole level.



## Others

If failures, such as reset failures, in the plunger model are possible, use a model that has a rubber cap.

Do not expose the Switch to water exceeding 70°C or use it in steam.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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