


## 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 to provide IEC IP67 degree of protection.
- Operation indicators available for easy monitoring (standard indicator is lit when Switch is not operating).
- Approved by UL and CSA.  
(Ask your OMRON representative for Information on approved models.)



 Be sure to read *Safety Precautions* on page 7 to 8 and *Safety Precautions for All Limit Switches*.

## Model Number Structure

**Model Number Legend** (Not all combinations are possible. Ask your OMRON representative for details.)

**D4CC-□0□□**  
(1) (2)

**(1) Rated Current**

- 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
- 24 : Roller lever
- 31 : Sealed pin plunger
- 32 : Sealed roller plunger
- 33 : Sealed crossroller plunger
- 50 : Plastic rod
- 60 : Center roller lever

## Ordering Information


### Switches

#### Limit Switches

| Actuator                      | Ratings<br>LED indicator  | 1 A at 125 VAC    |                | 1 A at 30 VDC     |                |
|-------------------------------|---|-------------------|----------------|-------------------|----------------|
|                               |   | Without indicator | With indicator | Without indicator | With indicator |
|                               |   | Model             | Model          | Model             | Model          |
| 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      |
| 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      |
| Plastic rod                   |  | D4CC-1050         | D4CC-2050      | D4CC-3050         | D4CC-4050      |
| Center roller lever           |  | D4CC-1060         | D4CC-2060      | D4CC-3060         | D4CC-4060      |

Note: 1. Ask your OMRON representative for Information on approved models.  
 2. The meaning of suffix codes in the D4CC model numbers is different from that in the D4C model numbers.  
 3. Refer to the following table for cable plugs.

## Applicable Cables

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

## Special Mounting Plate (Order Separately)

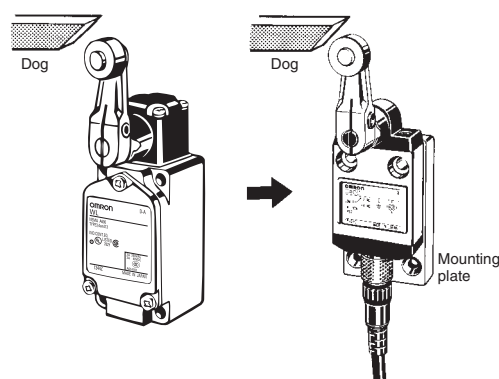
It is possible to replace an WL Limit Switch with a D4CC Limit Switch mounted on this plate without changing the position of the dog or cam.

### List of Replaceable Models

| WL model (Actuator)       | D4CC model (Actuator)        | Plate    |
|---------------------------|------------------------------|----------|
| WLD (Top plunger)         | → D4CC-□001 (Plunger)        | D4C-P001 |
| WLD2 (Top roller plunger) | → D4CC-□002 (Roller plunger) | D4C-P002 |
| WLG2 (Roller lever)       | → D4CC-□024 (Roller lever)   | D4C-P020 |

### Example of Replacement

Note: The position of the dog remains unchanged.



## Specifications

### Approved Standards

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

### Ratings

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

Note: 1. The above current ratings are for steady-state current.  
 2. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).  
 3. Lamp loads have an inrush current of 10 times the steady-state current.  
 4. 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. |

### Approved Standard Ratings

#### UL/CSA

#### D4CC-1, D4CC-2

#### D150

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

### Characteristics

|                               |   |   |
|-------------------------------|---|---|
| Degree of protection          |   | IP67  |
| Durability *1                 | Mechanical  | 10,000,000 operations min.  |
|                               | Electrical  | 200,000 operations min. (1 A at 125 VAC, resistive load)                              |
| Operating speed               |   | 0.1 mm/s to 0.5 m/s (in case of plunger)<br>1 mm/s to 1 m/s (in case of roller lever) |
| Operating frequency           | Mechanical  | 120 operations/min  |
|                               | 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           | Between terminals of same polarity                        | 1,000 VAC, 50/60 Hz for 1 min   |
|                               | Between current-carrying metal parts and ground           | 1,500 VAC, 50/60 Hz for 1 min   |
|                               | Between each terminal and non-current-carrying metal part | 1,500 VAC, 50/60 Hz for 1 min   |
| Vibration resistance          | Malfunition   | 10 to 55 Hz, 1.5-mm double amplitude *2   |
| Shock resistance              | Destruction   | 1,000 m/s <sup>2</sup> min.   |
|                               | Malfunition   | 500 m/s <sup>2</sup> min. *2  |
| Ambient operating temperature |   | -10°C to +70°C (with no icing)  |
| Ambient operating humidity    |   | 35% to 95%RH  |
| Weight                        |   | Approx. 120 g (in the case of D4CC-1002)  |

Note: The above figures are initial values.

\*1. The values are calculated at an operating temperature of +5°C to +35°C, and an operating humidity of 40% to 70%RH. Contact your OMRON sales representative for more detailed information on other operating environments.

\*2. Excluding plastic rod models.

### Leakage Current for Switches with Indicators

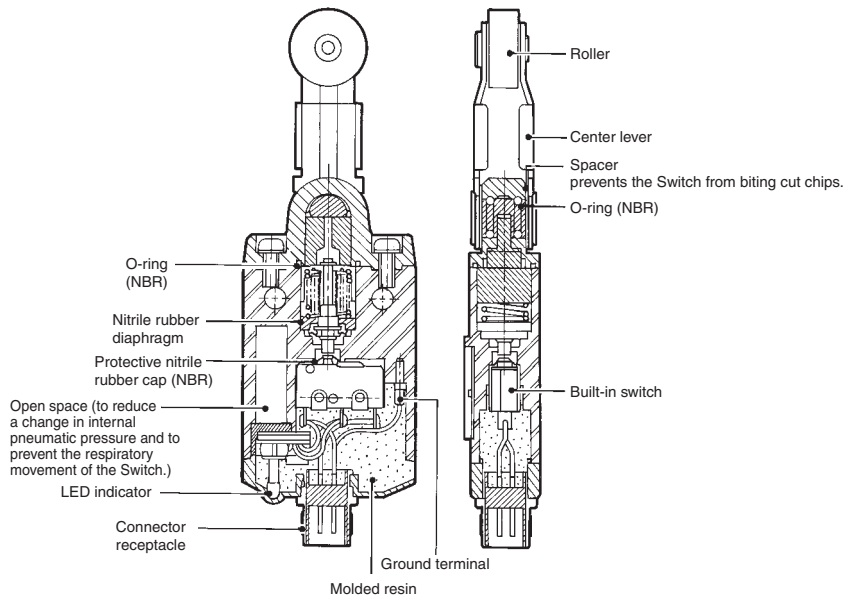
The leakage current and resistance of Switches with indicators are as follows:

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

# Structure and Nomenclature

## Structure

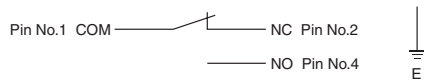
### Center Roller Lever Models with Indicator



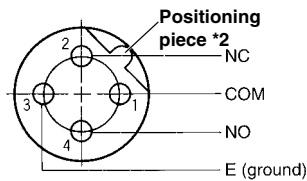
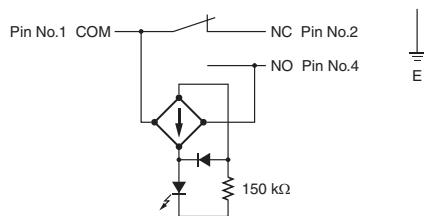
## Contact Form

### AC Switches (D4CC-10□□, 20□□)

#### Without Operation Indicator

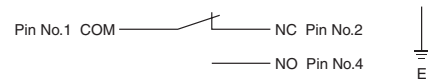


#### With Operation Indicator (Lit when Not Actuated) \*1

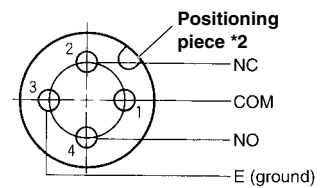
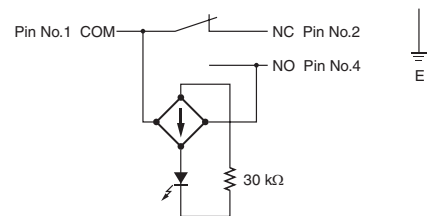


### DC Switches (D4CC-30□□, 40□□)

#### Without Operation Indicator



#### With Operation Indicator (Lit when Not Actuated) \*1



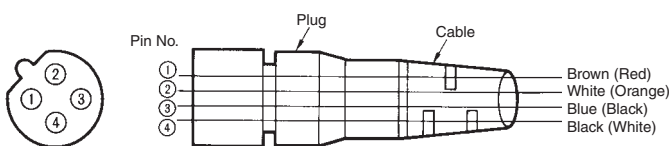
\*1. "Lit when not actuated" means that when the actuator is in the free position, the indicator is lit, and when the actuator is turned or pushed and the contact comes into contact with the NO side, the indicator turns OFF.

\*2. The position of the positioning piece is not always the same. If using an L-shaped connector causes problems in application, use a straight connector.

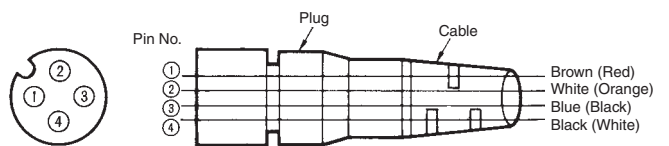
## Connections

Note: Colors in parentheses are the previous wire colors. Wire colors have been changed accompanying changes in standards.

### For AC



### For DC

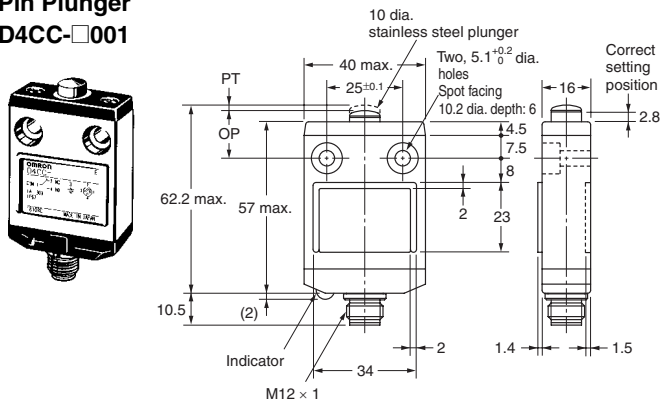


## Dimensions and Operating Characteristics

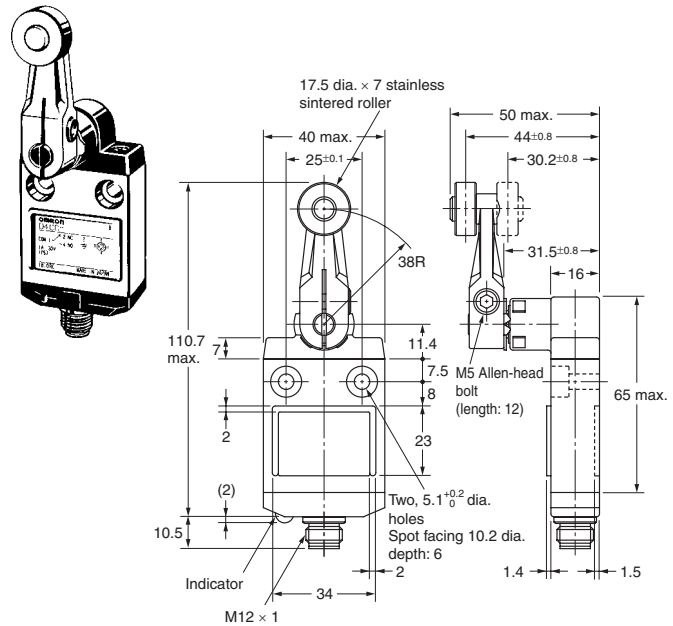
### Switches

**Limit Switches** The □ in each model number is replaced with the code expressing the rated load of the model. Refer to *Model Number Legend*.

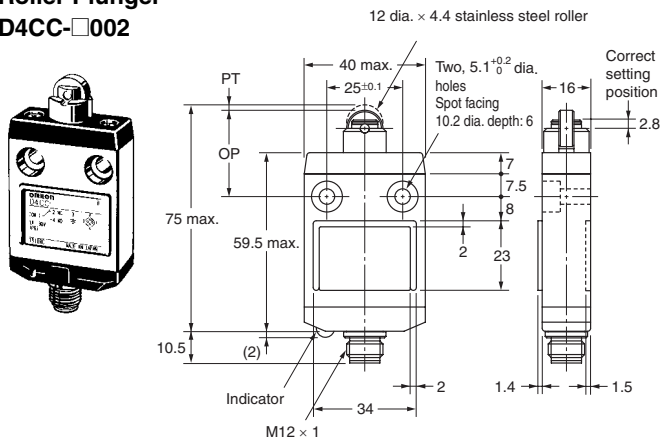
#### Pin Plunger D4CC-□001



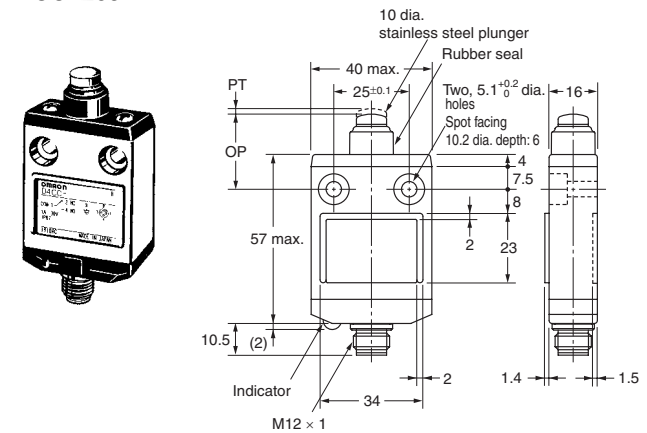
#### Roller Lever D4CC-□024



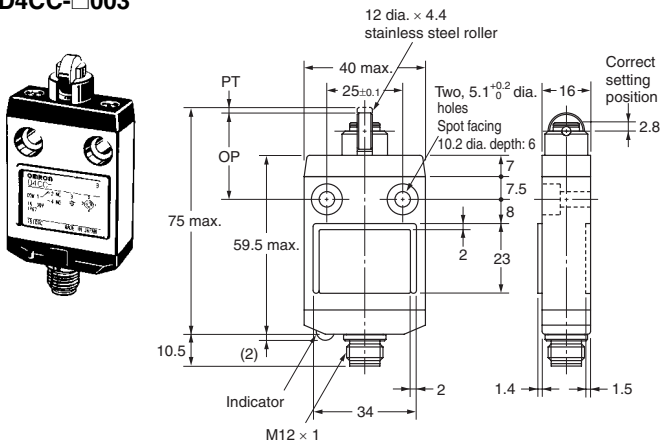
#### Roller Plunger D4CC-□002



#### Sealed Pin Plunger D4CC-□031



#### Crossroller Plunger D4CC-□003



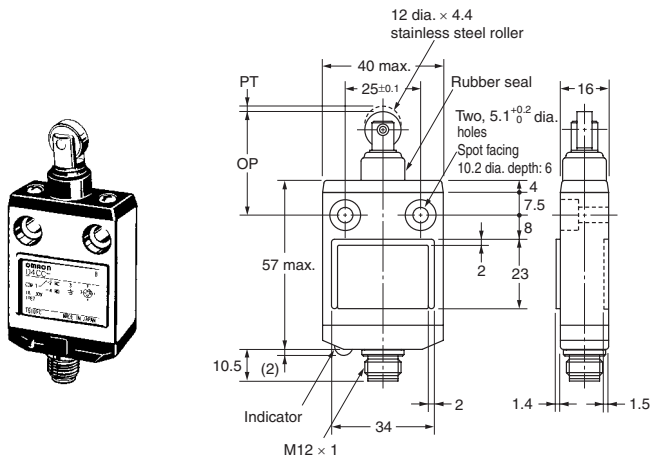
Note: Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

| Operating Characteristics |    | Model | D4CC-□001       | D4CC-□002       | D4CC-□003       | D4CC-□024              | D4CC-□031       |
|---------------------------|----|-------|-----------------|-----------------|-----------------|------------------------|-----------------|
| Operating force           | OF | max.  | 11.77 N         | 11.77 N         | 11.77 N         | 5.69 N                 | 17.65 N         |
| Release force             | RF | min.  | 4.41 N          | 4.41 N          | 4.41 N          | 1.47 N                 | 4.41 N          |
| Pretravel                 | PT | max.  | 1.8 mm          | 1.8 mm          | 1.8 mm          | $10^\circ \pm 3^\circ$ | 1.8 mm          |
| Overtravel                | OT | min.  | 3 mm            | 3 mm            | 3 mm            | $50^\circ$             | 3 mm            |
| Movement Differential     | MD | max.  | 0.2 mm          | 0.2 mm          | 0.2 mm          | $3^\circ$              | 0.2 mm          |
| Operating Position        | OP |       | $15.7 \pm 1$ mm | $28.5 \pm 1$ mm | $28.5 \pm 1$ mm | ---                    | $24.9 \pm 1$ mm |
| Total travel              | TT | *     | ---             | ---             | ---             | ---                    | (5) mm          |

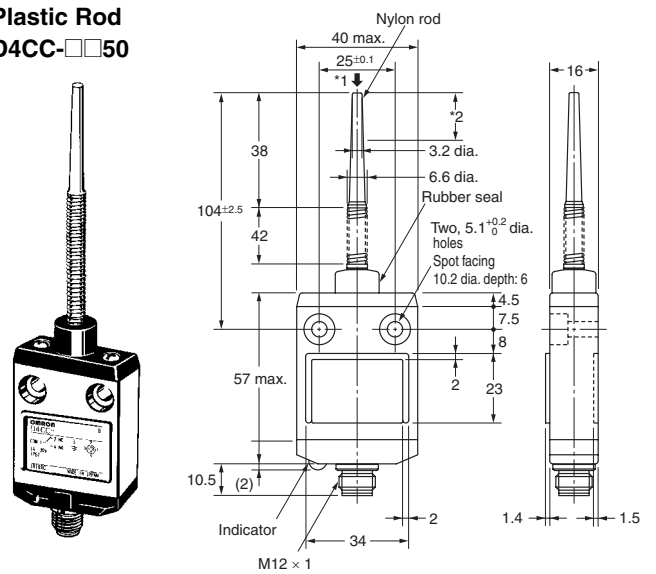
\* The TT is a reference value.

The □ in each model number is replaced with the code expressing the rated load of the model. Refer to *Model Number Legend*.

## Sealed Roller Plunger D4CC-□032

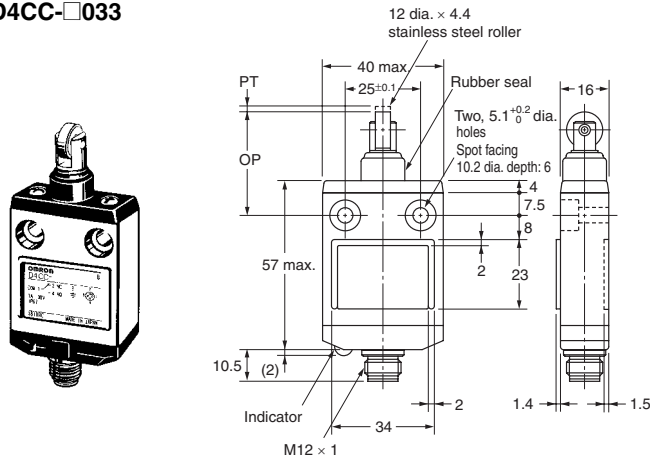


## Plastic Rod D4CC-□50

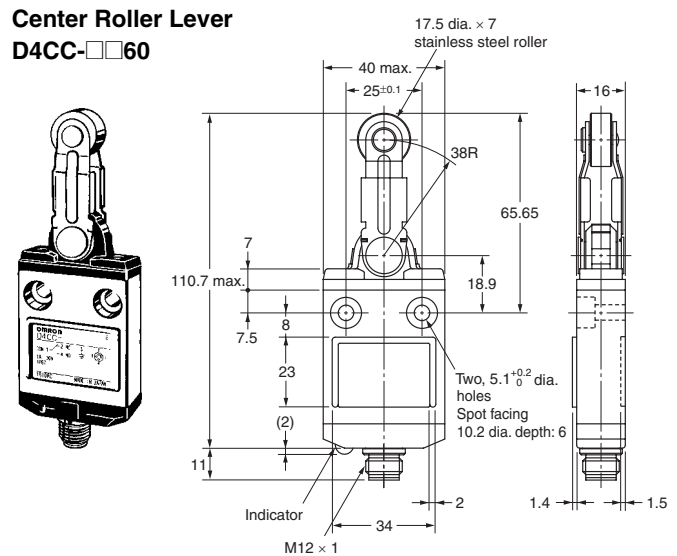


\*1. Operation is possible in any direction except parallel to the axis ↓.  
\*2. The ideal range for operation is between the tip of the rod and 1/3 of the length of the actuator.

## Sealed Crossroller Plunger D4CC-□033



## Center Roller Lever D4CC-□60



Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

| Operating Characteristics |    | Model | D4CC-□032 | D4CC-□033 | D4CC-□050 | D4CC-□060 |
|---------------------------|----|-------|-----------|-----------|-----------|-----------|
| Operating force           | OF | max.  | 17.65 N   | 17.65 N   | 1.47 N    | 6.67 N    |
| Release force             | RF | min.  | 4.41 N    | 4.41 N    | ---       | 1.47 N    |
| Pretravel                 | PT | max.  | 1.8 mm    | 1.8 mm    | 15°       | 10°±3°    |
| Overtravel                | OT | min.  | 3 mm      | 3 mm      | ---       | 50°       |
| Movement Differential     | MD | max.  | 0.2 mm    | 0.2 mm    | ---       | 3°        |
| Operating Position        | OP |       | 34.3±1 mm | 34.3±1 mm |           |           |
| Total travel              | TT | *     | (5) mm    | (5) mm    |           |           |

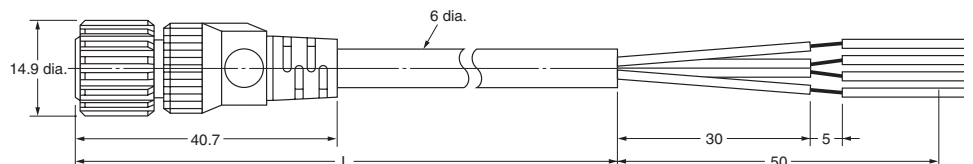
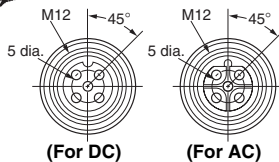
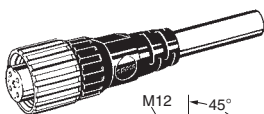
\* The TT is a reference value.

## Applicable Cables

Select one of the specified Connector Plugs from the following table.

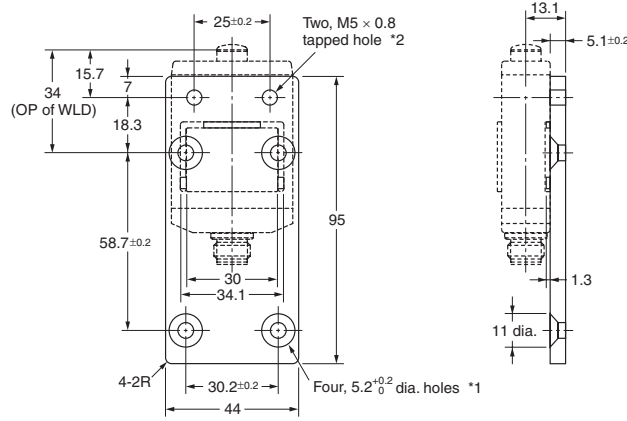
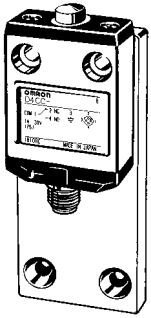
### XS2F-D421-□80-A (For DC) XS2F-A421-□90-A (For AC)

| For AC Model    | For DC Model    | Cable length (L) (m) |
|-----------------|-----------------|----------------------|
| XS2F-A421-C90-A | XS2F-D421-C80-A | 1                    |
| XS2F-A421-D90-A | XS2F-D421-D80-A | 2                    |
| XS2F-A421-G90-A | XS2F-D421-G80-A | 5                    |
| XS2F-A421-J90-A | XS2F-D421-J80-A | 10                   |



## Special Mounting Plates (Limit Switches are not attached to the Plates.)

### D4C-P001 (For D4CC-□001)

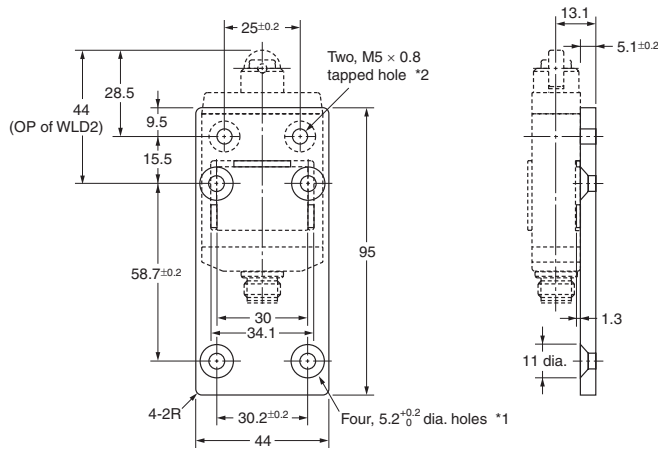
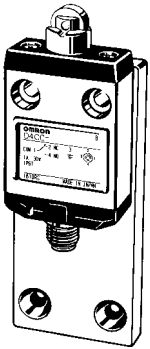


Note: Four hexagonal flat head bolts (M5 × 0.8, length: 10) and two Allen-head bolts (M5 × 0.8, length: 15) are included.

\*1. All the holes with  $5.2^{+0.2}_0$  dia. must be used with M5 × 10 Allen-head bolts.

\*2. All the M5-tapped holes must be used with M5 hexagonal flat head bolts.

### D4C-P002 (For D4CC-□002)

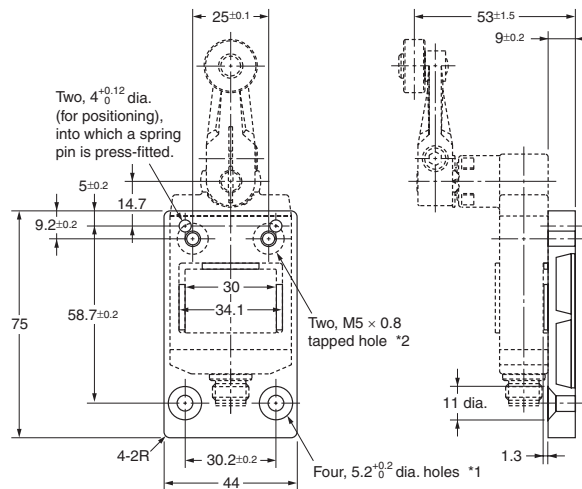
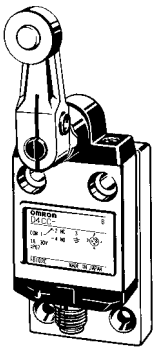


Note: Four hexagonal flat head bolts (M5 × 0.8, length: 10) and two Allen-head bolts (M5 × 0.8, length: 15) are included.

\*1. All the holes with  $5.2^{+0.2}_0$  dia. must be used with M5 × 10 Allen-head bolts.

\*2. All the M5-tapped holes must be used with M5 hexagonal flat head bolts.

### D4C-P020 (For D4CC-□024)



Note: Four hexagonal flat head bolts (M5 × 0.8, length: 10), two Allen-head bolts (M5 × 0.8, length: 15), and two spring pins (4 × 14) are included.

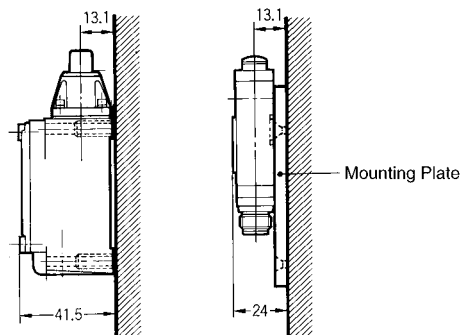
\*1. All the holes with  $5.2^{+0.2}_0$  dia. must be used with M5 × 10 Allen-head bolts.

\*2. All the M5-tapped holes must be used with M5 hexagonal flat head bolts.

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

### 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.



## Safety Precautions

Refer to *Safety Precautions for All Limit Switches*.

### Precautions for Correct Use

#### Operating Environment

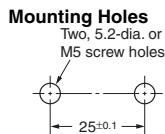
- Seal material may deteriorate if a Switch is used outdoor or where subject to special cutting oils, solvents, or chemicals. Always appraise performance under actual application conditions and set suitable maintenance and replacement periods.
- Install Switches where they will not be directly subject to cutting chips, dust, or dirt. The Actuator and Switch must also be protected from the accumulation of cutting chips or sludge.



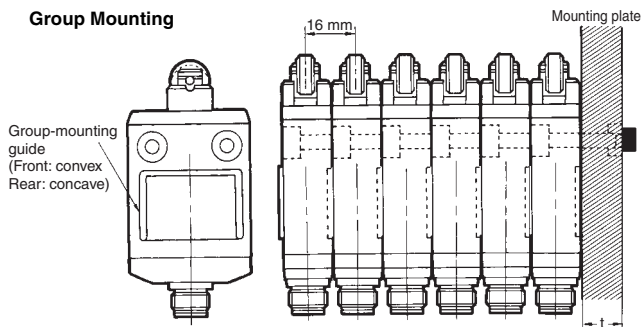
- Constantly subjecting a Switch to vibration or shock can result in wear, which can lead to contact interference with contacts, operation failure, reduced durability, and other problems. Excessive vibration or shock can lead to false contact operation or damage. Install Switches in locations not subject to shock and vibration and in orientations that will not produce resonance.
- The Switches have physical contacts. Using them in environments containing silicon gas will result in the formation of silicon oxide (SiO<sub>2</sub>) due to arc energy. If silicon oxide accumulates on the contacts, contact interference can occur. If silicon oil, silicon filling agents, silicon cables, or other silicon products are present near the Switch, suppress arcing with contact protective circuits (surge killers) or remove the source of silicon gas.

#### 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.
- 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.



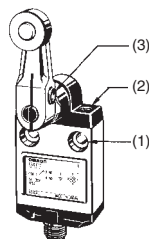
#### Group Mounting



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

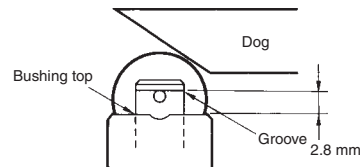
| No. | Type                     | Appropriate tightening torque * |
|-----|--------------------------|---------------------------------|
| (1) | M5 Allen-head bolt       | 4.90 to 5.88 N·m                |
| (2) | M3.5 head mounting screw | 0.78 to 0.88 N·m                |
| (3) | M5 Allen-head bolt       | 4.90 to 5.88 N·m                |

\* 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.

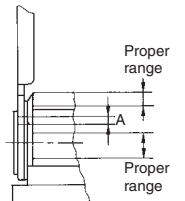
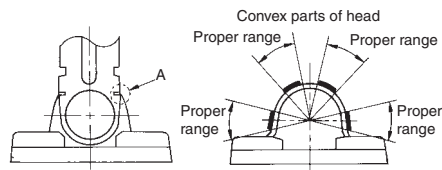
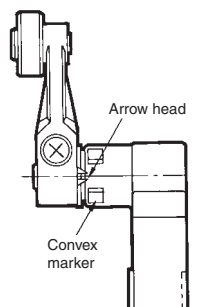


#### Operation

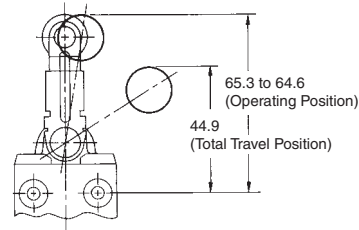
- Operation method, shapes of cam and dog, operating frequency, and overtravel have a significant effect on the service life and precision of a Limit Switch. For this reason, the dog angle must be 30° max., the surface roughness of the dog must be 6.3S min. and hardness must be Hv400 to 500.
- To allow the plunger-type actuator to travel properly, adjust the dog and cam to the proper setting positions. The proper position is where 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.



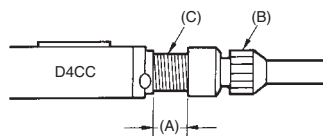
- Refer to the following to adjust the stroke of the lever based on the mounting hole level.





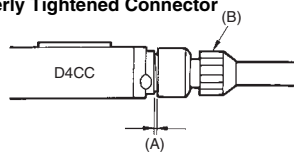
## Plug Tightening

- Connect the plug connector (B) to the connector threads (C) 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



## 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.



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