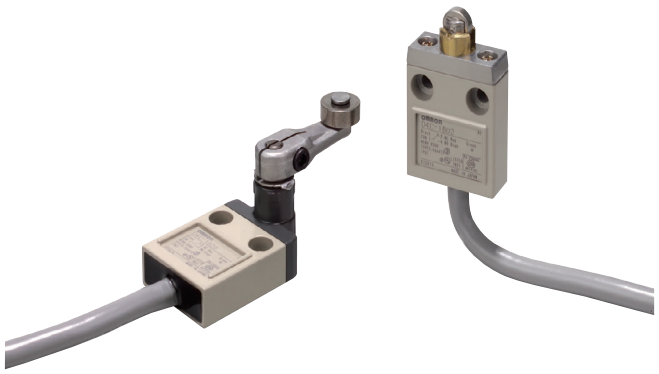
Enclosed Switch

# D4C

CSM_D4C_DS_E_2_1

## Compact Limit Switch That's Also Thin and Highly Sealed



- Approved by EN, UL, CSA, and CCC (Chinese standard). (Ask your OMRON representative for information on approved models.)
- Sealing characteristics that meet IEC IP67 degree of protection.
- Triple-sealed construction:
  Plunger section sealed via nitrile rubber packing seal and diaphragm; switch section sealed via nitrile rubber cap; cable entrance sealed via encapsulating material.
- Cable lengths of 3 and 5 m available on standard models. Models also available with UL and CSA-certified cables.
- Multiple mounting possible with Switches with Plungers.
- Models with red LED indicators added to series for easy confirmation of operation.
  (Set by default to light for non-operation.)
- VCTF cables with CE marking.
  (Applicable only to standard models.)

⚠ Be sure to read *Safety Precautions* on page 13 to 14 and *Safety Precautions for All Limit Switches*.

## Model Number Structure

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

#### Standard Models

D4C-□□□
(1)(2)(3)

**(1) Rated Current**

1: 5 A at 250 VAC, 4 A at 30 VDC
2: 5 A at 125 VAC (with LED indicator)
3: 4 A 30 VDC (with LED indicator)
4: 0.1 A at 125 VAC, 0.1 A at 30 VDC
5: 0.1 A at 125 VAC (with LED indicator)
6: 0.1 A at 30 VDC (with LED indicator)

**(2) Cable Specifications**

2: VCTF oil-resistant cable (3 m)
3: VCTF oil-resistant cable (5 m)
4: VCTF (3 m)
5: VCTF (5 m)
6: SJT(O) (3 m)
7: SJT(O) (5 m)

**(3) Actuator**

01: Pin plunger
02: Roller plunger
03: Crossroller plunger
20: Roller lever
24: Roller lever (high-sensitivity model)
31: Sealed pin plunger
32: Sealed roller plunger
33: Sealed crossroller
50: Plastic rod
60: Center roller lever

#### Pre-wired Models

D4C-□0□□-□□□□□□
(1) (2) (3) (4)

**(1) Rated Current**

1: 1 A at 125 VAC, 1 A at 30 VDC
(Without operation indicator)
2: 1 A at 125 VAC (with operation indicator)
3: 1 A at 30 VDC (with operation indicator)

**(2) Actuator**

01: Pin plunger
02: Roller plunger
31: Sealed plunger
32: Sealed roller plunger
24: Roller lever (high-sensitivity model)

**(3) Wiring Specifications**

DK1EJ: Pre-wired models
(3 conductors: DC specification)
AK1EJ: Pre-wired models
(3 conductors: AC specification)
M1J: Connector models for ASI devices
(2 conductors: NO wiring)

**(4) Cable length**

03: 0.3 m

**Wiring Specifications**

| Internal switch | Connector |
|---|---|
| COM | 3 |
| NC | 2 |
| NO | 4 |

#### Weather-resistant Models

D4C-□□□-P
(1)(2)(3) (4)

**(1) Rated Current**

1: 5 A at 250 VAC, 4 A at 30 VDC
2: 5 A at 125 VAC (with LED indicator)
3: 4 A at 30 VDC (with LED indicator)
4: 0.1 A at 125 VAC, 0.1 A at 30 VDC

**(2) Cable Specifications**

2: VCTF oil-resistant cable (3 m)
3: VCTF oil-resistant cable (5 m)

**(3) Actuator**

20: Roller lever
24: Roller lever (high-sensitivity model)
27: Adjustable roller lever
29: Adjustable rod lever

**(4) Structure**

P: Weather-resistant

# Ordering Information

## Switches

### Switches with No Operation Indicator

| Actuator | Ratings Cable Cable length (m) | Standard | | | Microload | |
|---|---|---|---|---|---|---|
| | | 5 A at 250 VAC, 4 A at 30 VDC | | | 0.1 A at 125 VAC, 0.1 A at 30 VDC | |
| | | VCTF oil-resistant cable *1 | VCTF cable *2 | SJT(O) cable *3 | VCTF oil-resistant cable *1 | VCTF cable *2 |
| | | Model | | | | |
| Pin plunger | 3 | **D4C-1201** | **D4C-1401** | **D4C-1601** | **D4C-4201** | **D4C-4401** |
| | 5 | **D4C-1301** | **D4C-1501** | **D4C-1701** | **D4C-4301** | **D4C-4501** |
| Roller plunger | 3 | **D4C-1202** | **D4C-1402** | **D4C-1602** | **D4C-4202** | **D4C-4402** |
| | 5 | **D4C-1302** | **D4C-1502** | **D4C-1702** | **D4C-4302** | **D4C-4502** |
| Crossroller plunger | 3 | **D4C-1203** | **D4C-1403** | **D4C-1603** | **D4C-4203** | **D4C-4403** |
| | 5 | **D4C-1303** | **D4C-1503** | **D4C-1703** | **D4C-4303** | **D4C-4503** |
| Roller lever | 3 | **D4C-1220** | **D4C-1420** | **D4C-1620** | **D4C-4220** | **D4C-4420** |
| | 5 | **D4C-1320** | **D4C-1520** | **D4C-1720** | **D4C-4320** | **D4C-4520** |
| Roller lever, high-sensitivity | 3 | **D4C-1224** | **D4C-1424** | **D4C-1624** | **D4C-4224** | **D4C-4424** |
| | 5 | **D4C-1324** | **D4C-1524** | **D4C-1724** | **D4C-4324** | **D4C-4524** |
| Sealed pin plunger | 3 | **D4C-1231** | **D4C-1431** | **D4C-1631** | **D4C-4231** | **D4C-4431** |
| | 5 | **D4C-1331** | **D4C-1531** | **D4C-1731** | **D4C-4331** | **D4C-4531** |
| Sealed roller plunger | 3 | **D4C-1232** | **D4C-1432** | **D4C-1632** | **D4C-4232** | **D4C-4432** |
| | 5 | **D4C-1332** | **D4C-1532** | **D4C-1732** | **D4C-4332** | **D4C-4532** |
| Sealed crossroller plunger | 3 | **D4C-1233** | **D4C-1433** | **D4C-1633** | **D4C-4233** | **D4C-4433** |
| | 5 | **D4C-1333** | **D4C-1533** | **D4C-1733** | **D4C-4333** | **D4C-4533** |
| Plastic rod | 3 | **D4C-1250** | **D4C-1450** | **D4C-1650** | **D4C-4250** | **D4C-4450** |
| | 5 | **D4C-1350** | **D4C-1550** | **D4C-1750** | **D4C-4350** | **D4C-4550** |
| Center roller lever | 3 | **D4C-1260** | **D4C-1460** | **D4C-1660** | **D4C-4260** | **D4C-4460** |
| | 5 | **D4C-1360** | **D4C-1560** | --- | **D4C-4360** | **D4C-4560** |

Note: 1. Models are available separately with resistance to viscous oils (oil drain holes are also available), but only with Plunger Models. Add "-M" to the model number (example: D4C-1202 would be D4C-1202-M).
2. Switches with variable roller levers are also available. Ask your nearest OMRON representative for details.

*1. Oil-resistant vinyl cabtire cables; approved by EN and IEC.
*2. Ordinary vinyl cabtire cables; approved by EN and IEC.
*3. Switches with SJT(O) Cables (cables approved by UL and CSA) are approved by UL and CSA.

## Standard Switches with Operation Indicator (Red)

| Actuator | Ratings Cable length (m) | 0.1 A at 125 VAC | | 0.1 A at 30 VDC | |
|---|---|---|---|---|---|
| | | VCTF oil-resistant cable *1 | VCTF cable *2 | VCTF oil-resistant cable *1 | VCTF cable *2 |
| | | Model | | | |
| Pin plunger | 3 | D4C-2201 | D4C-2401 | D4C-3201 | D4C-3401 |
| | 5 | D4C-2301 | D4C-2501 | D4C-3301 | D4C-3501 |
| Roller plunger | 3 | D4C-2202 | D4C-2402 | D4C-3202 | D4C-3402 |
| | 5 | D4C-2302 | D4C-2502 | D4C-3302 | D4C-3502 |
| Crossroller plunger | 3 | D4C-2203 | D4C-2403 | D4C-3203 | D4C-3403 |
| | 5 | D4C-2303 | D4C-2503 | D4C-3303 | D4C-3503 |
| Roller lever | 3 | D4C-2220 | D4C-2420 | D4C-3220 | D4C-3420 |
| | 5 | D4C-2320 | D4C-2520 | D4C-3320 | D4C-3520 |
| Roller lever, high-sensitivity | 3 | D4C-2224 | D4C-2424 | D4C-3224 | D4C-3424 |
| | 5 | D4C-2324 | D4C-2524 | D4C-3324 | D4C-3524 |
| Sealed pin plunger | 3 | D4C-2231 | D4C-2431 | D4C-3231 | D4C-3431 |
| | 5 | D4C-2331 | D4C-2531 | D4C-3331 | D4C-3531 |
| Sealed roller plunger | 3 | D4C-2232 | D4C-2432 | D4C-3232 | D4C-3432 |
| | 5 | D4C-2332 | D4C-2532 | D4C-3332 | D4C-3532 |
| Sealed crossroller plunger | 3 | D4C-2233 | D4C-2433 | D4C-3233 | D4C-3433 |
| | 5 | D4C-2333 | D4C-2533 | D4C-3333 | D4C-3533 |
| Plastic rod | 3 | D4C-2250 | D4C-2450 | D4C-3250 | D4C-3450 |
| | 5 | D4C-2350 | D4C-2550 | D4C-3350 | D4C-3550 |
| Center roller lever | 3 | D4C-2260 | D4C-2460 | D4C-3260 | D4C-3460 |
| | 5 | D4C-2360 | D4C-2560 | D4C-3360 | D4C-3560 |

Note: Ask your nearest OMRON representative for information on Switching with approved international standards.
*1. Oil-resistant vinyl cabtire cables; approved by EN and IEC.
*2. Ordinary vinyl cabtire cables.; approved by EN and IEC.

## Microload Switches with Operation Indicator

| Actuator | Ratings Cable length (m) | 0.1 A at 125 VAC VCTF oil-resistant cable* | 0.1 A at 30 VDC VCTF oil-resistant cable* |
|---|---|---|---|
| | | Model | |
| Pin plunger | 3 | **D4C-5201** | **D4C-6201** |
| | 5 | --- | **D4C-6301** |
| Roller plunger | 3 | **D4C-5202** | **D4C-6202** |
| | 5 | **D4C-5302** | **D4C-6302** |
| Crossroller plunger | 3 | **D4C-5203** | **D4C-6203** |
| | 5 | **D4C-5303** | **D4C-6303** |
| Roller lever | 3 | **D4C-5220** | **D4C-6220** |
| | 5 | **D4C-5320** | **D4C-6320** |
| Roller lever, high-sensitivity | 3 | **D4C-5224** | **D4C-6224** |
| | 5 | **D4C-5324** | **D4C-6324** |
| Sealed pin plunger | 3 | --- | **D4C-6231** |
| | 5 | --- | **D4C-6331** |
| Sealed roller plunger | 3 | **D4C-5232** | **D4C-6232** |
| | 5 | **D4C-5332** | **D4C-6332** |
| Sealed crossroller plunger | 3 | --- | **D4C-6233** |
| | 5 | --- | **D4C-6333** |
| Plastic rod | 3 | **D4C-5250** | **D4C-6250** |
| | 5 | **D4C-5350** | **D4C-6350** |

Note: Ask your nearest OMRON representative for information on Switching with approved international standards.
* Oil-resistant vinyl cabtire cables; approved by EN and IEC.

## Pre-wired Models (Use VCTF Oil-resistant Cable)

| Actuator | Ratings Operation indicator | 1 A at 125 VAC Without operation indicator | 1 A at 125 VAC With operation indicator | 1 A at 30 VDC Without operation indicator | 1 A at 30 VDC With operation indicator |
|---|---|---|---|---|---|
| Pin plunger | | **D4C-1001-AK1EJ□** | **D4C-2001-AK1EJ□** | **D4C-1001-DK1EJ□** | **D4C-3001-DK1EJ□** |
| Roller plunger | | **D4C-1002-AK1EJ□** | **D4C-2002-AK1EJ□** | **D4C-1002-DK1EJ□** | **D4C-3002-DK1EJ□** |
| Sealed plunger | | **D4C-1031-AK1EJ□** | **D4C-2031-AK1EJ□** | **D4C-1031-DK1EJ□** | **D4C-3031-DK1EJ□** |
| Sealed roller plunger | | **D4C-1032-AK1EJ□** | **D4C-2032-AK1EJ□** | **D4C-1032-DK1EJ□** | **D4C-3032-DK1EJ□** |
| Roller lever (high-sensitivity model) | | **D4C-1024-AK1EJ□** | **D4C-2024-AK1EJ□** | **D4C-1024-DK1EJ□** | **D4C-3024-DK1EJ□** |

Note: 1. The □ contains the length of the cable.
For example: 30 cm → 4C-1001-AK1EJ03
2. M1J models are also available. Contact your OMRON sales representative for further information.
3. Of the above model numbers, some with special specifications are not registered.

### Weather-resistant Models

| Actuator | Cable length (m) | Operation indicator: Without operating indication, Ratings: 5 A at 250 VAC 4 A at 30 VDC | Without operating indication, Microload: 0.1 A at 125 VAC 0.1 A at 30 VDC | With operating indication, Standard: 5 A at 125 VAC | With operating indication, Standard: 4 A at 30 VDC |
|---|---|---|---|---|---|
| | | Model | | | |
| Roller lever | 3 | **D4C-1220-P** | **D4C-4220-P** | **D4C-2220-P** | **D4C-3220-P** |
| | 5 | **D4C-1320-P** | **---** | **---** | **---** |
| Roller lever (high-sensitivity model) | 3 | **D4C-1224-P** | **D4C-4224-P** | **D4C-2224-P** | **D4C-3224-P** |
| | 5 | **D4C-1324-P** | **D4C-4324-P** | **D4C-2324-P** | **D4C-3324-P** |
| Adjustable roller lever | 3 | **D4C-1227-P** | **D4C-4227-P** | **D4C-2227-P** | **D4C-3227-P** |
| | 5 | **D4C-1327-P** | **D4C-4327-P** | **D4C-2327-P** | **D4C-3327-P** |
| Adjustable rod lever | 3 | **D4C-1229-P** | **D4C-4229-P** | **---** | **D4C-3229-P** |
| | 5 | **D4C-1329-P** | **---** | **D4C-2329-P** | **D4C-3329-P** |

Note: Silicon rubber is used to increase resistance to the environment. Silicon rubber, however, can generate silicon gas. (This can occur at room temperature, but the amount of silicon gas generated increases at higher temperatures.) Silicon gas will react as a result of arc energy and form silicon oxide ($SiO_2$). If silicon oxide accumulates on the contacts, contact interference can occur and can interfere with the device. Before using a Switch, test it under actual application conditions (including the environment and operating frequency) to confirm that no problems will occur in actual.

## Mounting Plates (Order Separately)

The WL model incorporated by equipment can be replaced with the D4C together with the Mounting Plate without changing the position of the dog or cam.

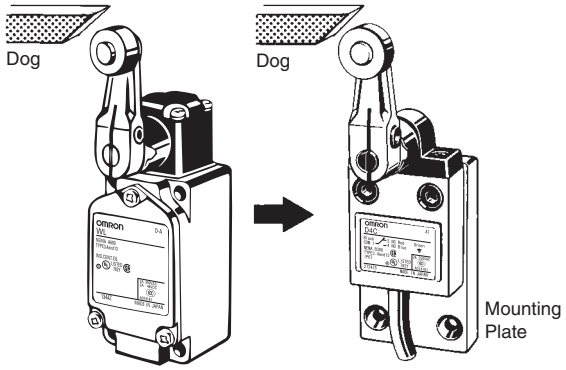
### List of Replaceable Models

| WL model (Actuator) | D4C model (Actuator) | Plate |
|---|---|---|
| WLD/WL01D (Top plunger) | → D4C-□□01 (Plunger) | **D4C-P001** |
| WLD2/WL01D2 (Top roller plunger) | → D4C-□□02 (Roller plunger) | **D4C-P002** |
| WLCA2/WL01CA2 (Roller lever) | → D4C-□□20 (Roller lever) | **D4C-P020** |

Note: The WL01□ is for micro loads.

### Example of Replacement

**Note: The position of the dog remains unchanged.**




## Individual Parts

### Head/Actuator

| Actuator | Head (with actuator) | Actuator |
|---|---|---|
| Pin plunger | **D4C-0001** | **---** |
| Roller plunger | **D4C-0002** | **---** |
| Crossroller plunger | **D4C-0003** | **---** |
| Roller lever | **D4C-0020** | **WL-1A100** |
| Environment-resistant roller lever | **D4C-0020-P** | **WL-1A100P1** |
| Roller lever | **D4C-0024** | **WL-1A100** |
| Variable roller lever | **D4C-0027** | **HL-1HPA320** |
| Variable rod lever | **D4C-0029** | **HL-1HPA500** |
| Sealed pin plunger | **D4C-0031** | **---** |
| Sealed roller plunger | **D4C-0032** | **---** |
| Sealed crossroller plunger | **D4C-0033** | **---** |
| Plastic rod | **D4C-0050** | **---** |
| Center roller lever | **D4C-0060** | **---** |

Note: 1. The model numbers for heads are of the form D4C-00□□, with the numbers in the squares indicating the type of actuator.
2. Actuators for plunger models, plastic rod models, and center roller lever models cannot be ordered individually. They must be ordered together with the head.

# Specifications

## Approved Standards

| Agency | Standard | File No. |
|---|---|---|
| TÜV Product Service | EN60947-5-1 | *1, 3 |
| UL | UL508 | E76675 *2 |
| CSA | CSA C22.2 No.14 | LR45746 *2 |
| CCC(CQC) | GB14048.5 | 2003010305077626 *3 |

*1. Models with VCTF oil-resistant cables and pre-wired models only. (Applicable only to standard models listed on pages 2 to 4.)
*2. SJT(O)-cable models only. (Applicable only to standard models listed on pages 2 to 3.)
*3. Ask your OMRON representative for information on approved models.

## Ratings

### Standard Model

| 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 | 5 (0.1) | | 1.5 | 0.7 | 3 | | 2.5 | 1.3 |
| 250 VAC | 5 | | 1 | 0.5 | 2 | | 1.5 | 0.8 |
| 8 VDC | 5 (0.1) | | 2 | | 5 | 4 | 3 | |
| 14 VDC | 5 (0.1) | | 2 | | 4 | 4 | 3 | |
| 30 VDC | 4 (0.1) | | 2 | | 3 | 3 | 3 | |
| 125 VDC | 0.4 | | 0.05 | | 0.4 | | 0.05 | |
| 250 VDC | 0.2 | | 0.03 | | 0.2 | | 0.03 | |

| | | |
|---|---|---|
| Inrush current | NC | 20 A max. |
| | NO | 10 A max. |

Note: 1. The values given on the left are steady-state currents.
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.
5. The values "0.1" given in parentheses are for micro load models.

### Pre-wired Model

| 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 |

## Approved Standard Ratings

### TÜV (EN60947-5-1), CCC (GB14048.5)

| Model | Applicable category and ratings | I the |
|---|---|---|
| D4C-1□□□ | AC-15 2 A/250 V<br>DC-12 2 A/30 V | 5 A<br>4 A |
| D4C-2□□□ | AC-15 2 A/125 V | 5 A |
| D4C-3□□□ | DC-12 2 A/30 V | 4 A |
| D4C-4□□□ | AC-14 0.1 A/125 V<br>DC-12 0.1 A/30 V | 0.5 A<br>0.5 A |
| D4C-5□□□ | AC-14 0.1 A/125 V | 0.5 A |
| D4C-6□□□ | DC-12 0.1 A/30 V | 0.5 A |

### UL/CSA

**B300 (D4C-16□□, -17□□)**
**B150 (D4C-26□□, -27□□)**

**B300**

| Rated voltage | Carry current | Current (A) | | Volt-amperes (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC | 5 A | 30 | 3 | 3,600 | 360 |
| 240 VAC | | 15 | 1.5 | 3,600 | 360 |

**B150**

| Rated voltage | Carry current | Current (A) | | Volt-amperes (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC | 5 A | 30 | 3 | 3,600 | 360 |

## Characteristics

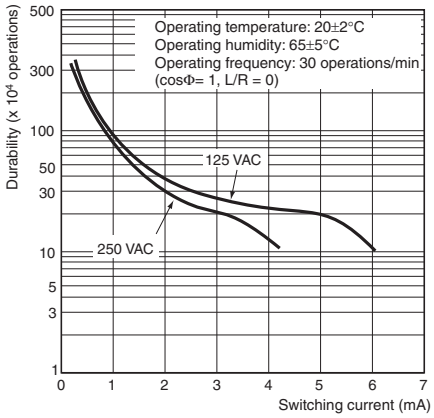
| | | |
|---|---|---|
| Degree of protection | | IP67 |
| Durability *1 | Mechanical *3 | 10,000,000 operations min. |
| | Electrical *2 | 200,000 operations min. (5 A at 125 VAC, resistive load) |
| Operating speed | | 0.1 mm/s to 0.5 m/s (in case of plunger)<br>1 mm/s to 1 m/s (in case of roller lever) |
| 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) | | 250 mΩ max. (initial value with 2-m VCTF cable)<br>300 mΩ max. (initial value with 3-m VCTF cable)<br>400 mΩ max. (initial value with 5-m VCTF cable) |
| Dielectric strength | Between terminals of the same polarity | 1,000 VAC, 50/60 Hz for 1 min |
| | Between current-carrying metal part and ground | 1,500 VAC, 50/60 Hz for 1 min<br>Uimp: 2.5 kV (EN60947-5-1) |
| | Between each terminal and non-current-carrying metal part, | 1,500 VAC, 50/60 Hz for 1 min<br>Uimp: 2.5 kV(EN60947-5-1) |
| Rated insulation voltage (Ui) | | 300 V (EN60947-5-1) *5 |
| Pollution degree (operating environment) | | 3 (EN60947-5-1) |
| Short-circuit protective device (SCPD) | | 10 A fuse type gI or gG (IEC60269) |
| Conditional short-circuit current | | 100 A (EN60947-5-1) |
| Conventional enclosed thermal current (I the) | | 5 A, 4 A, 0.5 A (EN60947-5-1) |
| Protection against electric shock | | Class I (with grounding wire) *6 |
| Vibration resistance | Malfunction | 10 to 55 Hz, 1.5-mm double amplitude *4 |
| Shock resistance | Destruction | 1,000 m/s² min. |
| | Malfunction | 500 m/s² min. *4 |
| Ambient operating temperature | | −10°C to +70°C (with no icing) |
| Ambient operating humidity | | 35% to 95%RH |
| Weight (D4C-1202) | | With 3-m VCTF cable: 360 g<br>With 5-m VCTF cable: 540 g |

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. Pre-wired Models: 1,000,000 operations min. (DC specifications, switching current: 0.1 A)
*3. Outdoor specifications: 500,000 operations min.
*4. Excluding Plastic Rods.
*5. Pre-wired models: 250 V
*6. Pre-wired models: class III

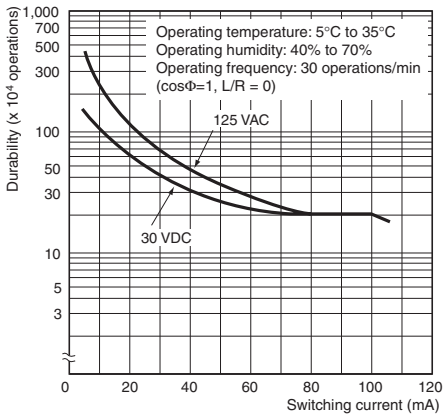
## Engineering Data

### Electrical Durability

**D4C-1□□□, -2□□□, -3□□□**




**D4C-4□□□, -5□□□, -6□□□**




### Leakage Current for LED-indicator Models

The leakage currents and resistances of LED-indicator models are given in the following table.

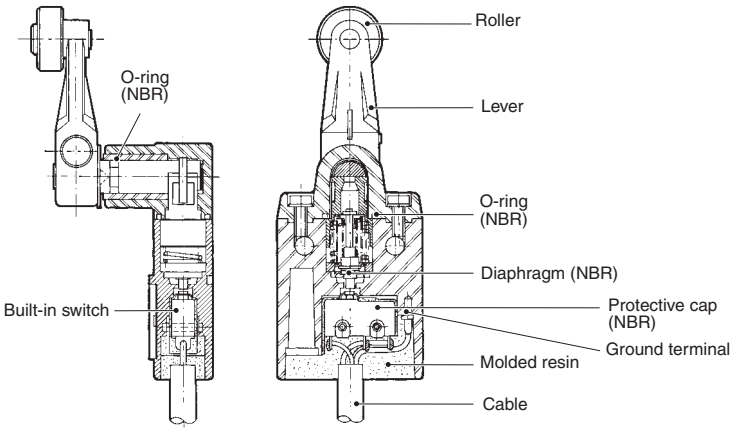
| Model | Voltage | Leakage current | Resistance |
|---|---|---|---|
| D4C-2□□□ | 125 VAC | 1.7 mA | 68 kΩ |
| D4C-3□□□ | 30 VDC | 1.7 mA | 15 kΩ |
| D4C-5□□□ | 125 VAC | 1.7 mA | 68 kΩ |
| D4C-6□□□ | 30 VDC | 1.7 mA | 15 kΩ |

## Structure and Nomenclature

### Structure

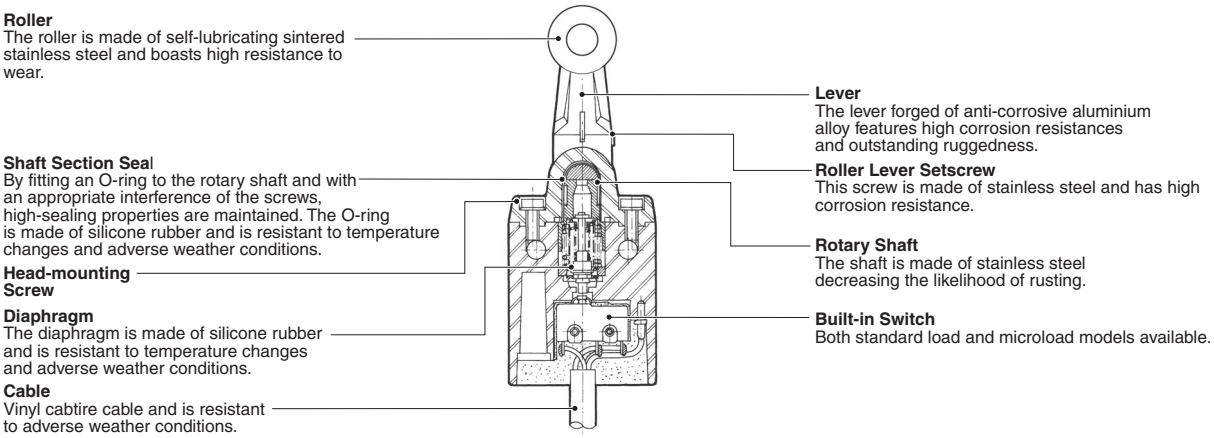
#### Standard Models

#### Roller Lever Models Without Indicator




#### Weather-resistant Models

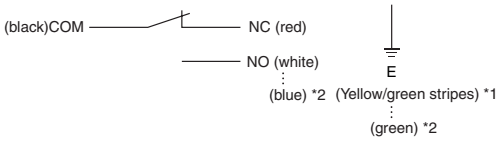
#### Roller Lever Models Without Indicator



## Contact Form

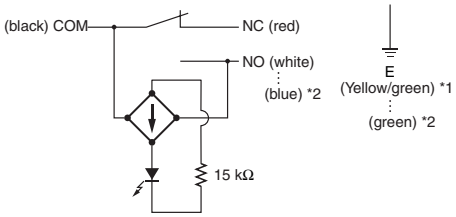
### Standard Models/Weather-resistant Models

#### Without Operation Indicator

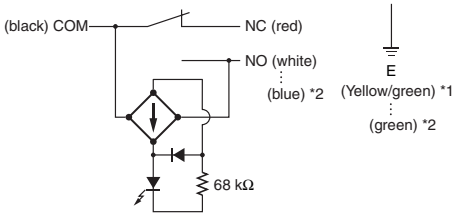



#### With Operation Indicator (Lit when Not Actuated)

<24 VDC LED>

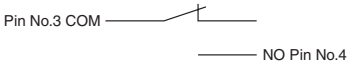



<100 VAC LED>

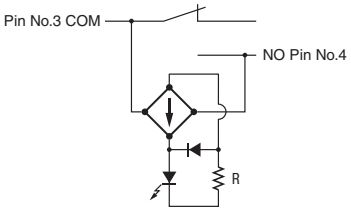



### Connector Models for ASI Devices (-M1J)

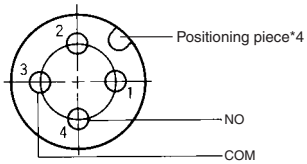
#### Without Operation Indicator




#### With Operation Indicator (Lit when Not Actuated)

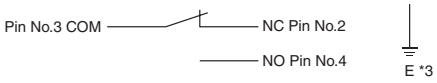



For DC



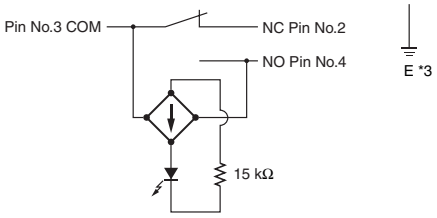

### Pre-wired Models (-AK1EJ□, -DK1EJ□)

#### Without Operation Indicator

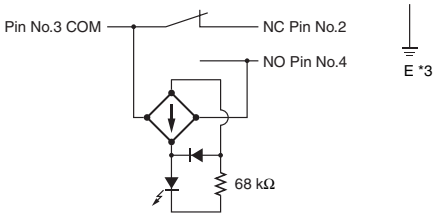



#### With Operation Indicator (Lit when Not Actuated)

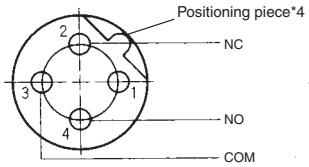
<24 VDC LED>



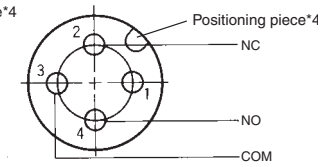

<100 VAC LED>




For AC




For DC




*1. Yellow/green: VCTF oil-resistant cable
Green: VCTF cable
*2. SJT(O) cable approved by UL and CSA.
*3. E (ground) is not grounded.
*4. The position of the positioning piece is not fixed. Using an L-shaped connector may result in failure. Use only a straight connector.

Note: "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.

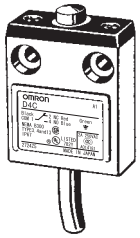
# Dimensions and Operating Characteristics

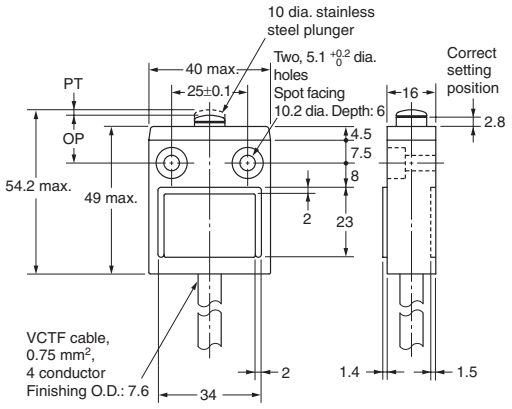
## Switches

### Standard Models

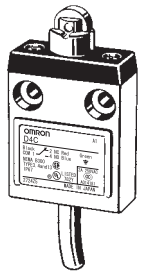
Models without LED indicators are shown in the illustrations and dimensions diagrams. Refer to page 11 for *Models with LED Indicators*. The boxes in the model numbers are replaced with the rating and cable type. Refer to page 1 for the *Model Number Structure*.

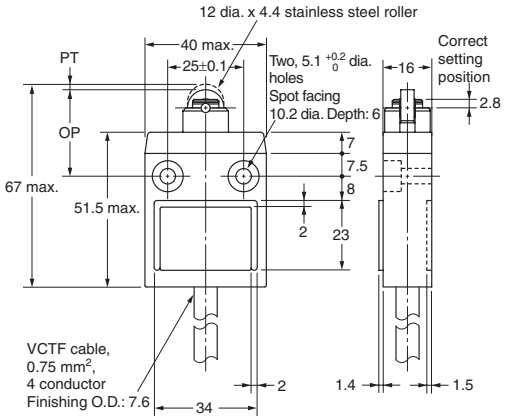
### Pin Plunger
**D4C-□□01**



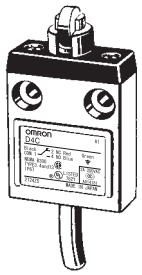


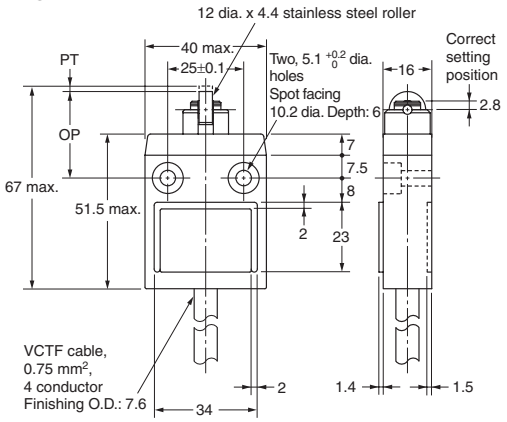

### Roller Plunger
**D4C-□□02**



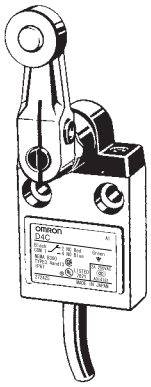


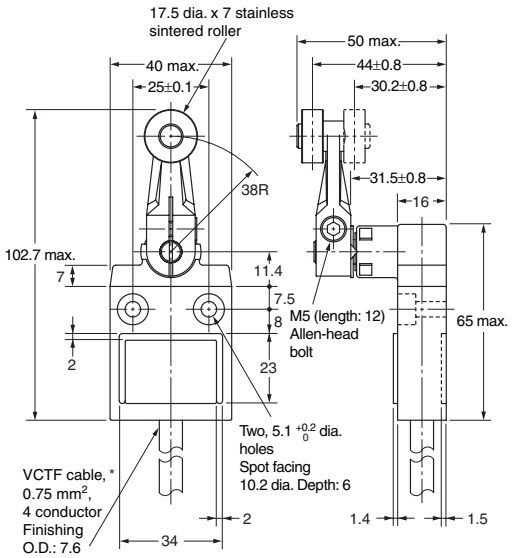

### Crossroller Plunger
**D4C-□□03**





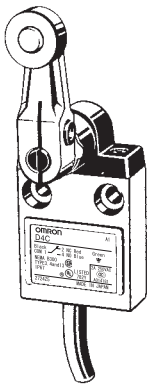

### Roller Lever
**D4C-□□20**
**D4C-□□20-P**

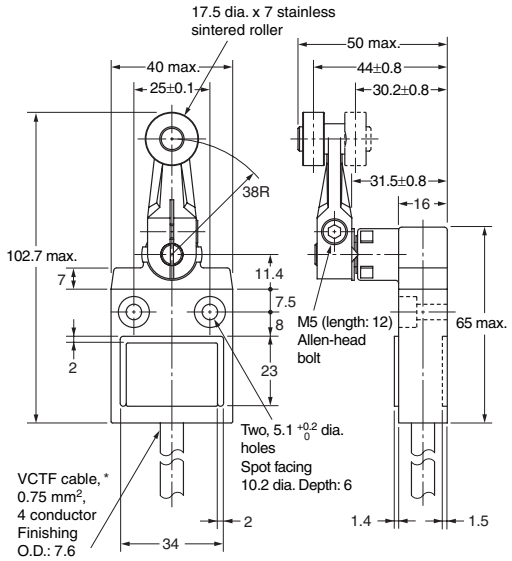





* S-FLEX VCTF Cables are used for weather-resistant models.

### Roller Lever (High-Sensitivity Model)
**D4C-□□24**
**D4C-□□24-P**



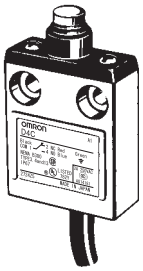


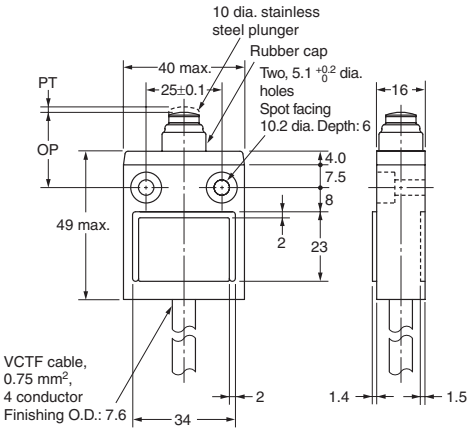

* S-FLEX VCTF Cables are used for weather-resistant models.

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

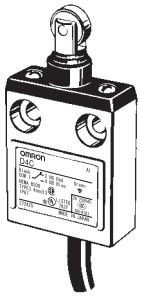
| Operating characteristics | | | Model D4C-□□01 | D4C-□□02 | D4C-□□03 | D4C-□□20<br>D4C-□□20-P | D4C-□□24<br>D4C-□□24-P |
|---|---|---|---|---|---|---|---|
| Operating force | OF | max. | 11.77 N | 11.77 N | 11.77 N | 5.69 N | 5.69 N |
| Release force | RF | min. | 4.41 N | 4.41 N | 4.41 N | 1.47 N | 1.47 N |
| Pretravel | PT | max. | 1.8 mm | 1.8 mm | 1.8 mm | 25° | 10°±3° |
| Overtravel | OT | min. | 3 mm | 3 mm | 3 mm | 40° | 50° |
| Movement Differential | MD | max. | 0.2 mm | 0.2 mm | 0.2 mm | 3° | 3° |
| Operating Position | OP | | 15.7±1 mm | 28.5±1 mm | 28.5±1 mm | --- | --- |

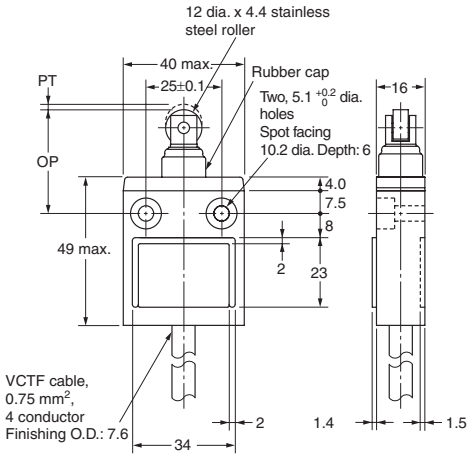
## Sealed Plunger
### D4C-□□31



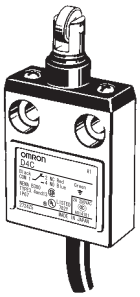


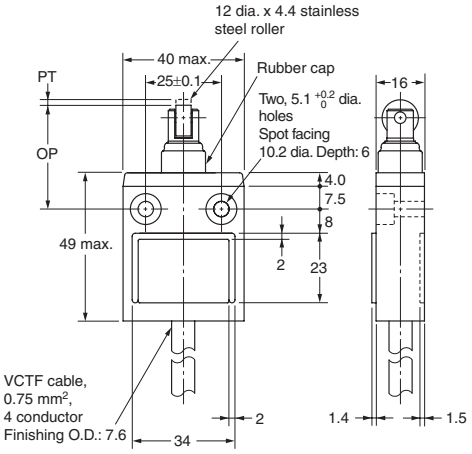

## Sealed Roller Plunger
### D4C-□□32






## Sealed Crossroller Plunger
### D4C-□□33



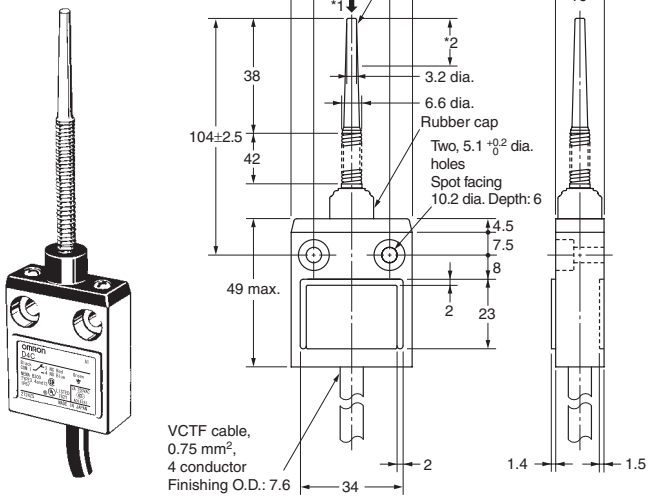



Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

| Operating characteristics | | Model | D4C-□□31 | D4C-□□32 | D4C-□□33 |
|---|---|---|---|---|---|
| Operating force | OF | max. | 17.65 N | 17.65 N | 17.65 N |
| Release force | RF | min. | 4.41 N | 4.41 N | 4.41 N |
| Pretravel | PT | max. | 1.8 mm | 1.8 mm | 1.8 mm |
| Overtravel | OT | min. | 3 mm | 3 mm | 3 mm |
| Movement Differential | MD | max. | 0.2 mm | 0.2 mm | 0.2 mm |
| Operating Position | OP | | 24.9±1 mm | 34.3±1 mm | 34.3±1 mm |
| Total travel | TT * | | (5) mm | (5) mm | (5) mm |

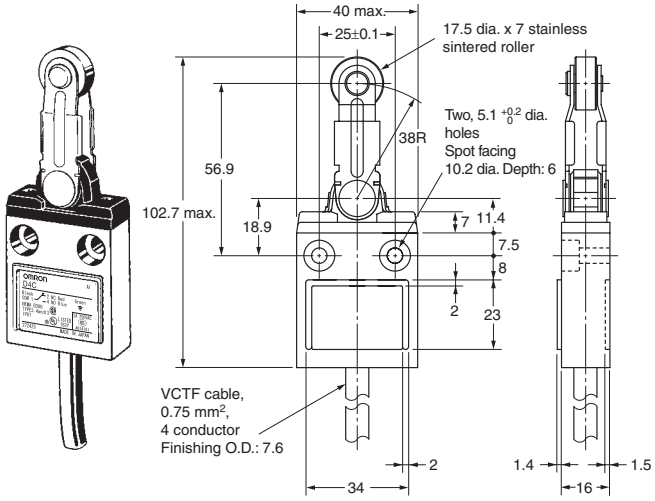
* The TT is a reference value.

### Plastic rod
### D4C-□□50




*1 Operation is possible in any direction except in 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 Plunger
### D4C-□□60

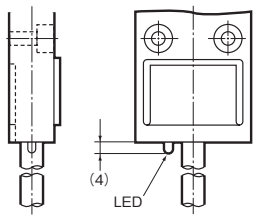



Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

| Operating characteristics | | Model | D4C-□□50 | D4C-□□60 |
|---|---|---|---|---|
| Operating force | OF | max. | 1.47 N | 6.67 N |
| Release force | RF | min. | --- | 1.47 N |
| Pretravel | PT | max. | 15° | 10°±3° |
| Overtravel | OT | min. | --- | 50° |
| Movement Differential | MD | max. | --- | 3° |
| Operating Position | OP | | --- | --- |
| Total travel | TT | | --- | --- |

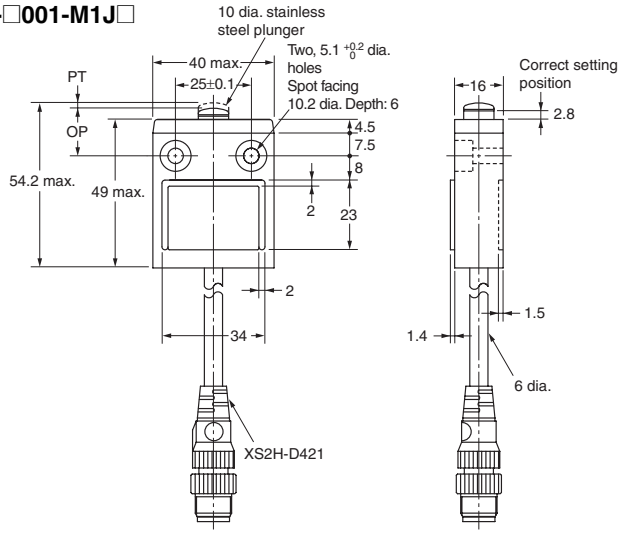
### Models with LED Indicator

The dimensions of the LED indicator for models equipped with one are shown below.

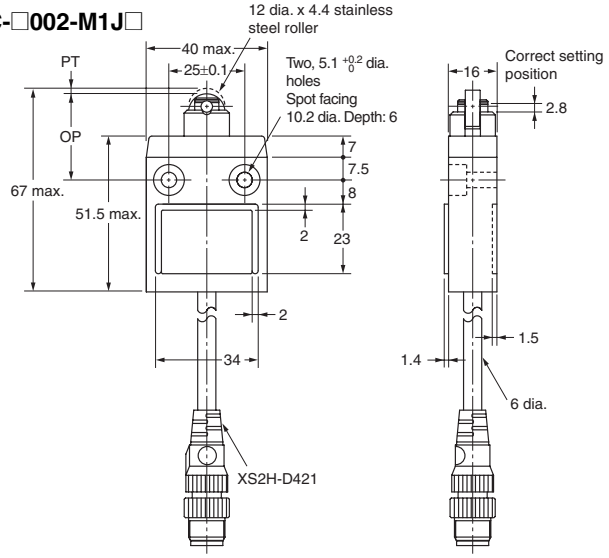



## Pre-wired Models

### Pin Plunger
### D4C-□001-□K1EJ□
### D4C-□001-M1J□




### Roller Plunger
### D4C-□002-□K1EJ□
### D4C-□002-M1J□




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

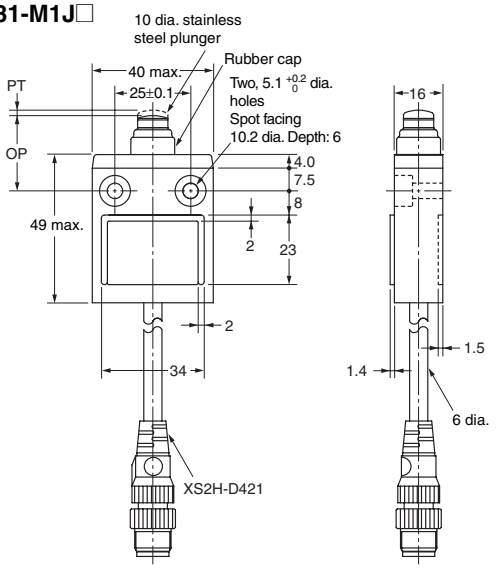
| Operating characteristics | | Model | D4C-□001 -□K1EJ□ | D4C-□002 -□K1EJ□ |
|---|---|---|---|---|
| Operating force | OF | max. | 11.77 N | 11.77 N |
| Release force | RF | min. | 4.41 N | 4.41 N |
| Pretravel | PT | max. | 1.8 mm | 1.8 mm |
| Overtravel | OT | min. | 3 mm | 3 mm |
| Movement Differential | MD | max. | 0.2 mm | 0.2 mm |
| Operating Position | OP | | 15.7±1 mm | 28.5±1 mm |

Note: Specifications are the same for -M1J Switches.

## Sealed Pin Plunger

**D4C-□031-□K1EJ□**

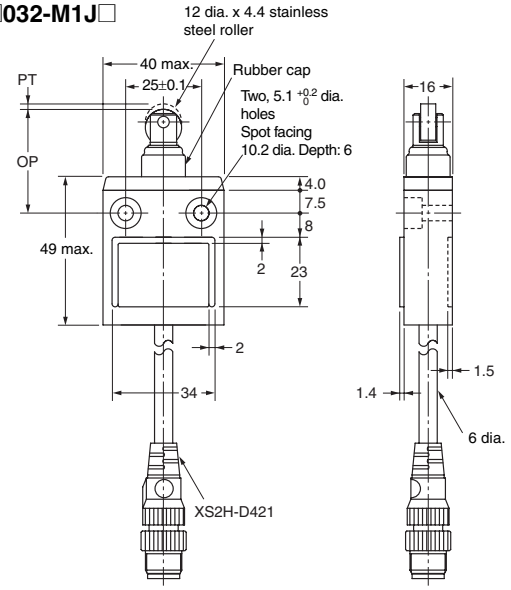
**D4C-□031-M1J□**




## Sealed Roller Plunger

**D4C-□032-□K1EJ□**

**D4C-□032-M1J□**




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

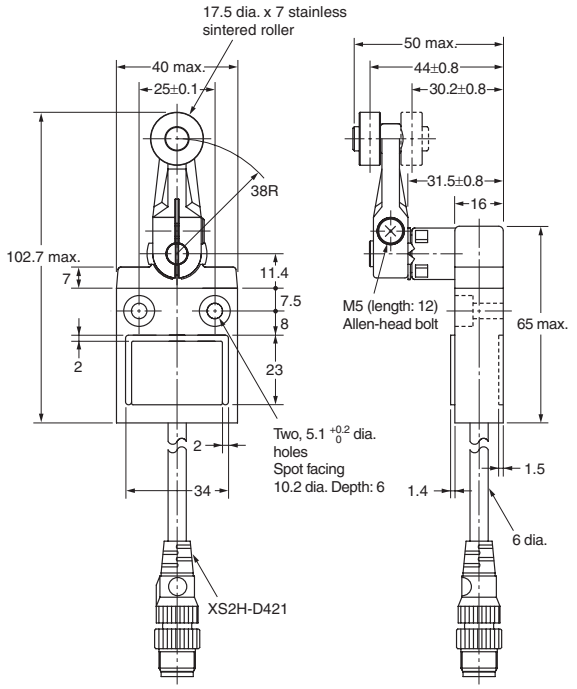
| Operating characteristics | | | Model D4C-□031 -□K1EJ□ | D4C-□032 -□K1EJ□ |
|---|---|---|---|---|
| Operating force | OF | max. | 17.65 N | 17.65 N |
| Release force | RF | min. | 4.41 N | 4.41 N |
| Pretravel | PT | max. | 1.8 mm | 1.8 mm |
| Overtravel | OT | min. | 3 mm | 3 mm |
| Movement Differential | MD | max. | 0.2 mm | 0.2 mm |
| Operating Position | OP | | 24.9±1 mm | 34.3±1 mm |

Note: Specifications are the same for -M1J Switches

## Roller Lever (High-sensitivity Model)

**D4C-□024-□K1EJ□**

**D4C-□024-M1J□**



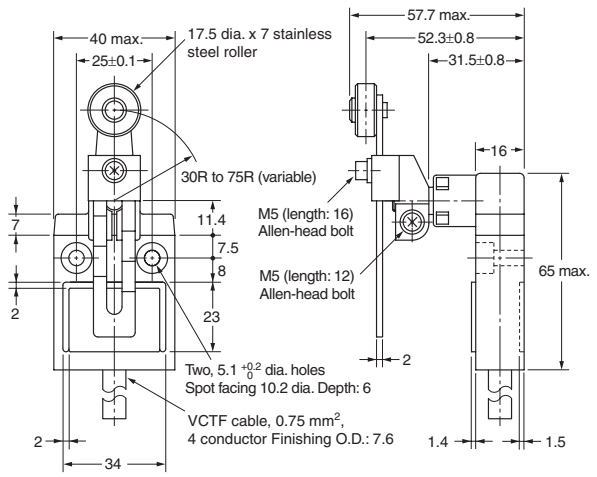

Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

| Operating characteristics | | | Model D4C-□024-□K1EJ□ |
|---|---|---|---|
| Operating force | OF | max. | 5.69 N |
| Release force | RF | min. | 1.47 N |
| Pretravel | PT | max. | 10°±3° |
| Overtravel | OT | min. | 50° |
| Movement Differential | MD | max. | 3° |
| Operating Position | OP | | --- |

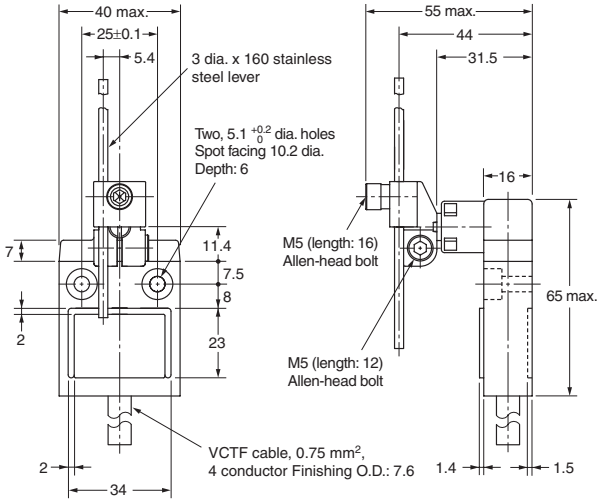
Note: Specifications are the same for -M1J Switches

## Weather-resistant Models

### Adjustable Roller Lever
**D4C-□□27-P**




### Adjustable Rod Lever
**D4C-□□29-P**




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

| Operating characteristics | Model | | D4C-□□27-P | D4C-□□29-P * |
|---|---|---|---|---|
| Operating force | OF | max. | 5.69 N | 5.69 N |
| Release force | RF | min. | 1.47 N | 1.47 N |
| Pretravel | PT | max. | 25° | 25° |
| Overtravel | OT | min. | 40° | 40° |
| Movement Differential | MD | max. | 3° | 3° |

* Operation characteristics for the D4C-□□27-P and D4C- □□29-P are for a lever length of 38 mm.

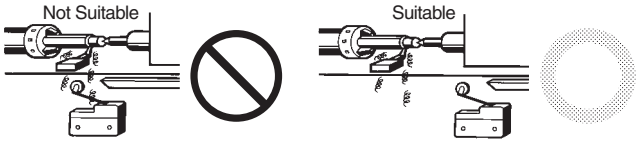
# Safety Precautions

**Refer to *Safety Precautions for All Limit Switches*.**

## Precautions for Correct Use

### Operating Environment

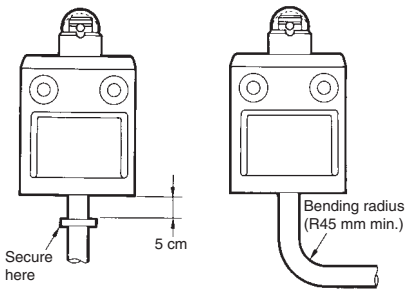
- Seal material may deteriorate if a Switch is used outdoor or where subject to special cutting oils, solvents, or chemicals. Always appraise performance under actual application conditions and set suitable maintenance and replacement periods.
- Install Switches where they will not be directly subject 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 ($SiO_2$) 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.

### Handling

The bottom of the Switch at the cable outlet is resin-molded. Secure the cable at a point 5 cm from the Switch bottom to prevent exertion of excess force on the cable.
When bending the cable, provide a bending radius of 45 mm min. so as not to damage the cable insulation or sheath. Excessive bending may cause fire or leakage current.

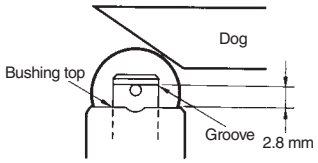



### Connections

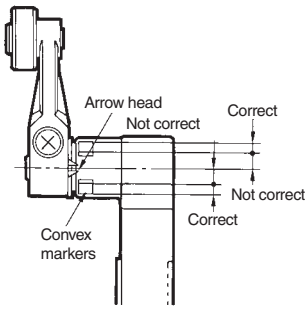
- Be sure to connect a fuse with a breaking current 1.5 to 2 times larger than the rated current to the Limit Switch in series in order to protect the Limit Switch from damage due to short-circuiting.
- When using the Limit Switch for the EN ratings, use the gI or gG 10-A fuse.

## 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 6.3 S min. and hardness must be Hv 400 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.



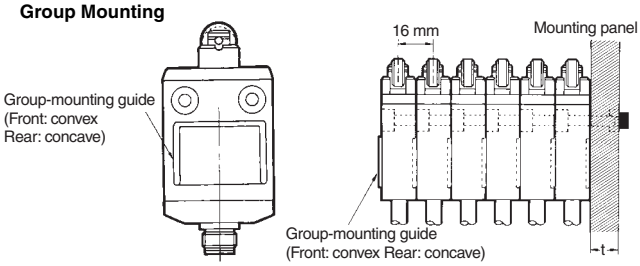

- To allow the roller lever-type actuator to travel properly, adjust the dog and cam so that the arrow head is positioned between the two convex markers as shown below.




## Mounting

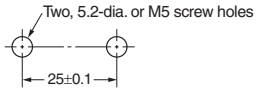
- A maximum of 6 Switches may be group-mounted. In this case, pay attention to the mounting direction so that the convex part of the group-mounting guide on one Switch fits into the concave part of the guide on the other Switch as shown in the figure below. For group mounting, the mounting panel must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

**Group Mounting**




- If the mounting panel is warped or has protruding parts, a malfunction may result. Make sure that the mounting panel is not warped and has even surfaces.

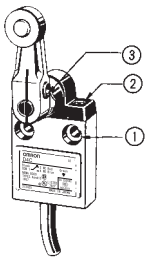
**Mounting Holes**




- Use a Switch with a rubber cap when using the plunger type in an environment where malfunction is possible due to environmental conditions such as dust or cutting chips which may not allow resetting.
- Do not expose the Switch to water exceeding 70°C or use it in steam.
- When the D4C is used in a circuit of a device to be exported to Europe, classified as Overvoltage Class III as specified in IEC664, provide a contact protection circuit.
- Tighten each screw to a torque according to the following table.

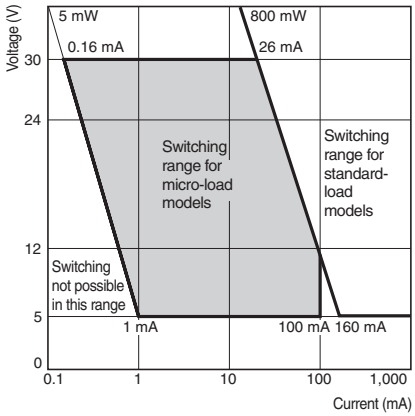
| No. | Type | Appropriate tightening torque* |
|---|---|---|
| 1 | M5 Allen-head bolt | 4.90 to 5.88 N·m |
| 2 | M3.5 head mounting screw | 0.78 to 0.88 N·m |
| 3 | M5 Allen-head bolt | 4.90 to 5.88 N·m |

* 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.




## Micro-load Models (D4C-4, -5, -6)

Micro-load models can be used for switching in the range shown below.



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2008.11

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