

Enclosed Switch D4MC

Economical, High Utility Enclosed Switch

- High precision and long life (10,000,000 mechanical operations) through employment of the moving spring used in OMRON Z Basic Switch.
- Sealed with gasket diaphragm to provide high sealing property without use of any adhesive or pin.
- Suitable for applications demanding higher mechanical strength, dustproof and drip-proof properties than those on basic switches.
- Panel mount versions have the same operating position as Z Basic Switch.
- Resin molded terminal versions are available.
- Approved by UL, CSA, and CCC (Chinese standard).



Model Number Structure

■ Model Number Legend









D4MC-
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1. Actuator

- 5000: Panel mount plunger
- 5020: Panel mount roller plunger
- 5040: Panel mount crossroller plunger
- 1020: Short hinge lever
- 1000: Hinge lever
- 2000: Hinge roller lever
- 2020: Short hinge roller lever
- 3030: One-way action short hinge roller lever

Ordering Information

■ List of Models

Actuator		Model
Panel mount plunger		D4MC-5000
Panel mount roller plunger		D4MC-5020
Panel mount crossroller plunger		D4MC-5040
Short hinge lever		D4MC-1020
Hinge lever		D4MC-1000
Hinge roller lever		D4MC-2000
Short hinge roller lever		D4MC-2020
One-way action short hinge roller lever		D4MC-3030

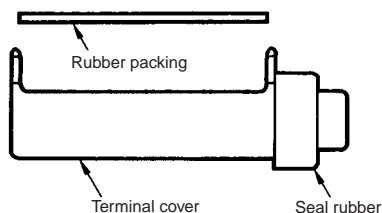
Note: Use molded terminal models (refer to page 158) when using the Switch under one of the following conditions:

a) dusty, b) high amount of dripping oil, or c) high humidity.

Models are available with the lead outlet in one of three locations: right-hand, left-hand, and underside.

■ Terminal Protective Cover, Seal Rubber, and Rubber Packing

(The Switch is equipped with these 3 items as a standard.)



- ZC Terminal Cover
(Product code: ZC55-0002H)
- ZC Seal Rubber
(Product code: SC-1404C)
- ZC Rubber Packing
(Product code: ZC55-0003F)

Specifications

■ Approved Standards (Except Molded Terminal Models)

Agency	Standard	File No.
UL	508	E76675
CSA	C22.2 No. 14	E45258
CCC (CQC)	GB14048.5	2003010303077627

Note: Ask your OMRON representative for information on approved models.

■ Approved Standard Ratings

UL/CSA

A300

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	10 A	60 A	6 A	7,200 VA	720 VA
240 VAC		30 A	3 A		

EN60947-1 and EN60947-5-1

250 V, 10 A (AC12) (Tested by ASTA)

CCC (GB14048.5)

Applicable category and ratings
AC-12 10 A/250 VAC

■ General 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	10 A		3 A	1.5 A	10 A		5 A	2.5 A
250 VAC	10 A		2.5 A	1.25 A	10 A		3 A	1.5 A
480 VAC	3 A		1.5 A	0.75 A	2.5 A		1.5 A	0.75 A
8 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A
14 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A
30 VDC	6 A		3 A	1.5 A	5 A		5 A	2.5 A
125 VDC	0.5 A		0.4 A	0.4 A	0.05 A		0.05 A	0.05 A
250 VDC	0.25 A		0.2 A	0.2 A	0.03 A		0.03 A	0.03 A

Inrush current	NC	30 A max.
	NO	15 A max.

- Note:**
- The above figures are for steady-state currents.
 - Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 - Lamp load has an inrush current of 10 times the steady-state current.
 - Motor load has an inrush current of 6 times the steady-state current.
 - The above ratings were tested under the following conditions.
 Ambient temperature: 20±2°C
 Ambient humidity: 65±5%
 Operating frequency: 20 operations/min

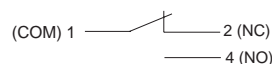
■ Characteristics

Degree of protection	IP67
Durability	Mechanical: 10,000,000 operations min. Electrical: 500,000 operations min.
Operating speed	0.05 mm/s to 0.5 m/s (for plunger models)
Operating frequency	Mechanical: 120 operations/min Electrical: 20 operations/min
Rated frequency	50/60 Hz
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	15 mΩ max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 2,000 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground, and between each terminal and non-current-carrying part
Rated insulation voltage (U _i)	1,000 VAC
Pollution degree (operating environment)	3 (IEC947-5-1)
Protection against electric shock	Class II
PTI (tracking characteristics)	175
Switch category	D (IEC335)
Rated operating current (I _e)	10 A
Rated operating voltage (U _e)	250 VAC
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (see note)
Shock resistance	Destruction: 1,000 m/s ² min. Malfunction: 100 m/s ² min. (for plunger models) (see note)
Ambient temperature	Operating: -10°C to 80°C (with no icing)
Ambient humidity	Operating: 35% to 95%
Weight	Approx. 71 g (at panel mount plunger)

Note: Less than 1 ms under a free state at the operating limits.

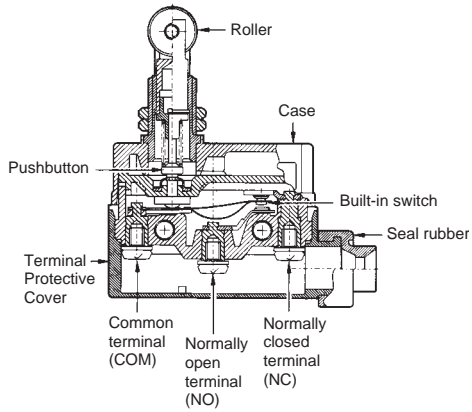
Connections

■ Contact Form



Nomenclature

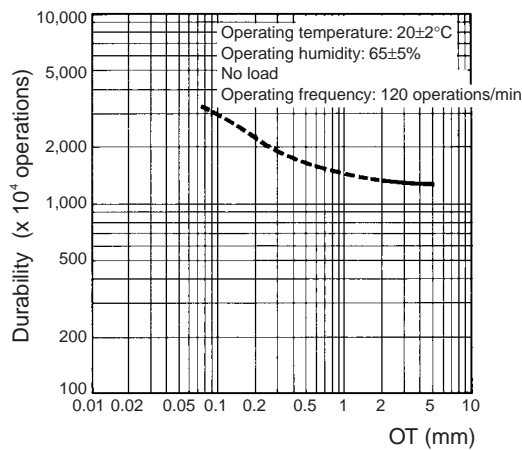
Changing the Terminal Protective Cover around allows the cable to be pulled out from either the right or the left.



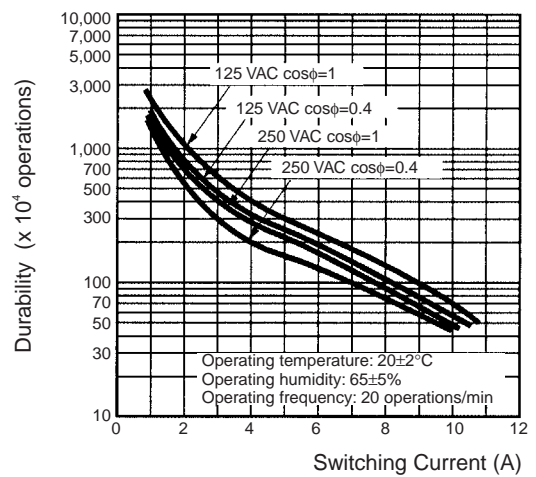
Note: M4 binding head screws (with toothed washers) are used as the terminal screws.

Engineering Data

■ Mechanical Durability (D4MC-5000)



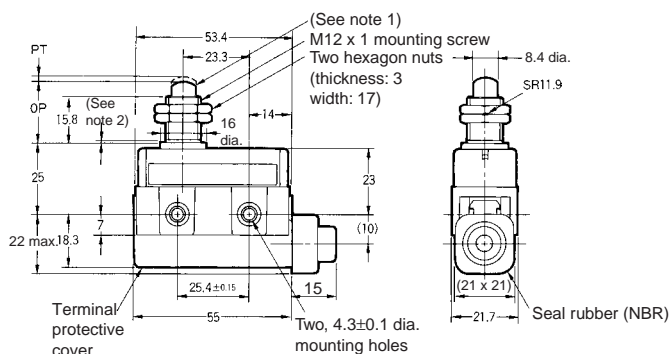
■ Electrical Durability



Dimensions

- Note:** 1. All units are in millimeters unless otherwise indicated.
 2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

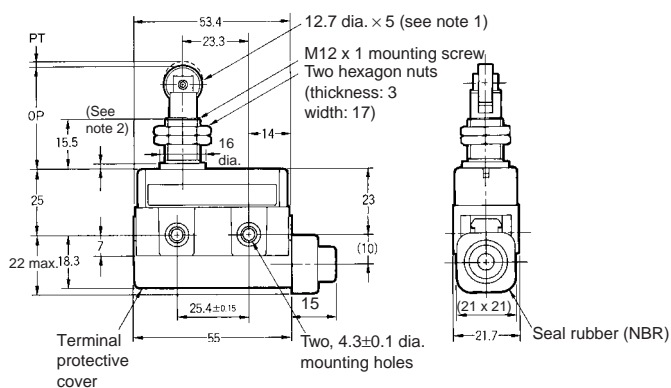
Panel Mount Plunger D4MC-5000



- Note:** 1. Stainless steel plunger
 2. The length of the imperfect threads is 1.5 mm maximum.
 3. Do not use the M12 mounting screw and the case mounting hole at the same time.

Model	D4MC-5000
OF max.	5.88 N
RF min.	0.98 N
PT max.	1.6 mm
OT min.	5 mm
MD max.	0.2 mm
OP	21.8 ± 1.2 mm
FP max.	---

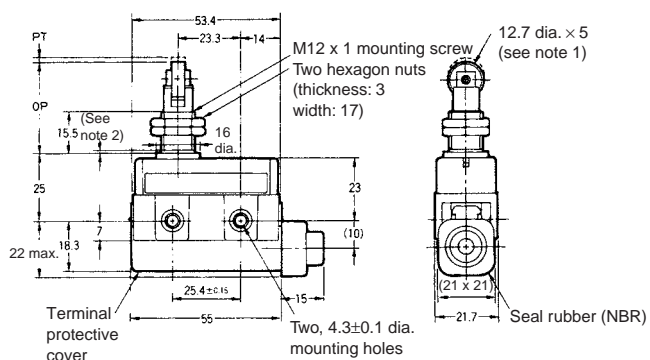
Panel Mount Roller Plunger D4MC-5020



- Note:** 1. Stainless steel roller
 2. The length of the imperfect threads is 1.5 mm maximum.
 3. Do not use the M12 mounting screw and the case mounting hole at the same time.

Model	D4MC-5020
OF max.	5.88 N
RF min.	0.98 N
PT max.	1.6 mm
OT min.	5 mm
MD max.	0.2 mm
OP	33.4 ± 1.2 mm
FP max.	---

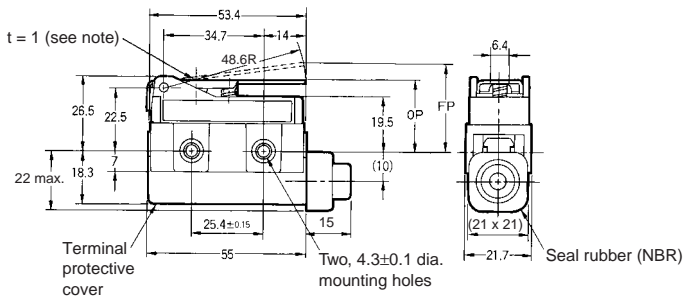
Panel Mount Crossroller Plunger D4MC-5040



- Note:** 1. Stainless steel roller
 2. The length of the imperfect threads is 1.5 mm maximum.
 3. Do not use the M12 mounting screw and the case mounting hole at the same time.

Model	D4MC-5040
OF max.	5.88 N
RF min.	0.98 N
PT max.	1.6 mm
OT min.	5 mm
MD max.	0.2 mm
OP	33.4 ± 1.2 mm
FP max.	---

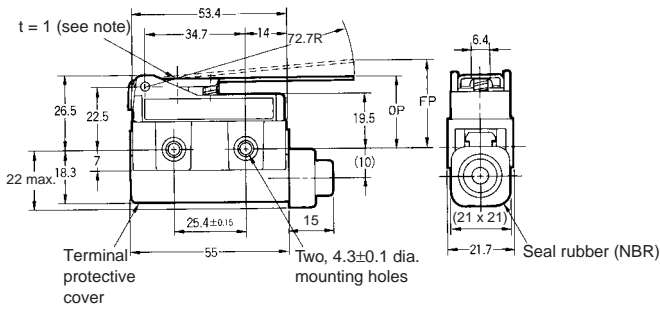
**Short Hinge Lever
D4MC-1020**



Note: Stainless steel lever

Model	D4MC-1020
OF max.	2.55 N
RF min.	0.34 N
PT max.	---
OT min.	2.5 mm
MD max.	1.7 mm
OP	25±1 mm
FP max.	33 mm

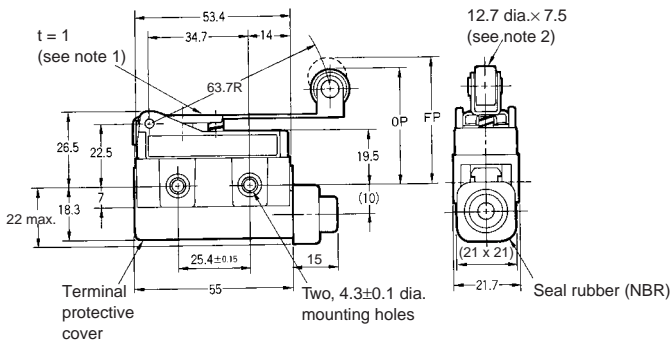
**Hinge Lever
D4MC-1000**



Note: Stainless steel lever

Model	D4MC-1000
OF max.	1.67 N
RF min.	0.25 N
PT max.	---
OT min.	4 mm
MD max.	3 mm
OP	25±1 mm
FP max.	36 mm

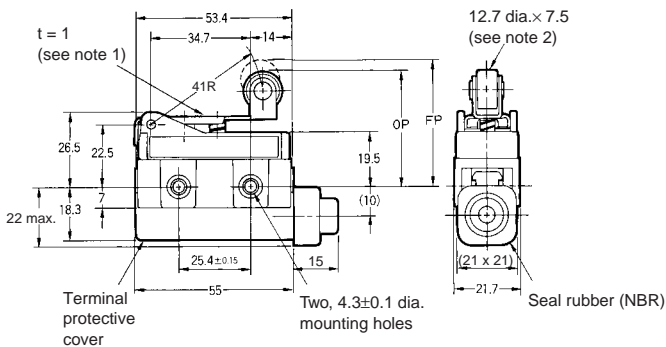
**Hinge Roller Lever
D4MC-2000**



Note: 1. Stainless steel lever
2. Plastic roller

Model	D4MC-2000
OF max.	1.96 N
RF min.	0.39 N
PT max.	---
OT min.	5 mm
MD max.	3 mm
OP	40±1 mm
FP max.	51 mm

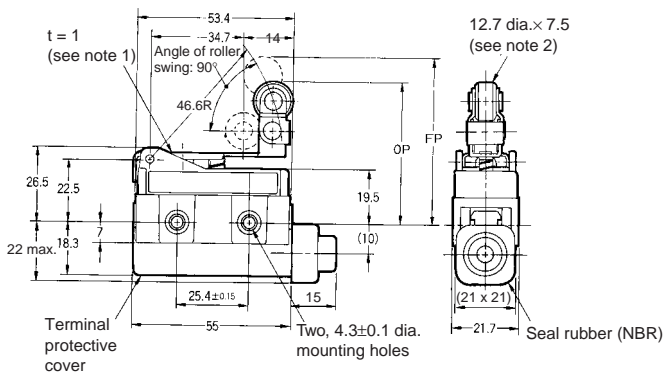
**Short Hinge Roller Lever
D4MC-2020**



Note: 1. Stainless steel lever
2. Plastic roller

Model	D4MC-2020
OF max.	2.94 N
RF min.	0.39 N
PT max.	---
OT min.	2 mm
MD max.	1.5 mm
OP	40±1 mm
FP max.	47 mm

**One-way Action Short Hinge Roller Lever
D4MC-3030**



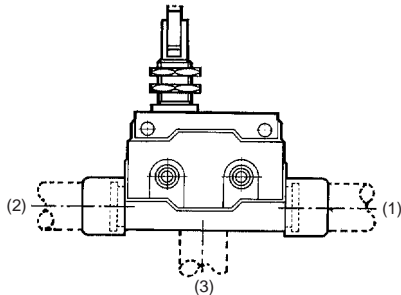
Note: 1. Stainless steel lever
2. Plastic roller

Model	D4MC-3030
OF max.	2.94 N
RF min.	0.39 N
PT max.	---
OT min.	2 mm
MD max.	1.5 mm
OP	50±1 mm
FP max.	57.2 mm

Molded Terminal Models

■ Molded Terminal Models (Not Approved by UL, CSA, or EN)

The molded terminal model is available with right-hand, left-hand and underside leads and is recommended for use where the Switch is exposed to dust, oil, or moisture.



When placing your order for the Switch specify the required length of V.C.T. cable in addition to the model number of the Switch

Example:

Standard type: D4MC-5020

Location of lead outlet: Underside

Length of lead: 1 m (V.C.T. lead)

When placing your order for the above Switch specify the model number as D4MC-5023 VCT 1M

Suffix by Location of Lead Outlet

Location of lead outlet	Model
	COM, NC, and NO
Right-hand	D4MC-□□□1
Left-hand	D4MC-□□□2
Underside	D4MC-□□□3

Leads Supplied

Leads	Nominal cross-sectional area	Finished outside diameter	Terminal connections	Standard length
V.C.T. (Vinyl cabtire cable)	1.25 mm ²	3 core:10.5 mm dia.	Black: COM White: NO Red: NC	1, 3 m

Precautions

Refer to the "Precautions for General-purpose Limit Switches (Including Multiple Limit Switches, Mechanical Touch Switches, High-precision Switches, Touch Switches, On-site Flexible Switches; Not Including Safety Switches)" on page 17.

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.



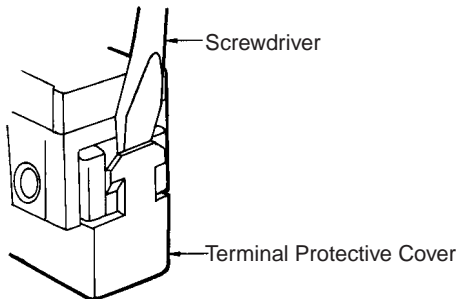
- Constantly subjecting a Switch to vibration or shock can result in wear, which can lead to contact interference with contacts, operation failure, reduced durability, and other problems. Excessive vibration or shock can lead to false contact operation or damage. Install Switches in locations not subject 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 (SiO₂) 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.

Operating

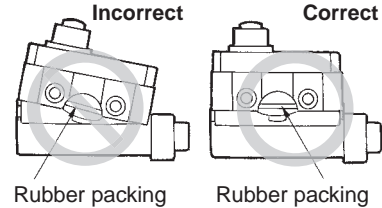
Excessive dog angle, operating speed, or overtravel (OT) may damage the actuator. Check that OT has a sufficient margin. The actual OT should be rated OT x 0.7 to 1.

Handling

- Do not expose the Switch to water exceeding 60°C or use it in steam.
- Do not use the Switch in oil or water.
- An 8.5- to 10.5-dia. cable can be applied as seal rubber for the lead wire outlet. (Use two- or three-core cable of VCT1.25 mm².)
- When detaching the Terminal Protective Cover, insert a screwdriver and apply a force in the opening direction. Do not use excess force to remove the cover. Doing so may cause deformation in the fitting section and reduce the holding force.



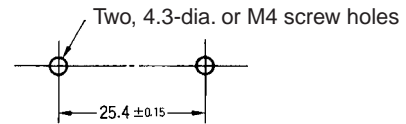
When mounting the Terminal Protective Cover to the case, align the cover on the case and then press the cover down to mount it firmly. If the cover is pressed down in an inclined position, rubber packing will deform and thus affect the sealing capability.



Mounting

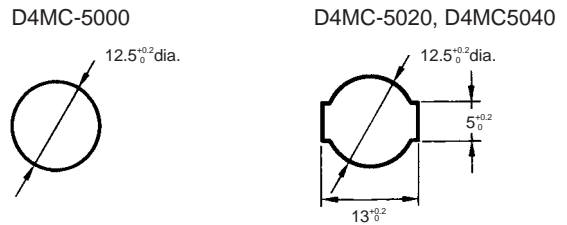
When mounting the Switch with screws on a side surface, fasten the Switch with M4 screws and use washers, spring washers, etc., to ensure secure mounting.

Mounting Holes



- When mounting the Panel Mount-type Switch (D4MC-5000, D4MC-5020, or D4MC-5040) with screws on a side surface, remove the hexagonal nuts from the actuator.
- When mounting the panel mount type on a panel, be careful not to tighten to an excessive torque. Tightening the screws to a torque exceeding 4.91 N·m will cause the plunger to fail.

Mounting Hole Dimensions



Correct Tightening Torque

A loose screw may cause malfunctions. Be sure to tighten each screw to the proper tightening torque as shown in the table.

No.	Type	Torque
1	Terminal screw	0.78 to 1.18 N·m
2	Panel mounting screw	2.94 to 4.92 N·m
3	Side mounting screw	1.18 to 1.47 N·m

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.