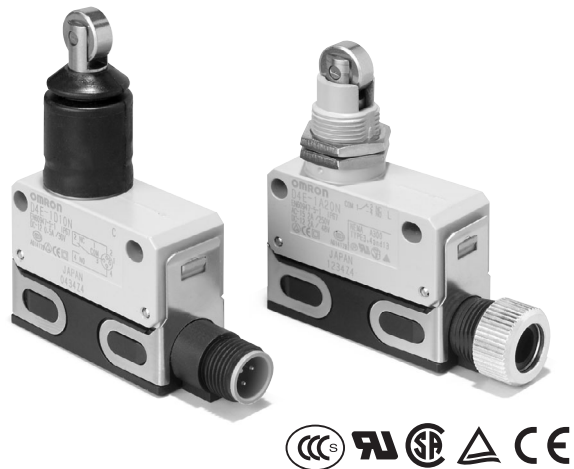


Small Sealed Switch D4E-□N

Slim and Compact Switch with Better Seal and Ensuring Longer Service Life than D4E

- Flat springs with an improved lever ratio of the built-in switch ensure smooth snap action and long life expectancy.
- Protection cover protects the built-in switch from dust and oil. Plunger incorporates a tough seal cap that lasts for a long time.
- One touch connector eliminates need for tedious wiring operations and reduces downtime for wiring and maintenance (models with standard, easy-to-use screw terminals are also available).
- Minute load model with gold cladding is optimal for electronic control.
- Molded terminal types as well as molded terminal types with operating indicator lamps are available for screw terminal systems.
- No difference in mounting pitch and characteristics between D4E-□N and D4E models.
- Approved by EN, UL, CSA, and CCC (Chinese standard).



Model Number Structure

■ Model Number Legend

D4E-□□□□N
1 2 3 4

1. Rated Current

- 1: 5 A at 125 VAC
(1 A at 125 VAC/30 VDC for model with a connector)
- 2: 0.1 A at 125 VAC
(0.1 A at 125 VAC/30 VDC for model with a connector)

2. Actuator

- A: Roller plunger
B: Crossroller plunger
C: Plunger
D: Sealed roller plunger
E: Sealed crossroller plunger
F: Sealed plunger
G: Roller lever
H: One-way action roller lever

3. Terminals

- 00: AC connector
10: DC connector
20: Screw terminals without a cable
21: Screw terminals with a cable (right-hand)
22: Screw terminals with a cable (left-hand)
23: Molded terminals with a cable (right-hand)
24: Molded terminals with a cable (left-hand)
(Cable is S-FLEX VCTF 3 m)

4. Operation Indicator

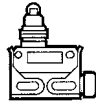

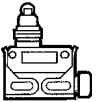
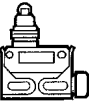
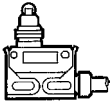
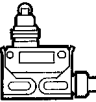








- None: Without operation indicator
L: Neon lamp (250 VAC)
L2: LED (24 VDC)

Note: 1. Only the molded terminal models can be equipped with an operation indicator.

2. Desired Switches may not be manufactured depending on the combination between molds and indicators. Contact our sales representative for further information.

Ordering Information

■ List of Models

Actuator	One-touch connector type		Screw terminal type			
	General-purpose	Micro load	General-purpose without cable	Micro load without cable	General-purpose with cable	Micro load with cable
						
Roller plunger 	D4E-1A□0N	D4E-2A□0N	D4E-1A20N (see note 2)	D4E-2A20N	D4E-1A21N	D4E-2A21N
Crossroller plunger 	D4E-1B□0N	D4E-2B□0N	D4E-1B20N (see note 2)	D4E-2B20N	D4E-1B21N	D4E-2B21N
Plunger 	D4E-1C□0N	D4E-2C□0N	D4E-1C20N (see note 2)	D4E-2C20N	D4E-1C21N	D4E-2C21N
Sealed roller plunger 	D4E-1D□0N	D4E-2D□0N	D4E-1D20N (see note 2)	D4E-2D20N	D4E-1D21N	D4E-2D21N
Sealed crossroller plunger 	D4E-1E□0N	---	D4E-1E20N (see note 2)	D4E-2E20N	D4E-1E21N	D4E-2E21N
Sealed plunger 	D4E-1F□0N	D4E-2F□0N	D4E-1F20N (see note 2)	D4E-2F20N	D4E-1F21N	D4E-2F21N
Roller lever 	D4E-1G□0N	D4E-2G□0N	D4E-1G20N (see note 2)	D4E-2G20N	D4E-1G21N	D4E-2G21N
One-way action roller lever 	D4E-1H□0N	D4E-2H□0N	D4E-1H20N (see note 2)	D4E-2H20N	D4E-1H21N	D4E-2H21N

- Note:** 1. When ordering, specify the current type by replacing the blank box of the model number with 0 for AC connector or 1 for DC connector.
 2. Approved by UL and CSA.
 3. For the plunger and lever actuator models, the NC and NO terminal indicators are reversed.

Accessories (Order Separately)

Plug

Model	Current	Type	No. of conductors	Cable length	Applicable models
XS2F-A421-D90-A	AC	Straight	4	2 m	D4E-□□00N
XS2F-A421-G90-A				5 m	
XS2F-D421-D80A	DC			2 m	D4E-□□10N
XS2F-D421-G80-A				5 m	

Specifications

■ Approved Standards

Agency	Standard	File No.	Approved models
UL	UL508	E76675	D4E-□□20N Switches only except for Indicator-equipped Switches
CSA	CSA C22.2 No. 14	LR45746	D4E-□□20N Switches only except for Indicator-equipped Switches
TÜV Rheinland	EN60947-5-1	R9551015	All models in the table on page 139 (Ask your OMRON representative about other models.)
CCC (CQC)	GB14048.5	2003010305086795	Ask your OMRON representative for information on approved models.

■ Approved Standard Ratings

UL, CSA

A300

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

TÜV (EN60947-5-1), CCC (GB14048.5)

D4E- $\frac{1}{I}$ $\frac{G}{II}$ $\frac{23}{III}$ $\frac{L}{IV}$ $\frac{N}{N}$

	Model				Applicable category and ratings	Thermal current (I _{the})	Indicator
	I	II	III	IV			
1	<input type="checkbox"/>	00			AC-14 0.5 A/125 VAC	5 A	---
1	<input type="checkbox"/>	10			DC-12 0.5 A/30 VDC	5 A	---
1	<input type="checkbox"/>	20, 21, 22			AC-15 2A/250 VAC DC-12 2A/48 VDC	5 A	---
1	<input type="checkbox"/>	23, 24	L		AC-15 2A/250 VAC	5 A	Neon lamp
1	<input type="checkbox"/>	23, 24	L1		DC-12 2A/12 VDC	5 A	LED
1	<input type="checkbox"/>	23, 24	L2		DC-12 2A/24 VDC	5 A	LED
1	<input type="checkbox"/>	23, 24	L3		DC-12 2A/48 VDC	5 A	LED
2	<input type="checkbox"/>	00			AC-14 0.1A/125 VAC	0.5 A	---
2	<input type="checkbox"/>	10			DC-12 0.1A/30 VDC	0.5 A	---
2	<input type="checkbox"/>	20, 21, 22			AC-14 0.1A/125 VAC DC-12 0.1A/48 VDC	0.5 A	---
2	<input type="checkbox"/>	23, 24	L		AC-14 0.1A/125 VAC	0.5 A	Neon lamp
2	<input type="checkbox"/>	23, 24	L1		DC-12 0.1A/12 VDC	0.5 A	LED
2	<input type="checkbox"/>	23, 24	L2		DC-12 0.1A/24 VDC	0.5 A	LED
2	<input type="checkbox"/>	23, 24	L3		DC-12 0.1A/48 VDC	0.5 A	LED

- Note:** 1. : Actuator variation of item II
 2. AC-14 0.5 A/125 VAC means as follows:
 Applicable category: AC-14
 Rated operating current (I_e): 0.5 A
 Rated operating voltage (U_e): 125 VAC

General Ratings

Rated voltage	Standard load								Micro load	
	Non-inductive load				Inductive load				Non-inductive load	
	Resistive load		Lamp load		Inductive load		Motor load		Resistive load	
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 (1) A		1.5 (1) A		3 (1) A		2 (1) A	1 (1) A		0.1 A
250 VAC	5 (1) A		1.5 (1) A		3 (1) A		1 A	0.5 A		---
8 VDC	5 (1) A		---		1.5 (1) A		---			0.1 A
14 VDC	5 (1) A		---		1.5 (1) A		---			0.1 A
30 VDC	5 (1) A		---		1.5 (1) A		---			0.1 A
125 VDC	0.5 A		---		0.05 A		---			---
250 VDC	0.25 A		---		0.03 A		---			---

Inrush current	NC	10 A max.
	NO	10 A max.

- Note:**
- The above current ratings are for a standard current and the values in parentheses are for models with a connector.
 - 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.

Characteristics

Degree of protection	IP67
Durability (see note 3)	Mechanical: 10,000,000 operations min. Electrical: 500,000 operations min. (5 A at 250 VAC, resistive load) 5,000,000 operations min. (10 mA at 24 VDC, resistive load)
Operating speed	0.1 mm to 0.5 m/sec
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	15 mΩ max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity 1,500 VAC, 50/60 Hz for 1 min/Uimp at 2.5 kV (EN60947-5-1) between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal part
Rated insulation voltage (Ui)	250 VAC
Switching overvoltage	1,000 VAC max. (EN60947-5-1)
Pollution degree (operating environment)	3 (EN60947-5-1)
Short-circuit protective device (SCPD)	10 A fuse (type gG or gI, IEC269 approved)
Conditional short-circuit current	100 A (EN60947-5-1)
Conventional enclosed thermal current (I _{the})	5 A (EN60947-5-1)
Protection against electric shock	Class II (grounding not required with double insulation)
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s ² min. Malfunction: 300 m/s ² min.
Ambient temperature	Operating: -10°C to 80°C (with no icing)
Ambient humidity	Operating: 35% to 95%
Weight	Approx. 86 g (in case of roller plunger)

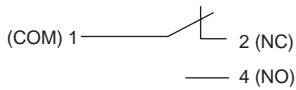
- Note:**
- The above values are initial values.
 - The above ratings may vary depending on the model. Contact your OMRON representative for further details.
 - Durability values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.

Connections

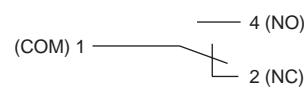
Contact Form

Screw Terminal Type

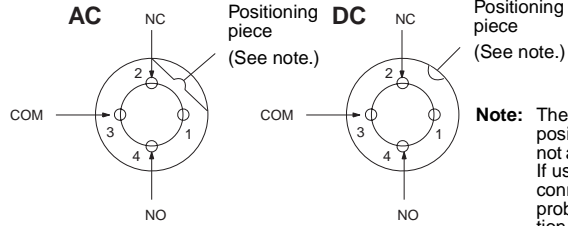
Plunger



Lever

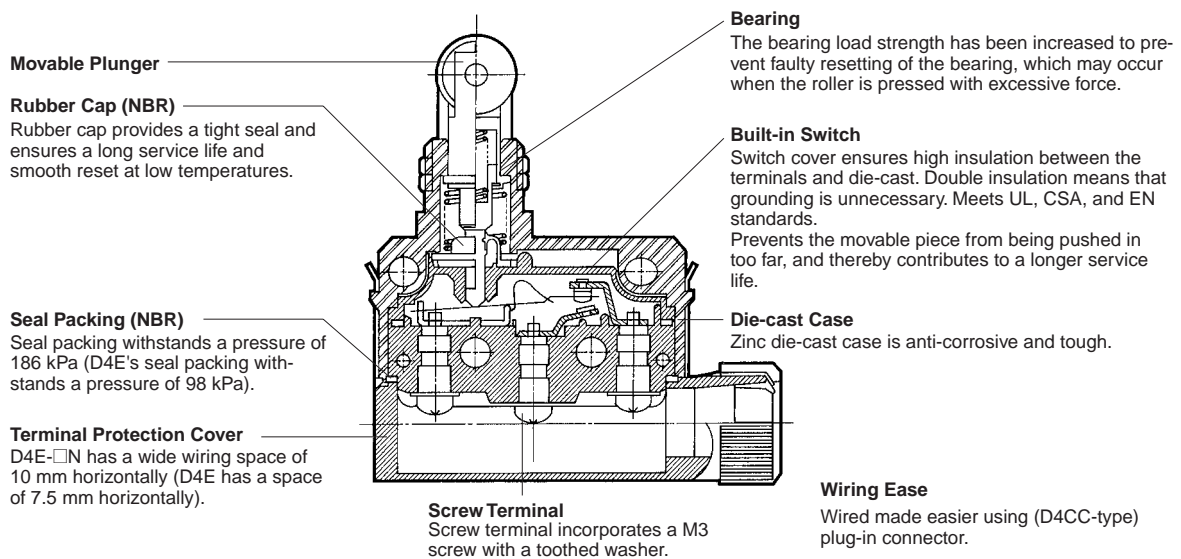


Connector Type



Note: 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.

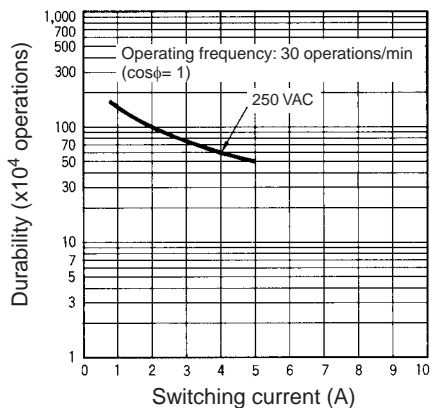
Nomenclature



Engineering Data

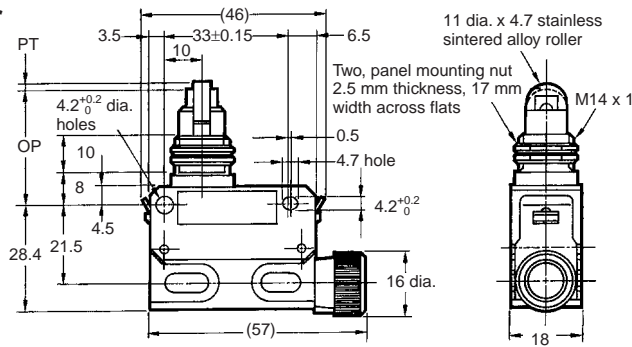
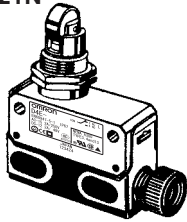
Electrical Durability (cosφ=1)

Operating temperature: 5°C to 30°C
 Operating humidity: 40% to 70%.



Cross Roller Plunger

D4E-1B20N
D4E-2B20N
D4E-1B21N
D4E-2B21N

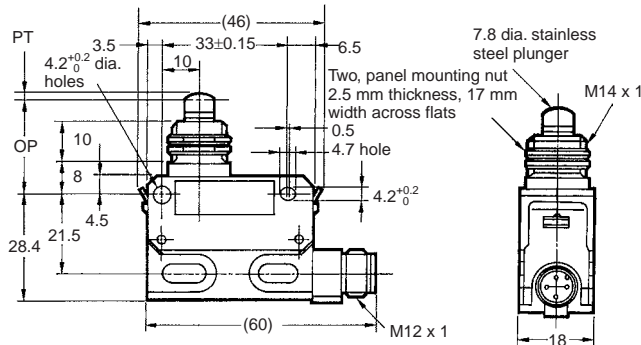
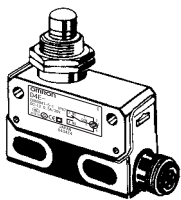


Model	D4E-1B□□N D4E-2B□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD (reference value)	(0.1 mm)
OP	31.4±0.8 mm

Note: The values given in parentheses are reference values.

Plunger

D4E-1C00N
D4E-1C10N
D4E-2C00N
D4E-2C10N

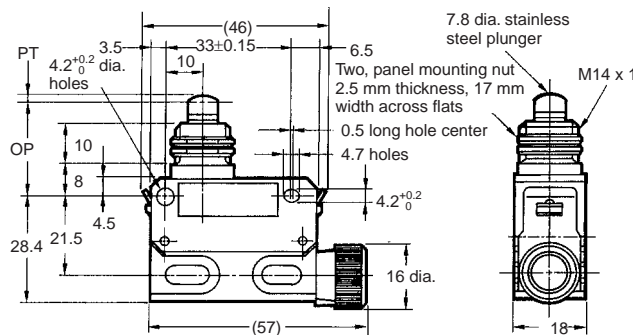
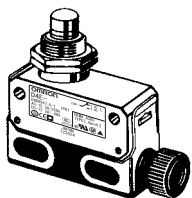


Model	D4E-1C□□N D4E-2C□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD (reference value)	(0.1 mm)
OP	25.4±0.8 mm

Note: The values given in parentheses are reference values.

Plunger

D4E-1C20N (See note 4.)
D4E-2C20N (See note 4.)
D4E-1C21N (See note 3.)
D4E-2C21N (See note 3.)

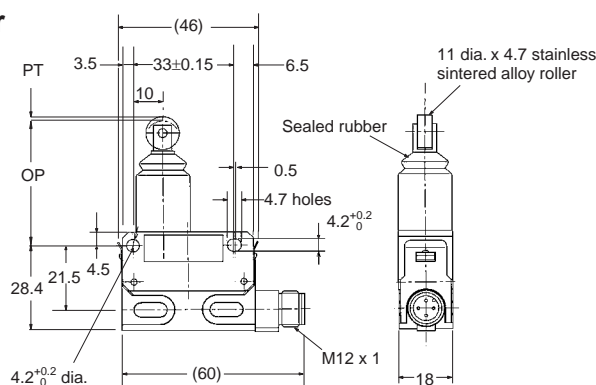
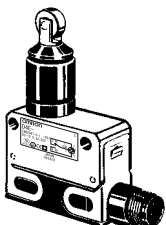


Model	D4E-1C□□N D4E-2C□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD (reference value)	(0.1 mm)
OP	25.4±0.8 mm

Note: The values given in parentheses are reference values.

Sealed Roller Plunger

D4E-1D00N
D4E-1D10N
D4E-2D00N
D4E-2D10N

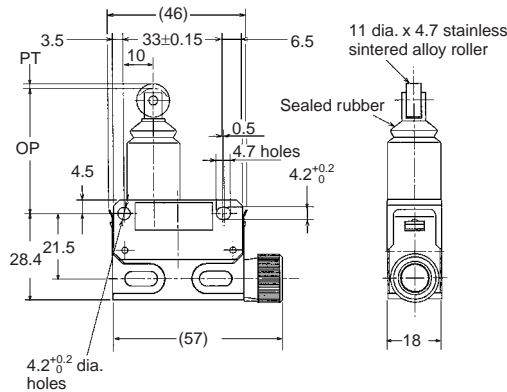
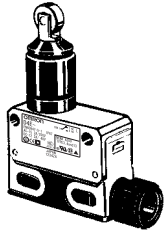


Model	D4E-1D□□N D4E-2D□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD (reference value)	(0.1 mm)
OP	41.3±0.8 mm

Note: The values given in parentheses are reference values.

Sealed Roller Plunger

D4E-1D20N (See note 4.)
 D4E-2D20N (See note 4.)
 D4E-1D21N (See note 3.)
 D4E-2D21N (See note 3.)

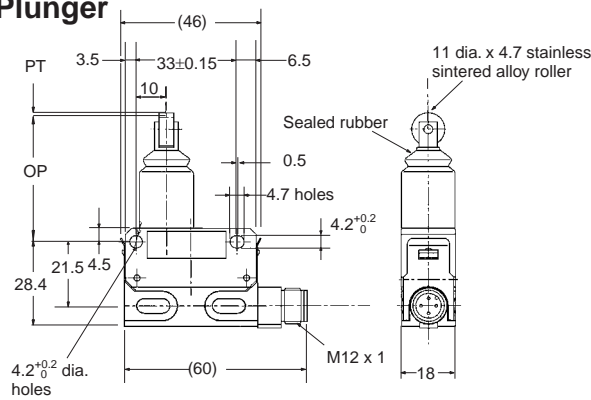
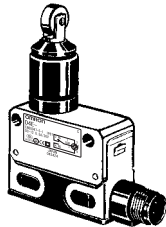


Model	D4E-1D□□N D4E-2D□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD(reference value)	(0.1 mm)
OP	41.3±0.8 mm

Note: The values given in parentheses are reference values.

Sealed Cross Roller Plunger

D4E-1E00N
 D4E-1E10N

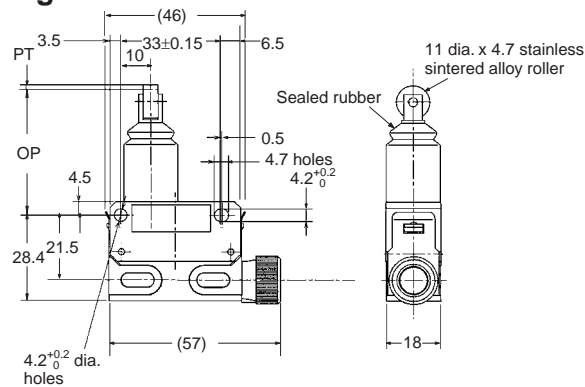
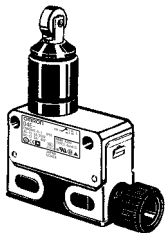


Model	D4E-1E□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD(reference value)	(0.1 mm)
OP	41.3±0.8 mm

Note: The values given in parentheses are reference values.

Sealed Cross Roller Plunger

D4E-1E20N (See note 4.)
 D4E-2E20N (See note 4.)
 D4E-1E21N (See note 3.)
 D4E-2E21N (See note 3.)

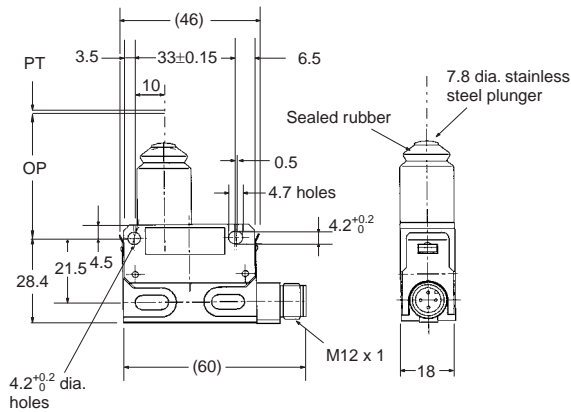
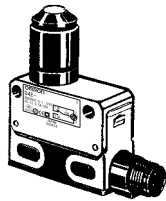


Model	D4E-1E□□N D4E-2E□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD(reference value)	(0.1 mm)
OP	41.3±0.8 mm

Note: The values given in parentheses are reference values.

Sealed Plunger

D4E-1F00N
D4E-1F10N
D4E-2F00N
D4E-2F10N

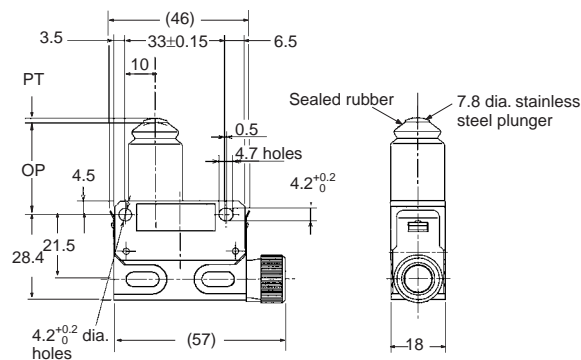
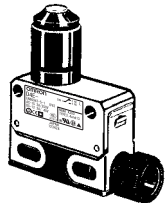


Model	D4E-1F□□N D4E-2F□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD(reference value)	(0.1 mm)
OP	30±0.8 mm

Note: The values given in parentheses are reference values.

Sealed Plunger

D4E-1F20N (See note 4.)
D4E-2F20N (See note 4.)
D4E-1F21N (See note 3.)
D4E-2F21N (See note 3.)

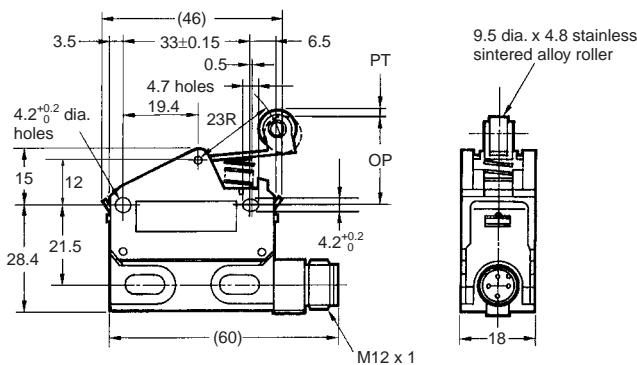
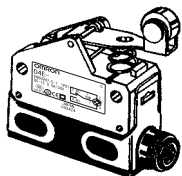


Model	D4E-1F□□N D4E-2F□□N
OF max.	11.77 N
RF min.	4.90 N
PT max.	1.5 mm
OT min.	3 mm
MD(reference value)	(0.1 mm)
OP	30±0.8 mm

Note: The values given in parentheses are reference values.

Roller Lever

D4E-1G00N
D4E-1G10N
D4E-2G00N
D4E-2G10N

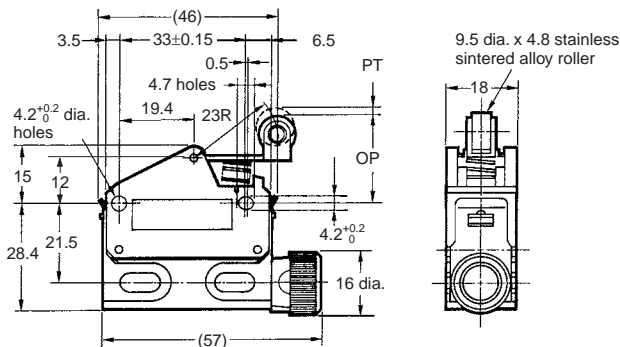
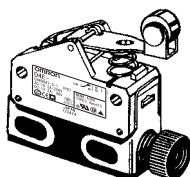


Model	D4E-1G□□N D4E-2G□□N
OF max.	3.92 N
RF min.	0.78 N
PT max.	2 mm
OT min.	4 mm
MD(reference value)	(0.3 mm)
OP	23.1±0.8 mm

Note: The values given in parentheses are reference values.

Roller Lever

D4E-1G20N (See note 4.)
D4E-2G20N (See note 4.)
D4E-1G21N (See note 3.)
D4E-2G21N (See note 3.)

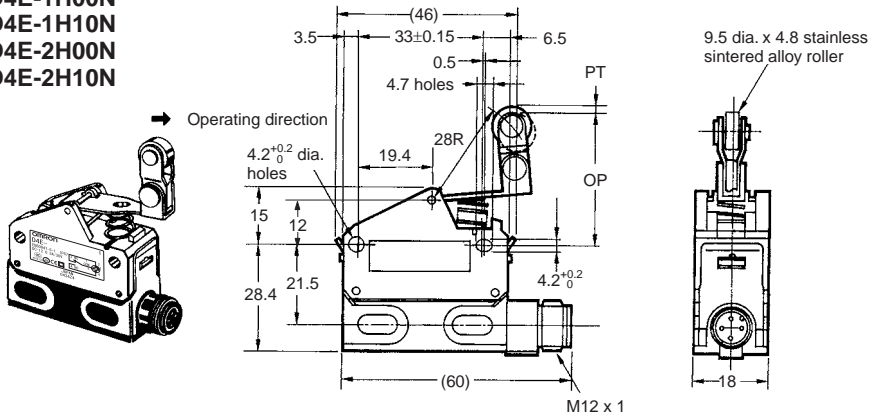


Model	D4E-1G□□N D4E-2G□□N
OF max.	3.92 N
RF min.	0.78 N
PT max.	2 mm
OT min.	4 mm
MD(reference value)	(0.3 mm)
OP	23.1±0.8 mm

Note: The values given in parentheses are reference values.

One-way Action Roller Lever

D4E-1H00N
D4E-1H10N
D4E-2H00N
D4E-2H10N

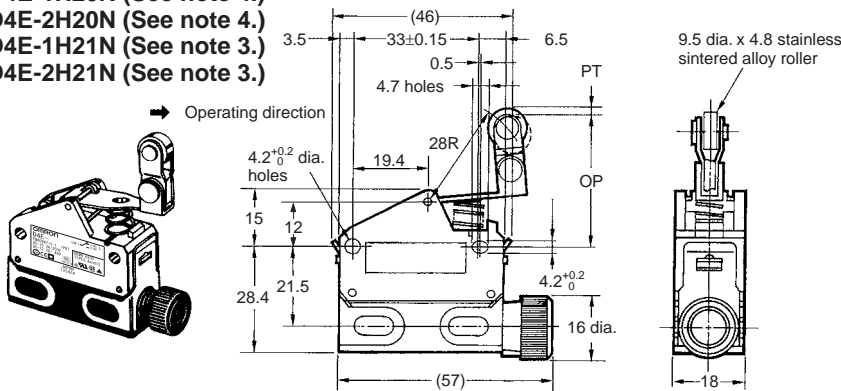


Model	D4E-1H□□N D4E-2H□□N
OF max.	3.92 N
RF min.	0.78 N
PT max.	2 mm
OT min.	4 mm
MD (reference value)	(0.3 mm)
OP	34.3±0.8 mm

Note: The values given in parentheses are reference values.

One-way Action Roller Lever

D4E-1H20N (See note 4.)
D4E-2H20N (See note 4.)
D4E-1H21N (See note 3.)
D4E-2H21N (See note 3.)



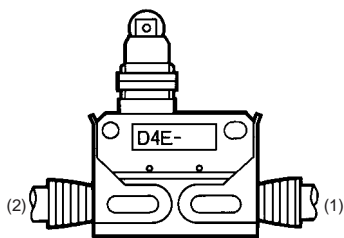
Model	D4E-1H□□N D4E-2H□□N
OF max.	3.92 N
RF min.	0.78 N
PT max.	2 mm
OT min.	4 mm
MD (reference value)	(0.3 mm)
OP	34.3±0.8 mm

Note: The values given in parentheses are reference values.

Molded Terminal Models

■ Molded Terminal Models

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. It can be used like a screw-terminal model (with a cable), and the dimensions and operating characteristics are the same as for standard models.



Example:

Standard type: D4E-1A20N
Location of lead output: Right-hand → D4E-1A23N

Suffix by Location of Lead Outlet

Location of lead output	Suffix for pre-wired terminal COM, NC, NO
	(1) Right-hand
(2) Left-hand	D4E-□□24N

Lead Supplies

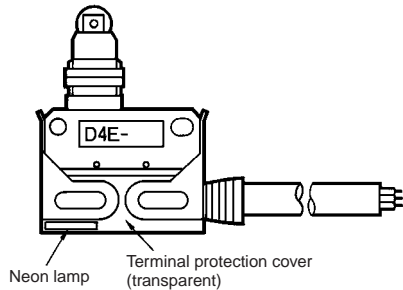
Leads	Nominal cross-sectional area	Finished outside diameter	Terminal connections	Standard length
V.C.T.F. S-FLEX (vinyl cabtire coat)	0.75 mm ²	3 conductors	Black: COM	3 m
		7 mm dia.	White: NO Red: NC	

■ Operation of Indicator-equipped Models

The molded terminal model may be equipped with an operation indicator (neon lamp or LED) upon request to facilitate maintenance and inspection. The operation indicator is designed to illuminate when the Switch is not operating. (Because of the molded terminal model, any change to the Switch wiring cannot be made.)

AC Operation

A neon lamp indicator is provided. The operating voltage is 90 to 250 VAC.



There is no difference in operating characteristics between D4E AC Models and corresponding D4E Standard Models.

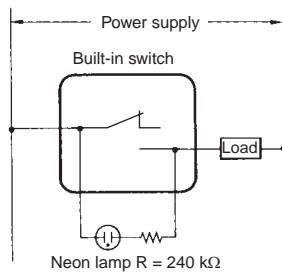
There is no difference in dimensions between D4E AC Models and D4E Standard Models.

Example:

Basic type: D4E-1A23N

When placing your order for the molded terminal model with a neon lamp operation indicator, specify the model number as D4E-1A23LN.

Internal Circuit



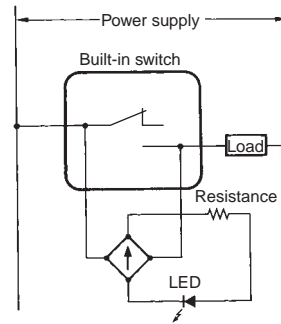
DC Operation

LED indicator is provided.

As a rectifier stack is incorporated, into the unit and no directionality exists for connection of + and -, this type can also be operated on AC.

Voltage ratings of LED indicators are as shown in the table below.

Internal Circuit



Type	Voltage rating	Lamp current	Internal resistance
L2	24 V	Approx. 1.2 mA	18 kΩ

Example:

When ordering a D4E DC Model, add the following suffix to the model number.

Basic Model: The model number of the D4E-1A23N with a built-in 24-V LED indicator is D4E-1A23L2N.

Precautions

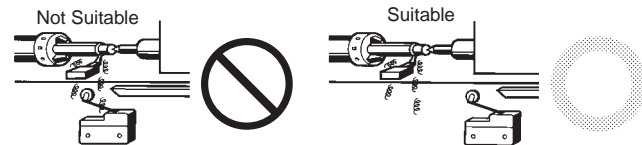
Refer to the "Precautions for General-purpose Limit Switches (Including Multiple Limit Switches, Mechanical Touch Switches, High-precision Switches, Touch Switches, On-site Flexible Switches; Not Including Safety Switches)" on page 17.

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.



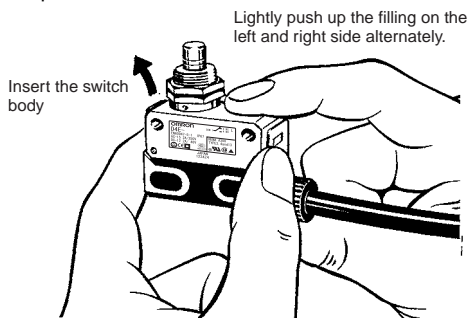
Constantly subjecting a Switch to vibration or shock can result in wear, which can lead to contact interference with contacts, operation failure, reduced durability, and other problems. Excessive vibration or shock can lead to false contact operation or damage. Install Switches in locations not subject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

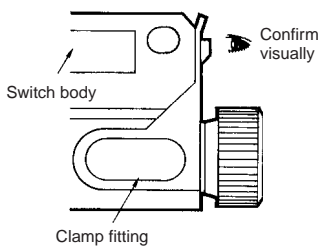
Do not solder the screw terminals.

Sealing materials may deteriorate when used outdoors or when exposed to cutting oil, solvents, or chemicals. Check this on actual equipment and, if deterioration is foreseen, consult your OMRON representative in advance.

If the one-touch connector is to be mounted onto the switch body, lightly push up the fitting so that the switch body can then be inserted into the clamp.



Be sure that the clamp is inserted to the full depth, because the Switch will not function properly if one of the clamps is improperly inserted.



If the clamp is properly inserted up to the full depth, it will not slide out easily. Be sure to carefully confirm all the above items.

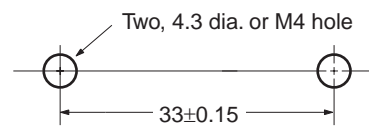
Be sure to connect a fuse with a breaking current 1.5 to 2 times the rated current to the Limit Switch in series in order to protect the Limit Switch from damage due to short-circuiting.

When using the Limit under the EN ratings, use a gl or gG 10-A fuse that conforms to IEC269.

Mounting

Secure the Switch with two M4 screws and washers. The tightening torque applied to each terminal must be 1.18 to 1.37 N·m. Tighten the screws to the specified torque. An excessive tightening torque may damage the Switch and cause a malfunction.

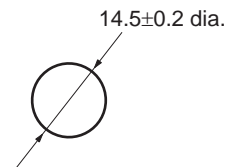
Mounting Holes



When mounting the panel mount-type Switch with screws on a side surface, remove the hexagonal nuts from the actuator.

When mounting the panel mount type on a panel, tighten the hexagonal nuts of the actuator to a torque less than 7.85 N·m.

Mounting Hole



Operating method, shape of cam or dog, operating frequency, and the overtravel (OT) have significant effect on the service life and precision of the Limit Switch. Make sure that the shape of the cam is smooth enough.

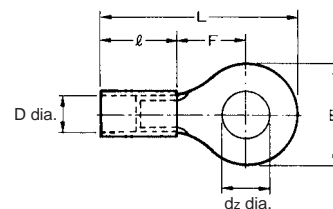
Check that OT has a sufficient margin. The actual OT should be rated OT x 0.7 to 1.

Do not change the operating position by remodeling the actuator.

Wiring

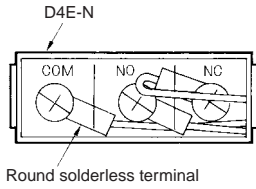
When wiring screw terminals, M3-size round solderless terminals with an insulation tube is recommended. The conductor size should be 0.75 mm² and cable diameter should be 7 mm.

Refer to the following when wiring.



dz dia.:	3.2
D dia.:	1.9
B:	5.2
L:	16.4
F:	5.8
l:	8.0 (mm)

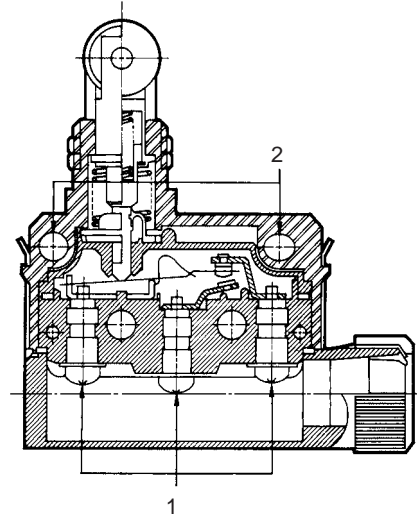
Wiring Method



Tightening Torque

A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

No.	Type	Torque
1	Terminal screw (M3)	0.24 to 0.44 N·m
2	Switch mounting screw (M4)	1.18 to 1.37 N·m



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