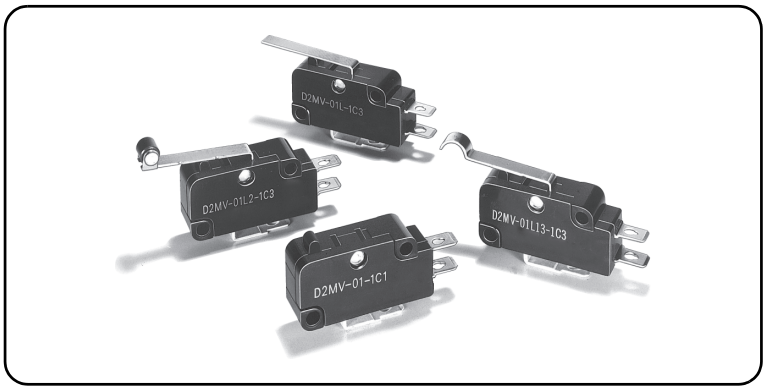
D2MV

Miniature Basic Switch

Highly reliable Miniature Basic Switch in spite of its Ultra-low Load action

- **Twin crossbar contact employed for exceptionally high contact reliability.**
- **Unique internal mechanism that ensures high contact reliability even in micro load operations. Applicable for detection of light objects.**

RoHS Compliant



Model Number Legend

D2MV-[1][2]-[3][4][5]

1. Ratings
1: 125 VAC 1A
01: 30 VDC 0.1A

2. Actuator
None : Pin plunger
L11 : Short hinge lever
L : Hinge lever
L111 : Long Hinge Lever
L13 : Simulated roller lever
L22 : Short hinge roller Lever
L2 : Hinge roller Lever

3. Contact form
1: SPDT

4. Terminals
C: Solder terminals

5. Maximum Operating Force (OF)
1: 0.10 N {10 gf} (for pin plunger models only)
2: 0.25 N {25 gf} (for pin plunger models only)
3: 0.49 N {50 gf}

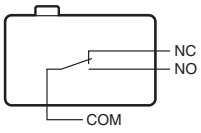
Note. These values are for the pin plunger models.

List of Models

Actuator	Ratings Max. Operating Force (OF)	1A	0.1A
Pin plunger	0.10 N {10 gf}	**D2MV-1-1C1**	**D2MV-01-1C1**
	0.25 N {25 gf}	**D2MV-1-1C2**	**D2MV-01-1C2**
	0.49 N {50 gf}	**D2MV-1-1C3**	**D2MV-01-1C3**
Short hinge lever	0.49 N {50 gf}	**D2MV-1L11-1C3**	**D2MV-01L11-1C3**
Hinge lever	0.29 N {30 gf}	**D2MV-1L-1C3**	**D2MV-01L-1C3**
Long hinge lever	0.15 N {15 gf}	**D2MV-1L111-1C3**	**D2MV-01L111-1C3**
Simulated roller lever	0.29 N {30 gf}	**D2MV-1L13-1C3**	**D2MV-01L13-1C3**
Short hinge roller lever	0.49 N {50 gf}	**D2MV-1L22-1C3**	**D2MV-01L22-1C3**
Hinge roller lever	0.29 N {30 gf}	**D2MV-1L2-1C3**	**D2MV-01L2-1C3**

Contact Form

●SPDT



Separator (Sold Separately), Actuator (Sold Separately), Terminal Connector (Sold Separately) ➡ Refer to **"Basic Switch Common Accessories"**

Contact Specifications

Item	Model	D2MV-1 models	D2MV-01 models
Contact	Specification	Needle	Twin crossbar
	Material	Silver	Gold alloy
	Gap (standard value)	0.5 mm	
Inrush current	NC	–	
	NO		
Minimum applicable load (reference value) *		5 VDC 30mA	5 VDC 1mA

* Please refer to "●**Using Micro Loads**" in "**Precautions**" for more information on the minimum applicable load.

Ratings

Model / Rated voltage / Item	D2MV-1 models	D2MV-01 models
	Resistive load	
125 VAC	1A	0.1A
30 VDC	1A	0.1A

Note. The above rating values apply under the following test conditions.
(1) Ambient temperature: 20±2°C
(2) Ambient humidity: 65±5%
(3) Operating frequency: 30 operations/min

Approved Safety Standard

UL (UL61058-1)/cUL (CSA C22.2 No.61058-1)

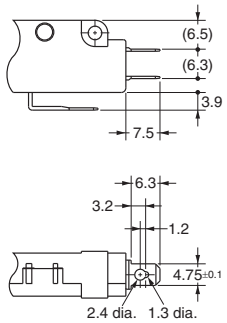
Rated voltage / Model	D2MV-1	D2MV-01
125 VAC	1A	0.1A
30 VDC	1A	0.1A

Characteristics

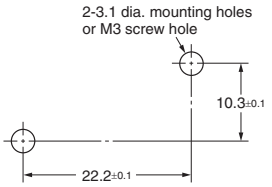
Item			Model	D2MV-1 models	D2MV-01 models
Permissible operating speed				1 mm to 1 m/s (for pin plunger models)	
Permissible operating frequency	Mechanical			300 operations/min (for pin plunger models)	
	Electrical			60 operations/min	
Insulation resistance				100MΩ min. (at 500 VDC with insulation tester)	
Contact resistance (initial value)				30 mΩ max.	50 mΩ max.
Dielectric strength * 1	Between terminals of the same polarity			1,000 VAC 50/60 Hz 1min	
	Between current-carrying metal parts and ground			1,500 VAC 50/60 Hz 1min	
	Between each terminal and non-current-carrying metal parts			1,500 VAC 50/60 Hz 1min	
Vibration resistance * 2	Malfunction			10 to 55 Hz, 1.5 mm double amplitude	
Shock resistance	Durability	Models with OF of 0.10N		150 m/s² {approx. 15G} max.	
		Models with OF between 0.25 to 0.49N		400 m/s² {approx. 40G} max.	
	Malfunction * 2			100 m/s² {approx. 10G} max.	
Durability * 3	Mechanical			10,000,000 operations min. (60 operations/min)	
	Electrical			500,000 operations min. (30 operations/min)	1,000,000 operations min. (30 operations/min)
Degree of protection				IEC IP40	
Ambient operating temperature				–25°C to +80°C (at ambient humidity of 60% max.) (with no icing or condensation)	
Ambient operating humidity				85% max. (for +5°C to +35°C)	
Weight				Approx. 6g (pin plunger models)	

Note. The data given above are initial values.
*1. The values for dielectric strength shown are for models with a Separator (refer to "**Micro Switch Common Accessories**").
*2. The values are at Free Position and Total Travel Position values for pin plunger, and Total Travel Position value for lever. Close or open circuit of the contact is 1ms max.

Terminals/Appearances (Unit:mm)

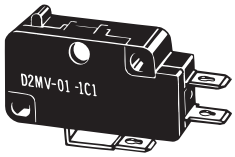


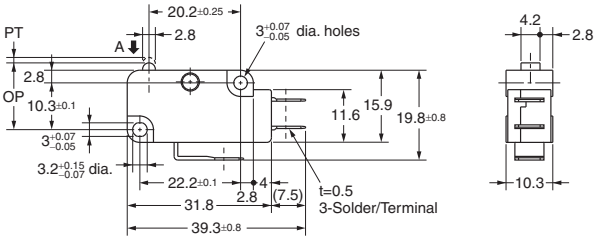
Mounting Holes (Unit: mm)



Dimensions (Unit: mm) /Operating Characteristics

●Pin plunger Models
D2MV-1-1C□
D2MV-01-1C□

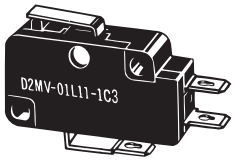


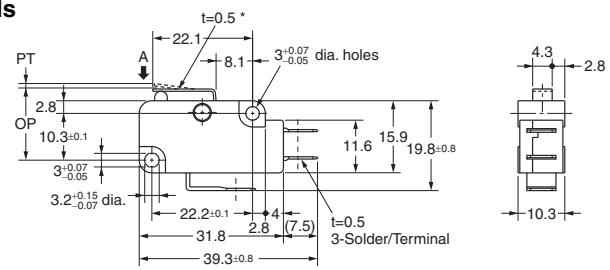


Operating characteristics	Model	D2MV-1-1C1 D2MV-01-1C1	D2MV-1-1C2 D2MV-01-1C2	D2MV-1-1C3 D2MV-01-1C3
Operating Force Releasing Force	OF Max. RF Min.	0.10N {10 gf} 0.005N {0.5 gf}	0.25N {25 gf} 0.01N {1 gf}	0.49N {50 gf} 0.02N {2 gf}
Pretravel Overtravel Movement Differential	PT Max. OT Min. MD Max.	1.2 mm 1.3 mm 0.25 mm		
Operating Position	OP	14.7±0.4 mm		

Note. The □ in the model number is for the OF code.

●Short Hinge Lever Models
D2MV-1L11-1C3
D2MV-01L11-1C3



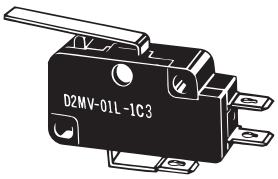


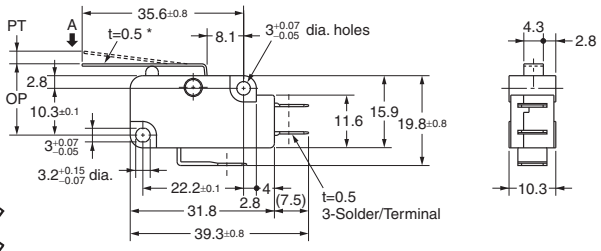
* Stainless-steel lever

Operating characteristics	Model	D2MV-1L11-1C3 D2MV-01L11-1C3
Operating Force Releasing Force	OF Max. RF Min.	0.49N {50 gf} 0.04N {4 gf} (reference value)
Pretravel Overtravel Movement Differential	PT Max. OT Min. MD Max.	1.7 mm 1.0 mm 0.4 mm
Operating Position	OP	15.2±0.5 mm

Note. The indicated reference values of RF are for cases where the lever weight is not applied to the plunger.

●Hinge Lever Models
D2MV-1L-1C3
D2MV-01L-1C3



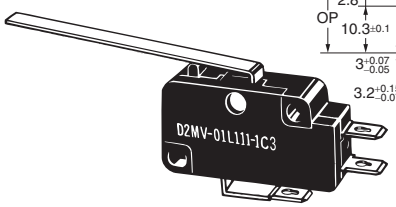


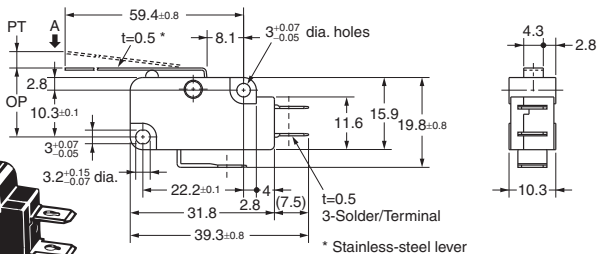
* Stainless-steel lever

Operating characteristics	Model	D2MV-1L-1C3 D2MV-01L-1C3
Operating Force Releasing Force	OF Max. RF Min.	0.29N {30 gf} 0.02N {2 gf} (reference value)
Pretravel Overtravel Movement Differential	PT Max. OT Min. MD Max.	3.3 mm 2.1 mm 0.7 mm
Operating Position	OP	15.2±1.2 mm

Note. The indicated reference values of RF are for cases where the lever weight is not applied to the plunger.

●Long Hinge Lever Models
D2MV-1L111-1C3
D2MV-01L111-1C3



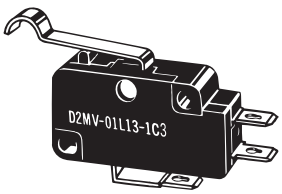


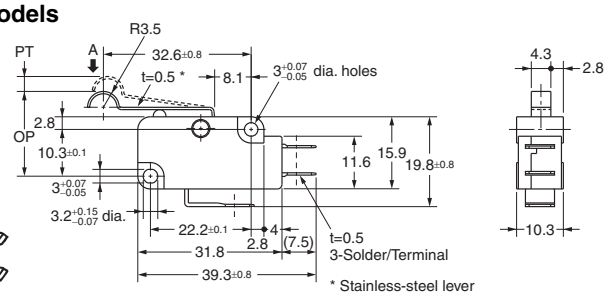
* Stainless-steel lever

Operating characteristics	Model	D2MV-1L111-1C3 D2MV-01L111-1C3
Operating Force Releasing Force	OF Max. RF Min.	0.15N {15 gf} 0.01N {1 gf} (reference value)
Pretravel Overtravel Movement Differential	PT Max. OT Min. MD Max.	6.0 mm 4.0 mm 1.4 mm
Operating Position	OP	15.2±2.6 mm

Note. The indicated reference values of RF are for cases where the lever weight is not applied to the plunger.

●Simulated Roller Lever Models
D2MV-1L13-1C3
D2MV-01L13-1C3





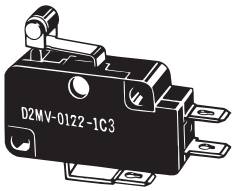
* Stainless-steel lever

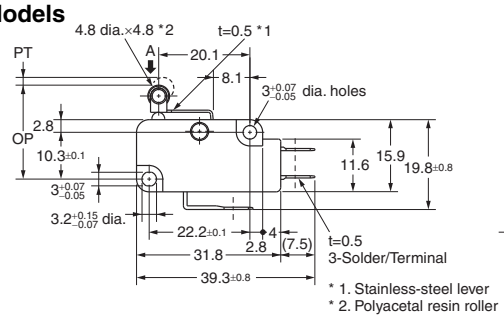
Operating characteristics	Model	D2MV-1L13-1C3 D2MV-01L13-1C3
Operating Force Releasing Force	OF Max. RF Min.	0.29N {30 gf} 0.02N {2 gf} (reference value)
Pretravel Overtravel Movement Differential	PT Max. OT Min. MD Max.	3.3 mm 1.9 mm 0.7 mm
Operating Position	OP	18.7±1.2 mm

Note. The indicated reference values of RF are for cases where the lever weight is not applied to the plunger.

Note 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
Note 2. The operating characteristics are for operation in the A direction (⬇).

●Short Hinge Roller Lever Models
D2MV-1L22-1C3
D2MV-01L22-1C3

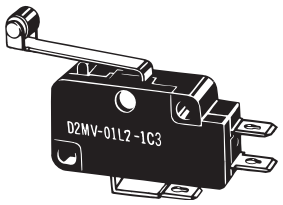


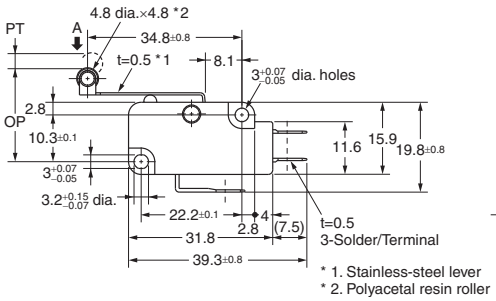


Operating characteristics	Model	D2MV-1L22-1C3 D2MV-01L22-1C3
Operating Force Releasing Force	OF Max. RF Min.	0.49N {50 gf} 0.04N {4 gf} (reference value)
Pretravel Overtravel Movement Differential	PT Max. OT Min. MD Max.	1.7 mm 1.0 mm 0.4 mm
Operating Position	OP	20.7±0.6 mm

Note. The indicated reference values of RF are for cases where the lever weight is not applied to the plunger.

●Hinge Roller Lever Models
D2MV-1L2-1C3
D2MV-01L2-1C3





Operating characteristics	Model	D2MV-1L2-1C3 D2MV-01L2-1C3
Operating Force Releasing Force	OF Max. RF Min.	0.29N {30 gf} 0.02N {2 gf} (reference value)
Pretravel Overtravel Movement Differential	PT Max. OT Min. MD Max.	3.3 mm 2.1 mm 0.7 mm
Operating Position	OP	20.7±1.2 mm

Note. The indicated reference values of RF are for cases where the lever weight is not applied to the plunger.

Note 1. Unless otherwise specified, a tolerance of ±0.4mm applies to all dimensions.
Note 2. The operating characteristics are for operation in the A direction (⬇).

Precautions

★Please refer to "Basic Switches Common Precautions" for correct use.

Cautions

●Handling
Do not apply excessive shock. Doing so may cause damage to the Switch's internal components because they designed for a small load.

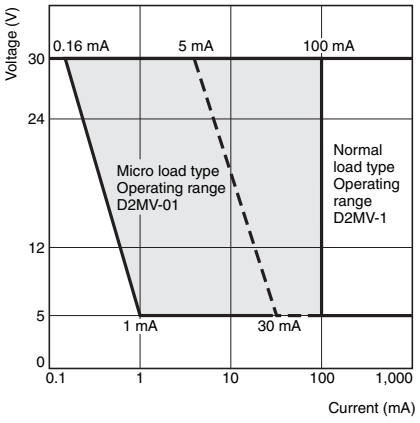
●Soldering
- Terminal connections
  Complete the soldering at the iron tip temperature between 250 to 350°C (60W) within 5 seconds, and do not apply any external force for 1 minute after soldering.
  Apply minimum amount of flux required. It may result in contact failure once the flux penetrates into the internal part of the Switch.

Correct Use

●Mounting
Use M3 mounting screw with plane washers or spring washers to securely mount the Switch. Tighten the screws to a torque of 0.39 to 0.59 N·m {4 to 6 kgf·cm}.

●Mounting Direction
For a Switch with an actuator, mount the Switch in a direction where the actuator weight will not be applied to the Switch. Since the Switch is designed for a low operating force, its release force is low. Therefore, release failure may occur if unnecessary force is applied to the Switch.

●Using Micro Loads
Using a model for ordinary loads to open or close the contact of a micro load circuit may result in faulty contact. Use models that operate in the following range. However, even when using micro load models within the following operating range, if inrush current occurs when the contact is opened or closed, it may increase the contact wear and so decrease durability. Therefore, insert a contact protection circuit where necessary. The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ_{60}).
(JIS C5003)
The equation, $\lambda_{60}=0.5\times10^{-6}$/ operations indicates that the estimated malfunction rate is less than $\frac{1}{2{,}000{,}000}$ operations with a reliability level of 60%.



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Cat. No. B018-E1-10
0322 (0207)