

Miniature Basic Switch with Low Operating Force and High Contact Reliability

- Wide variation extends from micro load to 5A switching current, with shapes identical to those of the V-series Miniature Basic Switch.
- A unique internal mechanism enables high contact strength with low operating force. Can be used for detecting lightweight objects.

RoHS Compliant



Ordering Information

■ Model Number Legend

VX-

□	□	-	□	□	□
1	2		3	4	5

1. Ratings

- 5: 5 A at 250 VAC
- 01: 0.1 A at 30 VDC

2. Actuator

- None: Pin plunger
- 1: Short hinge lever
- 2: Hinge lever
- 3: Long hinge lever
- 4: Simulated roller lever
- 5: Short hinge roller lever
- 6: Hinge roller lever

3. Contact Form

- 1: SPDT
- 2: SPST-NC
- 3: SPST-NO

4. Terminals








- A: Solder terminals
- C2: Quick-connect terminals (#187)

5. Maximum Operating Force

- 2: OF 0.25 N {25 gf}
- 3: OF 0.49 N {50 gf}

Note: These values are for the pin plunger models.

■ List of Models

Actuator	Terminals (see note)	OF max.	Model	
			5 A	0.1 A
Pin plunger 	A	0.25 N {25 gf}	VX-5-1A2	VX-01-1A2
		0.49 N {50 gf}	VX-5-1A3	VX-01-1A3
	C2	0.25 N {25 gf}	VX-5-1C22	VX-01-1C22
		0.49 N {50 gf}	VX-5-1C23	VX-01-1C23
Short hinge lever 	A	0.49 N {50 gf}	VX-51-1A3	VX-011-1A3
	C2		VX-51-1C23	VX-011-1C23
Hinge Lever 	A	0.29 N {30 gf}	VX-52-1A3	VX-012-1A3
	C2		VX-52-1C23	VX-012-1C23
Long hinge lever 	A	0.20 N {20 gf}	VX-53-1A3	VX-013-1A3
	C2		VX-53-1C23	VX-013-1C23
Simulated roller lever 	A	0.29 N {30 gf}	VX-54-1A3	VX-014-1A3
	C2		VX-54-1C23	VX-014-1C23
Short hinge roller lever 	A	0.59 N {60 gf}	VX-55-1A3	VX-015-1A3
	C2		VX-55-1C23	VX-015-1C23
Hinge roller lever 	A	0.29 N {30 gf}	VX-56-1A3	VX-016-1A3
	C2		VX-56-1C23	VX-016-1C23

Note: 1. Contact your OMRON sales representative for details on SPST-NO and SPST-NC models.

2. Terminals A: Solder terminals
C2: Quick-connect terminals (#187)

Specifications

■ Ratings

Model	Item	Resistive load
	Rated voltage	
VX-5	250 VAC	5 A
VX-01	125 VAC	0.1 A
	30 VDC	0.1 A

Note: The ratings values apply under the following test conditions:

Ambient temperature: 20±2°C

Ambient humidity: 65±5%

Operating frequency: 30 operations/min

■ Characteristics

Item	VX-5	VX-01
Operating speed	0.1 mm to 1 m/s (pin plunger models)	
Operating frequency	Mechanical: 600 operations/min max. (pin plunger models) Electrical: 60 operations/min max.	
Insulation resistance	100 MΩ min. (at 500 VDC)	
Contact resistance (initial value)	30 mΩ max.	50 mΩ max.
Dielectric strength (see note 2)	1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground 1,500 VAC, 50/60 Hz for 1 min between each terminal and non-current-carrying metal parts	
Vibration resistance (see note 3)	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude	
Shock resistance (see note 3)	Destruction: 400 m/s ² {approx. 40G} max. Malfunction: 100 m/s ² {approx. 10G} max.	
Durability (see note 4)	Mechanical: 50,000,000 operations min. (60 operations/min) Electrical: 500,000 operations min. (30 operations/min)	Mechanical: 10,000,000 operations min. (60 operations/min) Electrical: 1,000,000 operations min. (30 operations/min)
Degree of protection	IEC IP40	
Degree of protection against electric shock	Class I	
Proof tracking index (PTI)	175	
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. 6.2 g (pin plunger models)	

Note: 1. The data given above are initial values.

2. The value for dielectric strength shown is for models with a Separator.

3. For the pin plunger models, the above values apply for use at both the free position and total travel position. For the lever models, they apply at the total travel position. Contact opening or closing time is within 1 ms.

4. For testing conditions, contact your OMRON sales representative.

■ Approved Standards

Consult your OMRON sales representative for specific models with standard approvals.

UL1054 (File No. E41515)/CSA C22.2 No. 55 (File No. LR21642)

Rated voltage	VX-5	VX-01
125 VAC	5 A	0.1 A
250 VAC	5 A	---
30 VDC	---	0.1 A

EN61058-1 (File No. 124761, VDE approval)

Rated voltage	VX-5	VX-01
125 VAC	5 A	0.1 A
250 VAC	5 A	---

Testing conditions: 5E4 (50,000 operations), T105 (0°C to 105°C)

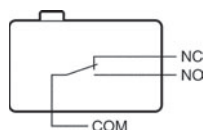
■ Contact Specifications

Item	VX-5	VX-01
Contact	Specification	Rivet
	Material	Silver alloy
	Gap (standard value)	0.5 mm
Inrush current	NC	15 A max.
	NO	---
Minimum applicable load (see note)	160 mA at 5 VDC	1 mA at 5 VDC

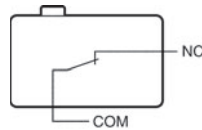
Note: For more information on the minimum applicable load, refer to *Using Micro Loads* on page 6.

■ Contact Form

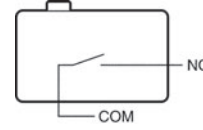
SPDT



SPST-NC



SPST-NO



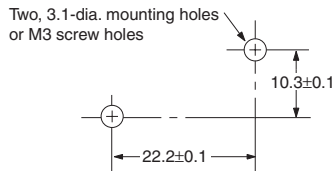
Dimensions

■ Terminals

- Note:** 1. All units are in millimeters unless otherwise indicated.
 2. The following is for the SPDT contact specifications.

Terminal type	Solder terminals (A)	Quick-connect terminals (#187) (C2)
COM bottom position	<p>Three, solder terminals</p>	<p>Three, quick-connect terminals (#187)</p>
Terminal dimensions	<p>Note: The length to the center of the 1.6-dia. holes.</p>	

■ Mounting Holes

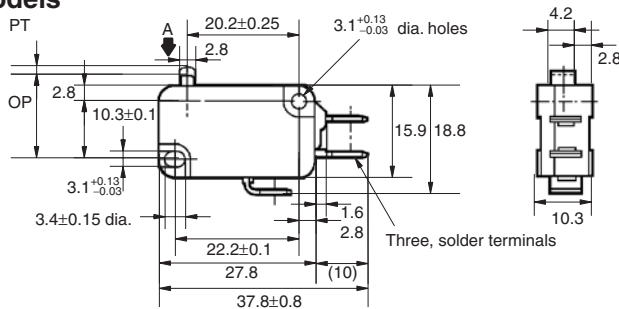
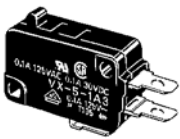


■ Dimensions and Operating Characteristics

- Note:** 1. All units are in millimeters unless otherwise indicated.
 2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
 3. The following illustrations and drawings are for solder terminals (Terminal A). Illustrations for Terminal C2 are omitted. For details, refer to *Terminals*.
 4. The □ in the model number is for the terminal code.
 A: Solder terminals
 C2: Quick-connect terminals (#187)
 5. The operating characteristics are for operation in the A direction (↓).

Pin Plunger Models

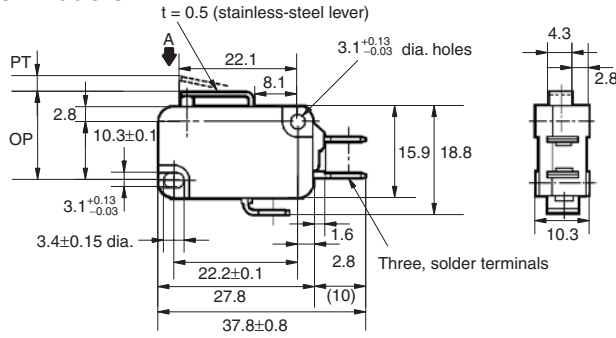
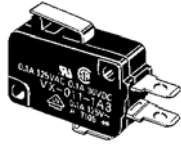
- VX-5-1□2
- VX-5-1□3
- VX-01-1□2
- VX-01-1□3



Model	VX-5-1□2 VX-01-1□2	VX-5-1□3 VX-01-1□3
OF max.	0.25 N {25 gf}	0.49 N {50 gf}
RF min.	0.03 N {3 gf}	0.05 N {5 gf}
PT max.	1.2 mm	
OT min.	1.0 mm	
MD max.	0.3 mm	
OP	14.7±0.4 mm	

Short Hinge Lever Models

VX-51-1□3
VX-011-1□3

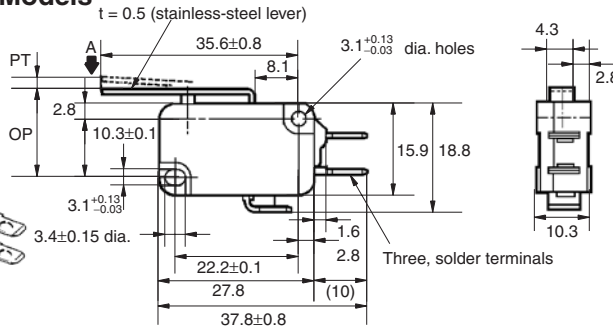
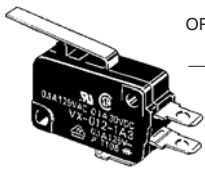


Model	VX-51-1□3	VX-011-1□3
OF max.	0.49 N {50 gf}	
RF min.	0.04 N {4 gf} (reference value)	
PT max.	1.6 mm	
OT min.	0.8 mm	
MD max.	0.5 mm	
OP	15.2±0.5 mm	

Note: The values indicated in parentheses are reference values for cases when the installation direction is such that the lever weight is not applied to the plunger.

Hinge Lever Models

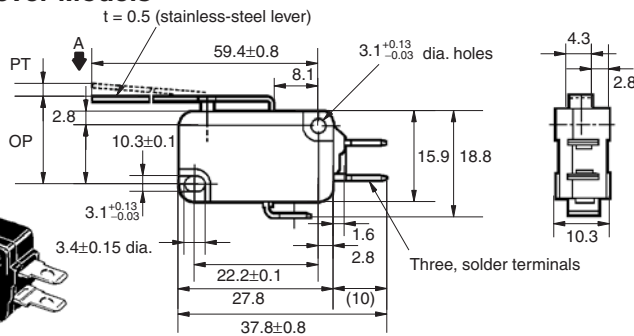
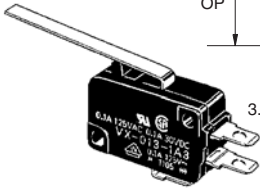
VX-52-1□3
VX-012-1□3



Model	VX-52-1□3	VX-012-1□3
OF max.	0.29 N {30 gf}	
RF min.	---	
PT max.	4.0 mm	
OT min.	1.6 mm	
MD max.	0.8 mm	
OP	15.2±1.2 mm	

Long Hinge Lever Models

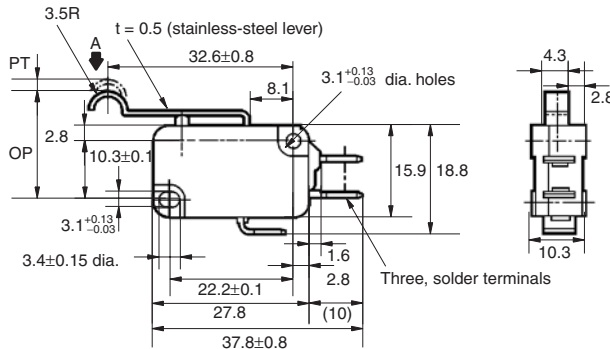
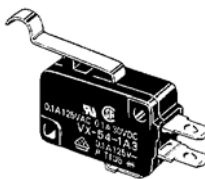
VX-53-1□3
VX-013-1□3



Model	VX-53-1□3	VX-013-1□3
OF max.	0.20 N {20 gf}	
RF min.	---	
PT max.	9.0 mm	
OT min.	3.2 mm	
MD max.	2.0 mm	
OP	15.2±2.6 mm	

Simulated Roller Lever Models

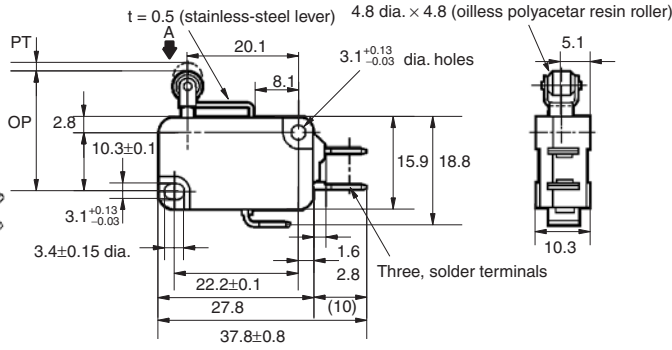
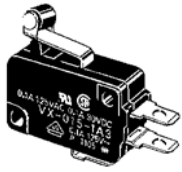
VX-54-1□3
VX-014-1□3



Model	VX-54-1□3	VX-014-1□3
OF max.	0.29 N {30 gf}	
RF min.	0.02 N {2 gf}	
PT max.	4.0 mm	
OT min.	1.6 mm	
MD max.	0.8 mm	
OP	18.7±1.2 mm	

Short Hinge Roller Lever Models

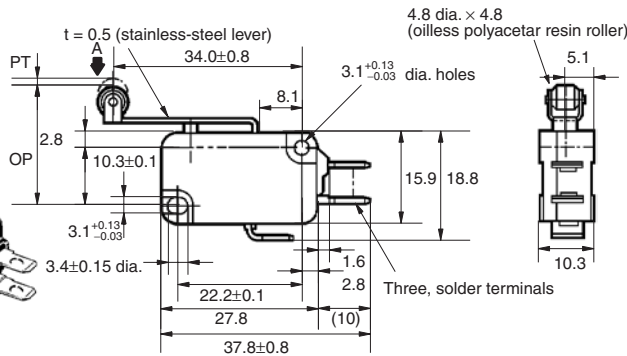
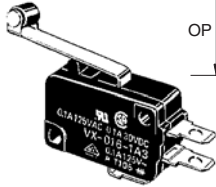
VX-55-1□3
VX-015-1□3



Model	VX-55-1□3	VX-015-1□3
OF max.	0.59 N {60 gf}	
RF min.	0.04 N {4 gf} (reference value)	
PT max.	1.6 mm	
OT min.	0.8 mm	
MD max.	0.5 mm	
OP	20.7±0.6 mm	

Hinge Roller Lever Models

VX-56-1□3
VX-016-1□3



Model	VX-56-1□3	VX-016-1□3
OF max.	0.29 N {30 gf}	
RF min.	---	
PT max.	4.0 mm	
OT min.	1.6 mm	
MD max.	0.8 mm	
OP	20.7±1.2 mm	

Note: The values indicated in parentheses are reference values for cases when the installation direction is such that the lever weight is not applied to the plunger.

Precautions

Refer to *General Information*.

■ **Cautions**

Handling

Be careful not to drop the Switch. Doing so may cause damage to the Switch's internal components because it is designed for a small load.

■ **Correct Use**

Mounting

Use M3 mounting screws 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}.

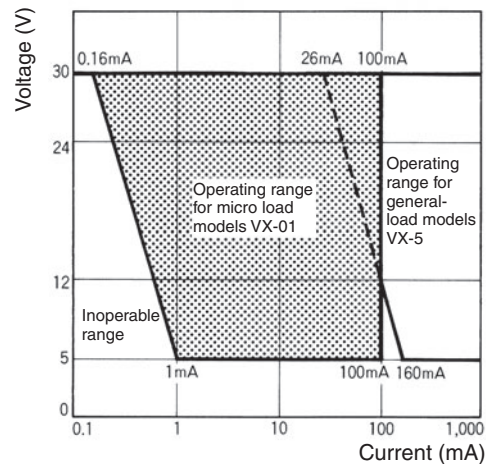
Mounting Direction

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 small load, its resetting force is small. Therefore, resetting failure may occur if unnecessary load 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 operating range shown below, if inrush current occurs when the contact is opened or closed, it may increase 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). The equation, λ 60 = 0.5×10^{-6} /operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



■ Actuator (Sold Separately)

Various Actuators are available as shown on D3V/V/VX/D2MV/
D2RV Common Accessories.

■ Connector (Sold Separately)

Refer to Terminal Connectors.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.