

Small, Lightweight Enclosed Switches

- V-series Switches were placed in diecast cases to provide superior dust resistance and mechanical strength.
- Cam arms and cam roller arms can be set to any position within 360°



Be sure to read *Safety Precautions* on page 4 and *Precautions for All Limit Switches*.

Model Number Legend

Model Number Structure (Some combinations may not be available. Contact your OMRON sales representative for details.)

□VE-10□-□-□
 1 2 3 4

1. Number of Built-in Switches

1: 1

2. Actuator Type

N: Sealed plunger
 CA: Cam arm
 CA2: Cam roller arm

3. Operation Direction (for Arm Actuators Only)

Blank: Plunger
 11: ↺ Counterclockwise operation (one-side operation)
 12: ↻ Clockwise operation (one-side operation)
 13: ↻↺ Operation in both directions (two-side operation)

4. Bushing Type

Blank: Rubber bushing for single-core vinyl cables
 C: Rubber bushing for vinyl cable

Note: For details, refer to *Safety Precautions* on page 4.

Ordering Information

| Actuator type | Operating direction | One built-in switch |
|--------------------|------------------------------|---------------------|
| | | Model |
| Sealed plunger | — | 1VE-10N |
| Cam arm | ↺ Counterclockwise operation | 1VE-10CA-11 |
| | ↻ Clockwise operation | 1VE-10CA-12 |
| | ↻↺ Two-side operation | 1VE-10CA-13 |
| Cam roller arm | ↺ Counterclockwise operation | 1VE-10CA2-11 |
| | ↻ Clockwise operation | 1VE-10CA2-12 |
| | ↻↺ Two-side operation | 1VE-10CA2-13 |

Ratings and Specifications

Ratings

| Rated voltage (V) | Non-inductive load (A) | | | | Inductive load (A) | | | |
|-------------------|------------------------|----|-----------|----|--------------------|----|------------|----|
| | Resistive load | | Lamp load | | Inductive load | | Motor load | |
| | NC | NO | NC | NO | NC | NO | NC | NO |
| 125 AC | 10 | | 2 | | 10 | | 3 | |
| 250 | 10 | | 1.5 | | 10 | | 2 | |
| 8 DC | 10 | | 2 | | 6 | | 6 | |
| 14 | 10 | | 3 | | 6 | | 6 | |
| 30 | 6 | | 3 | | 4 | | 4 | |
| 125 | 0.6 | | 0.1 | | 0.6 | | 0.1 | |
| 250 | 0.3 | | 0.05 | | 0.3 | | 0.05 | |

| | | |
|----------------|----|-----------|
| Inrush current | NC | 24 A max. |
| | NO | 24 A max. |

- Note:**
- The above values are continuous currents.
 - Inductive loads have a power factor of 0.4 or higher (AC) or a time constant of 7 ms or lower (DC).
 - Lamp loads have an inrush current of 10 times the steady-state current.
 - Motor loads have an inrush current of 6 times the steady-state current.

Characteristics

| | | |
|-------------------------------|--|---|
| Degree of protection | IP60 | |
| Durability* | Mechanical | 1,500,000 operations min. |
| | Electrical | 300,000 operations min. (10 A at 250 VAC, resistive load) |
| Operating speed | Sealed plunger: 0.1 mm/s to 0.5 m/s Cam arm: 0.5 mm/s to 0.5 m/s Cam roller arm: 0.5 mm/s to 0.5 m/s | |
| Allowable operating frequency | Mechanical | 120 operations/min. |
| | Electrical | 60 operations/min. |
| Rated frequency | 50/60 Hz | |
| Insulation resistance | 100 MΩ min. (at 500 VDC) | |
| Contact resistance | 15 mΩ max. (initial value) | |
| Dielectric strength | Between terminals of the same polarity | 1,000 VAC at 50/60 Hz for 1 minute |
| | Between each terminal and non-current-carrying parts | 1,500 VAC, 50/60 Hz for 1 minute |
| Vibration resistance | Malfunction: 10 to 55 Hz, 1.5-mm double amplitude | |
| Shock resistance | Destruction: 1,000 m/s ² max., Malfunction: 300 m/s ² max. | |
| Ambient operating temperature | -10°C to 80°C (with no icing) | |
| Ambient operating humidity | 35% to 95% | |
| Weight | Approx. 120 to 170 g | |

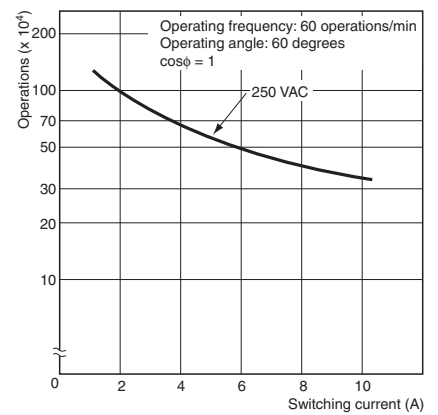
Note: The above values are initial values.

* The 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.

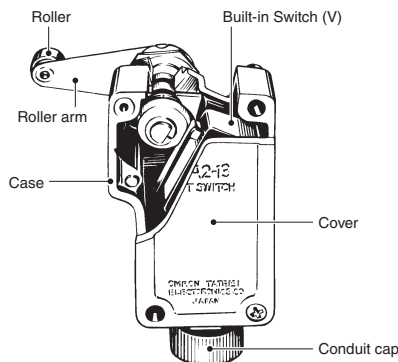
Engineering Data

Switch with Cam Roller Arm Electrical Durability Graph

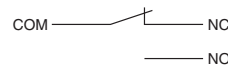


Nomenclature

Structure



Contact Form

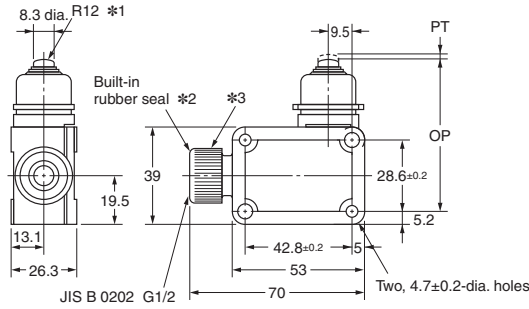
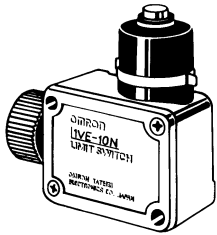


Dimensions/Operating Characteristics The □ in the model numbers is replaced by the operation direction code.

Refer to *Model Number Legend* on page 1 for details.

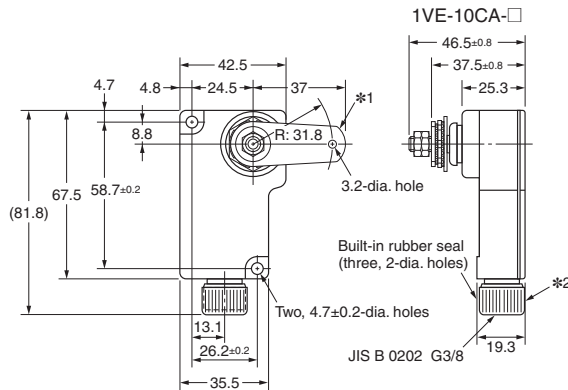
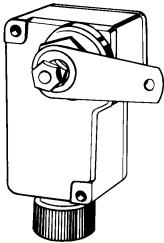
(Unit: mm)

Sealed Plunger 1VE-10N



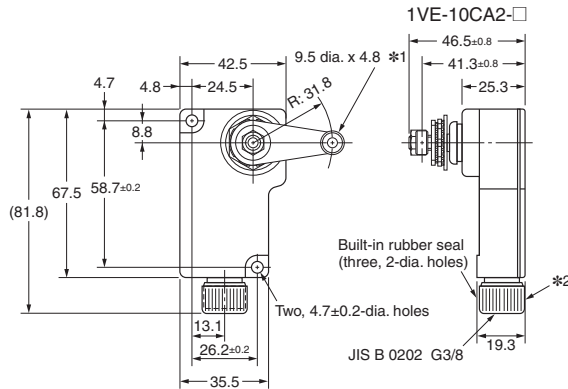
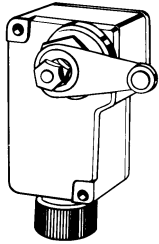
- *1. Stainless steel plunger.
- *2. Three, 2-dia. holes (1VE-10N).
- *3. Conduit cap.

Cam Arm 1VE-10CA-□



- *1. The stainless steel arm can be set to any position within 360°.
- *2. Conduit cap.

Cam Roller Arms 1VE-10CA2-□



- *1. The stainless steel roller arm can be set to any position within 360°.
- *2. Conduit cap.

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

| Operating characteristic | Model | 1VE-10N | 1VE-10CA-□ | 1VE-10CA2-□ |
|--------------------------|---------|------------|------------|-------------|
| Operating force | OF max. | 22.26N | 6.69N | 6.69N |
| Release force | RF min. | 2.23N | 1.12N | 1.12N |
| Pretravel | PT max. | 2mm | 30° | 30° |
| Overtravel | OT min. | 6.3mm | 55° | 55° |
| Movement differential | MD max. | 0.8mm | 10° | 10° |
| Operating position | OP | 61.1±0.8mm | --- | --- |

Safety Precautions

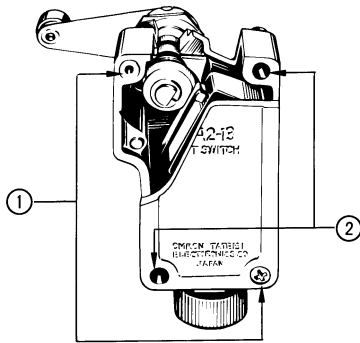
Refer to *Precautions for All Limit Switches* for general precautions.

Precautions for Correct Use

Tightening Torque

If screws are too loose, they can lead to an early malfunction of the Switch, so ensure that all screws are tightened using the correct torque.

| No. | Type | Tightening torque |
|-----|-----------------------|-------------------|
| ① | Cover mounting screws | 0.49 to 0.59 N·m |
| ② | Body clamping screws | 1.18 to 1.37 N·m |



Mounting Hole Dimensions

| 1VE-10CA-□ 1VE-10CA2-□ | 1VE-10N |
|--|--|
| <p>Two, 4.7-dia. or M4 screw holes</p> | <p>Two, 4.7-dia. or M4 screw holes</p> |

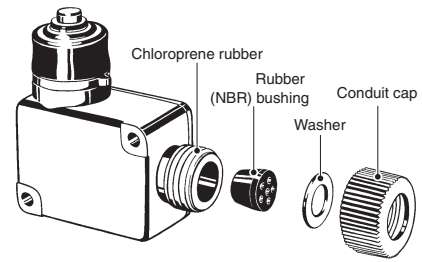
Operation

- The operating method, shape of cam or dog, operating frequency, and overtravel have a significant effect on the durability and precision of the Switch. Make sure that the shape of the cam is smooth enough.
- Check that OT has a sufficient margin. Set the overtravel to between 70% and 100% of the specified overtravel.
- Do not change the operating position by remodeling the actuator.

Wiring

- When routing wires into the conduit opening, be sure that cuttings and other foreign matter do not enter the Switch.
- 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.
- Refer to the following table for the cable connection method.

Conduit Part: 1VE-10N



| Cable type Item | Single-core, vinyl cables | Vinyl cabtire cable |
|---|--|--|
| Cable outlet | | |
| Accessories for Cable Connection | Rubber bushing, conduit cap, and washer | Rubber bushing, conduit cap, and washer |
| Connected cable specifications and dimensions | JIS C 3306 Finished OD: 2.6 to 3.4 mm | JIS C 3306 Finished OD: 6.6 to 7.6 mm |
| Resistance to water drops | High: The conduit cap can be tightened securely when connecting the cables without gaps resulting from twisting or other causes. | Good: Sealing is achieved by using a cable with diameter that is the same as or slightly larger than the inner diameter of the rubber bushing. |

Note: The accessories for the single-core vinyl cables are included as standard features. Ask your OMRON representative for details on vinyl cabtire cables (models that contain -C at the end).

* Bushing Types

| Model | 1VE-10N | 1VE-10CA-□ 1VE-10CA2-□ | Remarks |
|-------------------------------|---------|---------------------------|--|
| Type | | | |
| For single-core, vinyl cables | | | Standard product There is no -C at the end of the model number. |
| For vinyl cabtire cable | | | There is a -C at the end of the model number. |

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