Switch

Products Features

Miniature Basic Switch
V

Reliable Basic Switches in a Wide Variation

- Wide variation of best-selling microswitches with switching currents of 10 to 21 A.
- Can be used for interrupting current when doors are opened or closed.
- Available in two types of cases: thermoplastic resin and thermosetting resin.



Ordering Information

General-purpose Models

(Only standard combinations of terminal availability are shown.)

Thermoplastic Case

Actuator	COM terminal position	Contact form	Terminals (see note)	21 A (OF: 3.92 N {400 gf})		
				Without barrier	Right-hand barrier	Left-hand barrier
Pin plunger	Bottom	SPDT	C	V-21-1C6	V-21-1CR6	V-21-1CL6
		SPST-NC		V-21-2C6	V-21-2CR6	V-21-2CL6
		SPST-NO		V-21-3C6	V-21-3CR6	V-21-3CL6
Short hinge lever		SPDT		V-211-1C6	V-211-1CR6	V-211-1CL6
Hinge lever				V-212-1C6	V-212-1CR6	V-212-1CL6
Long hinge lever				V-213-1C6	V-213-1CR6	V-213-1CL6
Simulated roller lever				V-214-1C6	V-214-1CR6	V-214-1CL6
Short hinge roller lever				V-215-1C6	V-215-1CR6	V-215-1CL6
Hinge roller lever				V-216-1C6	V-216-1CR6	V-216-1CL6

Note: C: Quick-connect terminals (#250)

Actuator	COM terminal position	Contact form	Terminals (see note)	16 A (OF: 1.96 N {200 gf})		
				Without barrier	Right-hand barrier	Left-hand barrier

Pin plunger	Bottom	SPDT	A	V-16-1A5	V-16-1AR5	V-16-1AL5
			C2	V-16-1C25	V-16-1C2R5	V-16-1C2L5
			C	V-16-1C5	---	---
		SPST-NC	A	V-16-2A5	V-16-2AR5	V-16-2AL5
			C2	V-16-2C25	V-16-2C2R5	V-16-2C2L5
			C	V-16-2C5	---	---
		SPST-NO	A	V-16-3A5	V-16-3AR5	V-16-3AL5
			C2	V-16-3C25	V-16-3C2R5	V-16-3C2L5
			C	V-16-3C5	---	---
Short hinge lever 		SPDT	A	V-161-1A5	V-161-1AR5	V-161-1AL5
			C2	V-161-1C25	V-161-1C2R5	V-161-1C2L5
			C	V-161-1C5	---	---
Hinge lever 			A	V-162-1A5	V-162-1AR5	V-162-1AL5
			C2	V-162-1C25	V-162-1C2R5	V-162-1C2L5
			C	V-162-1C5	---	---
Long hinge lever 			A	V-163-1A5	V-163-1AR5	V-163-1AL5
			C2	V-163-1C25	V-163-1C2R5	V-163-1C2L5
			C	V-163-1C5	---	---
Simulated roller lever 			A	V-164-1A5	V-164-1AR5	V-164-1AL5
			C2	V-164-1C25	V-164-1C2R5	V-164-1C2L5
			C	V-164-1C5	---	---
Short hinge roller lever 			A	V-165-1A5	V-165-1AR5	V-165-1AL5
			C2	V-165-1C25	V-165-1C2R5	V-165-1C2L5
			C	V-165-1C5	---	---
Hinge roller lever 			A	V-166-1A5	V-166-1AR5	V-166-1AL5
			C2	V-166-1C25	V-166-1C2R5	V-166-1C2L5
			C	V-166-1C5	---	---

Note: A: Solder/quick-connect terminals (#187)
C2: Quick-connect terminals (#187)
C: Quick-connect terminals (#250)

Actuator	COM terminal position	Contact form	Terminals (see note)	11 A (OF: 0.98 N {100 gf})
				Without barrier 
Pin plunger	Bottom	SPDT	A	V-11-1A4

	C2	V-11-1C24
	C	V-11-1C4
Short hinge lever	A	V-111-1A4
	C2	V-111-1C24
	C	V-111-1C4
Hinge lever	A	V-112-1A4
	C2	V-112-1C24
	C	V-112-1C4
Long hinge lever	A	V-113-1A4
	C2	V-113-1C24
	C	V-113-1C4
Simulated roller lever	A	V-114-1A4
	C2	V-114-1C24
	C	V-114-1C4
Short hinge roller lever	A	V-115-1A4
	C2	V-115-1C24
	C	V-115-1C4
Hinge roller lever	A	V-116-1A4
	C2	V-116-1C24
	C	V-116-1C4

Note: A: Solder/quick-connect terminals (#187)
C2: Quick-connect terminals (#187)
C: Quick-connect terminals (#250)

Thermosetting Case

Actuator	COM terminal position	Contact form	Terminals (see note1)	15 A	10 A	
				OF: 1.96 N {200 gf}	OF: 1.96 N {200 gf}	OF: 0.98 N {100 gf}
Pin plunger	Bottom	SPDT	A	V-15-1A5	V-10-1A5	V-10-1A4
			C2	V-15-1C25	V-10-1C25	V-10-1C24
			B	V-15-1B5	V-10-1B5	V-10-1B4
		SPST-NC	A	V-15-2A5	V-10-2A5	V-10-2A4
			C2	V-15-2C25	V-10-2C25	V-10-2C24
			B	V-15-2B5	V-10-2B5	V-10-2B4
		SPST-NO	A	V-15-3A5	V-10-3A5	V-10-3A4
			C2	V-15-3C25	V-10-3C25	V-10-3C24
			B	V-15-3B5	V-10-3B5	V-10-3B4
	Side	SPDT	A	V-15-4A5	V-10-4A5	V-10-4A4
		SPST-NC		V-15-5A5	V-10-5A5	V-10-5A4
		SPST-NO		V-15-6A5	V-10-6A5	V-10-6A4
Short hinge lever	Bottom	SPDT	A	V-151-1A5	V-101-1A5	V-101-1A4
			C2	V-151-1C25	V-101-1C25	V-101-1C24
			B	V-151-1B5	V-101-1B5	V-101-1B4
Hinge lever			A	V-152-1A5	V-102-1A5	V-102-1A4

		C2	V-152-1C25	V-102-1C25	V-102-1C24
		B	V-152-1B5	V-102-1B5	V-102-1B4
Long hinge lever		A	V-153-1A5	V-103-1A5	V-103-1A4
		C2	V-153-1C25	V-103-1C25	V-103-1C24
		B	V-153-1B5	V-103-1B5	V-103-1B4
Simulated roller lever		A	V-154-1A5	V-104-1A5	V-104-1A4
		C2	V-154-1C25	V-104-1C25	V-104-1C24
		B	V-154-1B5	V-104-1B5	V-104-1B4
Short hinge roller lever		A	V-155-1A5	V-105-1A5	V-105-1A4
		C2	V-155-1C25	V-105-1C25	V-105-1C24
		B	V-155-1B5	V-105-1B5	V-105-1B4
Hinge roller lever		A	V-156-1A5	V-106-1A5	V-106-1A4
		C2	V-156-1C25	V-106-1C25	V-106-1C24
		B	V-156-1B5	V-106-1B5	V-106-1B4

Note: 1. A: Solder/quick-connect terminals (#187)
C2: Quick-connect terminals (#187)
B: Screw terminals
2. OF values shown in the table are for the pin plunger models.

Heat Resistant Models (Up to 150ºC)

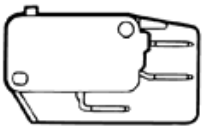
Actuator	COM terminal position	Contact specifications	Terminal specification	15A OF: 1.96 N {200 gf}	10A OF: 0.98 N {100 gf}
Pin plunger 	Bottom	SPDT	Solder / Quick connect terminal (#187) (A)	V-15-1A5-T	V-10-1A4-T
Short hinge lever				V-151-1A5-T	V-101-1A4-T
 Hinge lever				V-152-1A5-T	V-102-1A4-T
 Long hinge lever				V-153-1A5-T	V-103-1A4-T
 Simulated roller lever				V-154-1A5-T	V-104-1A4-T
 Short hinge roller lever				V-155-1A5-T	V-105-1A4-T
 Hinge roller				V-156-	V-106-

lever 1A5-T 1A4-T

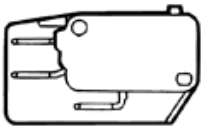


■Barrier (V-21 and V-16 Models Only)

Right-hand Barrier

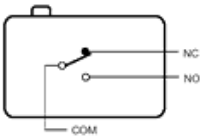


Left-hand Barrier

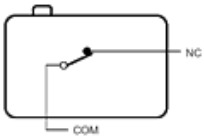


Contact Form

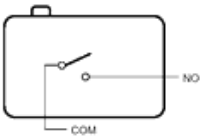
SPDT



SPST-NC



SPST-NO



Switch

Products Features

Miniature Basic Switch
V

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- Wide variation of best-selling microswitches with switching currents of 10 to 21 A.
- Can be used for interrupting current when doors are opened or closed.
- Available in two types of cases: thermoplastic resin and thermosetting resin.



Ratings / Characteristics

Ratings

Type	Rated voltage	Non-inductive load				Inductive laod			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
V-21	250 VAC	21 A		3A		12A		4A	
	8 VDC	21 A		5 A		12 A		7 A	
	30 VDC	14 A		5 A		12 A		5 A	
	125 VDC	0.6 A		0.1 A		0.6 A		0.1 A	
	250 VDC	0.3 A		0.05 A		0.3 A		0.05 A	
V-16	250 VAC	16 A		2 A		10 A		3 A	
	8 VDC	16 A		4 A		10 A		6 A	
	30 VDC	10 A		4 A		10 A		4 A	
	125 VDC	0.6 A		0.1 A		0.6 A		0.1 A	
	250 VDC	0.3 A		0.05 A		0.3 A		0.05 A	
V-15	250 VAC	15 A		2 A		10 A		3 A	
	8 VDC	15 A		4 A		10 A		6 A	
	30 VDC	10 A		4 A		10 A		4 A	
	125 VDC	0.6 A		0.1 A		0.6 A		0.1 A	
	250 VDC	0.3 A		0.05 A		0.3 A		0.05 A	
V-11	250 VAC	11 A		1.5 A		6 A		2 A	
	8 VDC	11 A		3 A		6 A		3 A	
	30 VDC	6 A		3 A		6 A		3 A	
	125 VDC	0.6 A		0.1 A		0.6 A		0.1 A	
	250 VDC	0.3 A		0.05 A		0.3 A		0.05 A	
V-10	250 VAC	10 A		1.5 A		6 A		2 A	
	8 VDC	10 A		3 A		6 A		3 A	
	30 VDC	6 A		3 A		6 A		3 A	
	125 VDC	0.6 A		0.1 A		0.6 A		0.1 A	
	250 VDC	0.3 A		0.05 A		0.3 A		0.05 A	

Note:
1. The above current values are the normal current values of models with a contact gap of 1 mm (gap F), which vary with the normal current values of models with a contact gap of 0.5 mm (gap G).
2. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
3. Lamp load has an inrush current of 10 times the steady-state current.
4. Motor load has an inrush current of 6 times the steady-state current.
5. The ratings values apply under the following test conditions:
   Ambient temperature: 20±2ºC
   Ambient humidity: 65±5%
   Operating frequency: 60 operations/min

Characteristics

Operating speed	0.1 mm to 1 m/s (at pin plunger models)
Operating frequency	Mechanical: 600 operations/min Electrical: 60 operations/min
Insulation resistance	100 MO min. (at 500 VDC)
Contact resistance	15 mO max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity V-21, V-16, and V-11 models: 2,000 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal parts (see note 1) V-15 and V-10 models: 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal parts (see note 1)
Vibration resistance (see note 2)	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance (see note 2)	Destruction: 1,000 m/s^2 {approx. 100G} max. Malfunction: V-21/V-16/V-15: 300 m/s^2 {approx. 30G} max. V-11/V-10: 200 m/s^2 {approx. 20G} max.
Life expectancy (see note 3)	Mechanical: 50,000,000 operations min. Electrical: V-21/V-16/V-15: 100,000 operations min. (V-15 heat resistive: 20,000 operation min.) V-11/V-10: 300,000 operations min. (V-10 heat resistive: 50,000 operation min.)
Degree of protection	IP00
Degree of protection against electric shock	Class I
Proof tracking index (PTI)	175
Ambient temperature	Operating: -25ºC to 80ºC (at ambient humidity of 60% max.) (with no icing) -25ºC to 150ºC for heat-resistive model (at ambient humidity of 60% max.) (with no icing)
Ambient humidity	Operating: 85% max. (for 5ºC to 35ºC)
Weight	Approx. 6.2 g (pin plunger model)

Note:
1. The dielectric strength values shown in the table are for models with a Separator.
2. 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.
3. For testing conditions, contact your OMRON sales representative.

Products Features

Miniature Basic Switch
V

Ordering Information | Ratings / Characteristics | Dimensions

Reliable Basic Switches in a Wide Variation

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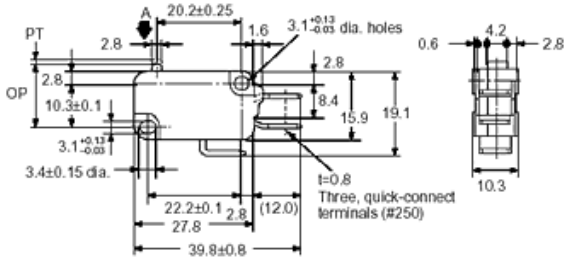


Dimensions

Note: 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
3. The following illustrations and drawings are for quick-connect terminals (#250) (terminals C). V models with a switching current of 16 A or 11 A incorporates terminals A and C2. These models are different from #250 models in terminal size only. Terminals A, C2, and side common terminals are omitted from the following drawings. Refer to Kinds of Terminals on page 107 for these terminals.
4. The □ in the model number is for the terminal code.
5. The operating characteristics are for operation in the A direction (▼).

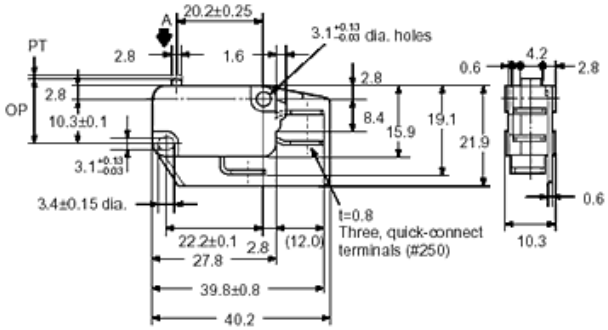
Pin Plunger(Without Barrier)
V-21-1□6
V-16-1□5
V-11-1□4





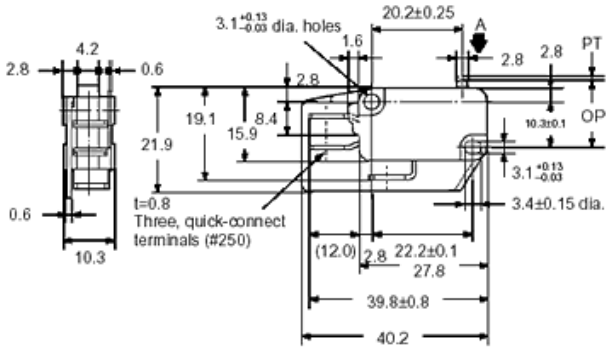
Pin Plunger(With Right-hand Barrier)
V-21-1□R6
V-16-1□R5





Pin Plunger(With Left-hand Barrier)
V-21-1□L6
V-16-1□L5

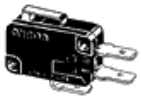


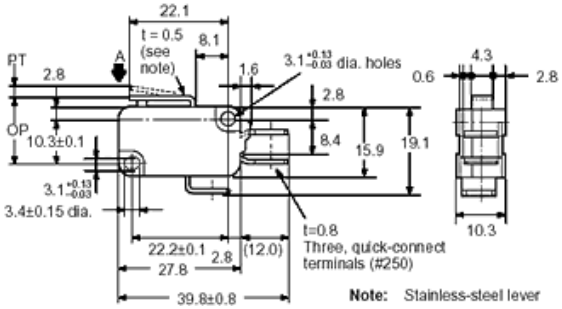


Model	V-21-1□6	V-16-1□5
OF max.	3.92 N {400 gf}	1.96 N {200 gf}
RF min.	0.78 N {80 gf}	0.49 N {50 gf}
PT max.	1.2 mm	
OT min.	1.0 mm	
MD max.	0.4 mm	
OP	14.7±0.4 mm	

Model	V-11-1□4	V-11-1□5
OF max.	0.98 N {100 gf}	1.96 N {200 gf}
RF min.	0.20 N {20 gf}	0.49 N {50 gf}
PT max.	1.2 mm	
OT min.	1.0 mm	
MD max.	0.4 mm	
OP	14.7±0.4 mm	

Short Hinge Lever
V-211-1□6
V-161-1□5
V-111-1□4



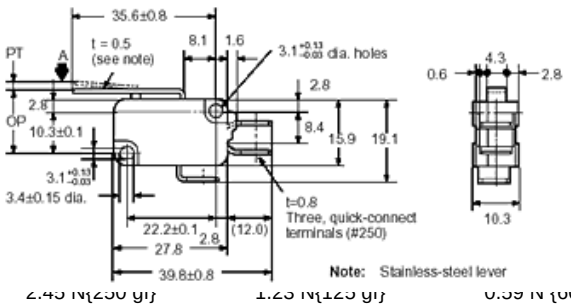


Model	V-211-1□6	V-161-1□5	V-111-1□4
OF max.	3.92 N {400 gf}	1.96 N {200 gf}	0.98 N {100 gf}
RF min.	0.49 N {50 gf}	0.49 N {50 gf}	0.15 N {15 gf}
PT max.	1.6 mm		
OT min.	0.8 mm		
MD max.	0.6 mm		
OP	15.2±0.5 mm		

Hinge Lever

V-212-1□6
V-162-1□5
V-112-1□4





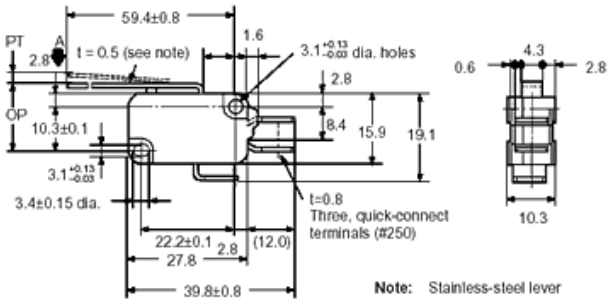
OF max.	2.45 N {250 gf}	1.23 N {125 gf}	0.59 N {60 gf}
RF min.	0.25 N {25 gf}	0.14 N {14 gf}	0.06 N {6 gf}

PT max.	4.0 mm
OT min.	1.6 mm
MD max.	1.5 mm
OP	15.2±1.2 mm

Long Hinge Lever

V-213-1□6
V-163-1□5
V-113-1□4



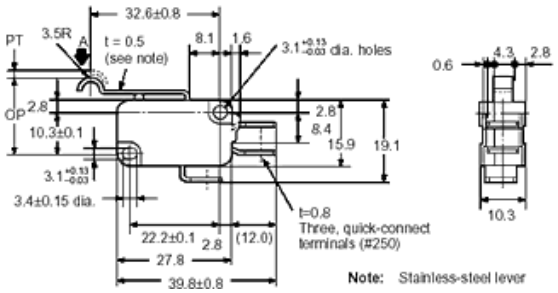


Model	V-213-1□6	V-163-1□5	V-113-1□4
OF max.	1.27 N {130 gf}	0.69 N {70 gf}	0.34 N {35 gf}
RF min.	0.12 N {12 gf}	0.06 N {6 gf}	---
PT max.	9.0 mm		9.0 mm
OT min.	2.0 mm		3.2 mm
MD max.	2.8 mm		2.8 mm
OP	$15.2\pm^{+2.6}_{-3.2}$mm		15.2±2.6 mm

Simulated Roller Lever

V-214-1□6
V-164-1□5
V-114-1□4

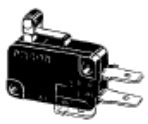


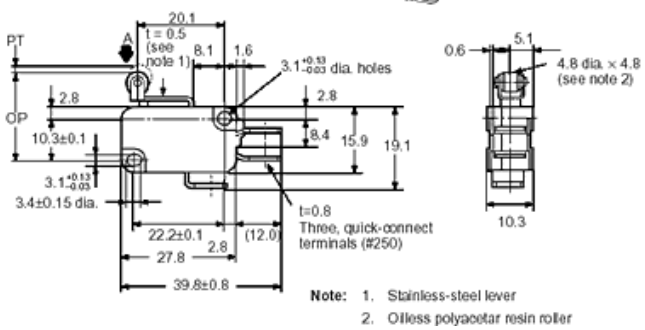


Model	V-214-1□6	V-164-1□5	V-114-1□4
OF max.	2.45 N{250 gf}	1.23 N {125 gf}	0.59 N {60 gf}
RF min.	0.25 N{25 gf}	0.14 N{14 gf}	0.06 N {6 gf}
PT max.	4.0 mm		
OT min.	1.6 mm		
MD max.	1.5 mm		
OP	18.7±1.2 mm		

Short Hinge Roller Lever

V-215-1□6
V-165-1□5
V-115-1□4

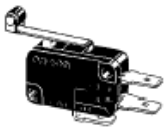


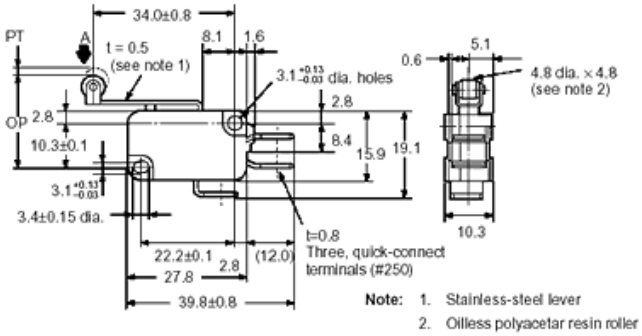


Model	V-215-1□6	V-165-1□5	V-115-1□4
OF max.	4.71 N{480 gf}	2.35 N {240 gf}	1.18 N {120 gf}
RF min.	0.49 N{50 gf}	0.49 N{50 gf}	0.15 N {15 gf}
PT max.	1.6 mm		
OT min.	0.8 mm		
MD max.	0.6 mm		
OP	20.7±0.6 mm		

Hinge Roller Lever

V-216-1□6
V-166-1□5
V-116-1□4





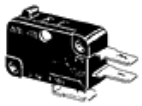
Model	V-216-1□6	V-166-1□5	V-116-1□4
OF max.	2.45 N{250 gf}	1.23 N {125 gf}	0.59 N {60 gf}
RF min.	0.25 N{25 gf}	0.14 N{14 gf}	0.06 N {6 gf}
PT max.	4.0 mm		
OT min.	1.6 mm		
MD max.	1.5 mm		
OP	20.7±1.2 mm		

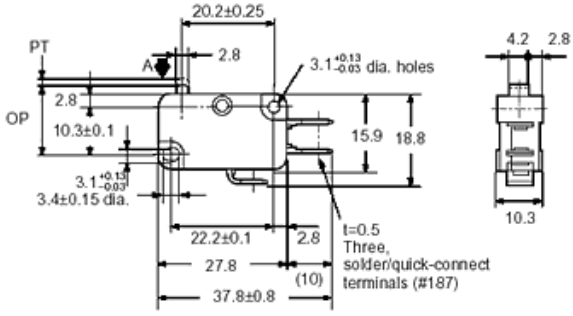
Thermosetting Case(V-15/-10 Models)

The following illustration and drawing are for solder and quick-connect terminals (#187) (terminals A). V models with a switching current of 15 A or 10 A incorporate terminals B or C2. These models are different from #187 models in terminal size only. Refer to Terminals on page 107 for these terminals.

Pin Plunger

V-15-1□5
V-10-1□5
V-10-1□4

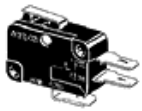


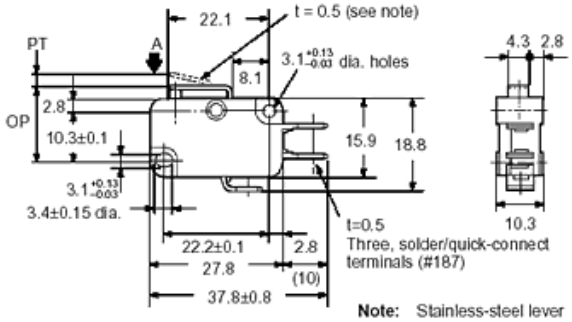


Model	V-15-1□5 V-10-1□5	V-10-1□4
OF max.	1.96 N{200 gf}	0.98 N {100 gf}
RF min.	0.49 N{50 gf}	0.20 N{20 gf}
PT max.	1.2 mm	
OT min.	1.0 mm	
MD max.	0.4 mm	
OP	14.7±0.4 mm	

Short Hinge Lever

V-151-1□5
V-101-1□5
V-101-1□4

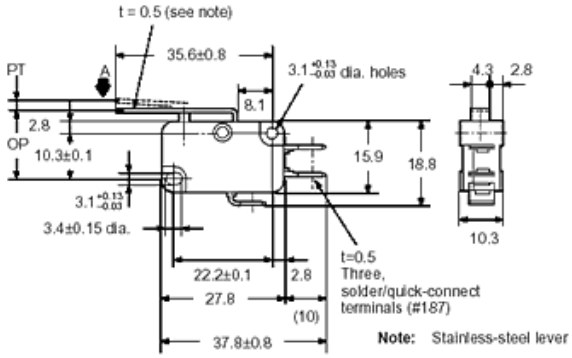




Model	V-151-1□5 V-101-1□5	V-101-1□4
OF max.	1.96 N{200 gf}	0.98 N {100 gf}
RF min.	0.49 N{50 gf}	0.15 N{15 gf}
PT max.	1.6 mm	
OT min.	0.8 mm	
MD max.	0.6 mm	
OP	15.2±0.5 mm	

Hinge Lever
V-152-1□5
V-102-1□5
V-102-1□4

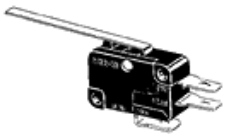


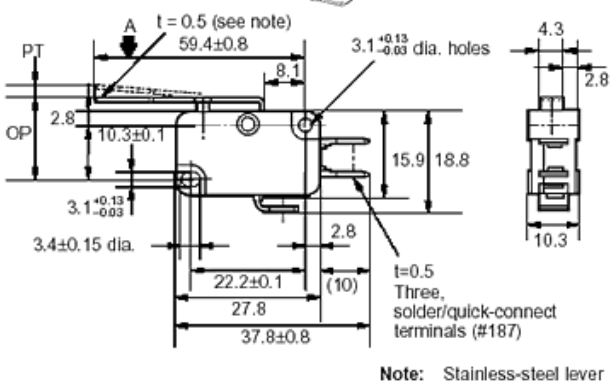


Model	V-152-1□5 V-102-1□5	V-102-1□4
OF max.	1.23 N{125 gf}	0.59 N {60 gf}
RF min.	0.14 N {14 gf}	0.06 N {6 gf}
PT max.	4.0 mm	
OT min.	1.6 mm	
MD max.	1.5 mm	
OP	15.2±1.2 mm	

Long Hinge Lever

V-153-1□5
V-103-1□5
V-103-1□4





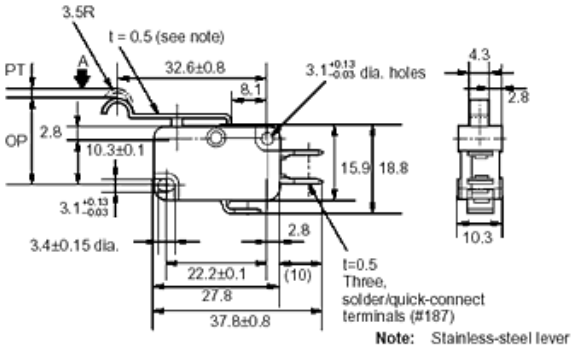
Model	V-153-1□5 V-103-1□5	V-101-1□4
OF max.	0.69 N{70 gf}	0.34 N {35 gf}
RF min.	0.06 N {6 gf}	---
PT max.	9.0 mm	
OT min.	2.0 mm	9.0 mm 3.2 mm

MD max.	2.8 mm	2.8 mm
OP	$15.2\pm^{+2.6}_{-3.2}$mm	15.2±2.6 mm

Simulated Roller Lever

V-154-1□5
V-104-1□5
V-104-1□4





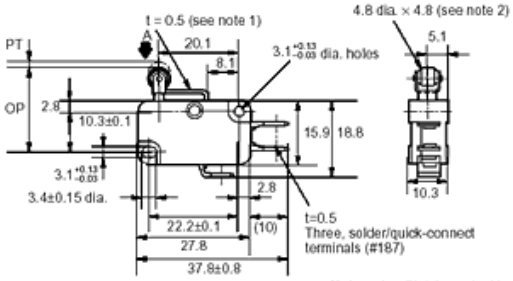
Note: Stainless-steel lever

Model	V-154-1□5 V-104-1□5	V-104-1□4
OF max.	1.23 N{125 gf}	0.59 N {60 gf}
RF min.	0.14 N {14 gf}	0.06 N {6 gf}
PT max.	4.0 mm	
OT min.	1.6 mm	
MD max.	1.5 mm	
OP	18.7±1.2 mm	

Short Hinge Roller Lever

V-155-1□5
V-105-1□5
V-105-1□4



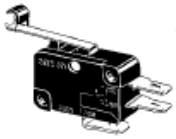


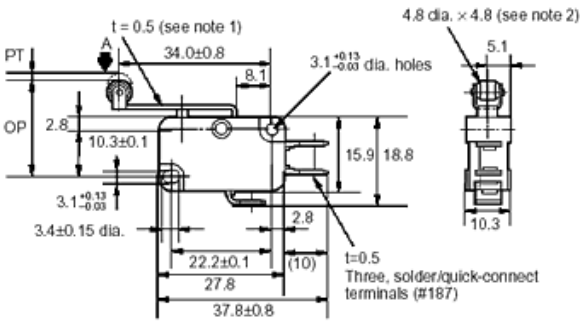
Note: 1. Stainless-steel lever
2. Oilless polyacetal resin roller

Model	V-155-1□5 V-105-1□5	V-105-1□4
OF max.	2.35 N{240 gf}	1.18 N {120 gf}
RF min.	0.49 N{50 gf}	0.15 N{15 gf}
PT max.	1.6 mm	
OT min.	0.8 mm	
MD max.	0.6 mm	
OP	20.7±0.6 mm	

Hinge Roller Lever

V-156-1□5
V-106-1□5
V-106-1□4





Note: 1. Stainless-steel lever
2. Oilless polyacetar resin roller

Model	V-156-1□5 V-106-1□5	V-106-1□4
OF max.	1.23 N{125 gf}	0.59 N {60 gf}
RF min.	0.14 N{14 gf}	0.06 N{6 gf}
PT max.	4.0 mm	
OT min.	1.6 mm	
MD max.	1.5 mm	
OP	20.7±1.2 mm	