

Multiple Plunger Limit Switch

VB




VB Series Offers High Sealability and Long Life with Aluminum Die-cast Enclosure

- Ideal for machine tools and sequential control
- Switch box has an oil drain
- Sturdy construction through integration of head with body
- Ground terminal models have EN/IEC approval (CE marking)



Ordering Information

■ LIMIT SWITCHES

Actuator type	Conduit	With flange (by no. of actuators)					Without flange (by no. of actuators)				
		2	3	4	5	6	2	3	4	5	6
Roller plunger 	G1/2 2 cond.	VB-2211	VB-3211	VB-4211	VB-5211	VB-6211	VB-2241	VB-3241	VB-4241	VB-5241	VB-6241
	G1/2 4 cond.	VB-2221	VB-3221	VB-4221	VB-5221	VB-6221	VB-2251	VB-3251	VB-4251	VB-5251	VB-6251
Bevel plunger 	G1/2 2 cond.	VB-2111	VB-3111	VB-4111	VB-5111	VB-6111	VB-2141	VB-3141	VB-4141	VB-5141	VB-6141
	G1/2 4 cond.	VB-2121	VB-3121	VB-4121	VB-5121	VB-6121	VB-2151	VB-3151	VB-4151	VB-5151	VB-6151
Hemi-spheric plunger 	G1/2 2 cond.	VB-2311	VB-3311	VB-4311	VB-5311	VB-6311	VB-2341	VB-3341	VB-4341	VB-5341	VB-6341
	G1/2 4 cond.	VB-2321	VB-3321	VB-4321	VB-5321	VB-6321	VB-2351	VB-3351	VB-4351	VB-5351	VB-6351

- Note:
1. Micro load (0.1 A) types are available. To order, add an "A" after the part number.
(ex.: VB-2211 → VB-2211A)
 2. Ground terminal types are available. To order, add an "E" after the part number.
(ex.: VB-2211 → VB-2211E)
 3. No replacement parts for actuators.

■ ACCESSORIES

Item	Part number	
Built-in switch for replacement (standard type)	VB-S101N	
Built-in switch for replacement (micro load type)	VB-S109N	
Metal cable fitting with sealing washer for G1/2 conduit	Cable dia. range: 5.5 to 7.5 mm	SC-1M
	Cable dia. range: 7.5 to 9.5 mm	SC-2M
	Cable dia. range: 11 to 13 mm	SC-3M
	Cable dia. range: 9 mm to 11 mm	SC-5M

■ MODEL NUMBER LEGEND

Base Units

VB - □□□□□□
 1 2 3 4 5 6

1. Number of actuators

- 2: 2 actuators
- 3: 3 actuators
- 4: 4 actuators
- 5: 5 actuators
- 6: 6 actuators

2. Actuator

- 1: Bevel plunger
- 2: Roller plunger
- 3: Hemispheric plunger

3. Switch box

- 1: 2 conduits with flange
- 2: 4 conduits with flange
- 4: 2 conduits without flange
- 5: 4 conduits without flange

4. Rubber material (scraper)

- 1: NBR (Nitrile Butadiene rubber)
- 2: FPM (Fluorine rubber)

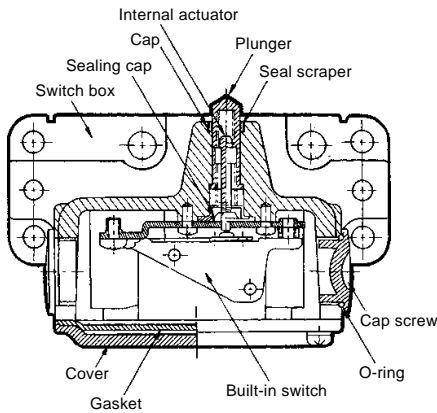
5. Contacts rating

- None: 10 A (standard)
- A: 0.1 A

6. Special type

- None: Without a ground terminal
- E: With a ground terminal

Construction



Specifications

■ RATINGS

Standard

Rated voltage	Resistive load (A)	
	NC	NO
125 VAC	10	
250 VAC		
125 VDC	0.5	
250 VDC	0.25	

Inrush current	
NC	NO
36 A max	24 A max

Micro load

Rated voltage	Resistive load (A)
125 VAC	0.1
8 VDC	
30 VDC	

■ APPROVED STANDARD RATINGS

TÜV (EN60947-5-1)

	Standard		Micro load	
	Utilization category	AC-15	DC-12	AC-14
Rated operating current (I_e)	2 A		0.1 A	
Rated operating voltage (U_e)	250 V	48 V	125 V	30 V

■ CHARACTERISTICS

Enclosure rating		IP67
Life expectancy	Mechanical	5,000,000 operations min.
	Electrical	300,000 operations min. (at 250 VAC 10 A resistive load)
Operating speed		0.1 mm/s to 0.5 m/s (0.039 to 19.69 in/sec)
Operating frequency	Mechanical	120 operations per minute max.
	Electrical	30 operations per minute max.
Rated frequency		50/60 Hz
Insulation resistance		100 M Ω min. (at 500 VDC)
Contact resistance		10 m Ω max. (initial value)
Dielectric strength		1,000 VAC min.: between terminals of same polarity 1,500 VAC min.: between current-carrying metal part and ground 1,500 VAC min.: between each terminal and non-current-carrying metal part
Rated impulse voltage (U_{imp})		4 kV (EN60947-5-1): between current-carrying metal part and ground 4 kV (EN60947-5-1): between each terminal and non-current-carrying metal part 4 kV (EN60947-5-1): between terminals of different polarity
Rated insulation voltage (U_i)		300 V (EN60947-5-1)
Switching overvoltage		1,000 V max (EN60947-5-1)
Pollution degree (operating environment)		3 (EN60947-5-1)
Short-circuit protective device		10 A fuse, type gI or gG (IEC 269)
Conditional short-circuit current		100 A (EN60947-5-1)
Conventional enclosed thermal current (I_{me})		5 A, 0.5 A (EN60947-5-1)
Protection against electric shock		Class I
Vibration resistance	Malfunction	10 to 55 Hz 1.5 mm (0.06 in.) double amplitude
Shock resistance	Destruction	1,000 m/s ² min. (approx. 100 G min.) (3280 ft/s ²)
	Malfunction	200 m/s ² min. (approx. 20 G min.) (656 ft/s ²)
Ambient temperature		-10°C to 80°C (14°F to 176°F) (no icing)
Ambient humidity		95% RH max.
Weight		Approx. 580 g (VB-4211) (20.5 oz)

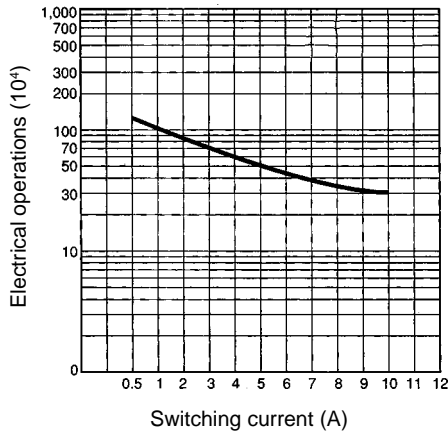
Note: The above mechanical and electrical life is ensured at an ambient temperature of 5°C to 35°C and an ambient humidity of 40% to 70%.

■ OPERATING CHARACTERISTICS

Model	VB-□221 VB-□211	VB-□251 VB-□241	VB-□121 VB-□111	VB-□151 VB-□141	VB-□321 VB-□311	VB-□351 VB-□341
OF max	14.71 N (1500 gf) (3.31 lbf)					
RF max	4.90 N (500 gf) (1.11 lbf)					
PT max	1.5 mm					
OT min	3.5 mm					
MD	0.5 mm					
OP	32 ± 0.4 mm	19 ± 0.4 mm	26 ± 0.4 mm	13 ± 0.4 mm	32 ± 0.4 mm	19 ± 0.4 mm

Engineering Data

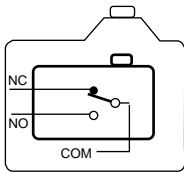
■ ELECTRICAL SERVICE LIFE



Operating frequency:
30 operations/min
cos φ = 1250 VAC

Operation

■ CONTACT FORM



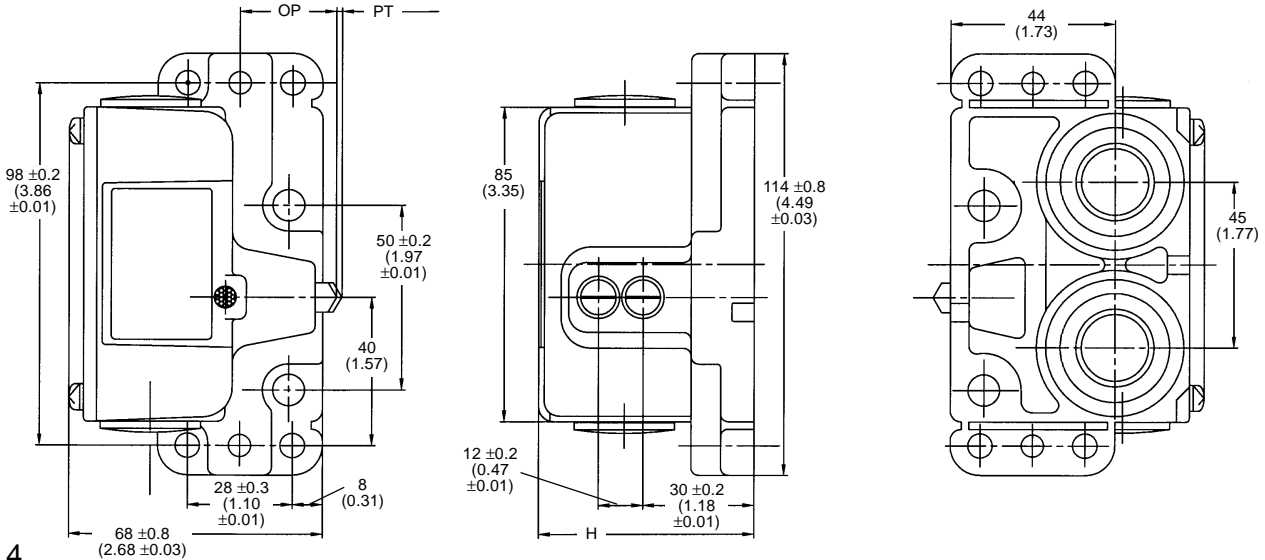
Dimensions

Unit: mm (inch)

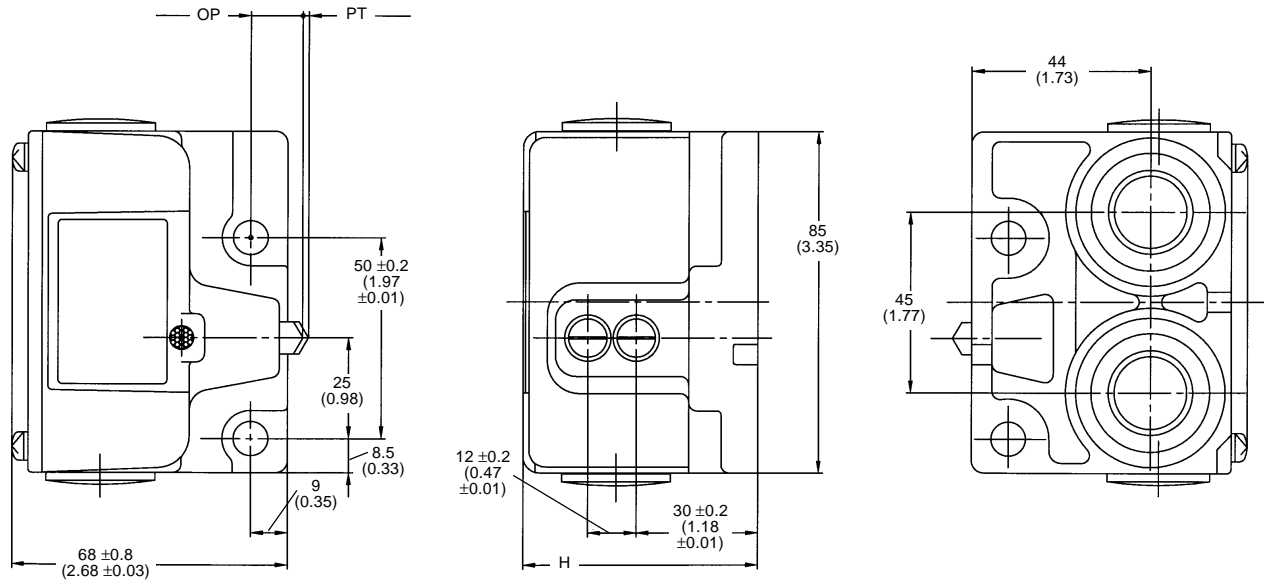
■ LIMIT SWITCHES

Note: For Dimension H, refer to table provided.

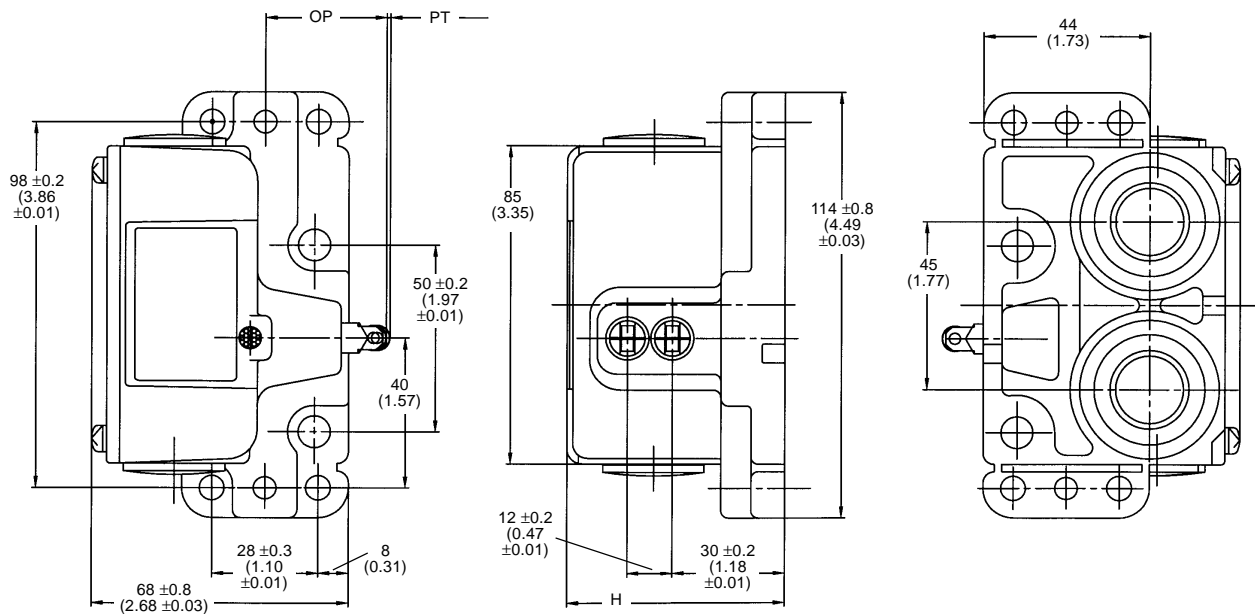
Bevel Plunger VB-□111



Bevel Plunger VB-□141



Roller Plunger VB-□211

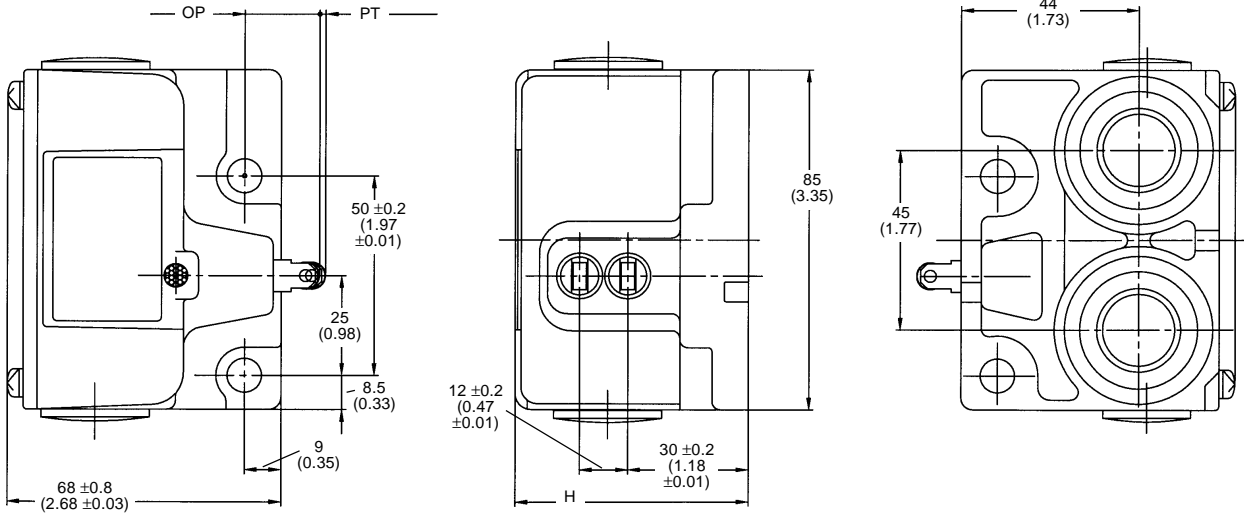


	2 actuators	3 actuators	4 actuators	5 & 6 actuators
Dimension H	58 (2.28)	70 (2.75)	82 (3.23)	106 (4.17)

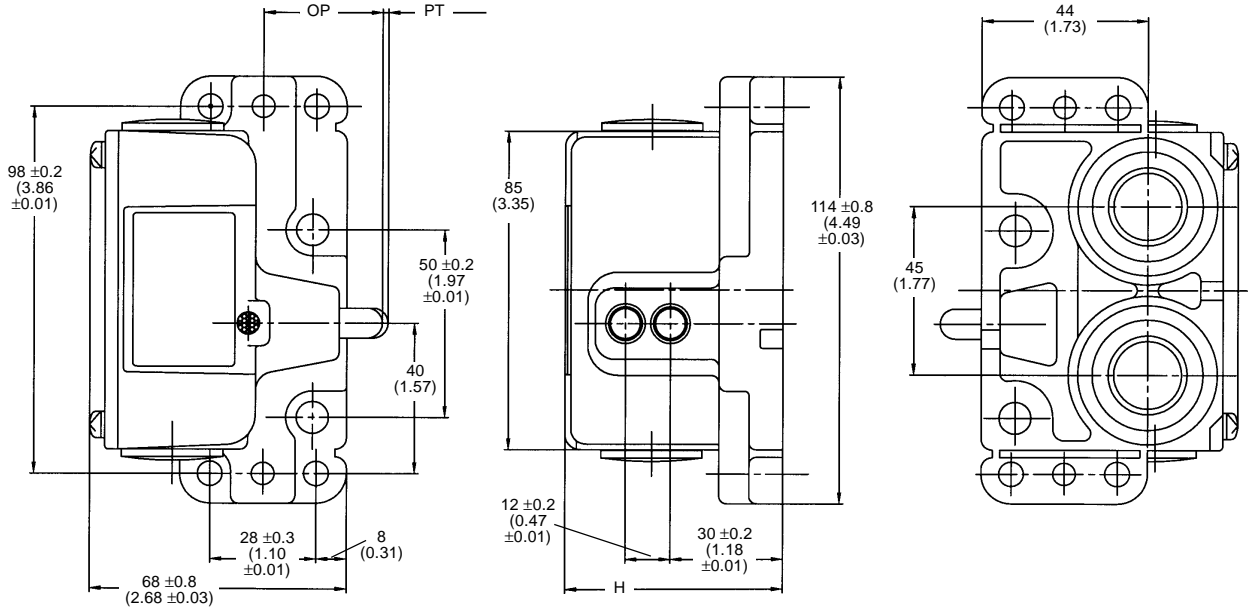
Unit: mm (inch)

Note: For Dimension H, refer to table provided.

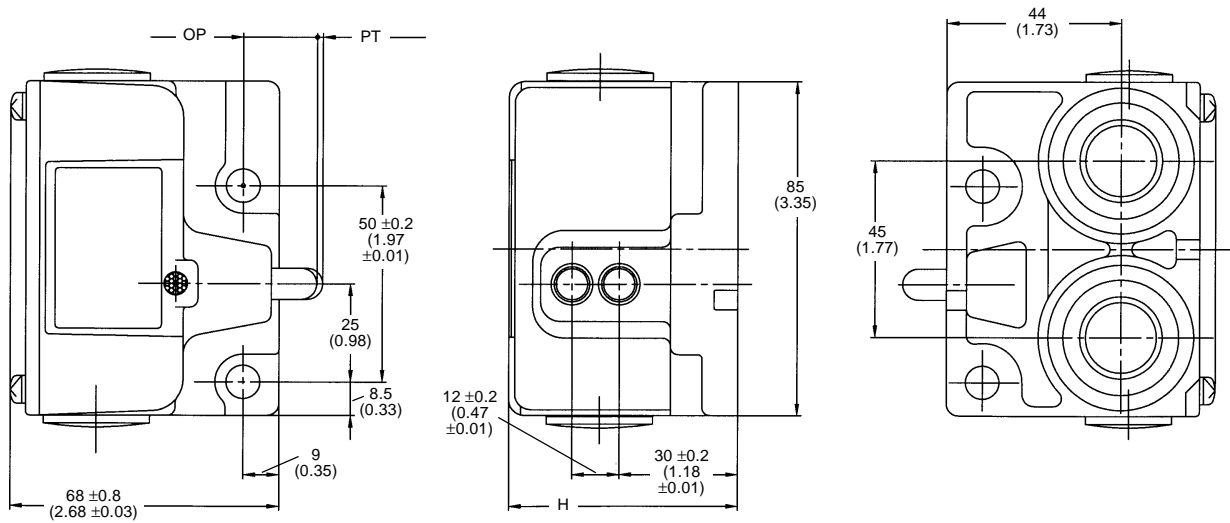
Roller Plunger VB-□241



Hemispheric Plunger VB-□311



Hemispheric Plunger VB-□341

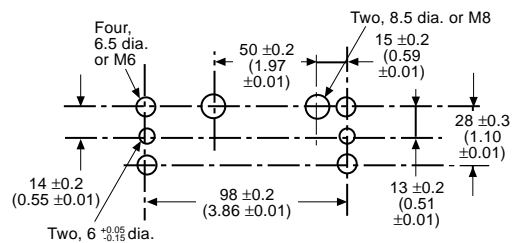


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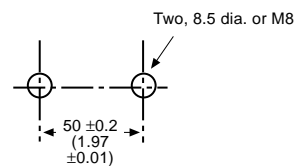
Installation

■ MOUNTING HOLES

With flange



Without flange



Replacement from Old VB

Our old VB series has been discontinued. If you need replacements, please refer to the following chart.

■ CROSS REFERENCE CHART

Old VB	Current VB
2VBQ3-1N	VB-2221
3VBQ3-1N	VB-3221
4VBQ3-1N	VB-4221
5VBQ3-1N	VB-5221
6VBQ3-1N	VB-6221

Old VB	Current VB
2VBD4-1N	VB-2121
3VBD4-1N	VB-3121
4VBD4-1N	VB-4121
5VBD4-1N	VB-5121
6VBD4-1N	VB-6121

Old VB	Current VB
2VBQ3-4N	VB-2251
3VBQ3-4N	VB-3251
4VBQ3-4N	VB-4251
5VBQ3-4N	VB-5251
6VBQ3-4N	VB-6251

Old VB	Current VB
2VBD4-4N	VB-2151
3VBD4-4N	VB-3151
4VBD4-4N	VB-4151
5VBD4-4N	VB-5151
6VBD4-4N	VB-6151

Old VB	Current VB
2VBQ3-1F	VB-2221 (similar)
3VBQ3-1F	VB-3221 (similar)
4VBQ3-1F	VB-4221 (similar)
5VBQ3-1F	VB-5221 (similar)
6VBQ3-1F	VB-6221 (similar)

Old VB	Current VB
2VBD4-1F	VB-2121 (similar)
3VBD4-1F	VB-3121 (similar)
4VBD4-1F	VB-4121 (similar)
5VBD4-1F	VB-5121 (similar)
6VBD4-1F	VB-6121 (similar)

Old VB	Current VB
2VBQ3-4F	VB-2251 (similar)
3VBQ3-4F	VB-3251 (similar)
4VBQ3-4F	VB-4251 (similar)
5VBQ3-4F	VB-5251 (similar)
6VBQ3-4F	VB-6251 (similar)

Old VB	Current VB
2VBD4-4F	VB-2151 (similar)
3VBD4-4F	VB-3151 (similar)
4VBD4-4F	VB-4151 (similar)
5VBD4-4F	VB-5151 (similar)
6VBD4-4F	VB-6151 (similar)

Actuators

Old	Current
VB-A103	N/A
VB-A124	N/A

Note: There are no replacement parts for old actuators.

Built-in switch

Old	Current
VB-S101	VB-S101N

Note: If you replace the built-in switch with a new one, some changes are needed.

1. Remove the coil spring from VB-S101N.
2. Use old mounting screw and mount the new switch.

NOTE: DIMENSIONS ARE SHOWN IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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One East Commerce Drive
Schaumburg, IL 60173
1-800-55-OMRON

OMRON CANADA, INC.

885 Milner Avenue
Scarborough, Ontario M1B 5V8
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