

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 -

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 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)

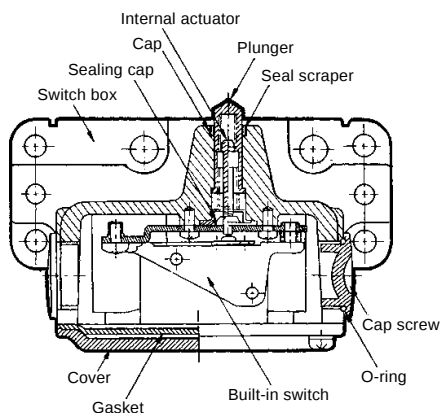
A: 0.1 A

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	DC-12
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)

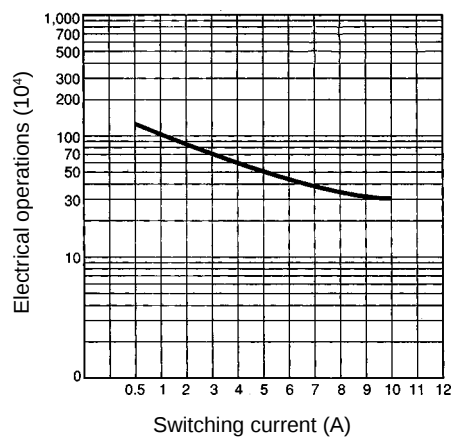
Note: The above mechanical and electrical life is ensured at an ambient temperature of 5°C to 35°C and an ambient humidity of 40% to 70%.

■ 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

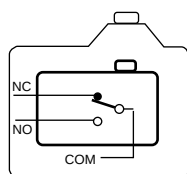
■ ELECTRICAL SERVICE LIFE



Operating frequency:
30 operations/min
 $\cos \phi = 1250 \text{ VAC}$

Operation

■ CONTACT FORM



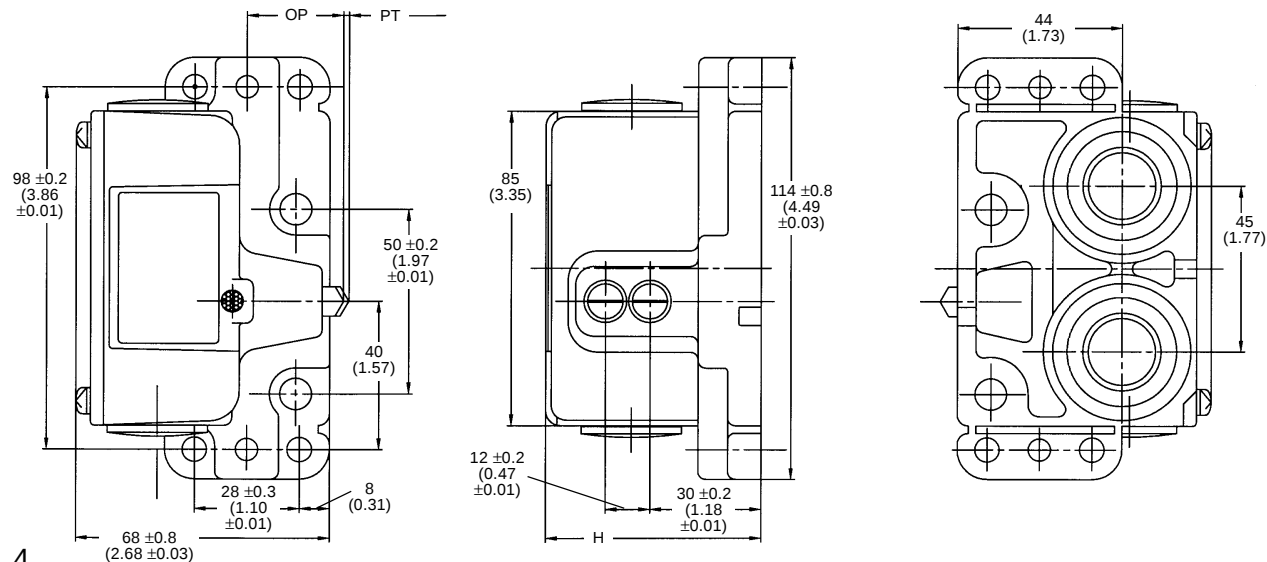
Dimensions

Unit: mm (inch)

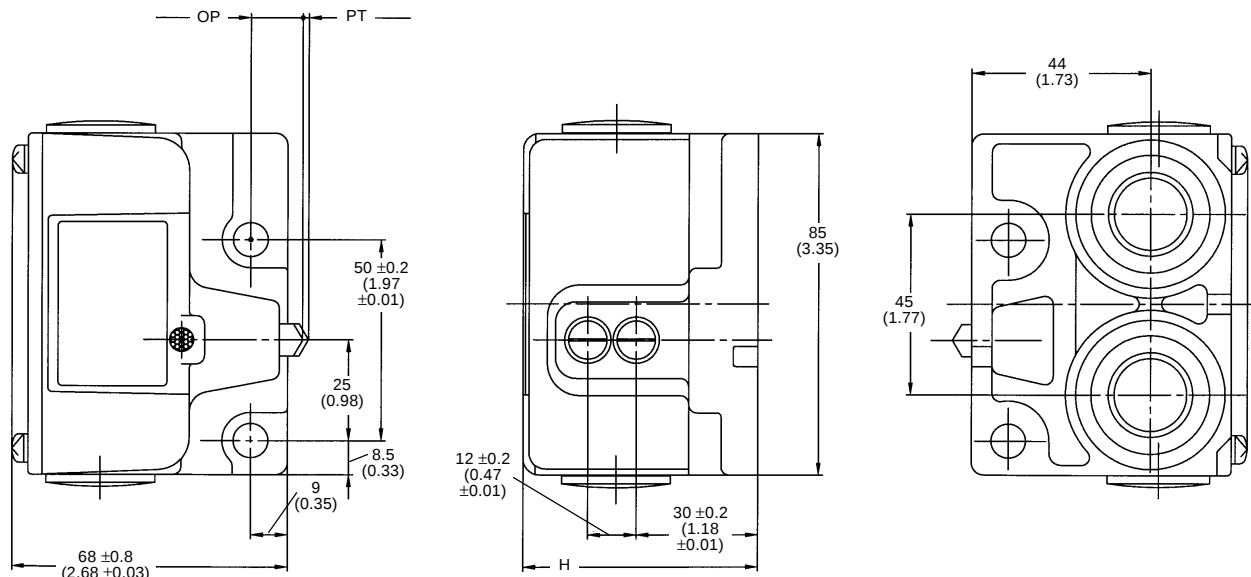
■ LIMIT SWITCHES

Note: For Dimension H, refer to table provided.

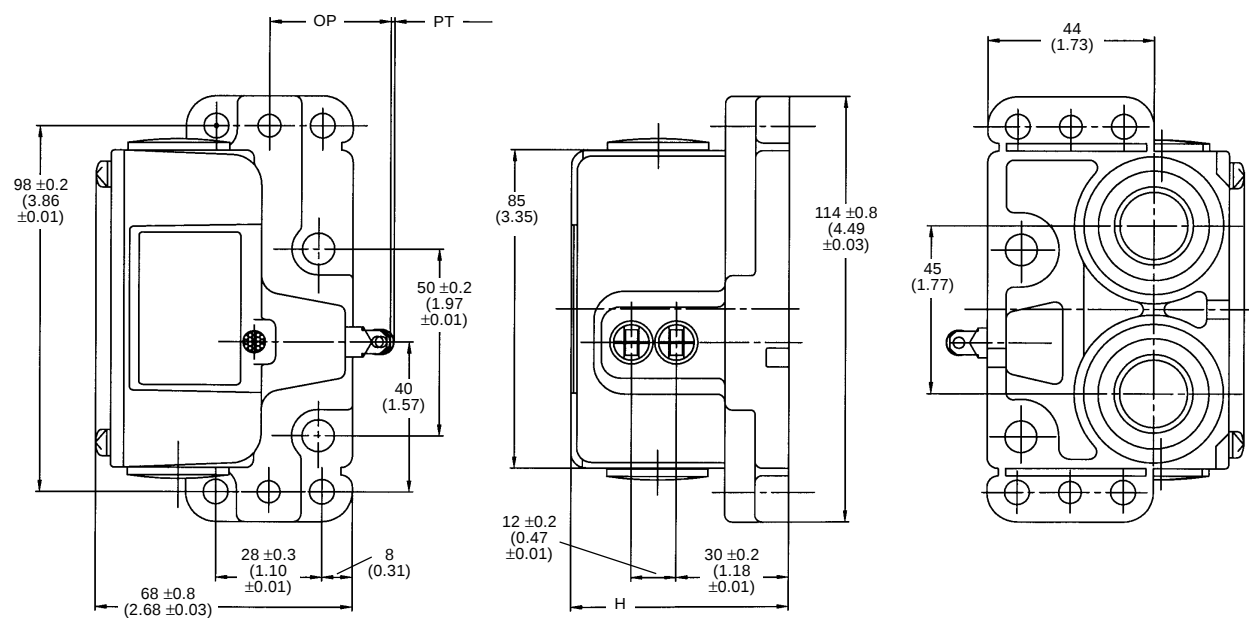
Bevel Plunger VB-□111



Bevel Plunger VB-□141



Roller Plunger VB-□211

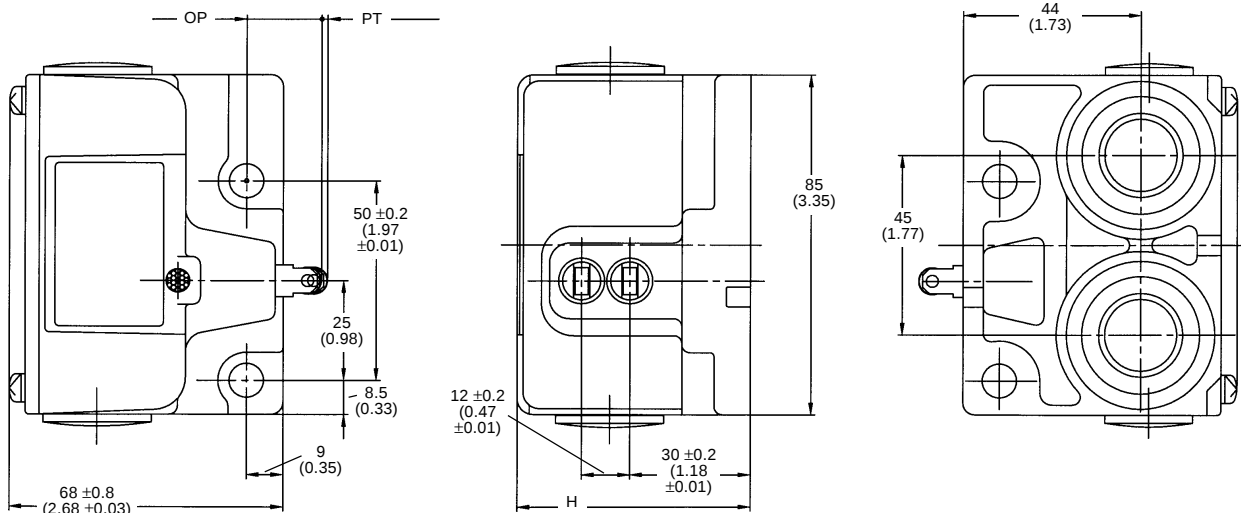


	2 actuators	3 actuators	4 actuators	5 & 6 actuators
Dimension H	58 (2.28)	70 (2.75)	82 (3.23)	106 (4.17)

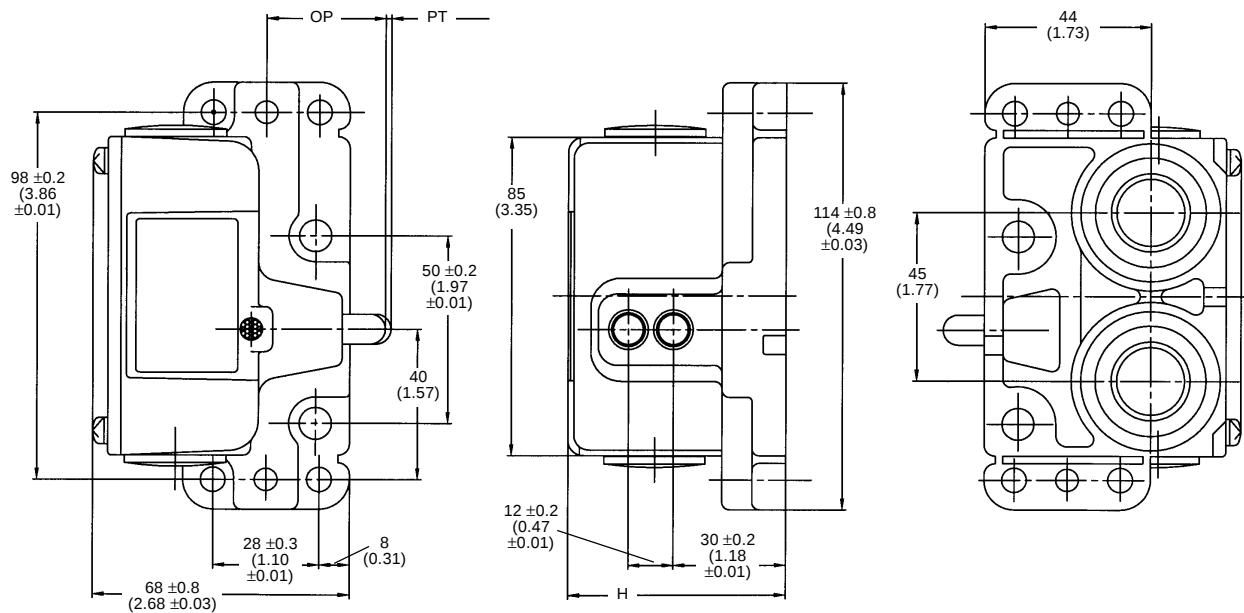
Unit: mm (inch)

Note: For Dimension H, refer to table provided.

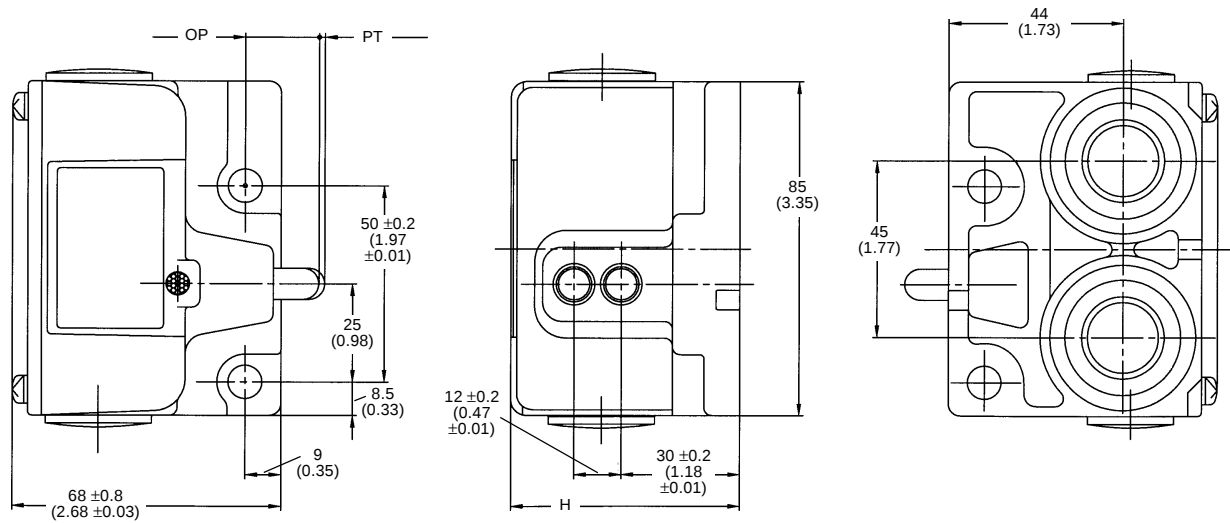
Roller Plunger VB-□241



Hemispheric Plunger VB-□311



Hemispheric Plunger VB-□341

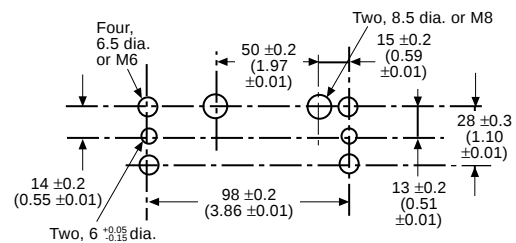


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Dimension H	58 (2.28)	70 (2.75)	82 (3.23)	106 (4.17)

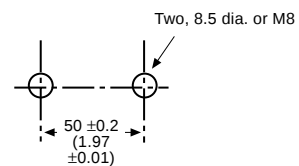
Installation

■ 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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