

Tactile Switch

D5B

Detects Objects in Multiple Directions with High Sensitivity

- Detects object contact from multiple directions and operates even with a slight force
- Gold-plated contacts capable of switching micro current/voltage load and providing high contact reliability
- Highly resistant to dust, fine particles and water or oil splash, conforming to IP67
- Three sizes (M10, M8, and M5)
- Three types of actuators: hemispheric, cone-shaped, and wobble-stick type



Ordering Information

■ LIMIT SWITCHES

Item		Part number			
Actuator	Cable length	M5	M8	M10	
Hemispheric plunger 	1 m	D5B-5011	D5B-8011	D5B-1011	
	3 m	D5B-5013	D5B-8013	D5B-1013	
	5 m	D5B-5015	D5B-8015	D5B-1015	
Cone-shaped plunger 	1 m	D5B-5021	D5B-8021	D5B-1021	
	3 m	D5B-5023	D5B-8023	D5B-1023	
	5 m	D5B-5025	D5B-8025	D5B-1025	
	Short spring wobble-stick	1 m	D5B-5511	D5B-8511	D5B-1511
		3 m	D5B-5513	D5B-8513	D5B-1513
		5 m	D5B-5515	D5B-8515	D5B-1515
	Long spring wobble-stick	1 m	---	---	D5B-1531
		3 m	---	---	D5B-1533
		5 m	---	---	D5B-1535

Specifications

■ RATINGS

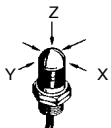
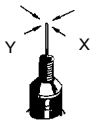
Switching power	1 mA at 5 VDC to 30 mA at 30 VDC (resistive load)
Max. force applicable to actuator	1.5 kg (3.3 lbf)

■ CHARACTERISTICS

Operating speed		5 to 500 mm/s (0.19 to 19.68 in/s)
Operating frequency	Mechanical	120 operations/min.
	Electrical	60 operations/min.
Insulation resistance		100 MΩ min. at 250 VDC
Contact resistance		With 1 m cable: 700 mΩ max. (initial value) With 3 m cable: 1.9 Ω max. (initial value) With 5 m cable: 3.1 Ω max. (initial value)
Dielectric strength		250 VAC, 50/60 Hz for 1 min between terminals of same polarity (TTP) 1,000 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground (600 V for M5 model)
Vibration resistance		Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (Wobble-stick type: 16.7 Hz, 1-mm double amplitude)
Shock resistance	Mechanical	1,000 m/s ² min. (3281 ft/sec ²) (approx. 100G)
	Malfunction	300 m/s ² min. (984 ft/sec ²) (approx. 30G) (Wobble-stick type: 50 m/s ² 164 ft/sec ²) (approx. 5G)
Life expectancy	Mechanical	10,000,000 operations min.
	Electrical	See <i>Engineering Data</i> .
Enclosure rating		IEC IP67
Ambient temperature (See Note.)	Operating	-10°C to 70°C (14°F to 158°F)
Ambient humidity	Operating	95% max.
Weight	Switch	M5: approx. 14 g (0.49 oz), M8: approx. 20 g (0.71 oz), M10: approx. 21 g (0.74 oz)
	Cable	Approx. 10 g/m

Note: Temperature range below 0°C are based on absence freezing moisture or water.

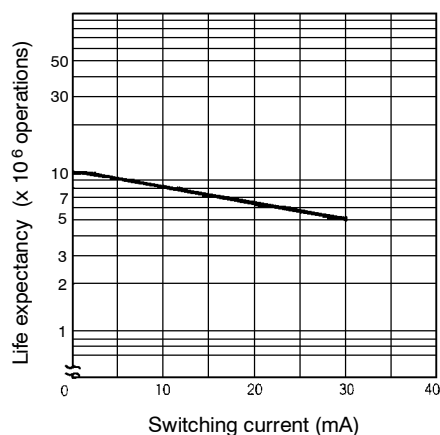
■ OPERATING CHARACTERISTICS

		Hemispheric actuator			Cone-shaped actuator			Wobble-stick actuator		
										
		M5	M8	M10	M5	M8	M10	M5	M8	M10
TT (max.) (reference value)	X, Y	0.8 mm	1 mm	1 mm	2 mm	2 mm	3 mm	20 mm	25 mm	30 mm
	Z	0.4 mm	0.5 mm	0.5 mm	0.4 mm	0.5 mm	0.5 mm	---		
OF (max.)	X, Y	0.49 N (50 gf) 0.11 lbf	0.74 N (75 gf) 0.17 lbf	0.98 N (100 gf) 0.22 lbf	0.20 N (20 gf) 0.045 lbf	0.20 N (20 gf) 0.045 lbf	0.39 N (40 gf) 0.087 lbf	0.05 N (5 gf) 0.011 lbf max.		
	Z	0.74 N (75 gf) 0.17 lbf	0.98 N (100 gf) 0.22 lbf	1.47 N (150 gf) 0.33 lbf	0.74 N (75 gf) 0.17 lbf	0.74 N (75 gf) 0.17 lbf	1.47 N (150 gf) 0.33 lbf	---		
Permissible operating force (max.)	X, Y, Z	1.96 N (200 gf) 0.44 lbf			1.96 N (200 gf) 0.44 lbf			0.49 N (50 gf) 0.11 lbf		
PT (reference value)	X, Y	0.3 to 0.5 mm	0.4 to 0.7 mm	0.4 to 0.7 mm	0.7 to 1.2 mm	1.0 to 1.5 mm	1.5 to 2.0 mm	4 to 8 mm	8 to 15 mm	10 to 18 mm
	Z	0.1 to 0.2 mm	0.2 to 0.3 mm	0.2 to 0.3 mm	0.1 to 0.2 mm	0.2 to 0.3 mm	0.2 to 0.3 mm	---	---	---

Note: The operating characteristic values shown in the above table are measured at the portions indicated by the downward arrows in *Dimensions*.

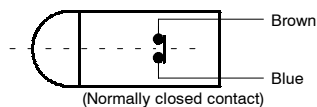
Engineering Data

■ ELECTRICAL LIFE EXPECTANCY ($\cos\phi = 1$)



Operation

■ CONTACT FORM



Dimensions

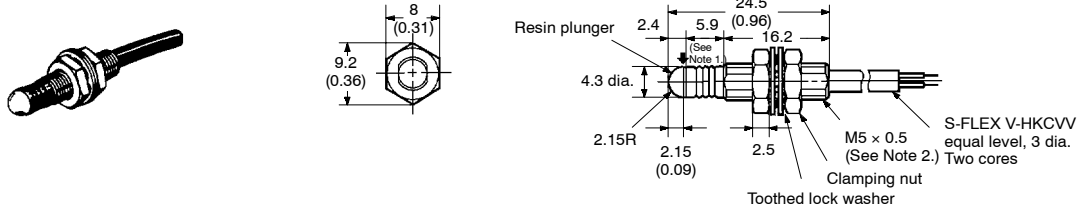
Unit: mm (inch)

Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions. Values in parentheses () are cumulative values and may exceed tolerance of ± 0.4 mm.

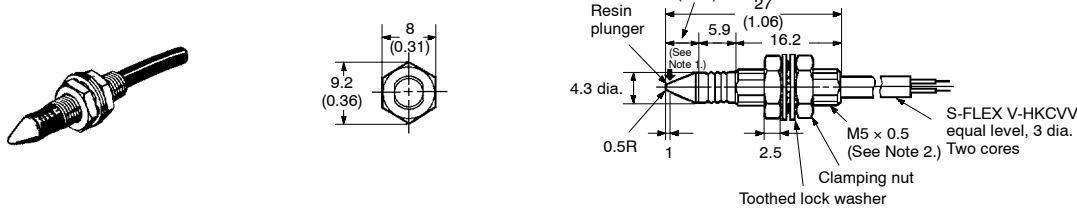
2. The square □ in the models represents the cable length. Refer to *Ordering Information*.

■ LIMIT SWITCHES

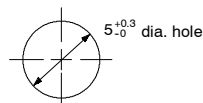
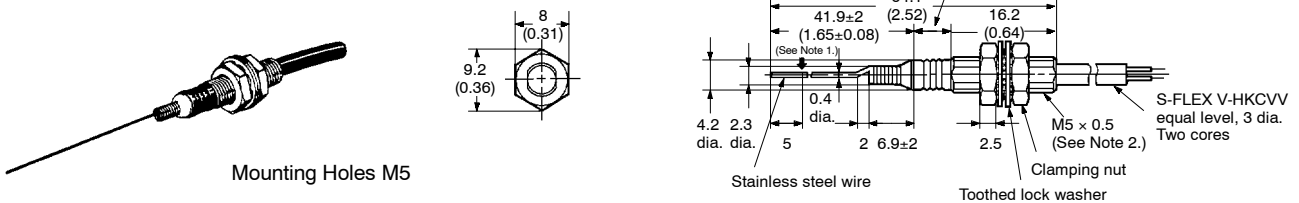
D5B-501 □



D5B-502 □

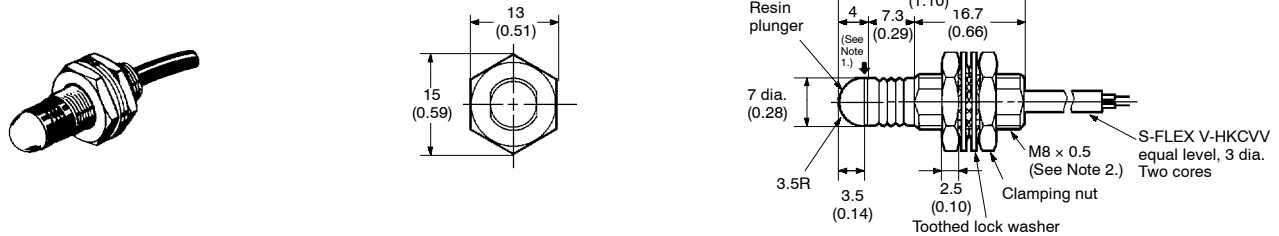


D5B-551 □

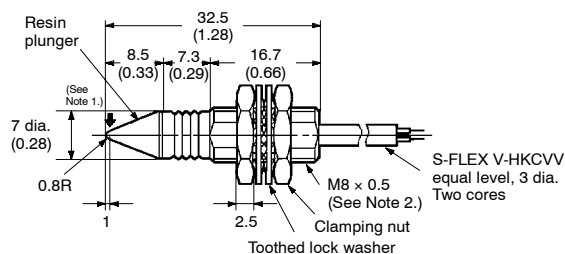
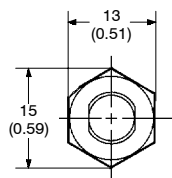
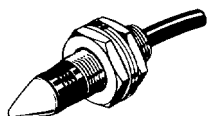


- Note: 1. Operating characteristics (X, Y) measuring position
2. The threads of the case are not standard. Therefore standard tapping to the case is not possible for mounting.

D5B-801 □

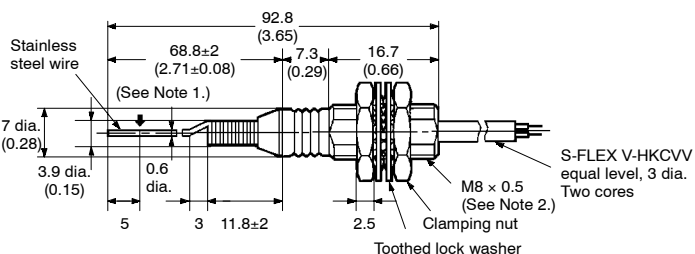
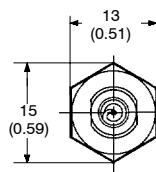
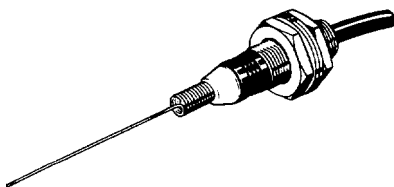


D5B-802□

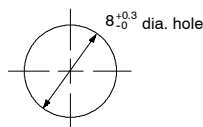


- Note: 1. Operating characteristics (X, Y) measuring position
 2. The threads of the case are not standard. Therefore standard tapping to the case is not possible for mounting.

D5B-851□

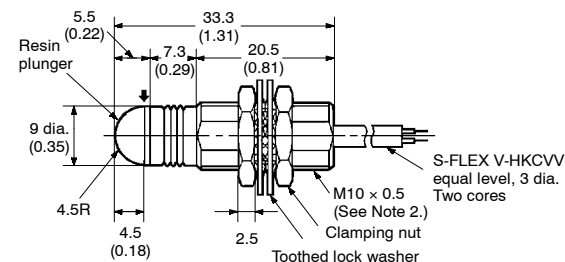
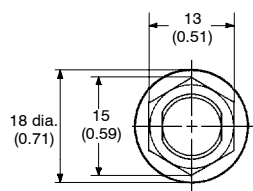


Mounting Holes M8

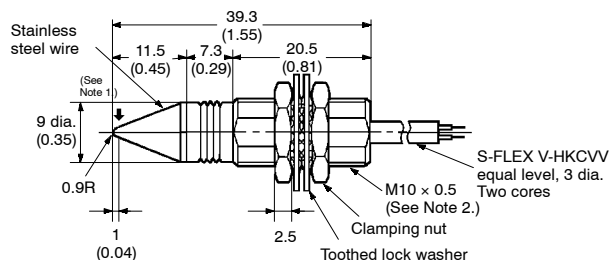
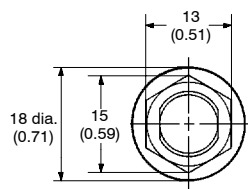
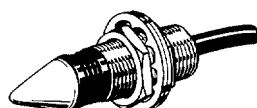


- Note: 1. Operating characteristics (X, Y) measuring position
 2. The threads of the case are not standard, so standard tapping to the case is not possible for mounting.

D5B-101□



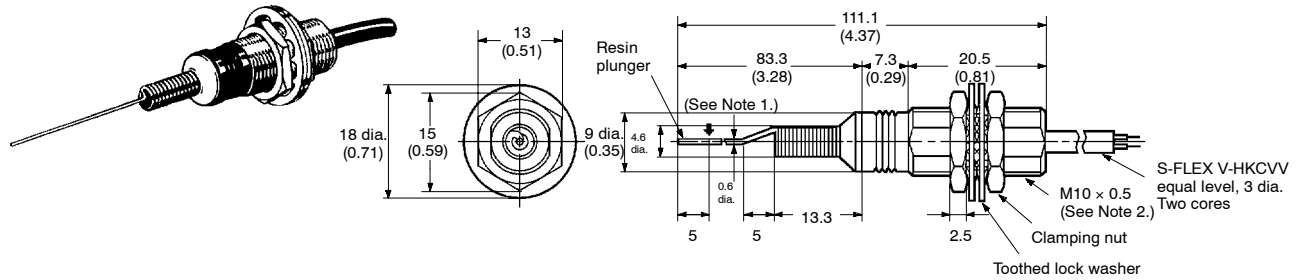
D5B-102□



- Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions. Values in parentheses () are cumulative values and may exceed tolerance of ± 0.4 mm.
 2. The square □ in the models represents the cable length. Refer to *Ordering Information*.

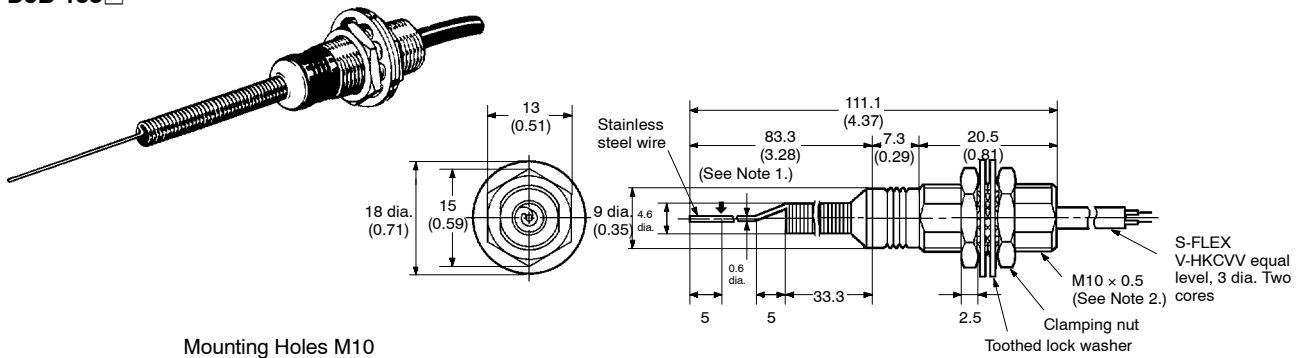
Unit: mm (inch)

D5B-151 □

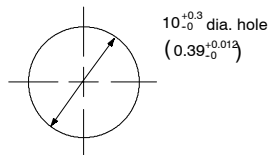


- Note: 1. Operating characteristics (X, Y) measuring position
 2. The threads of the case are not standard, so standard tapping to the case is not possible for mounting.

D5B-153 □



Mounting Holes M10



- Note: 1. Operating characteristics (X, Y) measuring position
 2. The threads of the case are not standard, so standard tapping to the case is not possible for mounting.

- Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions. Values in parentheses () are cumulative values and may exceed tolerance of ± 0.4 mm.
 2. The square □ in the models represents the cable length. Refer to *Ordering Information*.

Precautions

CLAMPING TORQUE

Type	Clamping torque (max.)
M5	0.98 N • m (0.72 ft • lbs)
M8	2.94 N • m (2.17 ft • lbs)
M10	3.92 N • m (2.89 ft • lbs)

CAUTION

Don't apply excessive force to the actuator, or it may break. The actuator can withstand a maximum force of 1.5 kg (3.3 lbf), but keep the force below 200 g (0.44 lbf) (wobble stick type: 50 g (0.11 lbf) max.) when the switch is operated repeatedly.

Breakage can occur if the stroke is exceeded for Wire Spring Types. Keep the TT to within the reference value.

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

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