

# Watertight Snap Action Switch



## D2FW-G

### Watertight, Snap Action Detection Switch For Use In Automotive and Industrial Vehicles

- Conforms to IP67
- Single-point mounting with an M4 screw
- Incorporates a fixed leaf lever for tough environments
- Lead wires have solderless connections to suit environmental concerns
- Wide operating-temperature range of -40°C to 85°C
- RoHS Compliant



## Ordering Information

Actuator	Rated load	Contact specifications (lead wires)	Model
Leaf lever 	0.1 A	SPDT	D2FW-G071M
		SPST-NC	D2FW-G072M
		SPST-NO	D2FW-G073M
	1 A	SPDT	D2FW-G271M
		SPST-NC	D2FW-G272M
		SPST-NO	D2FW-G273M
Long leaf lever 	0.1 A	SPDT	D2FW-G081M
		SPST-NC	D2FW-G082M
		SPST-NO	D2FW-G083M
	1 A	SPDT	D2FW-G281M
		SPST-NC	D2FW-G282M
		SPST-NO	D2FW-G283M

**Note:** The standard length of the lead wires (AVS0.5) is 30 cm.

# Specifications

## ■ Characteristics

Item		D2FW-G0□	D2FW-G2□
Operating speed		1.0 to 500 mm/s	
Operating frequency	Mechanical	120 operations/min max.	
	Electrical	20 operations/min max.	
Insulation resistance		100 MΩ min. (at 500 VDC)	
Contact resistance		150 mΩ max. (at 6 VDC, 0.1 A)	100 mΩ max. (at 6 VDC, 1 A)
Dielectric strength		600 VAC, 50/60 Hz for 1 min between terminals of the same polarity 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	
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude, 1-ms max. contact opening	
Shock resistance	Durability	1,000 m/s <sup>2</sup> max.	
	Malfunction	300 m/s <sup>2</sup> max., 1-ms max. contact opening	
Life expectancy	Mechanical	300,000 operations min.	
	Electrical	100,000 operations min.	30,000 operations min.
Degree of protection		Conforms to IP67.	
Ambient operating temperature		-40°C to 85°C (-40°F to 185°F) with no condensation at low temperatures	
Ambient operating humidity		95% max.	
Weight		Approx. 10.4 g (SPDT type)	

## ■ Operating Characteristics

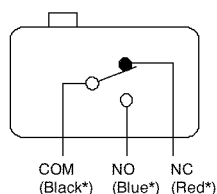
Characteristics	Part number	
	D2FW-G□7□M	D2FW-G□8□M
OF max.	250 gf	300 gf
RF min.	30 gf	60 gf
OT min.	1.0 mm (0.04 in)	1.0 mm (0.04 in)
MD max.	1.0 mm (0.04 in)	1.0 mm (0.04 in)
FP max.	15 mm (0.61 in)	19 mm (0.75 in)
OP	11.5±2 mm (0.45±0.08 in)	12±2 mm (0.47±0.08 in)
TTP	6.5 mm (0.26 in)	8.5 mm (0.33 in)

## ■ Ratings

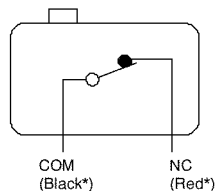
Rated voltage	D2FW-G0□ (micro-load models)	D2FW-G2□ (general-load models)
	Resistive load	
30 VDC	0.1 A	1 A

## ■ Contact Form

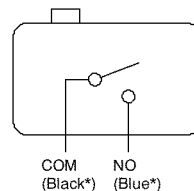
SPDT



SPST-NC



SPST-NO



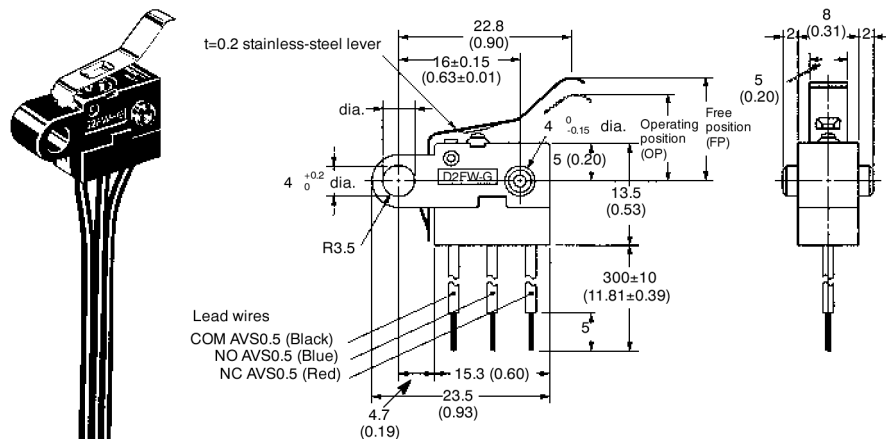
\* The color in parentheses indicates the color of the lead wire.

# Dimensions

Unit: mm (inch)

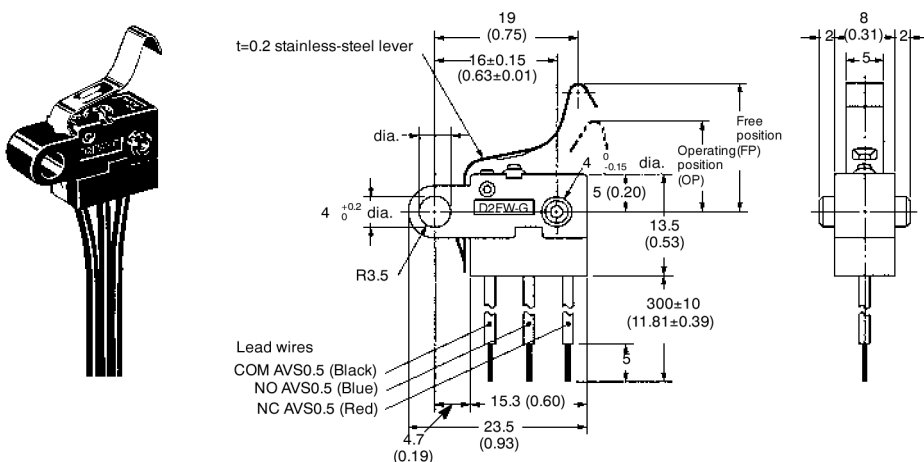
## ■ Leaf Lever

D2FW-G□7□M



## ■ Long Leaf Lever

D2FW-G□8□M



# Precautions

Use the Switch within the specified electrical ratings. Using the Switch outside of the rated values will not only shorten its service life but may cause heat generation or fire damage. When turning the power ON or OFF, use the rated voltage and current.

## Enclosure Ratings

### Do Not Use the Switch Underwater

The Switch was tested and found to meet the conditions necessary to meet the following standard. The test checks for water intrusion after immersion for a specified time period. The test does not check for switching operation underwater.

IEC Publication 529, degree of protection IP67.

### Protection Against Chemicals

Prevent the Switch from coming into contact with oil or chemicals, to avoid damaging (or deterioration of) Switch materials.

## Mounting

### Preparation for Mounting

Turn the power OFF before (1) mounting or removing the Switch, or (2) before performing maintenance or inspection. Failure to do so can cause electrical shock or fire.

Mount the Switch on a flat surface. If it is mounted on an uneven surface the Switch may bend, causing a malfunction or cracking the housing.

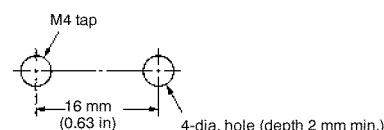
### Mounting the Switch

Mount the switch securely, using an M4 screw with a flat washer or spring washer. Tighten the screw to a torque of 1.18 to 1.47 N•m.

When mounting the switch, do not apply any external pressure to the actuator in a direction other than the direction of operation.

The following diagram shows the mounting hole dimensions.

### Mounting Holes



## Operation

Make sure that the switching object is perfectly separated from the actuator when the switch is not operated and the actuator is pressed appropriately by the switching object when the switch is operated. The switching object must not move beyond its operational limit position.

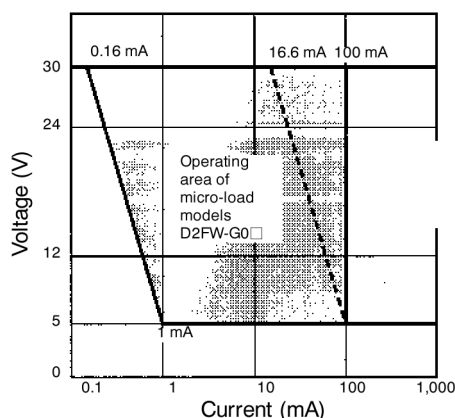
Position the switching object so that its moving direction is the same as that of the actuator.

## Using the Switch with Micro Loads

Even when the Switch is used within the appropriate operating range, power surges may shorten its service life. Insert a contact protection circuit as required.

Micro application loads are indicated by N standard reference values. This value represents the failure rate at a 60% ( $\lambda_{60}$ ) reliability level. (JIS C5003)

The equation  $\lambda_{60} = 0.5 \times 10^{-6}/\text{operations}$  indicates that a failure rate of 1/2,000,000 operations can be expected at a reliability level of 60%.



Model	D2FW-G0□	D2FW-G2□
Micro application load	5 VDC, 1 mA	5 VDC, 100 mA

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