

Sealed Ultra Subminiature Basic Switch with Integrated Resistors

D2AW-R

Detection of four states by internal resistor

- <Output of four states> Four states (switch ON/OFF, short circuit, open circuit) are output.
- <Extra-long stroke even without levers. (OT reference value: 1.4 mm)
- <Quiet operation> A sliding contact construction achieves high contact reliability and quiet operating sound.



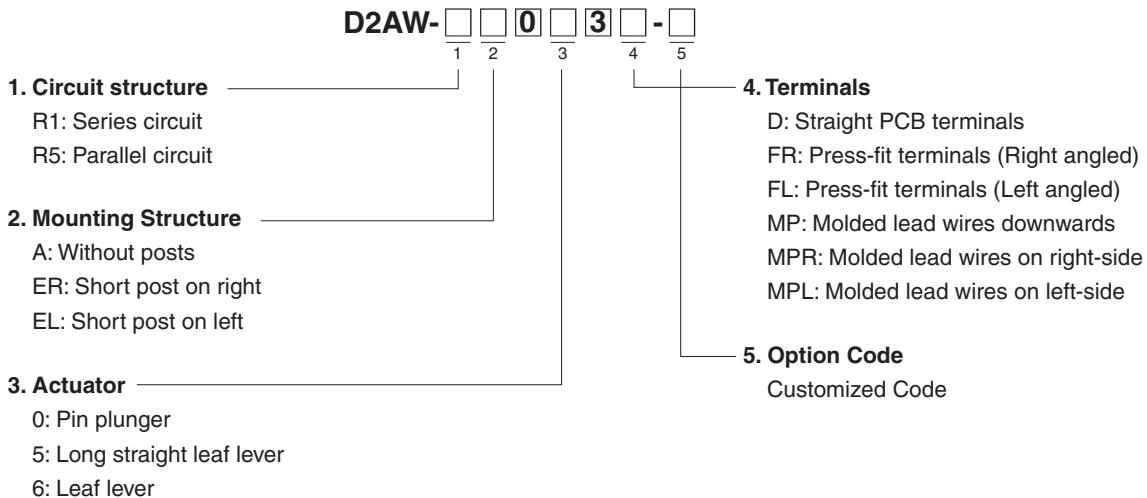
Refer to "Precautions".



Model Number Legend

Some model number elements cannot be used in conjunction.

If you have any desired model with a specification not in this model number legend, contact your OMRON sales representative. We will consider if a requested model can be manufactured by modifying existing models.



List of Models

Actuator	Terminals	Model	Without posts	Short post on right	Short post on left	
Pin plunger	PCB terminals (Straight)	Series circuit	D2AW-R1-A003D	D2AW-R1-ER003D	D2AW-R1-EL003D	
		Parallel circuit	D2AW-R5-A003D	D2AW-R5-ER003D	D2AW-R5-EL003D	
	Press-fit terminals (Right angled)	Series circuit	---	D2AW-R1-ER003FR	---	
		Parallel circuit	---	D2AW-R5-ER003FR	---	
	Press-fit terminals (Left angled)	Series circuit	---	---	D2AW-R1-EL003FL	
		Parallel circuit	---	---	D2AW-R5-EL003FL	
	Molded lead wires downwards	Series circuit		D2AW-R1-ER003MP	D2AW-R1-EL003MP	
		Parallel circuit		D2AW-R5-ER003MP	D2AW-R5-EL003MP	
	Molded lead wires on right-side	Series circuit		---	---	
		Parallel circuit		---	---	
	Molded lead wires on left-side	Series circuit		---	---	
		Parallel circuit		---	---	
	Long straight leaf lever	PCB terminals (Straight)	Series circuit	D2AW-R1-A053D	D2AW-R1-ER053D	D2AW-R1-EL053D
			Parallel circuit	D2AW-R5-A053D	D2AW-R5-ER053D	D2AW-R5-EL053D
Press-fit terminals (Right angled)		Series circuit	---	D2AW-R1-ER053FR	---	
		Parallel circuit	---	D2AW-R5-ER053FR	---	
Press-fit terminals (Left angled)		Series circuit	---	---	D2AW-R1-EL053FL	
		Parallel circuit	---	---	D2AW-R5-EL053FL	
Molded lead wires downwards		Series circuit		---	---	
		Parallel circuit		---	---	
Molded lead wires on right-side		Series circuit		---	---	
		Parallel circuit		---	---	
Molded lead wires on left-side		Series circuit		---	---	
		Parallel circuit		---	---	
Leaf lever		PCB terminals (Straight)	Series circuit	D2AW-R1-A063D	D2AW-R1-ER063D	D2AW-R1-EL063D
			Parallel circuit	D2AW-R5-A063D	D2AW-R5-ER063D	D2AW-R5-EL063D
	Press-fit terminals (Right angled)	Series circuit	---	D2AW-R1-ER063FR	---	
		Parallel circuit	---	D2AW-R5-ER063FR	---	
	Press-fit terminals (Left angled)	Series circuit	---	---	D2AW-R1-EL063FL	
		Parallel circuit	---	---	D2AW-R5-EL063FL	
	Molded lead wires downwards	Series circuit		D2AW-R1-ER063MP	D2AW-R1-EL063MP	
		Parallel circuit		D2AW-R5-ER063MP	D2AW-R5-EL063MP	
	Molded lead wires on right-side	Series circuit		---	---	
		Parallel circuit		---	---	
	Molded lead wires on left-side	Series circuit		---	---	
		Parallel circuit		---	---	

Items marked with '-' can also be considered if requested.

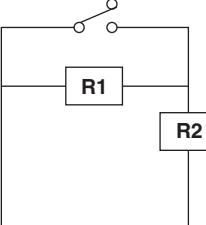
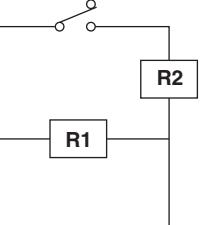
If you have any desired model with a specification not in this model number legend, contact your OMRON sales representative. We will consider if a requested model can be manufactured by modifying existing models.

Note: 1. The length of standard lead wires (AVSS 0.3) for molded lead wire models shown above is 300 mm.

Contact Specifications

Contact	Specification	Slide
	Material	Silver Plated

Electrical characteristic

		R1	R5
Rating voltage		5 to 14 VDC	
Resistance value *1	Resistor1	5110 Ω	3920 Ω
	Resistor2	1620 Ω	511 Ω
Output resistance *2	FP-OP	6730 $\Omega \pm 5\%$	3920 $\Omega \pm 5\%$
	OP-TTP	1620 $\Omega \pm 5\%$	452 $\Omega \pm 5\%$
Resistor power ratings		0.5 W	
Circuit diagram *2			

*1. The resistance value and power rating of resistors 1 and 2 can be changed.

Contact your OMRON sales representative for details.

*2. Avoid use outside of the operating temperature range of -40°C to +85°C. Temperature might cause output resistance to fluctuate which induces malfunction.

Characteristics

Permissible operating speed	30 to 500 mm/s (pin plunger models)	
Permissible operating frequency	Mechanical	30 operations/min max.
	Electrical	20 operations/min max
Vibration resistance *1	Malfunction • Destruction	Frequency: 10 to 55 Hz Amplitude: 1.5 mm Direction Time: X, Y and Z 10 minutes per axis
Shock resistance	Destruction	Shock: MAX 1000m/s ² Direction Time: X, Y and Z 10 times per axis
	Malfunction *1	Shock: MAX 300m/s ² Direction Time: X, Y and Z 3 times per axis
Durability *2	Mechanical	200,000 operations min. (30 operations/min)
	Electrical	200,000 operations min. (20 operations/min)
Heart resistant	85°C 500 hours	
Cold resistant	-40°C 500 hours	
Humidity resistance	70°C 95%RH 500 hours	
Temperature cycle resistance	-40°C (12 hours <-> 55°C (12 hours) 5 cycles	
Degree of protection	IEC IP67 (excluding the terminals on terminal models)	
Ambient operating temperature	-40 to +85°C (at ambient humidity of 60%RH max.) (with no icing or condensation)	
Ambient operating humidity	95%RH max. (for +5 to +35°C)	
Weight	Approx. 0.7 g (for pin plunger models with terminals)	

Note: The data given above are initial values.

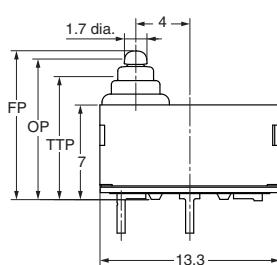
*1. For the pin plunger models, the above values apply for use at the free position, operating position, and total travel position. For the lever models, they apply at the total travel position. Close or open circuit of the contact is 1ms max.

*2. For testing conditions, consult your OMRON sales representative.

Mounting Structure and Reference Positions for Operating Characteristics (Unit: mm)

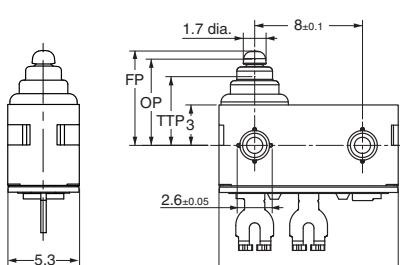
● Without posts

D2AW-R□-A

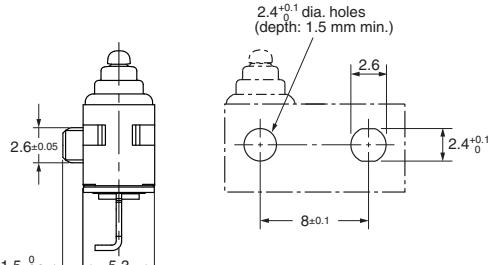


● Short post

D2AW-R□-E□

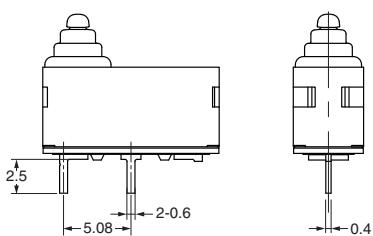


Mounting Hole Dimensions (Reference)

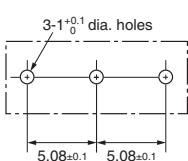
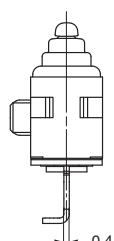
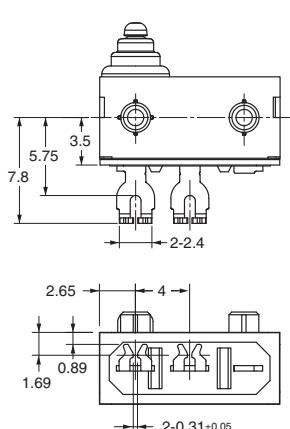


Terminals (Unit: mm)

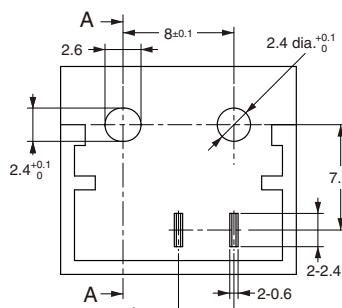
● PCB terminals



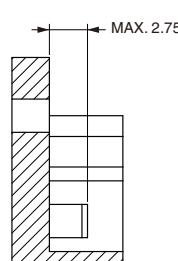
<PCB Mounting Dimensions (Reference)>

● Press-fit terminals
(Left angled)

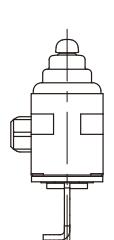
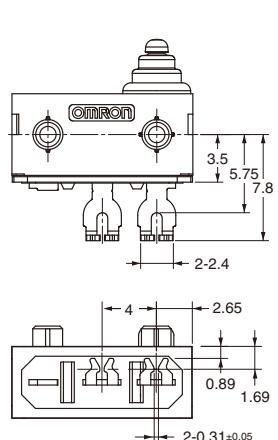
Insertion side unit mounting dimensions (for reference only)



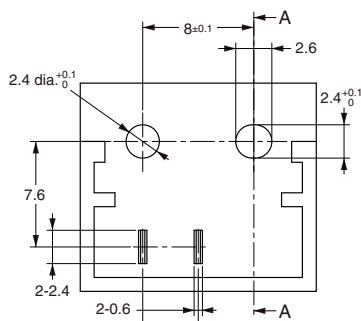
Cross section A-A



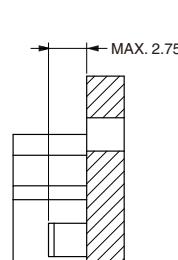
(Right angled)

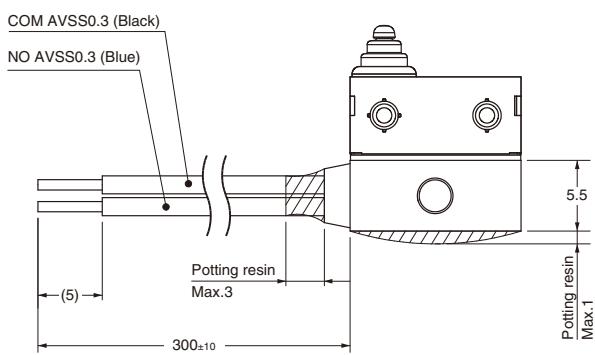
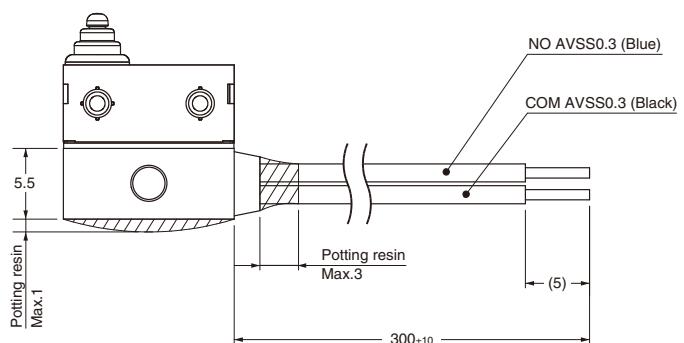
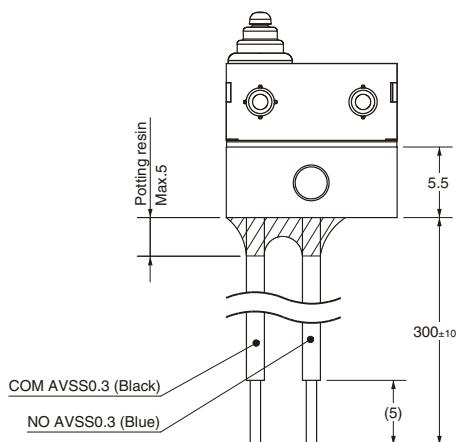


Insertion side unit mounting dimensions (for reference only)



Cross section A-A



Terminals (Unit: mm)**● Molded lead wires on left-side****● Molded lead wires on right-side****● Molded lead wires downwards**

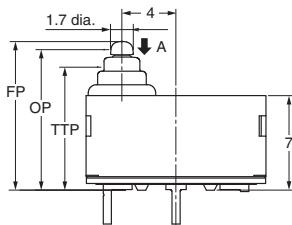
Dimensions (Unit: mm) / Operating Characteristics

CAD Data Please visit our website, which is noted on the last page.

The following illustrations and drawings are for solder terminal models. PCB terminal models are omitted from the drawings. Refer to *Terminals* for these terminals. When ordering, replace □ with the code for the rating that you need. For the combination of models, refer to *List of Models*.

● Pin plunger

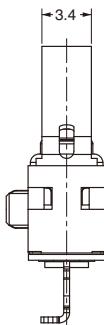
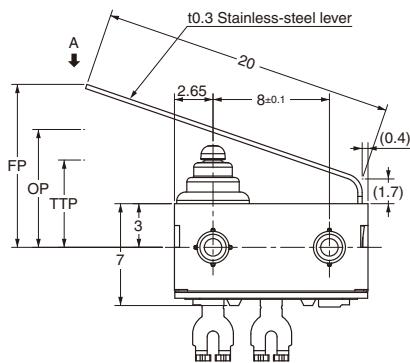
D2AW-R□-□003□



Operating characteristics	Type	Without posts	Models with posts
Operating Force	OF Max.	1.0N {101 gf}	
Releasing Force	RF Min.	0.1N {10 gf}	
Overtravel	OT	1.4 mm (reference value)	
Movement Differential	MD Max.	0.25 mm	
Free Position	FP Max.	11.2 mm	7.2 mm
Operating Position	OP	10.4 ± 0.3 mm	6.4 ± 0.3 mm
Total Travel Position	TP Max.	9.1 mm	5.1 mm

● Long straight leaf lever

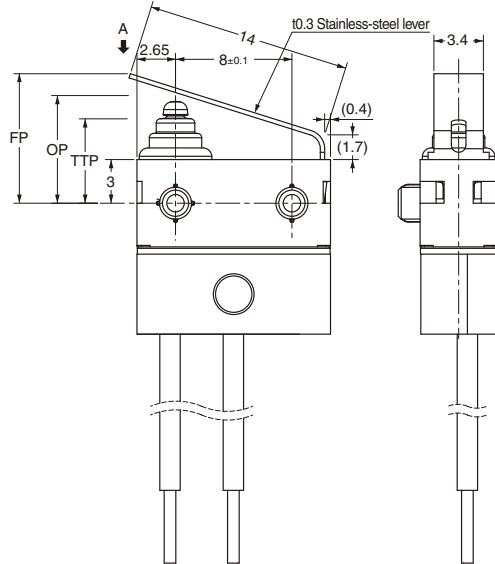
D2AW-R□-□053□



Operating characteristics	Type	Without posts	Models with posts
Operating Force	OF Max.	1.5N {152 gf}	
Releasing Force	RF Min.	0.1N {10 gf}	
Overtravel	OT	2.5 mm (reference value)	
Movement Differential	MD Max.	0.7 mm	
Free Position	FP Max.	15.9 mm	11.9 mm
Operating Position	OP	12.1 ± 0.8 mm	8.1 ± 0.8 mm
Total Travel Position	TP Max.	10.0 mm	6.0 mm

● Leaf lever

D2AW-R□-□063□



Operating characteristics	Type	Without posts	Models with posts
Operating Force	OF Max.	2.0N {203 gf}	
Releasing Force	RF Min.	0.2N {20 gf}	
Overtravel	OT	1.8 mm (reference value)	
Movement Differential	MD Max.	0.5 mm	
Free Position	FP Max.	13.3 mm	9.3 mm
Operating Position	OP	11.4 ± 0.5 mm	7.4 ± 0.5 mm
Total Travel Position	TP Max.	9.8 mm	5.8 mm

Note1. Unless otherwise specified, a tolerance of ± 0.2 mm applies to all dimensions.

Note2. The operating characteristics are for operation in the A direction (↓).

Precautions

Please refer to "Safety Precautions for All Detection Switches" for correct use.

Cautions	Correct Use
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●Degree of Protection

- Do not use this product underwater.

Although molded lead wire models satisfy the test conditions for the standard given below, this test is to check the ingress of water into the switch enclosure after submerging the Switch in water for a given time. Satisfying this test condition does not mean that the Switch can be used underwater.

JIS C0920:

Degrees of protection provided by enclosures of electrical apparatus (IP Code)

IEC 60529:

Degrees of protection provided by enclosures (IP Code)

Degree of protection: IP67

(check water intrusion after immersion for 30 min. submerged 1m underwater)

- Do not operate the Switch when it is exposed to water spray, or when water drops adhere to the Switch surface, or during sudden temperature changes, otherwise water may intrude into the interior of the Switch due to a suction effect.

- Prevent the Switch from coming into contact with oil and chemicals.

Otherwise, damage to or deterioration of Switch materials may result.

- Do not use the Switch in areas where it is exposed to silicon adhesives, oil, or grease. Otherwise faulty contact may result due to the generation of silicon oxide.

●Soldering

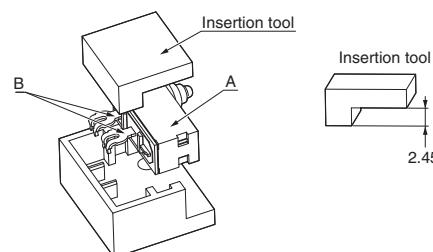
- Make sure that the temperature of the soldering iron tip does not exceed 300°C, and complete the soldering within 3 seconds. Do not apply any external force for 1 minute after soldering. Soldering at an excessively high temperature or soldering for more than 3 seconds may deteriorate the characteristics of the Switch. In case of automatic soldering, please do not apply the heat beyond 260°C within 5 seconds. Pay careful attention so that flux or solder liquid does not flow over the edge of the PCB panel.

●Horizontal and rotational operations

- Factors such as the operating speed, operating frequency, push-button indentation, and material and shape will affect the durability of the Switch. Confirm performance specifications under actual operating conditions before using the Switch in applications.

●Mounting

- Turn OFF the power supply before mounting or removing the Switch, wiring, or performing maintenance or inspection. Failure to do so may result in electric shock or burning.
- For models with posts, secure the posts by pressing into an attached device. Provide guides on the opposite ends of the posts to ensure that they do not fall out or rattle.
- When mounting a Press-fit terminals, press in A (body) and B (terminal) in the drawing below at the same time. If A (body) only is pressed in, the Press-fit terminals will be deformed and will not be properly inserted. Also, ensure that the Press-fit terminals is facing down when it is inserted. Mold the terminal part with urethane resin, etc., and use it in a state where the terminal part does not come into contact with outside air. Avoid connecting soldered or laser-welded terminals. Avoid mounting in conditions exposed to corrosive gases, high temperature and humidity, and dust.



●Operating Body

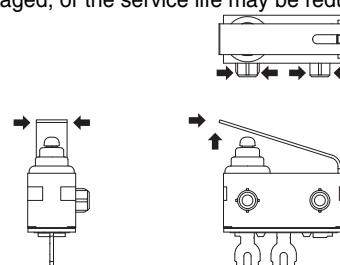
- Use an operating body with low frictional resistance and of a shape that will not interfere with the sealing rubber, otherwise the plunger may be damaged or the sealing may deteriorate.

●ESD

- Static electricity adversely affects the chip resistor inside. For this reason, adopt sufficient electrostatic discharge measures when handling the Switch. Also, take sufficient consideration in the handling of the Switch and its packaging and transportation container.

●Handling

- Do not handle the Switch in a way that may cause damage to the sealing rubber.
- When handling the Switch, ensure that pressure is not applied to the posts in the directions shown in the following diagram. Also, ensure that uneven pressure or pressure in a direction other than the operating direction is not applied to the Actuator as shown in the following diagram. Otherwise, the post, Actuator, or Switch may be damaged, or the service life may be reduced.



●Wiring Molded Lead Wire Models

- When wiring molded lead wire models, ensure that there is no weight applied on the wire or that there are no sharp bends near the parts where the wire is drawn out. Otherwise, damage to the Switch or deterioration in the sealing may result.

Please check each region's Terms & Conditions by region website.

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