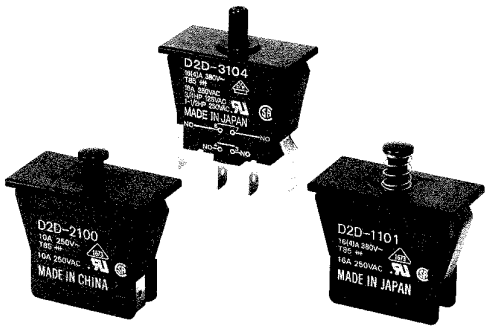
OMRON

Door Interlock Switch

D2D

Power Switch with Minimum Contact Gap of 3 mm

- Offers the minimum contact gap of 3 mm required for power switches as standard equipment. Highly reliable design conforms to European safety standards.
- Safety considerations include a double return spring and direct drive positive contact opening feature. Also conforms to Class II of VDE Insulation.
- Pull-on lock model for easy maintenance is also available.



Ordering Information

■ Model Number Legend

D2D-□□0□

1 2 3

1. Construction
- 1: Single pole, 3-mm contact gap
- 2: Pull-on-lock type, 1-mm contact gap
- 3: Double-pole, 3-mm contact gap

2. Mounting
- 0: Screw mounting
- 1: Panel snap-fit mounting

3. Contact Form
- 0: SPDB-NO/NC
- 1: SPDB-NO
- 2: SPDB-NC
- 3: SPDB-NO+SPDB-NO/NC
- 4: DPDB-NO

■ List of Models

Mounting method	Contact form	Standard	Pull-on lock (see note)
		Contact gap: 3 mm min.	Contact gap: 1 mm
Screw mounting	SPDB-NO/NC	D2D-1000	D2D-2000
	SPDB-NO	D2D-1001	---
	SPDB-NC	D2D-1002	---
Panel mounting	SPDB-NO/NC	D2D-1100	D2D-2100
	SPDB-NO	D2D-1101	---
	SPDB-NC	D2D-1102	---
	SPDB-NO+SPDB-NO/NC	D2D-3103	---
	DPDB-NO	D2D-3104	---

Note: Refer to page 273 for the pull-on lock function.

Specifications

■ Ratings

Type	Rated voltage	Item: Resistive load
Standard	250 VAC	16 A
Pull-on lock	250 VAC	10 A

Note: The ratings values apply under the following test conditions:
Ambient temperature: 20±2°C
Ambient humidity: 65±5%
Operating frequency: 30 operations/min

■ Switching Capacity per Load (Reference Values)

Type	Voltage	Non-inductive load		Inductive load	
		Resistive load		Motor load	
		NC	NO	NC	NO
Standard	**125 VAC**	16 A		4 A	
	250 VAC	16 A		4 A	
Pull-on lock	**125 VAC**	10 A		---	
	250 VAC	10 A		---	

Note: 1. The above values are for the steady-state current.
2. Motor load has an inrush current of 6 times the steady-state current.

■ Characteristics

Item		D2D-1000 models	D2D-2000 models	D2D-3000 models
Operating speed		10 mm to 1 m/s		
Operating frequency		Mechanical: 300 operations/min max. Electrical: 30 operations/min max.		
Insulation resistance		100 MΩ min. (at 500 VDC)		
Contact resistance (initial value)		50 mΩ max.		
Dielectric strength (50/60 Hz 1mm)	**Between terminals of same polarity**	2,000 VAC	1,000 VAC	2,000 VAC
	Between terminals and ground (see note 2)	2,000 VAC	1,500 VAC	2,000 VAC
	Between terminals and non-current-carrying metal part	2,500 VAC	1,500 VAC	---
	Between terminals and actuator	4,000 VAC	---	4,000 VAC
Vibration resistance		Malfunction: 10 to 55 Hz, 1.5-mm double amplitude		
Shock resistance		Destruction: 1,000 m/s^2 {approx. 100G} max.		
		Malfunction: 500 m/s^2 {approx. 50G} max.	Malfunction: 300 m/s^2 {approx. 30G} max.	Malfunction: 500 m/s^2 {approx. 50G} max.
Durability (see note 3)		Mechanical: 10,000,000 operations min. (60 operations/min) Electrical: 100,000 operations min. (30 operations/min)		
Degree of protection		IEC IP40		
Degree of protection against electric shock		Class II		
Proof tracking index (PTI)		175		
Ambient operating temperature		–25°C to 85°C (at ambient humidity of 60% max.) (with no icing)		
Ambient operating humidity		85% max. (for 5°C to 35°C)		
Weight		Approx. 14 g (D2D-1000)		

Note: 1. The data given above are initial values.
2. The dielectric strength shown in the table indicates a value for models with a Separator.
3. For testing conditions, consult your OMRON sales representative.

■ Approved Standards

Consult your OMRON sales representative for specific models with standard approvals.

UL1054 (File No. E41515)/ CSA C22.2 No. 55 (File No. LR21642)

Rated voltage	D2D-1000	D2D-2000	D2D-3000
125 VAC	---	---	3/4 HP
250 VAC	16 A	10 A	16 A, 1-1/2 HP

EN61058-1 (File No. 136005, VDE approval)

Rated voltage	D2D-1000	D2D-2000	D2D-3000
250 VAC	16 (4) A	10 A	16 (4) A

Testing conditions: 1E4 (10,000 operations), T85 (0°C to 85°C)

Note: The values in parentheses indicate motor load ratings.

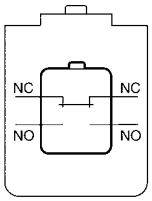
EN61058-1 (File No. R9551934, TÜV Rheinland approval)

Rated voltage	D2D-3104
24 VDC	4 A

Testing conditions: 5E4 (50,000 operations), T85 (0°C to 85°C)

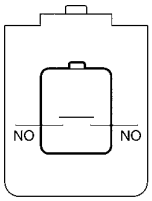
■ Contact Form

SPDB-NO/NC



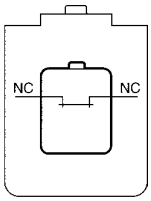
D2D-1000 D2D-2000
D2D-1100 D2D-2100

SPDB-NO



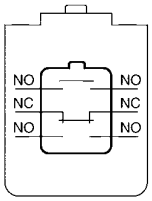
D2D-1001
D2D-1101

SPDB-NC



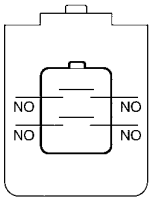
D2D-1002
D2D-1102

SPDB-NO +SPDB-NO/NC



D2D-3103

DPDB-NO



D2D-3104

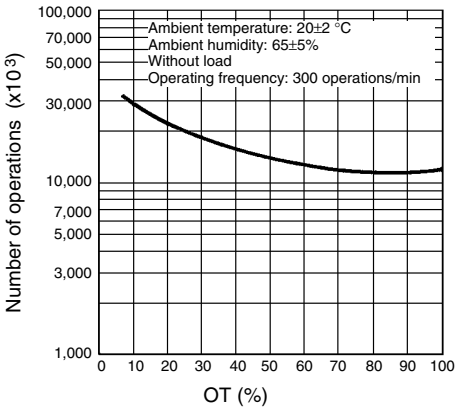
■ Contact Specifications

Item		Standard model	Pull-on lock model
Contact	Specification	Rivet	
	Material	Silver	
	Gap (standard value)	3 mm min.	1 mm
Inrush current	NC	30 A max.	24 A max.
	NO	30 A max.	24 A max.
Minimum applicable load (see note)		160 mA at 5 VDC	

Note: For more information on the minimum applicable load, refer to *Using Micro Loads* on page 277.

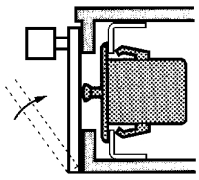
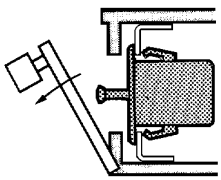
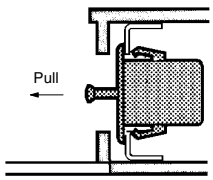
Engineering Data (Reference Values)

Mechanical Durability (D2D-1000)



■ Pull-on Lock Function

When opening or closing the door, the power ON state of the Switch can be checked with the door left open. By closing the door after maintenance inspection, the Switch will resume the normal momentary action. (This feature is ideal for conducting the electrical continuity test, inspection, repair, etc. of the Switch after its assembly.)

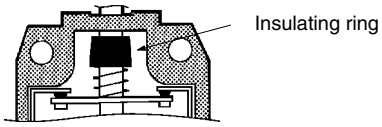
Example		To turn ON the power when the door is closed	To turn OFF the power when the door is open	To turn ON the power with the door left open
State				
Connection	NO-NO	ON	OFF	ON
	NC-NC	OFF	ON	OFF

■ Double Spring Mechanism

Two return springs are provided for the pin plunger. Thus, if either of the springs is broken, this feature will prevent the Switch from malfunctioning or short-circuiting.
Applicable Models: D2D-1000 and 3000 models

■ Direct Contact Opening Mechanism

The insulating ring ▲ will positively break the circuit if a contact weld occurs in the Switch.
Applicable Models: D2D-1000 Models

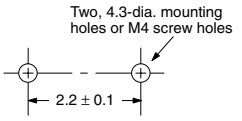


Example of D2D-1000.

Dimensions

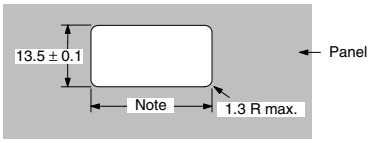
■ Mounting Holes

Note: All units are in millimeters unless otherwise indicated.



Panel Cutout Dimensions

Panel thickness: 1.0 to 2.5 mm



Note: Dimension is 36.7±0.1 with a panel thickness of 1.0 mm and 37.0±0.1 with a panel thickness of 2.5 mm

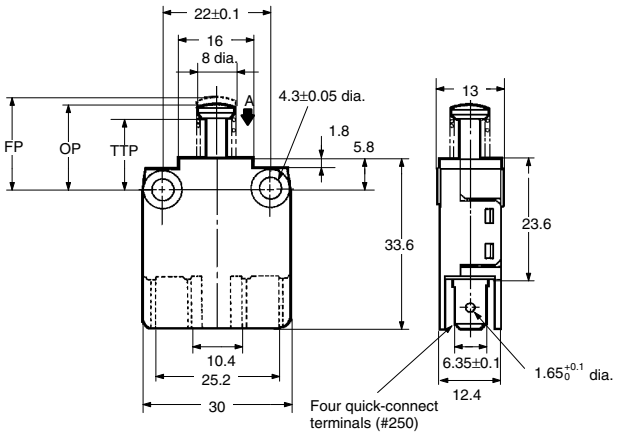
■ Dimensions and Operating Characteristics

Note: 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
3. The operating characteristics are for operation in the A direction (▼).

■ Standard Models

Screw Mounting

D2D-1000
D2D-1001
D2D-1002

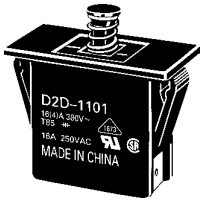


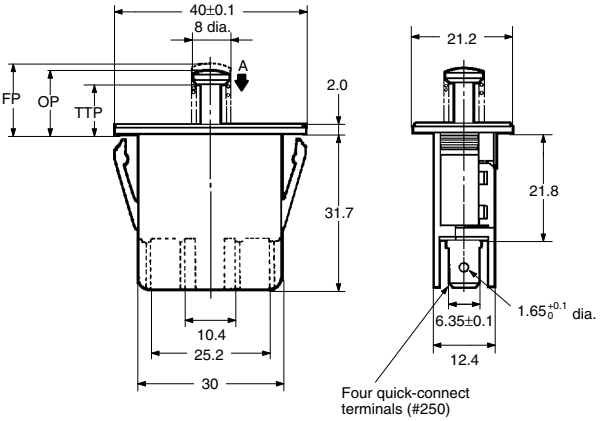
Note: NC-OFF: The force applied to the actuator to cause it to move from the free position to the position at which the NC contact opens.
NO-ON: The force applied to the actuator to cause it to move from the free position to the position at which the NO contact closes.

Model		Screw mounting		
		D2D-1000	D2D-1001	D2D-1002
OF max.	NC-OFF	2.94 N {300 gf}	---	2.94 N {300 gf}
	NO-ON	5.88 N {600 gf}	5.88 N {600 gf}	---
TTF max.		7.35 N {750 gf}	7.35 N {750 gf}	7.35 N {750 gf}
OT min.		2.3 mm	2.3 mm	5.5 mm
FP max.		16.4 mm	17 mm	16.4 mm
OP	NC-OFF	15.9±0.4 mm	---	15.9±0.4 mm
	NO-ON	12.7±0.4 mm	12.7±0.4 mm	---
TTP max.		10 mm	10 mm	10 mm

Panel Mounting

D2D-1100
D2D-1101
D2D-1102

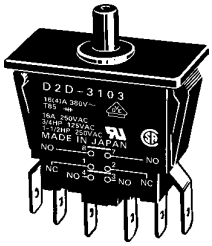


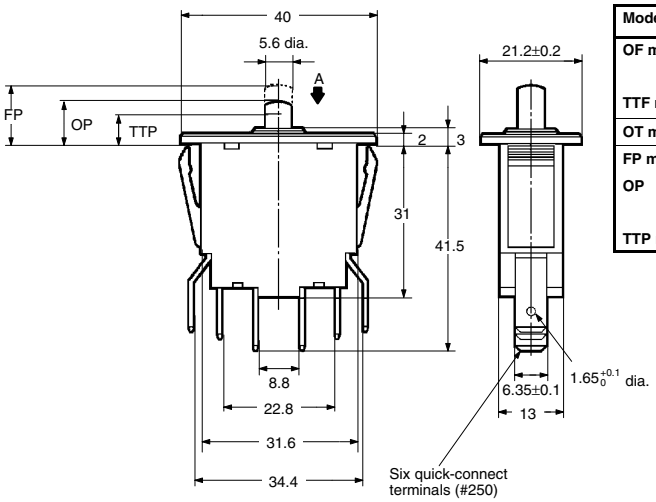


Model		Panel mounting		
		D2D-1100	D2D-1101	D2D-1102
OF max.	NC-OFF	2.94 N {300 gf}	---	2.94 N {300 gf}
	NO-ON	5.88 N {600 gf}	5.88 N {600 gf}	---
TTF max.		7.35 N {750 gf}	7.35 N {750 gf}	7.35 N {750 gf}
OT min.		2.3 mm	2.3 mm	5.5 mm
FP max.		12.4 mm	13 mm	12.4 mm
OP	NC-OFF	11.9±0.4 mm	---	11.9±0.4 mm
	NO-ON	8.7±0.4 mm	8.7±0.4 mm	---
TTP max.		6 mm	6 mm	6 mm

Panel Mounting

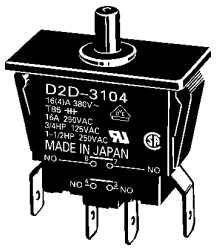
D2D-3103

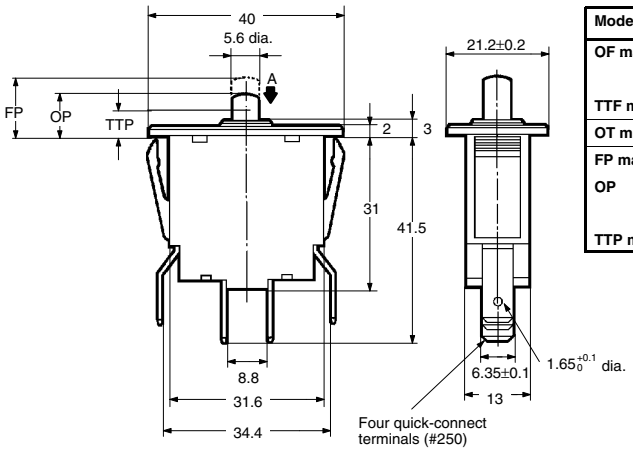




Model		D2D-3103
OF max.	NC-OFF	2.94 N {300 gf}
	NO-ON	5.88 N {600 gf}
TTF max.		9.81 N {1,000 gf}
OT min.		2.3 mm
FP max.		12.4 mm
OP	NC-OFF	11.9±0.8 mm
	NO-ON	8.7±0.8 mm
TTP max.		6.4 mm

Panel Mounting
D2D-3104



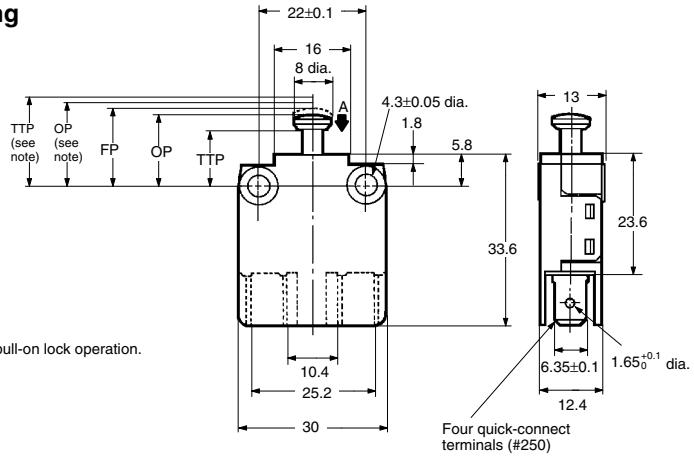


Model		D2D-3104
OF max.	NC-OFF	---
	NO-ON	5.88 N {600 gf}
TTF max.		9.81 N {1,000 gf}
OT min.		2.3 mm
FP max.		13.5 mm
OP	NC-OFF	---
	NO-ON	8.7±0.8 mm
TTP max.		6.4 mm

■ Pull-on Lock Models

Screw Mounting
D2D-2000

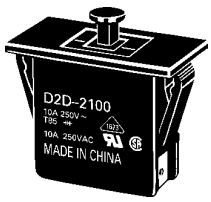
Note: At pull-on lock operation.



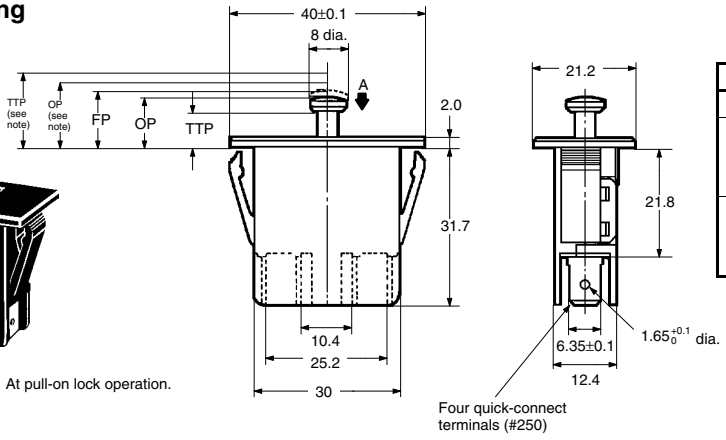
Momentary Operation (Normal Operation)

Model		D2D-2000	D2D-2100
OF max.	NC-OFF	1.96 N {200 gf}	1.96 N {200 gf}
	NO-ON	2.94 N {300 gf}	2.94 N {300 gf}
TTF max.		5.88 N {600 gf}	5.88 N {600 gf}
OT min.		4.5 mm	4.5 mm
FP max.		14.3 mm	10.3 mm
OP	NC-OFF	13.5± 0.6 mm	9.5±0.6 mm
	NO-ON	12.7± 0.6 mm	8.7±0.6 mm
TTP max.		8.3 mm	4.3 mm

Panel Mounting
D2D-2100



Note: At pull-on lock operation.



Pull-on Lock Operation

Model	D2D-2000	D2D-2100
OF max.	19.61 N {2,000 gf}	
PT max.	2 mm	
OT min.	0.4 mm	
MD max.	1.5 mm	
FP max.	14.3 mm	10.3 mm
OP	15.1±0.6 mm	11.1±0.6 mm
TTP max.	16.5 mm	12.5 mm

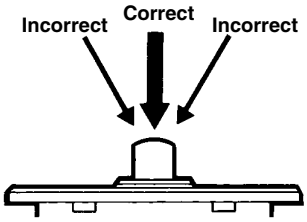
Precautions

Refer to pages 26 to 31 for common precautions.

■ Correct Use

Mounting

Apply operation force to the pin plunger in the direction it operates. Applying forces laterally or from an oblique direction may damage the pin plunger.

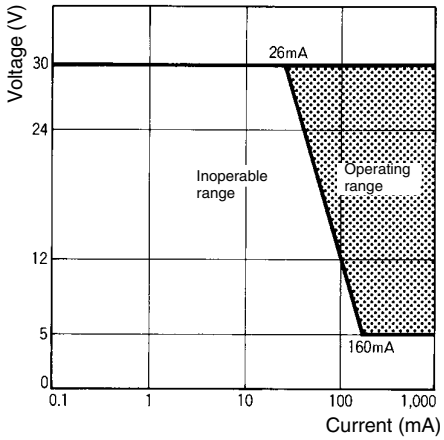


Use M4 mounting screws with plane washers or spring washers to securely mount the Switch. Tighten the screws to a torque of 0.49 to 0.69 N • m {5 to 7 kg • cm}

Using Micro Loads

Using a model for ordinary loads to open or close the contact of a micro load circuit may result in faulty contact. Use models that operate in the following range. However, even when using micro load models within the operating range shown below, if inrush current occurs when the contact is opened or closed, it may increase contact wear and so decrease durability. Therefore, insert a contact protection circuit where necessary.

The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ 60). The equation, $\lambda\ 60 = 0.5 \times 10^{-6}$/operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



■ Connector (Sold Separately)

Refer to Terminal Connectors on page 282.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. B085-E1-05B