

Safety-door Switch D4NS

Safety Interlock
Switches
D4NS

Multi-contact, Labor-saving, Environment-friendly, Next-generation Safety-door Switch

- Lineup includes three contact models with 2NC/1NO and 3NC contact forms and MBB models in addition to the previous contact forms 1NC/1NO, and 2NC.
- M12-connector models are available, saving on labor and simplifying replacement.
- Standardized gold-clad contacts provide high contact reliability.
- Applicable to both standard loads and microloads.
- Free of lead, cadmium, and hexavalent chrome, reducing the burden on the environment.



NEW

Model Number Structure

Model Number Legend

Switch

D4NS-
1 2 3

1. Conduit/Connector size

- 1: Pg13.5 (1-conduit)
- 2: G1/2 (1-conduit)
- 3: 1/2-14NPT (1-conduit)
- 4: M20 (1-conduit)
- 5: Pg13.5 (2-conduit)
- 6: G1/2 (2-conduit)
- 7: 1/2-14NPT compatible (2-conduit model with M20 conduit size includes an M20-to-1/2-14NPT conversion adapter)
- 8: M20 (2-conduit)
- 9: M12 connector (1-conduit)

2. Built-in Switch

- A: 1NC/1NO (slow-action)
- B: 2NC (slow-action)
- C: 2NC/1NO (slow-action)
- D: 3NC (slow-action)
- E: 1NC/1NO (MBB contact)
- F: 2NC/1NO (MBB contact)

3. Head Mounting Direction and Material

- F: Four mounting directions possible (Front-side mounting at time of delivery)/plastic
- D: Four mounting directions possible (Front-side mounting at time of delivery)/metal

Note: An order for the head part or the switch part alone cannot be accepted. The Operation Key is sold separately.

Operation Key

D4DS-K
1

1. Operation Key Type

- 1: Horizontal mounting
- 2: Vertical mounting
- 3: Adjustable mounting (Horizontal)
- 5: Adjustable mounting (Horizontal/ Vertical)

Ordering Information

■ List of Models

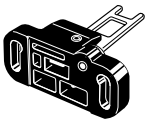
Switches (Operation Keys are sold separately.)

Type	Contact configuration		Conduit opening/Connector	Model
1-Conduit	Slow-action	1NC/1NO	Pg13.5	D4NS-1AF
			G1/2	D4NS-2AF
			1/2-14NPT	D4NS-3AF
			M20	D4NS-4AF
		2NC	Pg13.5	D4NS-1BF
			G1/2	D4NS-2BF
			1/2-14NPT	D4NS-3BF
			M20	D4NS-4BF
		2NC/1NO	Pg13.5	D4NS-1CF
			G1/2	D4NS-2CF
			1/2-14NPT	D4NS-3CF
			M20	D4NS-4CF
		3NC	Pg13.5	D4NS-1DF
			G1/2	D4NS-2DF
			1/2-14NPT	D4NS-3DF
			M20	D4NS-4DF
	Slow-action MBB contact	1NC/1NO	Pg13.5	D4NS-1EF
			G1/2	D4NS-2EF
			1/2-14NPT	D4NS-3EF
			M20	D4NS-4EF
		2NC/1NO	Pg13.5	D4NS-1FF
			G1/2	D4NS-2FF
			1/2-14NPT	D4NS-3FF
			M20	D4NS-4FF
2-Conduit	Slow-action	1NC/1NO	Pg13.5	D4NS-5AF
			G1/2	D4NS-6AF
			M20, includes M20-to-1/2-14NPT conversion adapter	D4NS-7AF
			M20	D4NS-8AF
		2NC	Pg13.5	D4NS-5BF
			G1/2	D4NS-6BF
			M20, includes M20-to-1/2-14NPT conversion adapter	D4NS-7BF
			M20	D4NS-8BF
		2NC/1NO	Pg13.5	D4NS-5CF
			G1/2	D4NS-6CF
			M20, includes M20-to-1/2-14NPT conversion adapter	D4NS-7CF
			M20	D4NS-8CF
		3NC	Pg13.5	D4NS-5DF
			G1/2	D4NS-6DF
			M20, includes M20-to-1/2-14NPT conversion adapter	D4NS-7DF
			M20	D4NS-8DF
	Slow-action MBB contact	1NC/1NO	Pg13.5	D4NS-5EF
			G1/2	D4NS-6EF
			M20, includes M20-to-1/2-14NPT conversion adapter	D4NS-7EF
			M20	D4NS-8EF
		2NC/1NO	Pg13.5	D4NS-5FF
			G1/2	D4NS-6FF
			M20, includes M20-to-1/2-14NPT conversion adapter	D4NS-7FF
			M20	D4NS-8FF
1-Conduit, with connector	Slow-action	1NC/1NO	M12 connector	D4NS-9AF
		2NC		D4NS-9BF
	Slow-action MBB contact	1NC/1NO		D4NS-9EF

Note: 1. The recommended models for equipment and machinery being exported to Europe are those with an M20 or Pg13.5 conduit sizes, and for North America, the recommended models are those with a 1/2-14NPT conduit sizes.

2. Resin is used as the material for the D4NS housing and head. Use the metal D4BS Safety-door Switch for applications requiring greater mechanical strength.

Operation Keys

Type	Model
Horizontal mounting 	D4DS-K1
Vertical mounting 	D4DS-K2
Adjustable mounting (Horizontal) 	D4DS-K3
Adjustable mounting (Horizontal/Vertical) 	D4DS-K5

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Specifications

■ Standards and EC Directives

- Conforms to the following EC Directives:
Machinery Directive
Low Voltage Directive
EN50047
EN1088
GS-ET-15

■ Approved Standards

Agency	Standard	File No.
TÜV Product Service	EN60947-5-1 (approved direct opening)	(See note 1.)
UL (See note.)	UL508, CSA C22.2 No.14	E76675
CQC (CCC)	GB14048.5	2003010305077 330

- Note:** 1. Consult your OMRON representative for details.
2. Approval for CSA C22.2 No. 14 is authorized by the UL mark.
3. Ask your OMRON representative for information on approved models.

■ Approved Standard Ratings

TÜV (EN60947-5-1), CCC (GB14048.5)

Item	Utilization category	AC-15	DC-13
Rated operating current (I_e)		3 A	0.27 A
Rated operating voltage (U_e)		240 V	250 V

Note: Use a 10-A fuse type gI or gG that conforms to IEC60269 as a short-circuit protection device. This fuse is not built into the Switch.

UL/CSA (UL508, CSA C22.2 No. 14)

A300

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	10 A	60 A	6 A	7,200 VA	720 VA
240 VAC		30 A	3 A		

Q300

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
125 VDC	2.5 A	0.55 A	0.55 A	69 VA	69 VA
250 VDC		0.27 A	0.27 A		

■ Characteristics

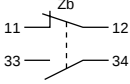
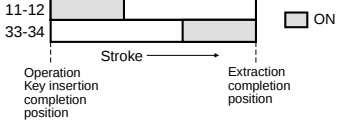
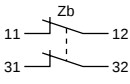
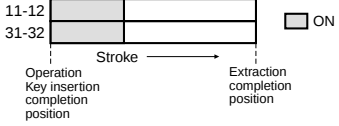
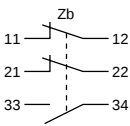
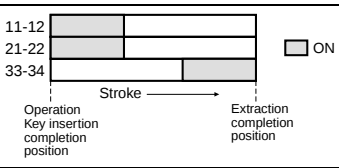
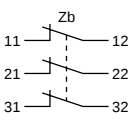
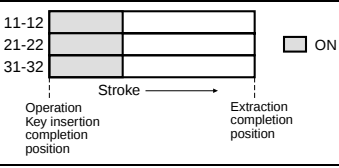
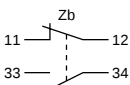
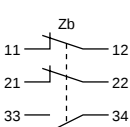
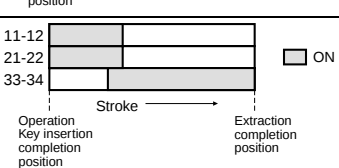
Degree of protection (See note 3.)		IP67 (EN60947-5-1) (This applies for the Switch only. The degree of protection for the key hole is IP00.)	
Durability (See note 4.)	Mechanical	1,000,000 operations min.	
	Electrical	500,000 operations min. for a resistive load of 3 A at 250 VAC (See note 5.) 300,000 operations min. for a resistive load of 10 A at 250 VAC	
Operating speed		0.05 to 0.5 m/s	
Operating frequency		30 operations/minute max.	
Direct opening force (See note 6.)		60 N min.	
Direct opening travel (See note 6.)		10 mm min.	
Contact resistance		25 mΩ max. (initial value)	
Minimum applicable load (See note 7.)		Resistive load of 1 mA at 5 VDC (N-level reference value)	
Rated insulation voltage (U _i)		300 V	
Protection against electric shock		Class II (double insulation)	
Pollution degree (operating environment)		3 (EN60947-5-1)	
Impulse withstand voltage (EN60947-5-1)		Between terminals of the same polarity	2.5 kV
		Between terminals of different polarities	4 kV
		Between other terminals and uncharged metallic parts	6 kV
Insulation resistance		100 MΩ min.	
Contact gap		2 x 2 mm min	
Vibration resistance	Malfunction	10 to 55 Hz, 0.75-mm single amplitude	
Shock resistance	Destruction	1,000 m/s ² min.	
	Malfunction	300 m/s ² min.	
Conditional short-circuit current		100 A (EN60947-5-1)	
Rated open thermal current (I _{th})		10 A (EN60947-5-1)	
Ambient temperature		Operating: -30°C to 70°C with no icing	
Ambient humidity		Operating: 95% max.	
Weight		Approx. 96 g (D4NS-1CF)	

Note: 1. The above values are initial values.

- The Switch contacts can be used with either standard loads or microloads. Once the contacts have been used to switch a load, however, they cannot be used to switch smaller loads. The contact surfaces will become rough once they have been used and contact reliability for smaller loads may be reduced.
- The degree of protection is tested using the method specified by the standard (EN60947-5-1). Confirm that sealing properties are sufficient for the operating conditions and environment beforehand. Although the switch box is protected from dust or water penetration, do not use the D4NS in places where foreign material may enter through the key hole on the head, otherwise Switch damage or malfunctioning may occur.
- The durability is for an ambient temperature of 5°C to 35°C and an ambient humidity of 40% to 70%. For more details, consult your OMRON representative.
- If the ambient temperature is greater than 35°C, do not pass the 3-A, 250-VAC load through more than 2 circuits.
- These figures are minimum requirements for safe operation.
- This value will vary with the switching frequency, environment, and reliability level. Confirm that correct operation is possible with the actual load beforehand.

Connections

■ Contact Form (Diagrams Show State with Key Inserted)

Model	Contact	Contact form	Operating pattern	Remarks
D4NS-□A□	1NC/1NO			Only NC contacts 11-12 have an approved direct opening mechanism. ➡ The terminals 11-12 and 33-34 can be used as unlike poles.
D4NS-□B□	2NC			Only NC contacts 11-12 and 31-32 have an approved direct opening mechanism. ➡ The terminals 11-12 and 31-32 can be used as unlike poles.
D4NS-□C□	2NC/1NO			Only NC contacts 11-12 and 21-22 have an approved direct opening mechanism. ➡ The terminals 11-12, 21-22, and 33-34 can be used as unlike poles.
D4NS-□D□	3NC			Only NC contacts 11-12, 21-22, and 31-32 have an approved direct opening mechanism. ➡ The terminals 11-12, 21-22, and 31-32 can be used as unlike poles.
D4NS-□E□	1NC/1NO MBB			Only NC contacts 11-12 have an approved direct opening mechanism. ➡ The terminals 11-12 and 33-34 can be used as unlike poles.
D4NS-□F□	2NC/1NO MBB			Only NC contacts 11-12 and 21-22 have an approved direct opening mechanism. ➡ The terminals 11-12, 21-22 and 33-34 can be used as unlike poles.

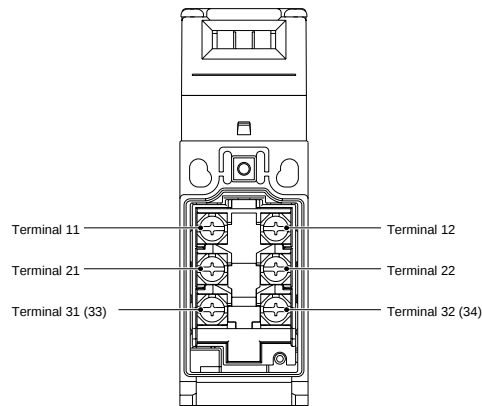
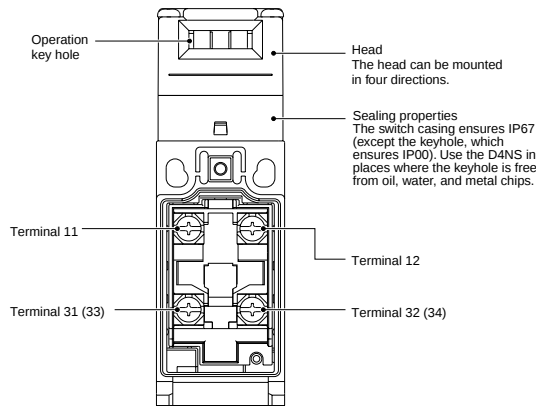
Note: MBB (Make Before Break) contacts have an overlapping structure, so that before the normally closed contact (NC) opens, the normally open contact (NO) closes.

Nomenclature

■ Structure

D4NS-□A□, D4NS-□B□, D4NS-□E□

D4NS-□C□, D4NS-□D□, D4NS-□F□



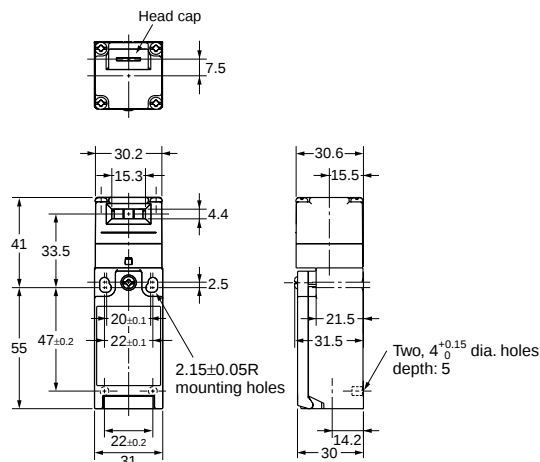
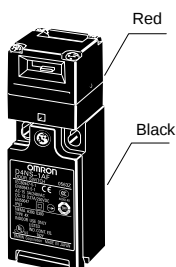
Dimensions

Note: All units are in millimeters unless otherwise indicated.

Switches

1-Conduit Models

D4NS-1□F
D4NS-2□F
D4NS-3□F
D4NS-4□F

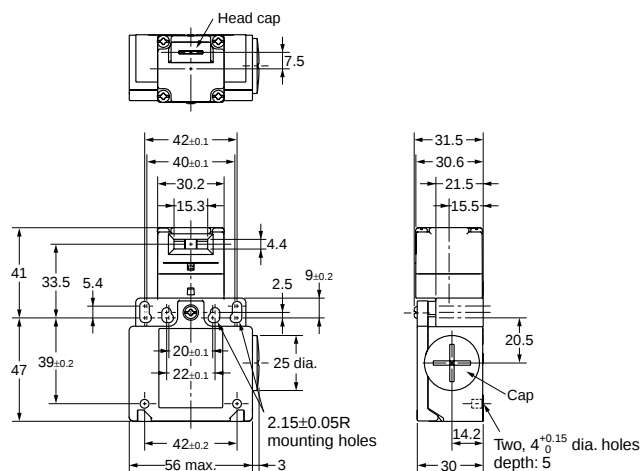
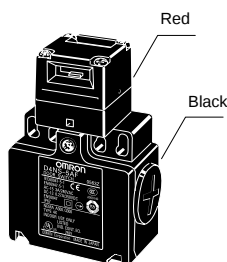


Operating characteristics	D4NS-1□F D4NS-2□F D4NS-3□F D4NS-4□F
Key insertion force Key extraction force	15 N max. 30 N max.
Pretravel (PT)	6±3 mm
Total travel (TT)	(28 mm)
Direct opening force* Direct opening stroke*	60 N min. 10 mm min.

* Always maintain the above operating characteristics for safe use.

2-Conduit Models

D4NS-5□F
D4NS-6□F
D4NS-7□F
D4NS-8□F

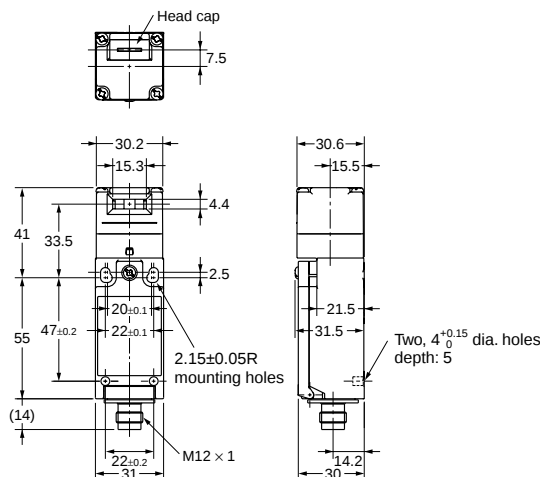
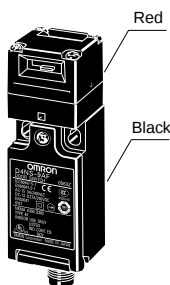


Operating characteristics	D4NS-5□F D4NS-6□F D4NS-7□F D4NS-8□F
Key insertion force Key extraction force	15 N max. 30 N max.
Pretravel (PT)	6±3 mm
Total travel (TT)	(28 mm)
Direct opening force* Direct opening stroke*	60 N min. 10 mm min.

* Always maintain the above operating characteristics for safe use.

1-Conduit Connector Models

D4NS-9□F



Operating characteristics	D4NS-9□F
Key insertion force Key extraction force	15 N max. 30 N max.
Pretravel (PT)	6±3 mm
Total travel (TT)	(28 mm)
Direct opening force* Direct opening stroke*	60 N min. 10 mm min.

* Always maintain the above operating characteristics for safe use.

Note: 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

2. There are fluctuations in the contact ON/OFF timing for Switches with multiple poles (2NC, 2NC/1NO, or 3NC). Confirm performance before application.