Safety-Door Switch

Features Special Operation Key That Positively Pulls Apart Contacts, Contributing to Machine Safety

- The switch contact is opened by a positive opening mechanism (NC contacts only)
- Mounting pitch and shape of the switch box conforms to CENELEC (EN50041)
- Degree of protection of the switch box: IP67 (EN60947-5-1)
- Standards and EC Directives:
  - Conforms to the following EC Directives:
    Machinery Directive
    Low Voltage Directive
    EN50041
    EN1088
- Approved Standards

Agency	Standard	File No.
TÜV Rheinland	EN60947-5-1	R9351022 (Positive opening: approved)
UL	UL508	E76675
CSA	CSA C22.2 No. 14	LR45746
BIA	GS-ET-15	9303323
SUVA	SUVA	E6187.d

Ordering Information

■ MODEL NUMBER LEGEND

Switch

D4BS -□ □ □ S
1 2 3

1. **Conduit**
   1: PG13.5 (1 conduit, European type)
   2: G1/2 (1 conduit, Japanese type)
   3: 1/2-14NPT (1 conduit, North American type)
   5: PG13.5 (3-conduit, European tyype)
   6: G1/2 (3-conduit, Japanese type)
   7: 1/2-14NPT (3-conduit, North American type)
2. **Built-in Switch**
   5: 1NC/1NO (Slow-action)
   A: 2NC (Slow-action)
3. **Head Mounting Direction**
   F: Four mounting directions possible (front-side mounting at shipping)

Operation Key

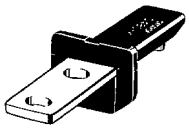
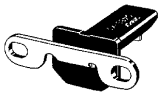
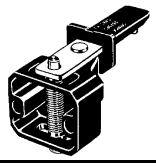
D4BS - K □
1

1. **Operation Key Type**
   1: Horizontal mounting
   2: Vertical mounting
   3: Adjustable mounting (Horizontal)

■ SWITCHES

Description				Part number	
Conduit size/type		Mounting direction		1NC/1NO (Slow-action)	2NC (Slow-action)
1-conduit	Pg13.5 (European type)	Front-side mounting		**D4BS-15FS**	**D4BS-1AFS**
	G1/2 (Japanese type)			**D4BS-25FS**	**D4BS-2AFS**
	1/2-14NPT (North American type)			**D4BS-35FS**	**D4BS-3AFS**
3-conduit	Pg13.5 (European type)			**D4BS-55FS**	**D4BS-5AFS**
	G1/2 (Japanese type)			**D4BS-65FS**	**D4BS-6AFS**
	1/2-14NPT (North American type)			**D4BS-75FS**	**D4BS-7AFS**

■ OPERATION KEYS (ORDER SEPARATELY)

Type	Part number
Horizontal mounting 	**D4BS-K1**
Vertical mounting 	**D4BS-K2**
Adjustable mounting (Horizontal) 	**D4BS-K3**

Specifications

■ APPROVED STANDARD RATINGS

TÜV (EN60947-5-1)

Utilization category	AC-15
Rated operating current (Ie)	2 A
Rated operating voltage (Ue)	400 V

Note: Use IEC269-compliant 10-A fuse type gI or gG as a short-circuit protective device.

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

A600

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		
480 VAC		15 A	1.5 A		
600 VAC		12 A	1.2 A		

■ CHARACTERISTICS

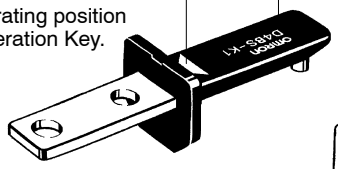
Degree of protection (see note 2)	IP67 (EN60947-5-1))
Life expectancy (see note 3)	Mechanical: 1,000,000 operations min. Electrical: 500,000 operations min. (10 A at 250 VAC, resistive load)
Operating speed	0.1 m/s to 0.5 m/s
Operating frequency	30 operations/min max.
Rated frequency	50/60 Hz
Contact gap	2 x 2 mm min.
Positive opening force (see note 4)	19.61 N min. (EN60947-5-1)
Positive opening travel (see note 4)	20 mm min. (EN60947-5-1)
Full stroke	23 mm min.
Insulation resistance	100 MΩ min. (at 500 VDC) between terminals of same or different polarity, between each terminal and ground, and between each terminal and non-current-carrying metal part
Contact resistance	25 mΩ max. (initial value)
Rated insulation voltage (U_i)	600 VAC (EN60947-5-1)
Conventional enclosed thermal current (I_{the})	20 A (EN60947-5-1)
Dielectric strength (U_{imp})	Impulse dielectric strength (U_{imp}) 4 kV (EN60947-5-1) for 1 min between terminals of same or different polarity, between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal part
Switching overvoltage	1,500 V max. (EN60947-5-1)
Conditional short-circuit current	100 A (EN60947-5-1)
Short-circuit protective device (SCPD)	10 A fuse type gI of gG (IEC 269)
Pollution degree (operating environment)	3 (EN60947-5-1)
Insulation class	Class I (with ground terminal)
Vibration resistance	Malfunction: 10 to 500 Hz, 0.65-mm single amplitude
Shock resistance	Destruction: 1,000 m/s^2 min. (IEC68-2-27) Malfunction: 300 m/s^2 min. (IEC68-2-27)
Ambient temperature	Operating: −40°C to 80°C (with no icing)
Ambient humidity	Operating: 95% max.
Weight	Approx. 285 g (in the case of D4BS-15FS)

Note: 1. The above figures are initial values.
2. Although the Switch casing resists dust, oil, and water, make sure that the keyhole on the head is free from dust, oil, water, and chemical, or the D4BS may wear out, break, or malfunction.
3. Life expectancy values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.
4. These figures are minimum requirements for safe operation.

■ OPERATING CHARACTERISTICS

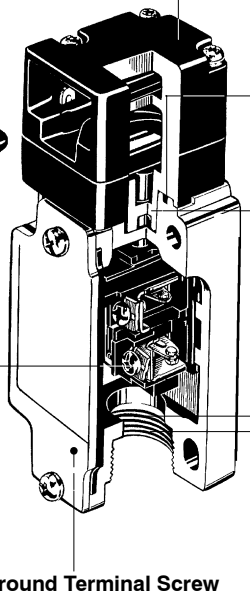
Model	D4BS-1□□S/D4BS-2□□S/D4BS-3□□S	D4BS-5□□S/D4BS-6□□S/D4BS-7□□S
Operating force (extraction)	19.61 N max.	
Release force (insertion)	19.61 N max.	
Pretravel (PT)	10±5 mm	
Positive opening force	19.61 N min.	
Positive opening stroke	20 mm min.	

Nomenclature



Operation Key
D4BS's exclusive-use Operation Key is provided to assure accurate switching operation.

Set Zone Mark
A triangular Set Zone Mark makes it easy to adjust the operating position when inserting the Operation Key.



Head
The switch head is coated with easy-to-see red paint. The mounting direction of the switch head can be varied to any of the four directions.

Seal Ring (NBR)

Oil Seal (NBR)
The operation plunger employs an oil seal, with which the switch box meets the requirements of IP67 (the sealing capability of the Operation Key's insertion mouth is IP00).

Built-in Switch
A shearing force contact separating mechanism (NC contact) is employed, which positively pulls apart the contacts from each other by using shearing force if any abnormality such as contact welding should occur in the contact area.

There is a difference in level between the NC and NO terminal, which assures easy wiring.

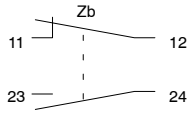
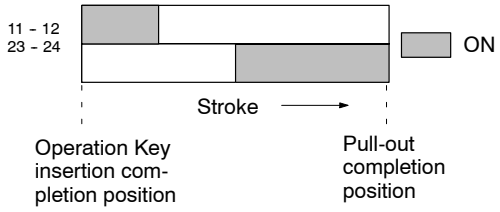
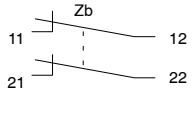
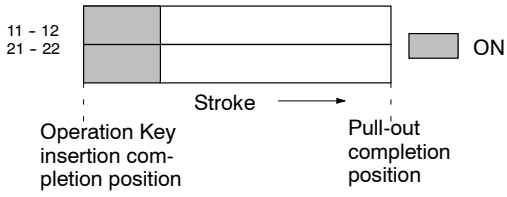
Seal Packing (NBR)

Conduit Opening
Available in three different types of conduit threads: Pg 13.5, G1/2, or 1/2-14NPT.

Ground Terminal Screw
A ground terminal is provided to improve safety. (Built into the Unit.)

Operation

■ Contact Form (Diagrams Show State with Key Inserted)

Model	Contact form		Diagrams	Remarks
D4BS-□5□S	1NC/1NO			Only NC contact 11-12 has an approved positive opening mechanism. ⊖ Terminals 11-12 and 23-24 can be used as unlike poles.
D4BS-□A□S	2NC			NC contacts 11-12 and 21-22 have an approved positive opening mechanism. ⊖ Terminals 11-12 and 21-22 can be used as unlike poles.

Note: The terminal numbers are in accordance with EN50013, and the contact symbols are in accordance with IEC947-5-1.

Dimensions

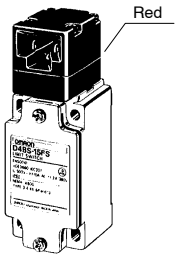
Unit: mm

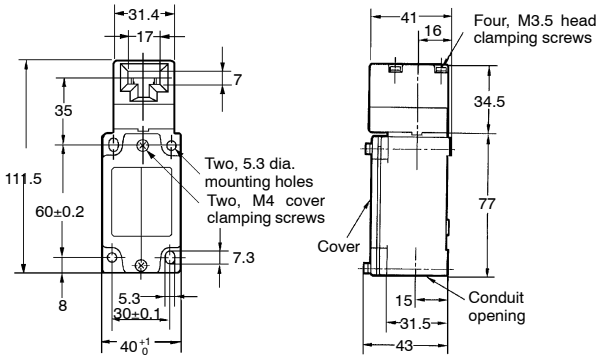
Note: 1. A tolerance of ±0.4 mm applies to all dimensions, unless a different tolerance is specifically indicated.
2. The conduit thread varies with the model as follows:.

Conduit type	Model
Pg 13.5 (European)	D4BS-1□□S, D4BS-5□□S
G1/2 (Japanese)	D4BS-2□□S, D4BS-6□□S
1/2-14NPT (North American)	D4BS-3□□S, D4BS-7□□S

■ SWITCHES

1-Conduit
D4BS-1□□S
D4BS-2□□S
D4BS-3□□S





3-Conduit
D4BS-5□□S
D4BS-6□□S
D4BS-7□□S