

# Safety Interlock Switches

# D4BS



Rev. 11.12

## Safety-Door Switch

- The special operation key activates a direct opening mechanism to open the contacts and shut off control circuits when protective doors are opened on machine tools or other equipment
- Conforms to EN (TÜV) standards corresponding to the CE marking.
- Certified by UL and CSA standards.
- The Switch contact is opened by a direct opening mechanism (NC-contacts only) when the protective cover is opened.
- Malfunctions and false operation prevented by special Operation Key
- Wide temperature range specifications: -40 to 80°C
- Degree of protection of the switch box: IP67 (EN60947-5-1)
- Series includes models with gold-plated contacts for handling microloads



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## Specifications

### Standards and EC Directives

Conforms to the following EC Directives:

- Machinery Directive
- Low Voltage Directive
- EN50041
- EN 1088

### Certified Standards

| Certification body | Standard                                | File No.         |
|--------------------|-----------------------------------------|------------------|
| TÜV Rheinland      | EN 60947-5-1 (certified direct opening) | J50084815        |
| UL                 | UL 508                                  | E76675           |
| CSA                | CSA C22.2 No. 14                        | LR45746          |
| CQC (CCC)          | GB14048.5                               | 2003010305073833 |

### Certified Standard Ratings

TÜV (EN 60947-5-1), CCC (GB14048.5)

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

Note: Use a 10 A fuse type gI or gG that conforms to IEC 60269 as a short-circuit protection device.

UL/CSA (UL 508, CSA C22.2 No. 14)  
A600

| Rated voltage | Carry current | Current (A) |       | Volt-amperes (VA) |       |
|---------------|---------------|-------------|-------|-------------------|-------|
|               |               | Make        | Break | Make              | Break |
| 120 VAC       | 10 A          | 60          | 6     | 7,200             | 720   |
| 240 VAC       |               | 30          | 3     |                   |       |
| 480 VAC       |               | 15          | 1.5   |                   |       |
| 600 VAC       |               | 12          | 1.2   |                   |       |

## Connections

### Contact Form

Diagrams show state with key inserted.

| Model     | Contact | Contact form | Operating pattern | Remarks                                                                                                                                       |
|-----------|---------|--------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| D4BS-□□□S | 1NC/1NO |              |                   | <p>Only NC contact 11-12 has a certified direct opening mechanism. →</p> <p>Terminals 11-12 and 23-24 can be used as unlike poles.</p>        |
| D4BS-□A□S | 2NC     |              |                   | <p>NC contacts 11-12 and 21-22 have a certified direct opening mechanism. →</p> <p>Terminals 11-12 and 21-22 can be used as unlike poles.</p> |

Note: The terminal numbers are in accordance with EN50013, and the contact symbols are in accordance with IEC60947-5-1.

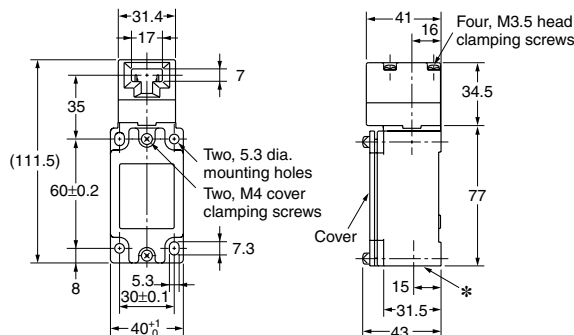
## Dimensions and Operating Characteristics

(mm)

### Switches

#### 1-conduit

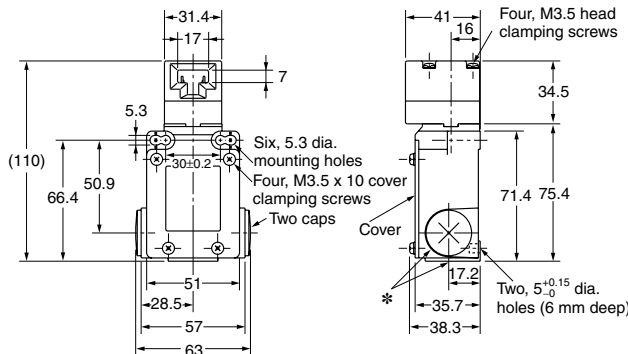
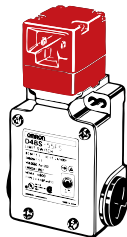
D4BS-1□□S  
D4BS-2□□S  
D4BS-3□□S



| Operating characteristics | Model                               |
|---------------------------|-------------------------------------|
|                           | D4BS-1□□S<br>D4BS-2□□S<br>D4BS-3□□S |
| Key insertion force       | 19.61 N max.                        |
| Key extraction force      | 19.61 N max.                        |
| Pretravel (PT)            | 10±5 mm                             |
| Total travel              | 23 mm min.                          |
| Direct opening force      | 19.61 N min.                        |
| Direct opening stroke     | 20 mm min.                          |

#### 3-conduit

D4BS-5□□S  
D4BS-6□□S  
D4BS-7□□S



| Operating characteristics | Model                               |
|---------------------------|-------------------------------------|
|                           | D4BS-5□□S<br>D4BS-6□□S<br>D4BS-7□□S |
| Key insertion force       | 19.61 N max.                        |
| Key extraction force      | 19.61 N max.                        |
| Pretravel (PT)            | 10±5 mm                             |
| Total travel              | 23 mm min.                          |
| Direct opening force      | 19.61 N min.                        |
| Direct opening stroke     | 20 mm min.                          |

Notes: 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 2NC contacts. Confirm performance before application.

\*The conduit thread varies with the model as follows:

D4BS-1□□S, D4BS-5□□S: Pg 13.5

D4BS-2□□S, D4BS-6□□S: G1/2

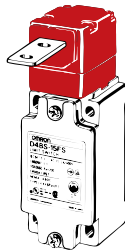
D4BS-3□□S, D4BS-7□□S: 1/2-14NPT

(mm)

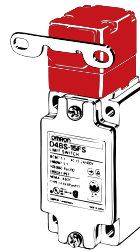
## Dimensions and Operating Characteristics (continued)

## With Operation Key Inserted

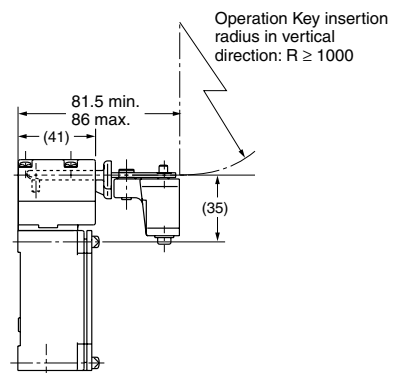
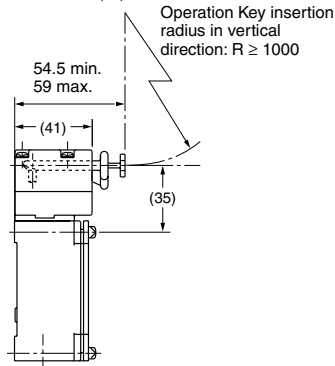
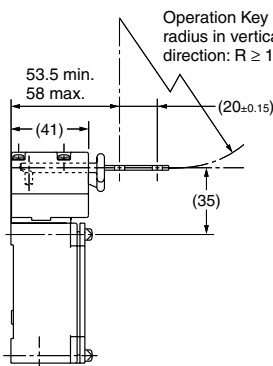
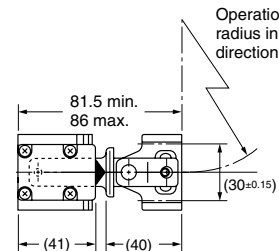
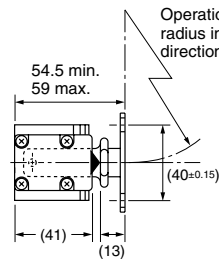
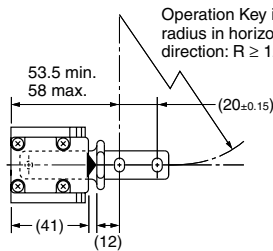
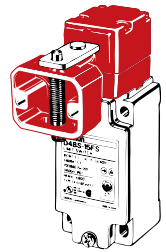
D4BS-1□□S + D4BS-K1  
D4BS-2□□S + D4BS-K1  
D4BS-3□□S + D4BS-K1



D4BS-1□□S + D4BS-K2  
D4BS-2□□S + D4BS-K2  
D4BS-3□□S + D4BS-K2



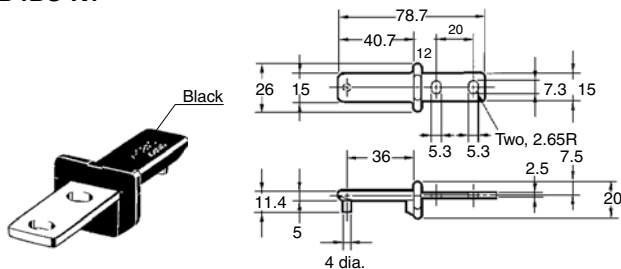
D4BS-1□□S + D4BS-K3  
D4BS-2□□S + D4BS-K3  
D4BS-3□□S + D4BS-K3



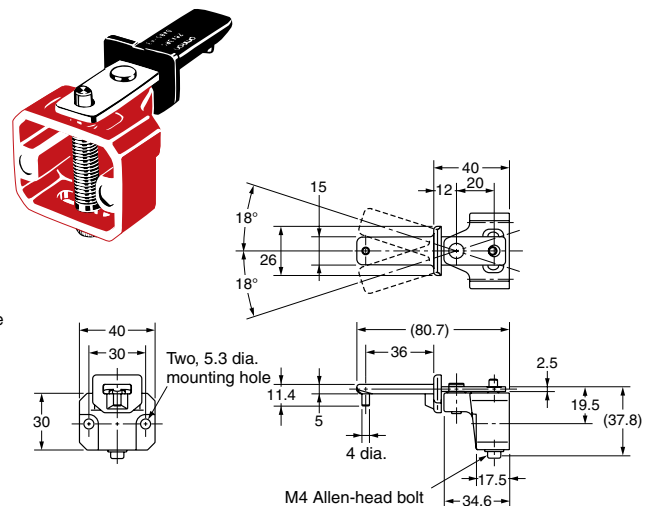
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## Operation Keys

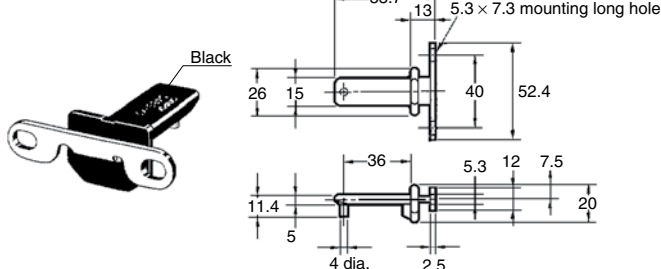
## D4BS-K1



## D4BS-K3



## D4BS-K2



Note: Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

## Ordering

### Model Number Structure

#### Switch

D4BS – □ □ □ S

① ② ③

- ① Conduit Size  
 1: Pg13.5 (1-conduit)  
 2: G1/2 (1-conduit)  
 3: NPT  
 4: M20 (1-conduit)  
 8: M20 (2-conduit)
- 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)

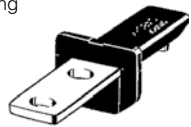
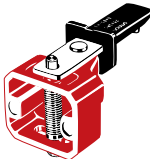
Note: An order for the head part or the switch part alone cannot be accepted.  
 (The operation key is sold separately.)

#### Operation Key

D4BS-K □

①

- ① Operation Key Type  
 1: Horizontal mounting  
 2: Vertical mounting  
 3: Adjustable mounting (horizontal)

| Type                                                                                                                    | Model   |
|-------------------------------------------------------------------------------------------------------------------------|---------|
| Horizontal mounting<br>              | D4BS-K1 |
| Vertical mounting<br>                | D4BS-K2 |
| Adjustable mounting (horizontal)<br> | D4BS-K3 |

### List of Models

Switches (Operation Keys are sold separately)

| Type      | Mounting direction  |                                                                                     | Conduit size | 1NC/1NO (Slow-action) | 2NC (Slow-action) |
|-----------|---------------------|-------------------------------------------------------------------------------------|--------------|-----------------------|-------------------|
| 1-conduit | Front-side mounting |  | Pg13.5       | D4BS-15FS             | D4BS-1AFS         |
|           |                     |                                                                                     | G1/2         | D4BS-25FS             | D4BS-2AFS         |
|           |                     |                                                                                     | 1/2-14NPT    | D4BS-45FS-NPT         | D4BS-4AFS-NPT     |
|           |                     |                                                                                     | M20          | D4BS-45FS             | D4BS-4AFS         |
| 3-conduit |                     |  | M20          | D4BS-85FS             | D4BS-8AFS         |

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