

# Slim Safety Door Switch D4GS-N

## Slim Safety Door Switches with IP67 Rating

- Slim design with a width of only 17 mm (three-contact models).
- Reversible design allowing either front or rear mounting.
- Built-in Switches with two- or three-terminal contact construction are available.
- Operation Key with rubber mounting hole to absorb vibration and shock.

**Note:** Be sure to read the "Precautions for All Safety Door Switches" on page A-2.

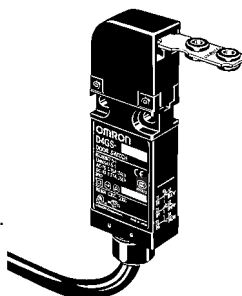
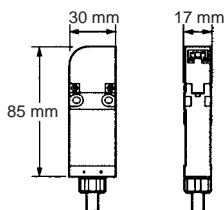


Safety Door Switches  
D4GS-N

## Features

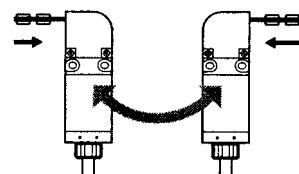
### Slim Safety Door Switches with 3-terminal Contact Construction

Thin and 1/2 the size as OMRON's previous models.



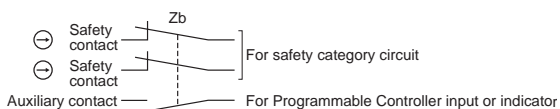
### Reversible Design

Front and rear mounting are both possible.



### Built-in Switches

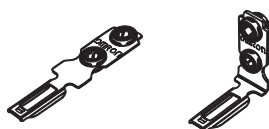
Two- and three-terminal contact models are available.



**Note:** The safety contacts are direct opening contacts approved by EN and each of them is indicated with the mark .

### Operation Key

The operation key mounting hole is designed with rubber to absorb vibration and shock.



### IP67 Degree of Protection

(Applicable to main body only; Operation Key insertion face meets IP00.)

The D4GS-N uses rust-resistant materials and incorporates a drain opening as effective countermeasures against problems caused by water.

**Note:** IP67 is based on the test method specified in EN60947-5-1. Be sure to confirm in advance the sealing performance under the actual operating environment and conditions.

### Safety Standards

Meeting EN (TÜV) Standards and CE marking requirements along with a variety of international standard requirements, such as UL and CSA requirements. All NC contacts satisfy requirements for the direct opening mechanism.

# Model Number Structure

## Model Number Legend

### Switch

D4GS-N□□-□  
1 2 3

- 1. Built-in Switch
  - 1: 1NC/1NO (slow-action)
  - 2: 2NC (slow-action)
  - 3: 2NC/1NO (slow-action)
  - 4: 3NC (slow-action)
- 2. Direction of Operation Key Insertion
  - R: Horizontal
  - T: Vertical
- 3. Cable Length
  - Blank: 1 m
  - 3: 3 m
  - 5: 5 m

### Operation Key

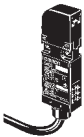
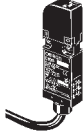
D4GS-NK□  
1

- 1. Operation Key Type
  - 1: Horizontal mounting
  - 2: Vertical mounting
  - 4: Adjustable mounting (Vertical)

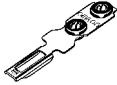


## Ordering Information

### List of Models

#### Switches

Appearance	Direction of Operation Key insertion	Cable length	1NC/1NO (Slow-action)	2NC (Slow-action)	2NC/1NO (Slow-action)	3NC (Slow-action)
	Horizontal	1 m	D4GS-N1R	D4GS-N2R	D4GS-N3R	D4GS-N4R
		3 m	D4GS-N1R-3	D4GS-N2R-3	D4GS-N3R-3	D4GS-N4R-3
		5 m	D4GS-N1R-5	D4GS-N2R-5	D4GS-N3R-5	D4GS-N4R-5
	Vertical	1 m	D4GS-N1T	D4GS-N2T	D4GS-N3T	D4GS-N4T
		3 m	D4GS-N1T-3	D4GS-N2T-3	D4GS-N3T-3	D4GS-N4T-3
		5 m	D4GS-N1T-5	D4GS-N2T-5	D4GS-N3T-5	D4GS-N4T-5

### Operation Keys (Order Separately)


Type	Model
Horizontal mounting 	D4GS-NK1
Vertical mounting 	D4GS-NK2
Adjustable mounting (Vertical) 	D4GS-NK4

# Specifications

## ■ Standards and EC Directives

- Conforms to the following EC Directives:  
 Machinery Directive  
 Low Voltage Directive  
 EN1088  
 EN60204-1  
 GS-ET-15

## ■ Approved Standards

Agency	Standard	File No.
TÜV Rheinland	EN60947-5-1 GS-ET-15	J2051125  (Direct opening: approved)
UL (see note1.)	UL508 CSA C22.2 No. 14	E76675
CQC (CCC)	GB14048.5	2003010305064262

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

## ■ Approved Standard Ratings

### TÜV (EN60947-5-1), CCC (GB14048.5)

Item	AC-15	DC-13
Rated operating current ( $I_o$ )	0.75 A	0.27 A
Rated operating voltage ( $U_o$ )	240 V	250 V

**Note:** Use a 10-A fuse type gI or gG that conforms to IEC60269 as a short-circuit protection device.

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

#### C300

Rated voltage	Carry current	Current (A)		Voltage (VA)	
		Make	Break	Make	Break
120 VAC	2.5 A	15	1.5	1,800	180
240 VAC		7.5	0.75		

#### Q300

Rated voltage	Carry current	Current (A)		Voltage (VA)	
		Make	Break	Make	Break
125 VDC	2.5 A	0.55	0.55	69	69
250 VDC		0.27	0.27		

## ■ Characteristics

Degree of protection (see note 3.)	Body: IP67 (EN60947-5-1) (Operation Key insertion face: IP00)
Durability (see note 4.)	Mechanical: 1,000,000 times min. Electrical: 100,000 times min. (1-A resistive load at 125 VAC) (see note 5.)
Operating speed	0.1 to 0.5 m/s
Contact gap	2 × 2 mm min.
Operating frequency	30 operations/minute
Direct opening force (see note 6.)	60 N min.
Direct opening travel (see note 6.)	10 mm min.
Insulation resistance	100 MΩ min. (at 500 VDC) between terminals of the same polarities, between terminals of different polarities, and between each terminal and non-current carrying metal parts
Minimum applicable load (see note 7.)	4 mA at 24 VDC
Contact resistance	300 mΩ max. (Initial value with 1-m cable)
Dielectric strength	Between terminals of same polarities: Uimp 2.5 kV (EN60947-5-1) Between terminals of different polarities: Uimp 4 kV (EN60947-5-1) Between each terminal and non-current carrying metal parts: Uimp 6 kV (EN60947-5-1)
Conditional short-circuit current	100 A (EN60947-5-1)
Pollution degree (operating environment)	3 (EN60947-5-1)
Conventional free air thermal current (I <sub>m</sub> )	2.5 A (EN60947-5-1)
Protection against electric shock	Class II (double insulation) (IEC60536)
Vibration resistance	Malfunction: 10 to 55 Hz, 0.35-mm single amplitude
Shock resistance	Malfunction: 300 m/s <sup>2</sup> min.
Ambient temperature	Operating: -30°C to 70°C (with no icing)
Ambient humidity	Operating: 95% max.
Cable	UL2464 No. 22 AWG, finishing O.D.: 7.2 mm
Weight	Approx. 120 g (D4GS-N1R, with 1-m cable)

**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 shown above is based on the test method specified in EN60947-5-1. Be sure to confirm in advance the sealing performance under the actual operating environment and conditions.  
Although the switch box is protected from dust, oil, or water penetration, do not use the D4GS-N in places where dust, oil, water, or chemicals 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%.
- When the ambient temperature is 35°C or higher, do not apply 1 A at 125 VAC to more than one circuit.
- These figures are minimum requirements for safe operation.
- The value given for minimum applicable load is a reference value for microloads. The value will vary depending on factors such as the switching frequency, the ambient environment, and the reliability level. Be sure to confirm correct operation with the actual load before application.

# Connections

## ■ Contact Form (Diagrams Show State with Key Inserted)

Model	Contact	Operating pattern	Remarks
D4GS-N1□-□	1NC/1NO		<p>Only NC contact 11-12 has an approved direct opening mechanism. (→)</p> <p>The terminals 11-12 and 33-34 can be used as unlike poles.</p>
D4GS-N2□-□	2NC		<p>NC contacts 11-12 and 31-32 have an approved direct opening mechanism. (→)</p> <p>The terminals 11-12 and 31-32 can be used as unlike poles.</p>
D4GS-N3□-□	2NC/1NO		<p>Only NC contacts 11-12 and 21-22 have an approved direct opening mechanism. (→)</p> <p>The terminals 11-12, 21-22 and 33-34 can be used as unlike poles.</p>
D4GS-N4□-□	3NC		<p>NC contacts 11-12, 21-22 and 31-32 have an approved direct opening mechanism. (→)</p> <p>The terminals 11-12, 21-22 and 31-32 can be used as unlike poles.</p>

Safety Door Switches

D4GS-N

# Dimensions

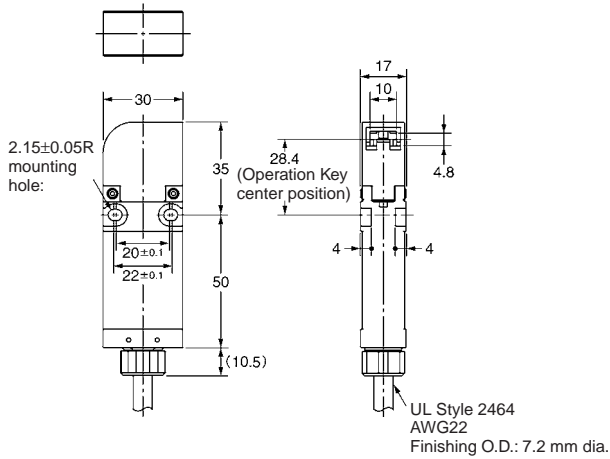
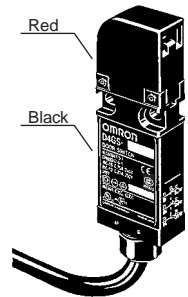
**Note:** 1. All units are in millimeters unless otherwise indicated.

2. Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions. Dimensions in parentheses are reference values.

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

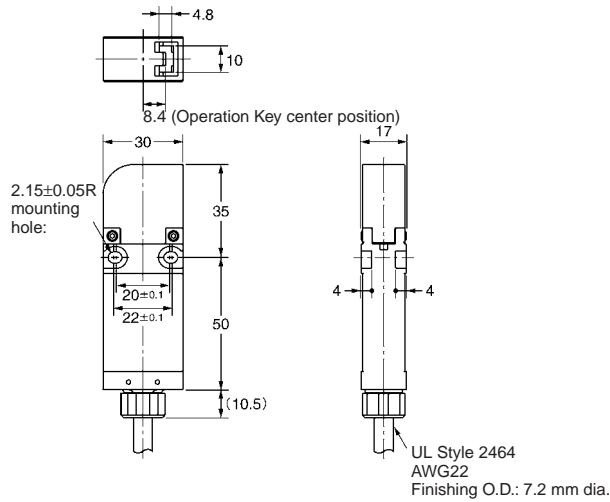
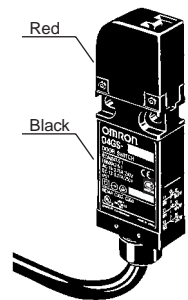
## Switches

D4GS-N□R-□



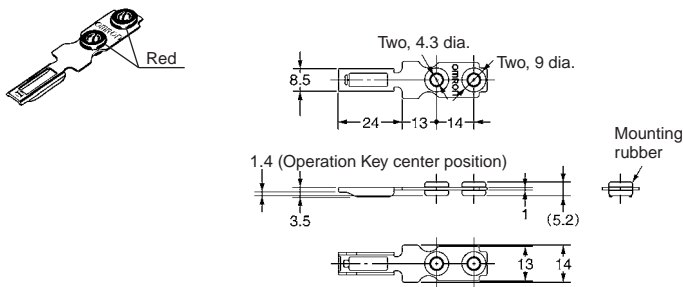
Operating characteristics	Model
Key insertion force	15 N max.
Key extraction force	30 N max.
Pretravel (PT)	0.8±3 mm
Movement before being locked	(22 mm) min.
Direct opening force	60 N min.
Direct opening stroke	10 mm min.

D4GS-N□T-□

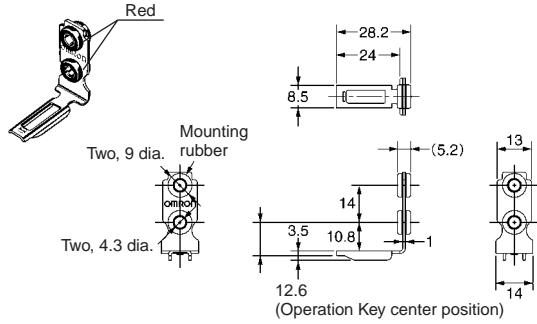


## ■ Operation Keys

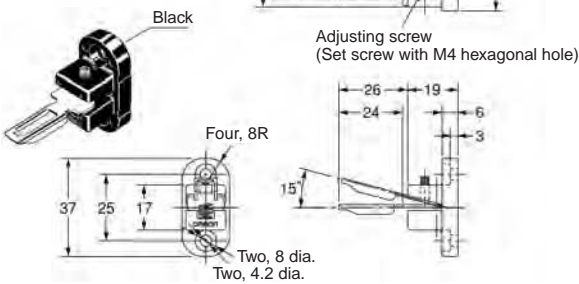
D4GS-NK1



D4GS-NK2

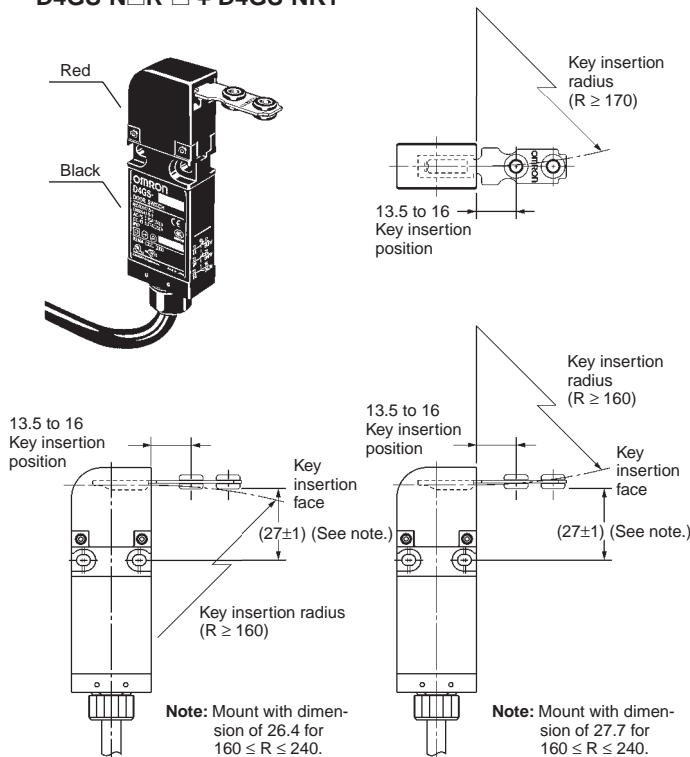


D4GS-NK4

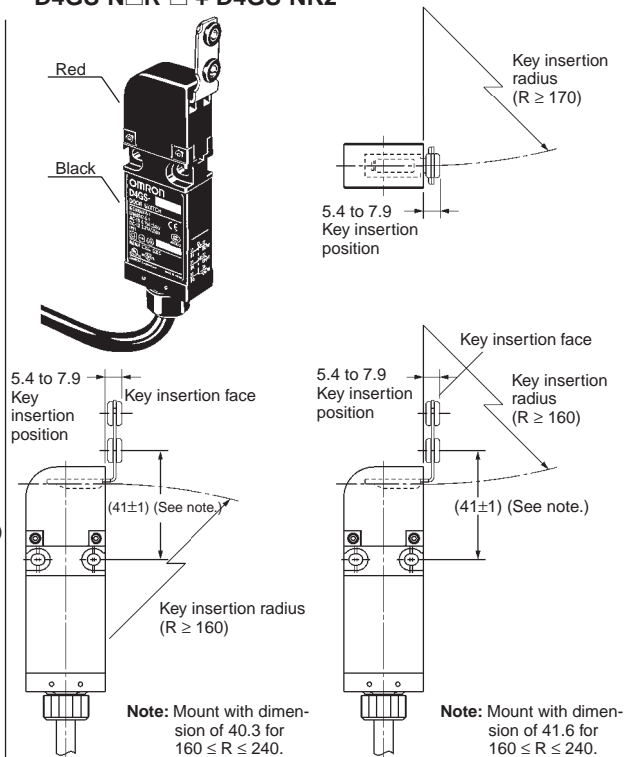


## ■ With Operation Key Inserted

D4GS-N□R-□ + D4GS-NK1



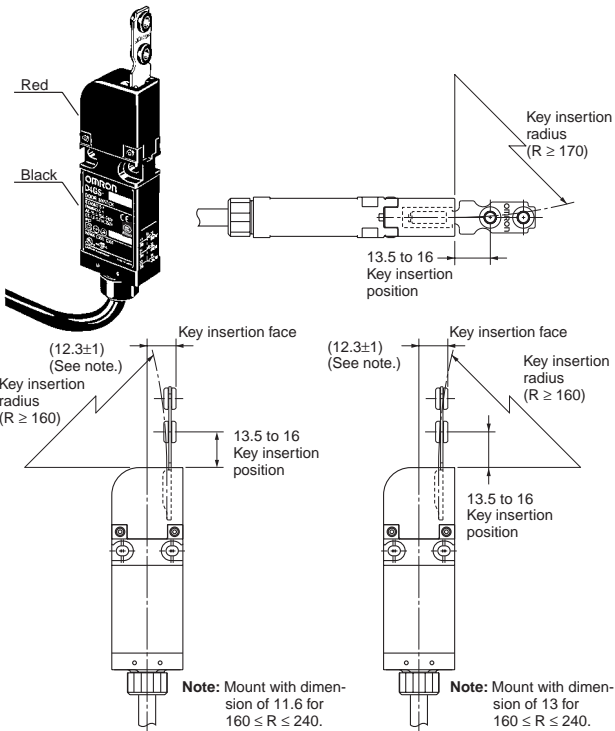
D4GS-N□R-□ + D4GS-NK2



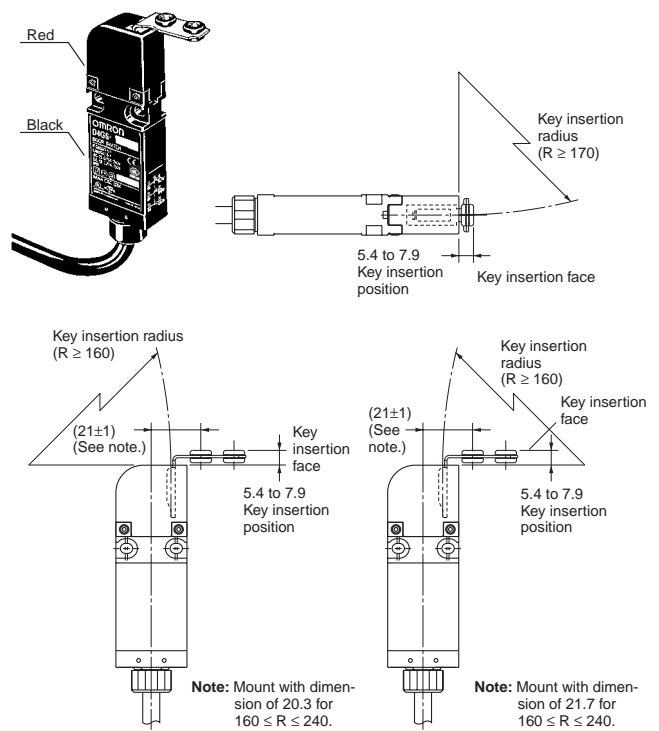
**Note:** 1. All units are in millimeters unless otherwise indicated.

2. Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions. Dimensions in parentheses are reference values.

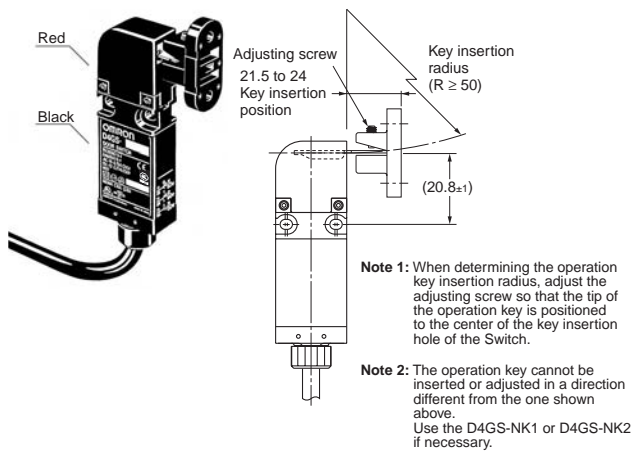
D4GS-N□T-□ + D4GS-NK1



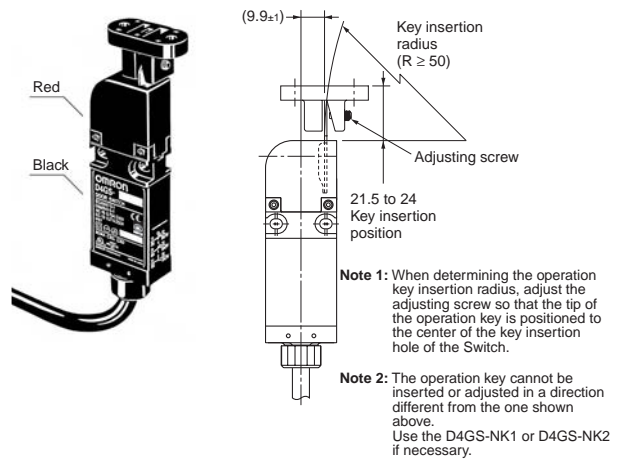
D4GS-N□T-□ + D4GS-NK2



D4GS-N□R-□ + D4GS-NK4



D4GS-N□T-□ + D4GS-NK4



Note: 1. All units are in millimeters unless otherwise indicated.

2. Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions. Dimensions in parentheses are reference values.

Safety Door Switches  
D4GS-N

# Safety Precautions

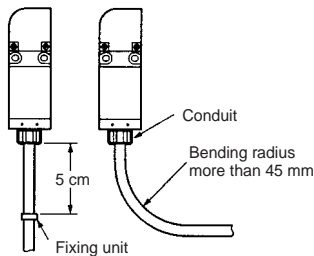
Refer to the "Precautions for All Switches" on page I-2 and "Precautions for All Safety Door Switches" on page A-2.

## Precautions for Safe Use

- Do not use the Switch submersed in oil or water or in locations continuously subject to splashes of oil or water. Doing so may result in oil or water entering the Switch. (The IP67 degree of protection of the Switch specifies the amount of water penetration after the Switch is submersed in water for a certain period of time.)
- Although the Switch body is protected from the ingress of dust or water, avoid the ingress of foreign substance through the key hole on the head. Otherwise, accelerated wear or breaking may result.
- When switching general loads (125VAC/1A), do not operate two circuits or more at the same time. Otherwise, insulation performance may be degraded.
- Do not use the D4GS-N□ Switch or D4GS-NK□ Operation Key (rubber color: red) in combination with the D4GS-□ Switch or D4GS-K□ Operation Key (rubber color: black).
- Be sure to evaluate the D4GS-N under actual working conditions after installation.
- Do not drop the D4GS-N. Excessive shock or vibration can cause malfunction or damage to Switch characteristics. Do not disassemble the internal switch, there are no user-serviceable parts inside.

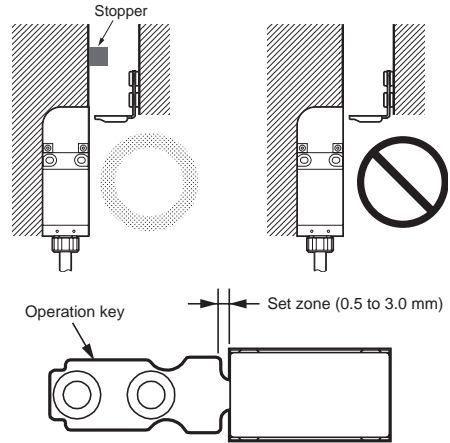
## Handling Cables

Cables should not be bent repeatedly. A cable is fixed with sealing materials on the bottom of the D4GS-N. When excessive force may be imposed on the cable, fix the cable with a fixing unit at the distance of 5 cm from the bottom of the D4GS-N as shown. When bending the cable, secure the cable with more than 45-mm bending radius so as not to cause damage to the insulator or sheath of the cable. Do not fasten or loosen the conduit at the bottom of the D4GS-N. When wiring, be sure not to allow a liquid such as water or oil into the tip of cable.



## Stopper Installation

Do not use a Switch as a stopper. Be sure to install a stopper as shown in the following illustration when mounting the Switch so that the base of the Operation Key does not strike the Head.



## ■ Precautions for Correct Use

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.

### Life Expectancy

The life of the D4GS-N will vary with the switching conditions. Before applying the D4GS-N, test the D4GS-N under actual operating conditions and be sure to use the D4GS-N in actual operation within switching times that will not lower the performance of the D4GS-N.

### Mounting Methods

#### Tightening Torque

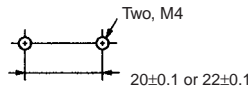
Loose screws may result in malfunction. Tighten the screws to the specified torques.

Type	Torque	Size
Body mounting screw	0.75 to 1.15 N·m	M4 screw
Operation Key mounting screw	0.75 to 1.15 N·m	M4 screw

**Note:** Use the specified sizes of mounting screws flat or spring washers to mount the Switch and Operation Key, and tighten the screws to the proper tightening torque. For safety, use screws that cannot be easily removed or a similar means to prevent the Switch and Operation Key from being easily removed.

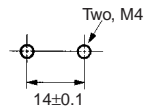
### Mounting

Mounting hole dimensions for mounting the main body are as shown below.

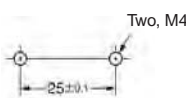


### Operation Key Mounting Holes

D4GS-NK1/NK2

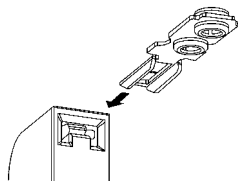


D4GS-NK4



### Operation Key

As shown below, mount the Operation Key after matching the concave surface of the Operation Key with the convex surface of the insertion face.



Depending on the conditions in which the Switch is used, the rubber of the Operation Key may deteriorate. If the rubber becomes deformed or cracked, replace it as soon as possible.

Be sure to adjust the position correctly when mounting the Operation Key and the Switch to ensure that the Operation Key does not miss the insertion face and exert an excessive force on the Switch head.

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

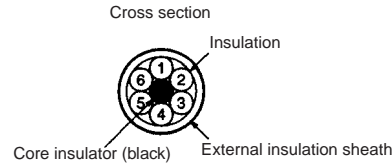
Cat. No. C120-E1-05

In the interest of product improvement, specifications are subject to change without notice.

## Wiring

### Identifying Wires

Identify wires according to the color (with or without white lines) of the insulation on the wire.



### Wire Colors

No.	Color of insulation	No.	Color of insulation
1	Blue/white	4	Orange
2	Brown/white	5	Brown
3	Orange/white	6	Blue

**Note:** "Blue/white, brown/white, or orange/white" means that the cover is blue, brown, or orange with a white line.

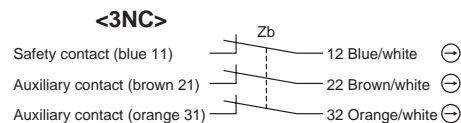
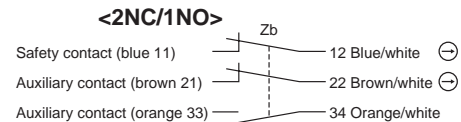
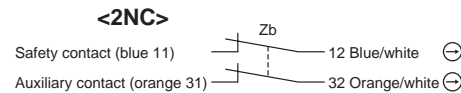
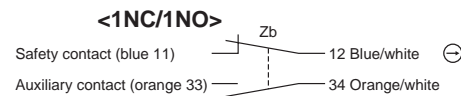
### Terminal Numbers

Identify terminal numbers based on the color of the insulation on the wire.

The safety and auxiliary contacts of D4GS-N models of three-terminal contact construction and those of two-terminal contact construction are described below.

The auxiliary contacts (orange) can be used as safety contacts.

The safety contacts are direct opening contacts approved by EN and each of them is indicated with the mark  $\ominus$ .



Cut the black core insulator and all unused wires at the end of the external insulation sheath when wiring the cable.