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Guard Lock Safety-door Switch/Slide key D4JL/D4JL-SK40

C381-E-02

Holding Force of 3,000 N

- Two safety circuits and two monitor contacts provide an array of monitoring patterns.
- Standard gold-clad contacts enable use with ordinary loads and microloads.
- Models with trapped keys prevent workers from being locked in hazardous work areas.
- Models with rear release buttons allow people to unlock the Switch and escape if they are locked into hazardous areas.
- IP67 degree of protection.
- Conforms to ISO 14119.

 Be sure to read the "Safety Precautions" on page 24.



Slide keys



Guard Lock Safety-door Switch

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Features

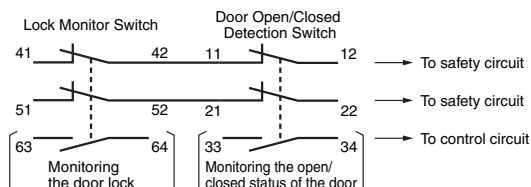
Plastic Guard Lock Safety-door Switches Rank Among the Strongest in the World

A holding force of 3,000 N makes these Switches suitable for large, heavy doors.



Two Safety Circuits and Two Monitor Contacts

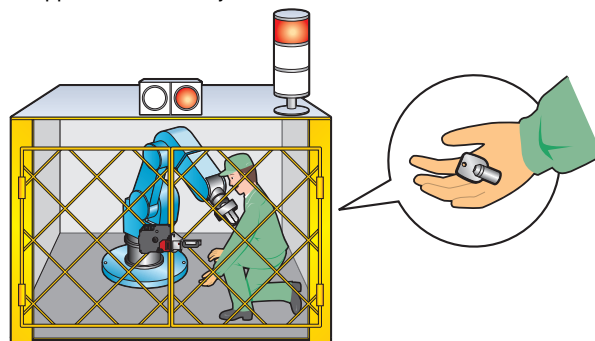
The D4JL has two safety circuits. It also has two contacts to separately monitor the open/closed status of the door and the status of the lock.



Wide variations to protect workers who enter hazardous areas.

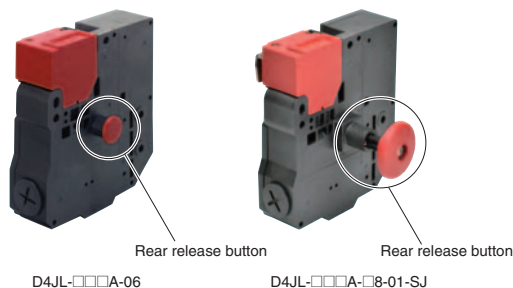
• Models with Trapped Keys (mechanical lock models only)

As long as a person has the trapped key when he enters a hazardous area, he does not have to worry about somebody locking the door and trapping him inside. The door can be opened only by supplying power to the solenoid and then turning the trapped key to unlock the D4JL. There are thirty different types of trapped keys available for use in applications with adjacent hazardous areas.



• Models with Rear Release Buttons

A rear release button allows the door to be unlocked from inside a hazardous area in an emergency.



• Special Slide Key

A special Slide Key shortens the lead time for mounting design. The padlock that can be attached to the disable-prevention cover prevents other workers from restarting machines. (See page 5 for details.)

Model Number Structure

Model Number Legend

Switches (Standard type)

D4JL-□□□□-□□-□□
 1 2 3 4 5 6 7

1. Conduit Size

2: G1/2

4: M20

2. Built-in Switch

N: 2NC/1NO + 2NC/1NO (slow-action contacts)

P: 2NC/1NO + 3NC (slow-action contacts)

Q: 3NC + 2NC/1NO (slow-action contacts)

R: 3NC + 3NC (slow-action contacts)

3. Head Material

F: Plastic

4. Door Lock and Release

A: Mechanical lock/24 VDC solenoid release

G: 24 VDC Solenoid lock/Mechanical release

5. Indicator

C: 24 VDC (green LED indicator)

D: 24 VDC (orange LED indicator)

6. Release Key Type

5: Special release key *1

6: Special release key + rear release button *1

7: Trapped key

7. Trapped Key Type

01 to 30: 30 types *2

Note: A 24 VDC solenoid lock cannot be combined with a trapped key.

A 24 VDC solenoid lock cannot be combined with a special release key and rear release button.

*1. Release keys are provided.

*2. Thirty types of trapped keys can be manufactured. Specify the trapped key type in numerical order starting from 01 when ordering.

Switches (Connector type)

D4JL-2RFA-D5N-X
 1 2 3 4 5 6 7 8

1. Conduit Size

2: G1/2

2. Built-in Switch

R: 3NC + 3NC (slow-action contacts)

3. Head Material

F: Plastic

4. Door Lock and Release

A: Mechanical lock/24 VDC solenoid release

5. Indicator

C: 24 VDC (green LED indicator)

D: 24 VDC (orange LED indicator)

6. Release Key Type

5: Standard release key

7. Connection Method

N: Connector type

8. Cover Mounting Screws

T: Standard screws

X: Special screws

Note: For more information about connector types, contact your OMRON sales representative.

Switches (Trapped key + Rear release buttons type)

D4JL-□□□□-□□-□□-**SJ**
 1 2 3 4 5 6 7

1. Conduit Size

2: G1/2

4: M20

2. Built-in Switch

N: 2NC/1NO + 2NC/1NO (slow-action contacts)

P: 2NC/1NO + 3NC (slow-action contacts)

Q: 3NC + 2NC/1NO (slow-action contacts)

R: 3NC + 3NC (slow-action contacts)

3. Head Material

F: Plastic

4. Door Lock and Release

A: Mechanical lock/24 VDC solenoid release

5. Indicator

C: 24 VDC (green LED indicator)

D: 24 VDC (orange LED indicator)

6. Release Key Type

8: Trapped key + Rear release buttons

7. Trapped Key Type

01: 1 type

Operation Keys

D4JL-K□
 1

1. Operation Key Type

1: Horizontal mounting

2: Vertical mounting

3: Adjustable mounting (horizontal)

Ordering Information

Switches (Operation Keys are sold separately.)

Consult with your OMRON representative when ordering any models that are not listed in this table.

Standard Models

■ : Models with certified direct opening contacts.

Release key type	Indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit opening	Model
Special release key	Green	Mechanical lock Solenoid release	2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-C5
				M20	D4JL-4NFA-C5
			2NC/1NO+3NC	G1/2	D4JL-2PFA-C5
				M20	D4JL-4PFA-C5
			3NC+2NC/1NO	G1/2	D4JL-2QFA-C5
			M20	D4JL-4QFA-C5	
		3NC+3NC	G1/2	D4JL-2RFA-C5	
			M20	D4JL-4RFA-C5	
		Solenoid lock Mechanical release	2NC/1NO+2NC/1NO	G1/2	D4JL-2NFG-C5
				M20	D4JL-4NFG-C5
	2NC/1NO+3NC		G1/2	D4JL-2PFG-C5	
			M20	D4JL-4PFG-C5	
	3NC+2NC/1NO		G1/2	D4JL-2QFG-C5	
		M20	D4JL-4QFG-C5		
			3NC+3NC	G1/2	D4JL-2RFG-C5
				M20	D4JL-4RFG-C5
	Orange	Mechanical lock Solenoid release	2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-D5
				M20	D4JL-4NFA-D5
			2NC/1NO+3NC	G1/2	D4JL-2PFA-D5
				M20	D4JL-4PFA-D5
3NC+2NC/1NO			G1/2	D4JL-2QFA-D5	
		M20	D4JL-4QFA-D5		
3NC+3NC		G1/2	D4JL-2RFA-D5		
		M20	D4JL-4RFA-D5		
Solenoid lock Mechanical release		2NC/1NO+2NC/1NO	G1/2	D4JL-2NFG-D5	
			M20	D4JL-4NFG-D5	
	2NC/1NO+3NC	G1/2	D4JL-2PFG-D5		
		M20	D4JL-4PFG-D5		
	3NC+2NC/1NO	G1/2	D4JL-2QFG-D5		
	M20	D4JL-4QFG-D5			
		3NC+3NC	G1/2	D4JL-2RFG-D5	
			M20	D4JL-4RFG-D5	

Models with Rear Release Buttons

■ : Models with certified direct opening contacts.

Release key type	Indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit opening	Model
Special release key	Green	Mechanical lock Solenoid release	2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-C6
				M20	D4JL-4NFA-C6
			2NC/1NO+3NC	G1/2	D4JL-2PFA-C6
				M20	D4JL-4PFA-C6
			3NC+2NC/1NO	G1/2	D4JL-2QFA-C6
				M20	D4JL-4QFA-C6
	3NC+3NC		G1/2	D4JL-2RFA-C6	
			M20	D4JL-4RFA-C6	
	Orange		2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-D6 *
				M20	D4JL-4NFA-D6 *
			2NC/1NO+3NC	G1/2	D4JL-2PFA-D6 *
				M20	D4JL-4PFA-D6 *
		3NC+2NC/1NO	G1/2	D4JL-2QFA-D6 *	
			M20	D4JL-4QFA-D6 *	
3NC+3NC		G1/2	D4JL-2RFA-D6 *		
		M20	D4JL-4RFA-D6 *		

* Models with Korean S-mark certification.

Models with Trapped Keys

■ : Models with certified direct opening contacts.

Release key type	Indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit opening	Model
Trapped key #1	Green	Mechanical lock Solenoid release	2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-C7-01
				M20	D4JL-4NFA-C7-01
			2NC/1NO+3NC	G1/2	D4JL-2PFA-C7-01
				M20	D4JL-4PFA-C7-01
			3NC+2NC/1NO	G1/2	D4JL-2QFA-C7-01
				M20	D4JL-4QFA-C7-01
			3NC+3NC	G1/2	D4JL-2RFA-C7-01
				M20	D4JL-4RFA-C7-01
	Orange		2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-D7-01 *2
				M20	D4JL-4NFA-D7-01 *2
			2NC/1NO+3NC	G1/2	D4JL-2PFA-D7-01 *2
				M20	D4JL-4PFA-D7-01 *2
			3NC+2NC/1NO	G1/2	D4JL-2QFA-D7-01 *2
				M20	D4JL-4QFA-D7-01 *2
3NC+3NC	G1/2	D4JL-2RFA-D7-01 *2			
	M20	D4JL-4RFA-D7-01 *2			

*1. Thirty types of trapped keys can be manufactured. Specify the trapped key type in numerical order starting from 01 when ordering.

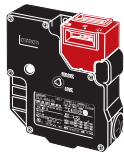
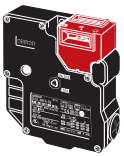
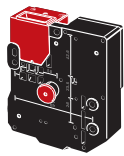
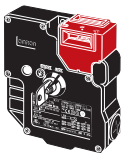
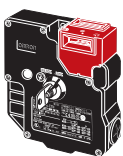
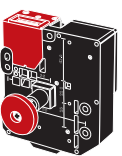
*2. Models with Korean S-mark certification.

Trapped Key + Rear Release Button type

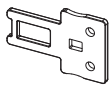

■ : Models with certified direct opening contacts.


Release key type	Indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit opening	Model
Trapped key	Green	Mechanical lock Solenoid release	2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-C8-01-SJ *
				M20	D4JL-4NFA-C8-01-SJ *
			2NC/1NO+3NC	G1/2	D4JL-2PFA-C8-01-SJ *
				M20	D4JL-4PFA-C8-01-SJ *
			3NC+2NC/1NO	G1/2	D4JL-2QFA-C8-01-SJ *
				M20	D4JL-4QFA-C8-01-SJ *
			3NC+3NC	G1/2	D4JL-2RFA-C8-01-SJ *
				M20	D4JL-4RFA-C8-01-SJ *
	Orange		2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-D8-01-SJ *
				M20	D4JL-4NFA-D8-01-SJ *
			2NC/1NO+3NC	G1/2	D4JL-2PFA-D8-01-SJ *
				M20	D4JL-4PFA-D8-01-SJ *
			3NC+2NC/1NO	G1/2	D4JL-2QFA-D8-01-SJ *
				M20	D4JL-4QFA-D8-01-SJ *
3NC+3NC	G1/2	D4JL-2RFA-D8-01-SJ *			
	M20	D4JL-4RFA-D8-01-SJ *			

* Models with Korean S-mark certification.

Release key position	Front	Front and rear release button	Front	Front and rear release button
Release key type	Special release key	Special release key	Trapped key	Trapped key
Switch appearance		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Front</p>  </div> <div style="text-align: center;"> <p>Rear</p>  </div> </div>		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Front</p>  </div> <div style="text-align: center;"> <p>Rear</p>  </div> </div>

Operation Keys

Type	Model
Horizontal mounting 	D4JL-K1
Vertical mounting 	D4JL-K2

Type	Model
Adjustable mounting (horizontal) 	D4JL-K3

Specifications

Standards and EC Directives

Conforms to the following EC Directives:

- Machinery Directive
- Low Voltage Directive
- EN ISO 14119
- EN 60204-1
- GS-ET-19
- CCC

Certified Standards

Certification body	Standard	File No.
TÜV SÜD *3	EN 60947-5-1 (certified direct opening)	Consult your OMRON representative for details.
UL *1 *3	UL 508, CSA C22.2 No. 14	E76675
CQC (CCC) *3	GB14048.5	2005010305167533
KOSHA *2 *3	EN60947-5-1	Consult your OMRON representative for details.

*1. CSA C22.2 No. 14 was certified by UL.

*2. Only certain models have been certified.

*3. D4JL-□□FA-□8-01-SJ will be certificated soon.

Certified Standard Ratings

TÜV (EN 60947-5-1)

Item	Utilization category	AC-15	DC-13
Rated operating current (Ie)		3 A	0.27 A
Rated operating voltage (Ue)		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 (UL 508, CSA C22.2 No. 14)

A300 (between terminals 12 and 41)

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		

A300 (between all other terminals)

Rated voltage	Carry current	Current (A)		Volt-amperes (VA)	
		Make	Break	Make	Break
240 VAC	3 A	30	3	7,200	720

Q300

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

Solenoid Coil Characteristics

Item	Type	24 VDC
Rated operating voltage (100% ED)		24 VDC ^{+10%} _{-15%}
Current consumption		Approx. 200 mA
Insulation Class		Class B (130°C max.)

Indicator Characteristics

Item	Type	LED	
Rated voltage		24 VDC	24 VDC
Current consumption		Approx. 1 mA	Approx. 8 mA
Color (LED)		Orange	Green

Characteristics

Degree of protection *1		IP67 (EN60947-5-1)
Durability *2	Mechanical	1,000,000 operations min.
		Trapped key
	Rear release button	D4JL-□□FA-□7-□: 3,000 operations min. D4JL-□□FA-□8-01-SJ: 500 operations min.
Electrical		500,000 operations min. (3 A resistive load at 250 VAC) *3
Operating speed		0.05 to 0.5 m/s
Operating frequency		30 operations/minute max.
Direct opening force *4		60 N min. (EN60947-5-1)
Direct opening travel *4		15 mm min. (EN60947-5-1)
Holding force *5		3,000 N min.
Contact resistance		25 mΩ max. (per contact)
Minimum applicable load *6		1 mA resistive load at 5 VDC (N-level reference value)
Rated insulation voltage (U_i)		300 V (EN60947-5-1)
Rated frequency		50/60 Hz
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 same polarity	2.5 kV
	Between terminals of different polarity	4 kV
	Between other terminals and non-current carrying metallic parts	6 kV
Insulation resistance		100 MΩ min. (at 500 VDC)
Contact gap		2 × 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	80 m/s ² min.
Conditional short-circuit current		100 A (EN60947-5-1) *7
Conventional free air thermal current (I_{th})		10 A (between terminals 12 and 41), 3 A (between all other terminals) (EN60947-5-1)
Ambient operating temperature		-10 to +55°C (with no icing)
Ambient operating humidity		95% max.
Weight		Approx. 650 g (D4JL-4NFA-C7-01)

Note: The above values are initial values.

*1. 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 D4JL in places where foreign material may enter through the key hole on the head, otherwise Switch damage or malfunctioning may occur.

*2. The durability is for an ambient temperature of 5 to 35°C and an ambient humidity of 40% to 70%. For further conditions, consult your OMRON sales representative.

*3. Do not pass a 3 A, 250 VAC load through more than two circuits.

*4. These figures are minimum requirements for safe operation.

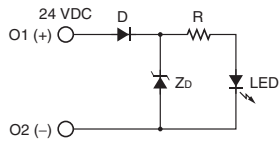
*5. This figure is based on the GS-ET-19 evaluation method.

*6. This value will vary with the switching frequency, environment, and reliability level. Confirm that correct operation is possible with the actual load beforehand.

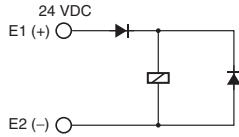
*7. Use a 10 A fuse type gI or gG that conforms to IEC 60269 as a short-circuit protection device.

Connections

Internal Circuit Diagram Indicator



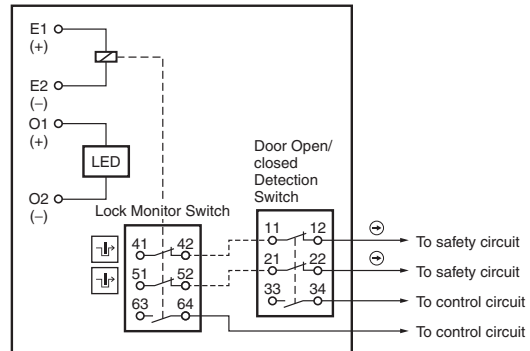
Solenoid



Circuit Connection Example

(Examples for the D4JL-□NF□-□)

- Terminals 11-42 and terminals 21-52 are connected internally and so connect terminals 12-41 and 22-51 for safety-circuit input (GS-ET-19).

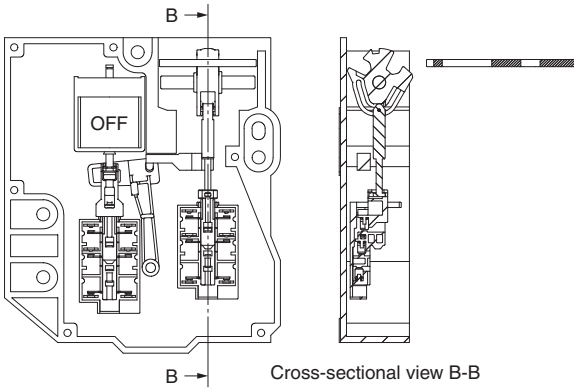


- Direct opening contacts used as safety-circuit input are indicated with the \ominus mark.
Terminals 11-12 and terminals 21-22 are direct opening contacts.
- Do not connect the indicator directly to direct opening contacts. If indicator is connected in parallel with direct opening contacts, a short-circuit current may flow in the event that the indicator is damaged, causing equipment to malfunction.
- Do not switch standard loads for more than 2 circuits. Otherwise, the level of insulation may decrease.
- The solenoid terminals have polarity (E1: + and E2: -). Confirm the polarity before wiring.

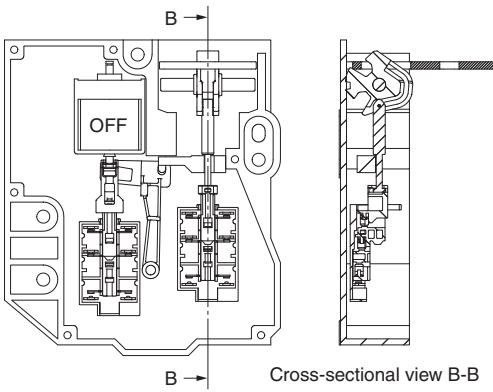
Operation Method

Operation Principles Mechanical Lock Models

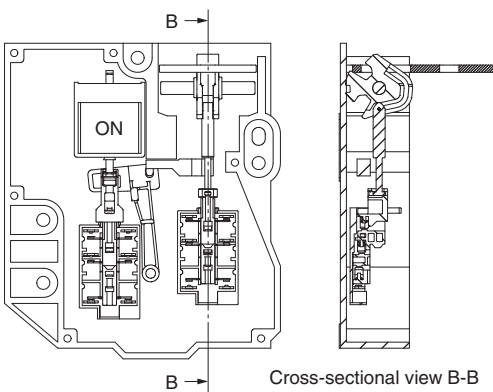
Operation Key removed.



Operation Key inserted: Door locked.

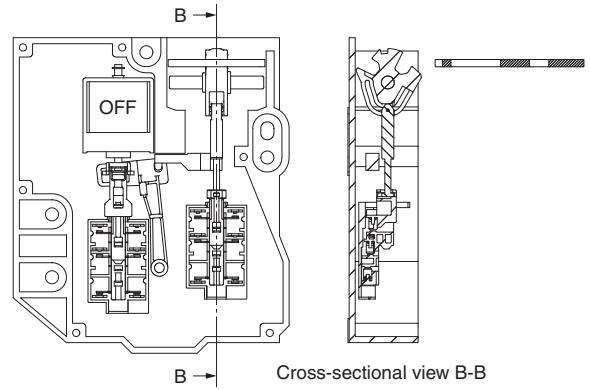


Solenoid ON: Door unlocked.

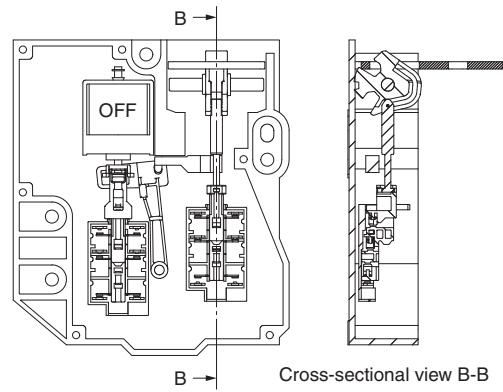


Solenoid Lock Models

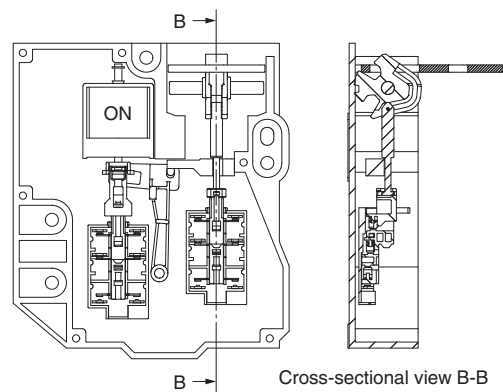
Operation Key removed.



Operation Key inserted: Door unlocked.

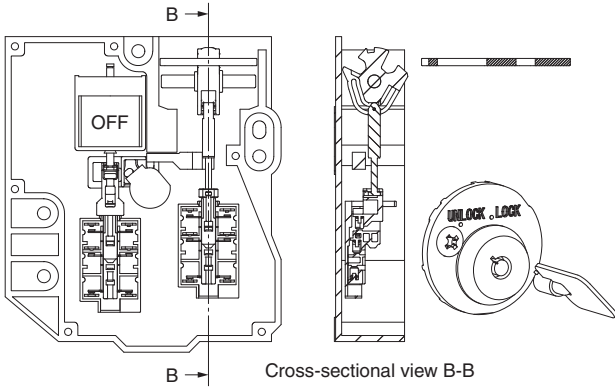


Solenoid ON: Door locked.

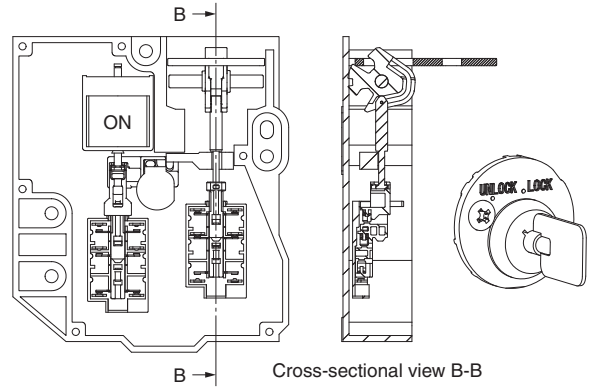


Trapped Key Models

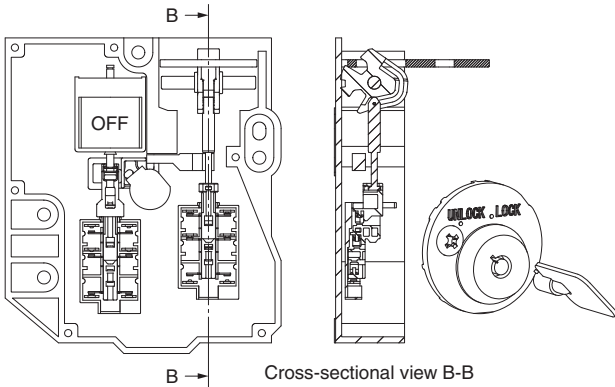
(1) Operation Key removed, solenoid OFF, and trapped key removed.



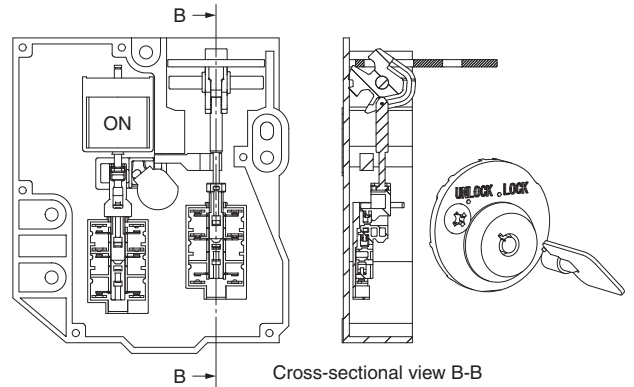
(4) Operation Key inserted, solenoid ON, and trapped key inserted. Status: Door locked and trapped key can be removed.



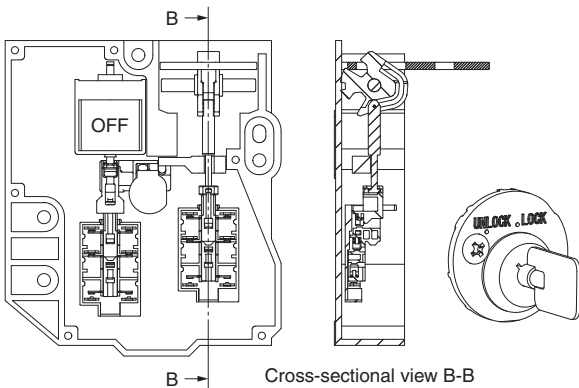
(2) Operation Key inserted, solenoid OFF, and trapped key removed. Status: Door unlocked.



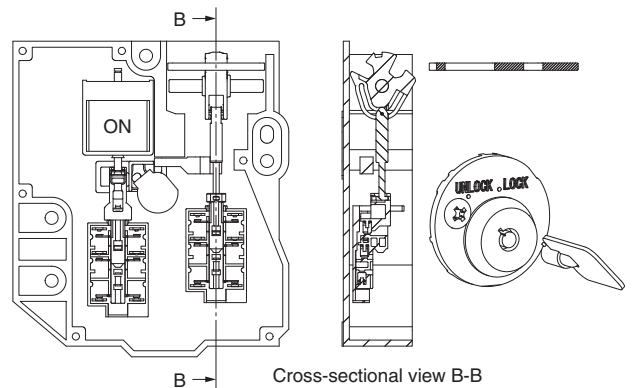
(5) Operation Key inserted, solenoid ON, and trapped key removed. Status: Door unlocked.



(3) Operation Key inserted, solenoid OFF, and trapped key inserted. Status: Door locked and trapped key cannot be removed.

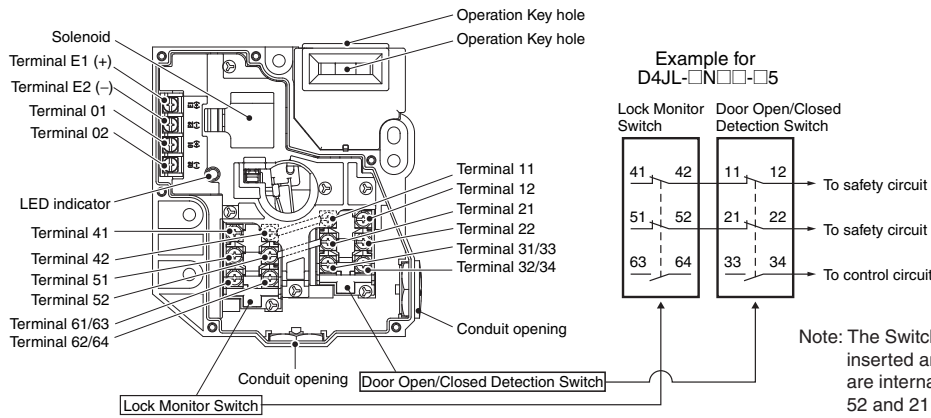


(6) Operation Key removed, solenoid ON, and trapped key removed.



Structure and Nomenclature

Structure (D4JL-□□□A-□5 and D4JL-□□□G-□5)



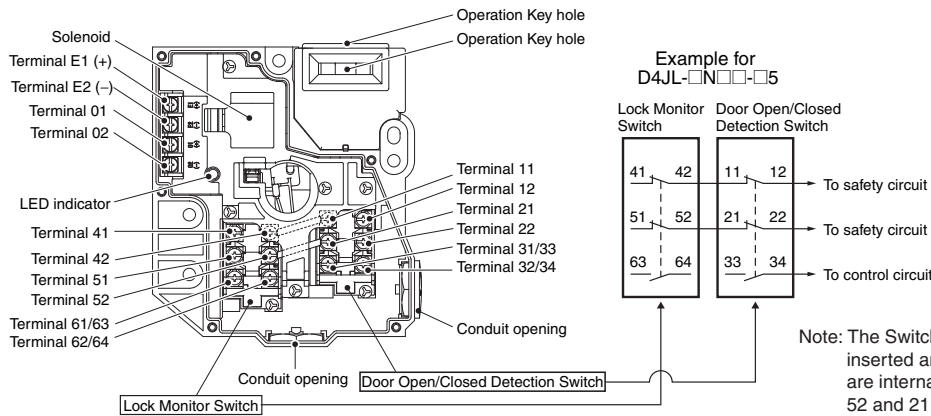
Contact Forms

Indicates conditions where the Key is inserted and the lock is applied. Terminals 42-11 and terminals 52-21 are connected internally (as per BIA GS-ET-19).

Model	Contact (door open/closed detection and lock monitor)	Contact form		Operating pattern	Remarks
		Lock monitor	Door open/closed detection		
D4JL-□NF□-□	2NC/1NO+2NC/1NO				NC contacts 11-12 and 21-22 have a certified direct opening mechanism (⊖). The terminals 41-12, 51-22, 33-34, and 63-64 can be used as unlike poles.
D4JL-□PF□-□	2NC/1NO+3NC				NC contacts 11-12 and 21-22 have a certified direct opening mechanism (⊖). The terminals 41-12, 51-22, 33-34, and 61-62 can be used as unlike poles.
D4JL-□QF□-□	3NC+2NC/1NO				NC contacts 11-12, 21-22 and 31-32 have a certified direct opening mechanism (⊖). The terminals 41-12, 51-22, 31-32, and 63-64 can be used as unlike poles.
D4JL-□RF□-□	3NC+3NC				NC contacts 11-12, 21-22, and 31-32 have a certified direct opening mechanism (⊖). The terminals 41-12, 51-22, 31-32, and 61-62 can be used as unlike poles.

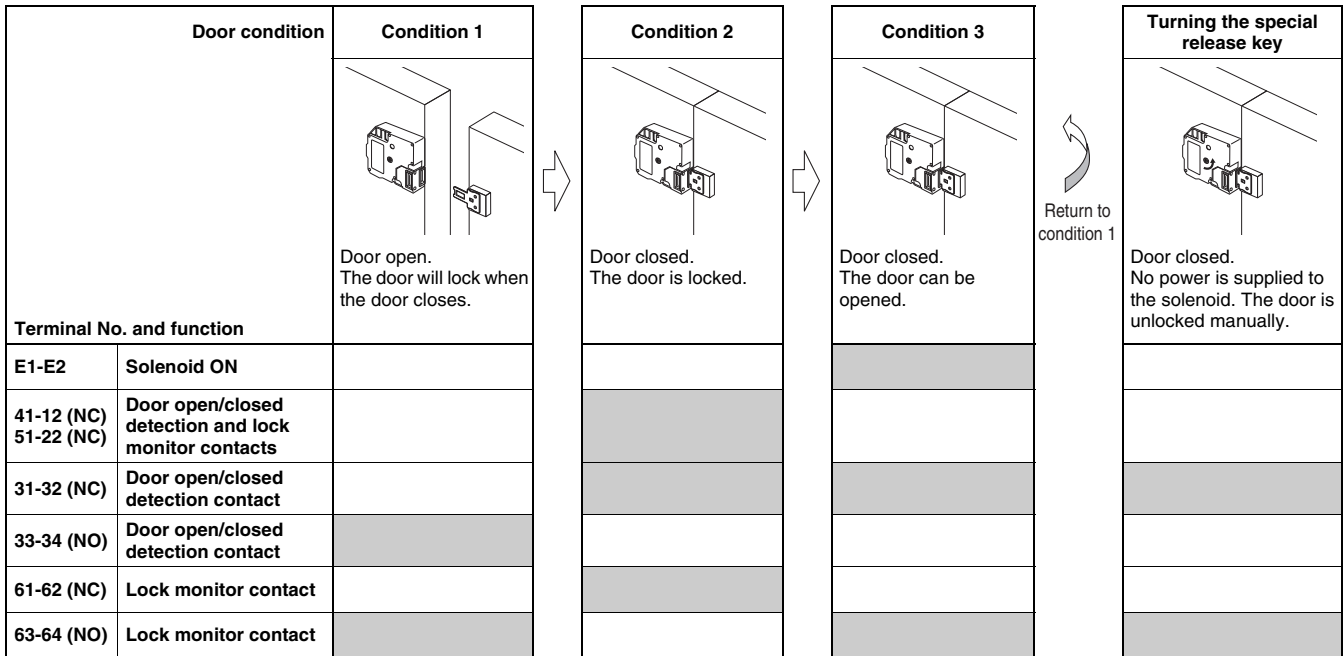
Operating Cycle

Structure (D4JL-□□□A-□5 and D4JL-□□□G-□5)

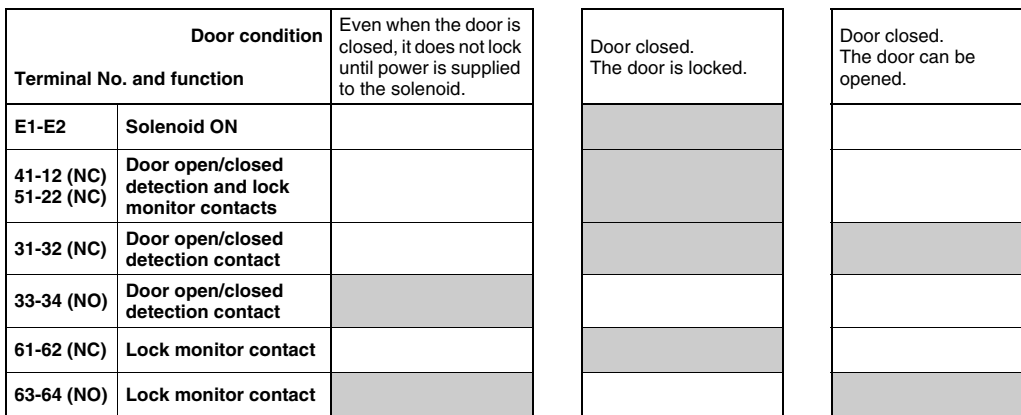


Operating Cycle Examples (for Standard Models)

D4JL-□□□A-□5 (Mechanical Lock Models with Special Release Keys)



D4JL-□□□G-□5 (Solenoid Lock Models with Special Release Keys)

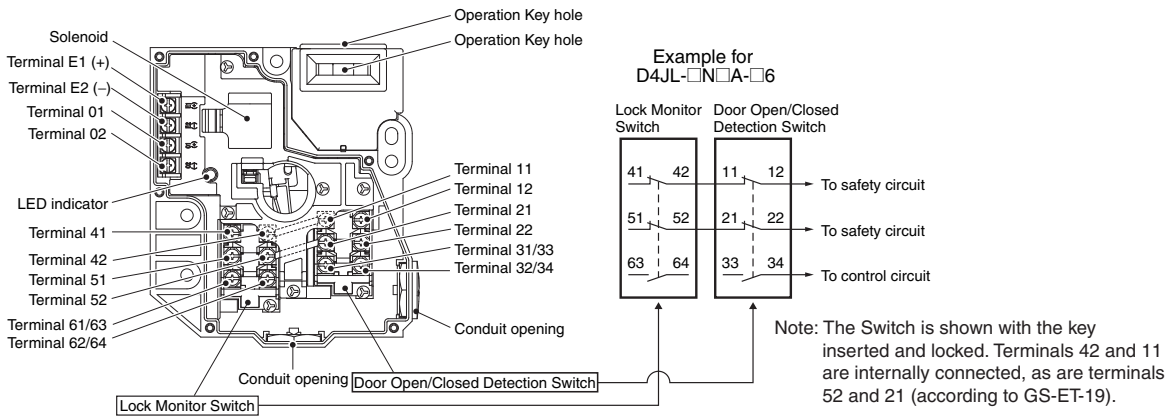


The shaded areas indicate the contact is closed and power is supplied to the solenoid.

- Door open/closed detection and lock monitor contacts: Can be used in safety circuits because of the direct opening mechanisms.
- Door open/closed detection contact: Can be used to confirm whether the key is inserted and to monitor the open/closed status of a door.
- Lock monitor contact: Can be used to confirm whether power is supplied to the solenoid and to monitor whether or not a door can be opened or closed.

Note: The door open/closed detection and lock monitor contact configuration depends on the model.

Structure (D4JL-□□□A-□6)



Operating Cycle Examples (for Models with Rear Release Buttons)

D4JL-□□□A-□6 (Mechanical Lock Models with Special Release Keys and Rear Release Buttons)

Door condition	Condition 1	Condition 2	Condition 3	Turning the special release key	Pressing the rear release button
	Door open. The door will lock when the door closes.	Door closed. The door is locked.	Door closed. The door can be opened.	Door closed. No power is supplied to the solenoid. The door is unlocked manually.	Door closed. No power is supplied to the solenoid. The door is unlocked manually.
Terminal No. and function					
E1-E2	Solenoid ON				
41-12 (NC) 51-22 (NC)	Door open/closed detection and lock monitor contacts				
31-32 (NC)	Door open/closed detection contact				
33-34 (NO)	Door open/closed detection contact				
61-62 (NC)	Lock monitor contact				
63-64 (NO)	Lock monitor contact				

The shaded areas indicate the contact is closed and power is supplied to the solenoid.

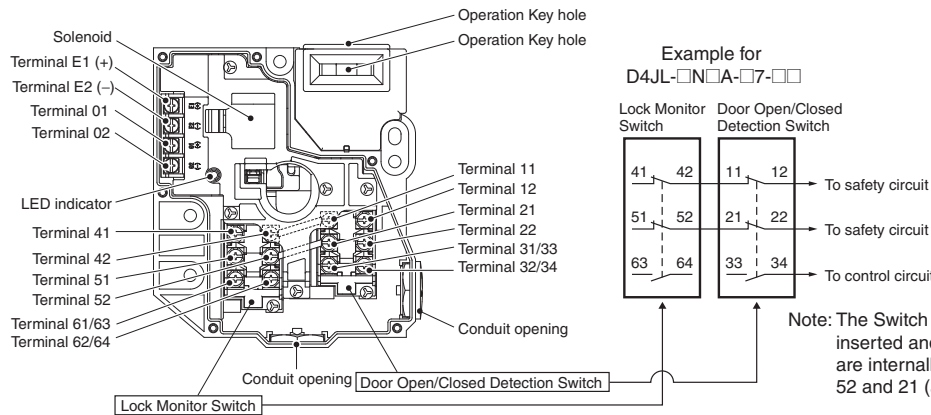
Door open/closed detection and lock monitor contacts: Can be used in safety circuits because of the direct opening mechanisms.

Door open/closed detection contact: Can be used to confirm whether the key is inserted and to monitor the open/closed status of a door.

Lock monitor contact: Can be used to confirm whether power is supplied to the solenoid and to monitor whether or not a door can be opened or closed.

Note: The door open/closed detection and lock monitor contact configuration depends on the model.

Structure (D4JL-□□□A-□7-□□)



Operating Cycle Examples (for Models with Trapped Keys)

D4JL-□□□A-□7-□□ (Models with Trapped Keys)

Door condition	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5	Condition 6
	Door open. The Key is not inserted. The door will not lock when the door closes.	Door closed. The Key is not inserted. The door is not locked.	Door closed. The Key is inserted. The door is locked.	Door closed. The Key is inserted. The door remains locked.	Door closed. The Key is not inserted. The door can be opened.	Door open. The Key is not inserted. The door will not lock when the door closes.
Terminal No. and function						
E1-E2	Solenoid ON					
41-12 (NC) 51-22 (NC)	Door open/closed detection and lock monitor contacts					
31-32 (NC)	Door open/closed detection contact					
33-34 (NO)	Door open/closed detection contact					
61-62 (NC)	Lock monitor contact					
63-64 (NO)	Lock monitor contact					

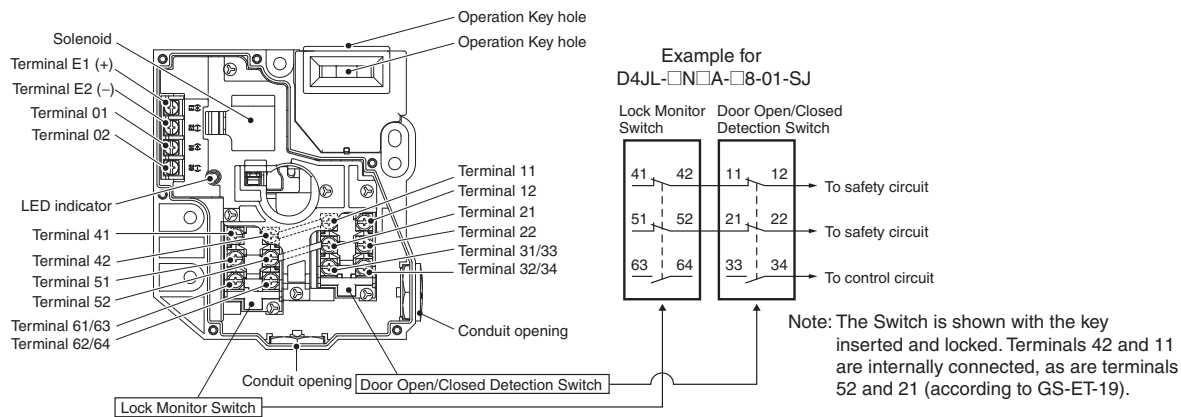
Return to condition 1

The shaded areas indicate the contact is closed and power is supplied to the solenoid.

- Door open/closed detection and lock monitor contacts: Can be used in safety circuits because of the direct opening mechanisms.
- Door open/closed detection contact: Can be used to confirm whether the key is inserted and to monitor the open/closed status of a door.
- Lock monitor contact: Can be used to confirm whether power is supplied to the solenoid and to monitor whether or not a key can be removed.

- Note:**
- Door open/closed detection and lock monitor contact configuration depends on the model.
 - If power is supplied to the solenoid, the door cannot be unlocked until the Key is turned to the left and removed. The Key cannot be removed unless it is in the UNLOCK position.

Structure (D4JL-□□□A-□8-01-SJ)



Operating Cycle Examples (for Models with Trapped Keys + Rear Release Buttons)

D4JL-□□□A-□8-01-SJ (Models with Trapped Keys + Rear Release Buttons)

Door condition		Condition 1	Condition 2	Condition 3	Condition 4	Condition 5	Condition 6	Pressing the rear release button
Terminal No. and function								
E1-E2	Solenoid ON							
41-12 (NC) 51-22 (NC)	Door open/closed detection and lock monitor contacts							
31-32 (NC)	Door open/closed detection contact							
33-34 (NO)	Door open/closed detection contact							
61-62 (NC)	Lock monitor contact							
63-64 (NO)	Lock monitor contact							

The shaded areas indicate the contact is closed and power is supplied to the solenoid.

- Door open/closed detection and lock monitor contacts: Can be used in safety circuits because of the direct opening mechanisms.
- Door open/closed detection contact: Can be used to confirm whether the key is inserted and to monitor the open/closed status of a door.
- Lock monitor contact: Can be used to confirm whether power is supplied to the solenoid and to monitor whether or not a key can be removed.

- Note:**
- Door open/closed detection and lock monitor contact configuration depends on the model.
 - If power is supplied to the solenoid, the door cannot be unlocked until the Key is turned to the left and removed. The Key cannot be removed unless it is in the UNLOCK position.

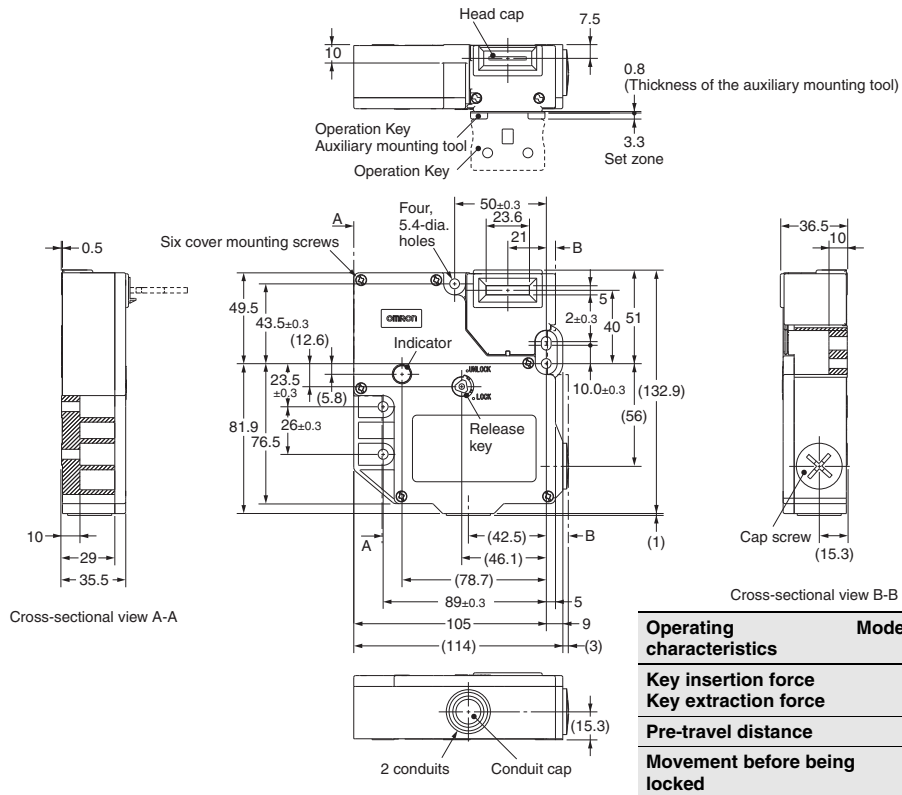
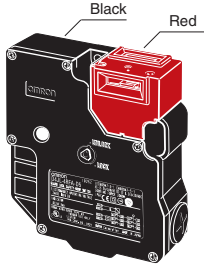
Dimensions

Dimensions and Operating Characteristics

Switches

D4JL-□□F□-C5

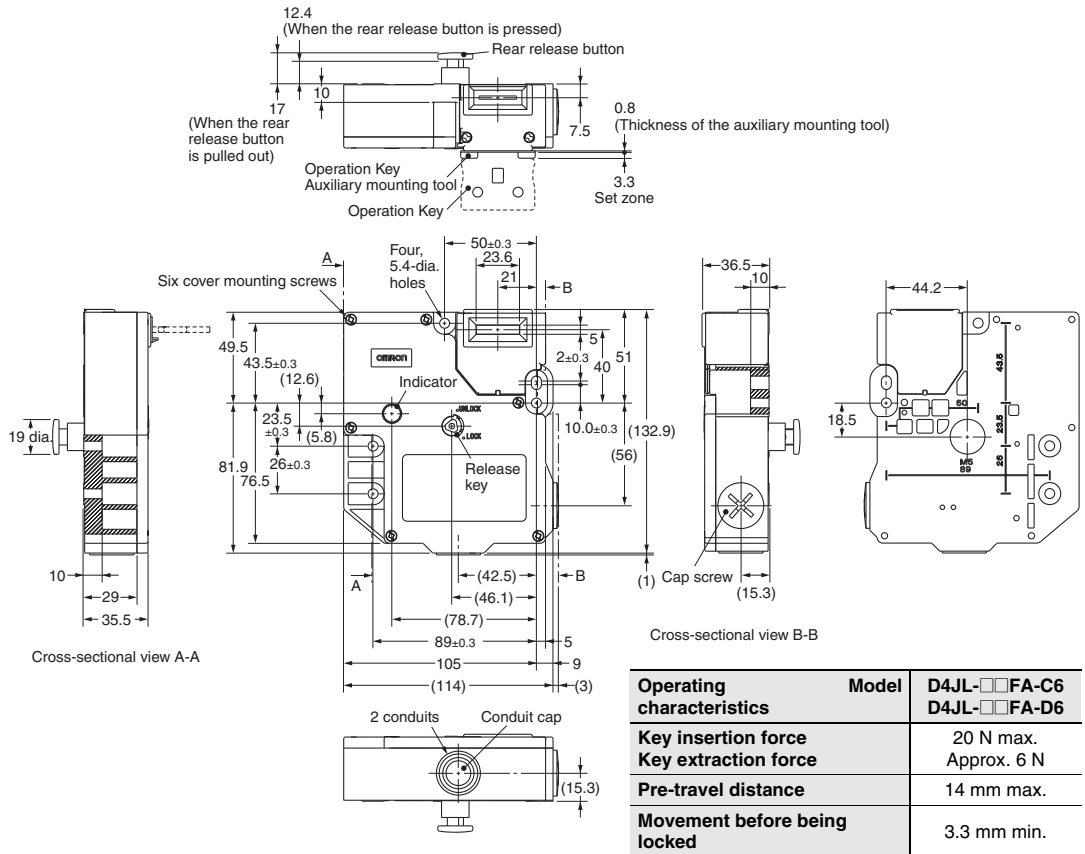
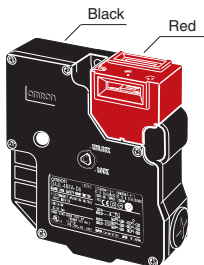
D4JL-□□F□-D5



Operating characteristics	Model	D4JL-□□F□-C5 D4JL-□□F□-D5
Key insertion force		20 N max.
Key extraction force		Approx. 6 N
Pre-travel distance		14 mm max.
Movement before being locked		3.3 mm min.

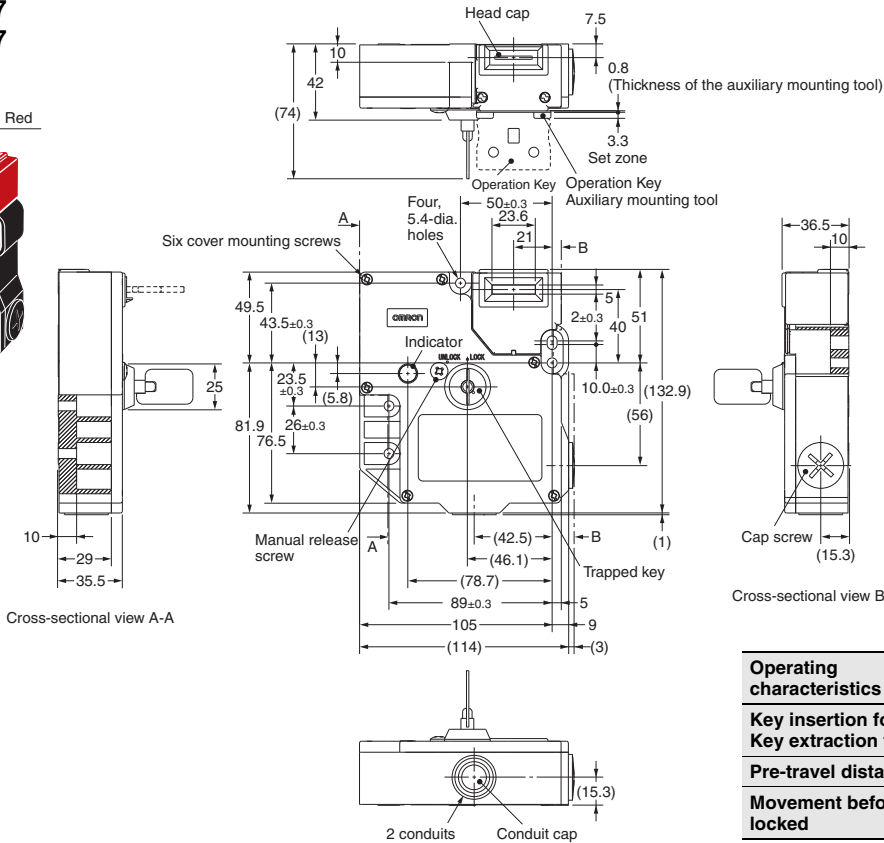
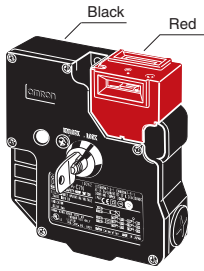
D4JL-□□FA-C6

D4JL-□□FA-D6



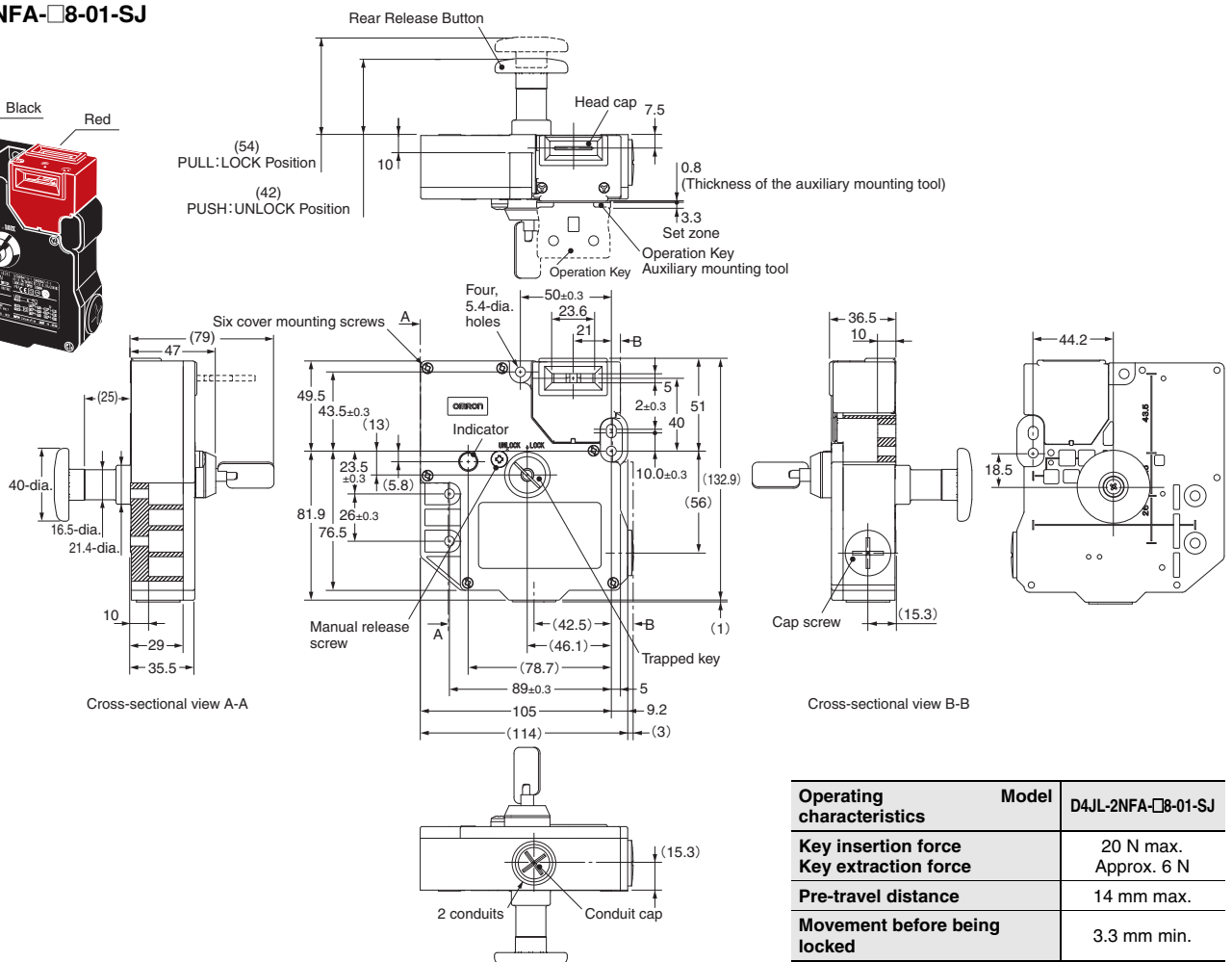
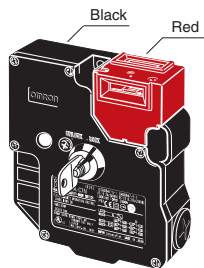
Operating characteristics	Model	D4JL-□□FA-C6 D4JL-□□FA-D6
Key insertion force		20 N max.
Key extraction force		Approx. 6 N
Pre-travel distance		14 mm max.
Movement before being locked		3.3 mm min.

D4JL-□□FA-C7
D4JL-□□FA-D7



Operating characteristics	Model	D4JL-□□FA-C7 D4JL-□□FA-D7
Key insertion force		20 N max.
Key extraction force		Approx. 6 N
Pre-travel distance		14 mm max.
Movement before being locked		3.3 mm min.

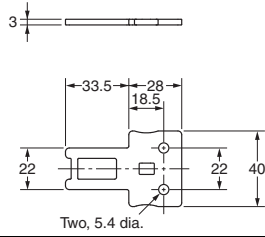
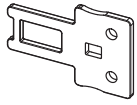
D4JL-2NFA-□8-01-SJ



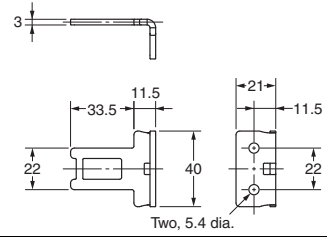
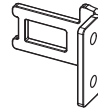
Operating characteristics	Model	D4JL-2NFA-□8-01-SJ
Key insertion force		20 N max.
Key extraction force		Approx. 6 N
Pre-travel distance		14 mm max.
Movement before being locked		3.3 mm min.

Operation Keys

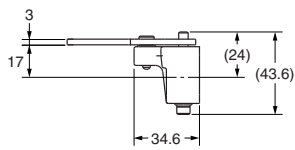
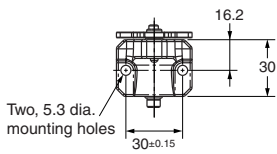
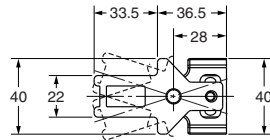
D4JL-K1



D4JL-K2



D4JL-K3

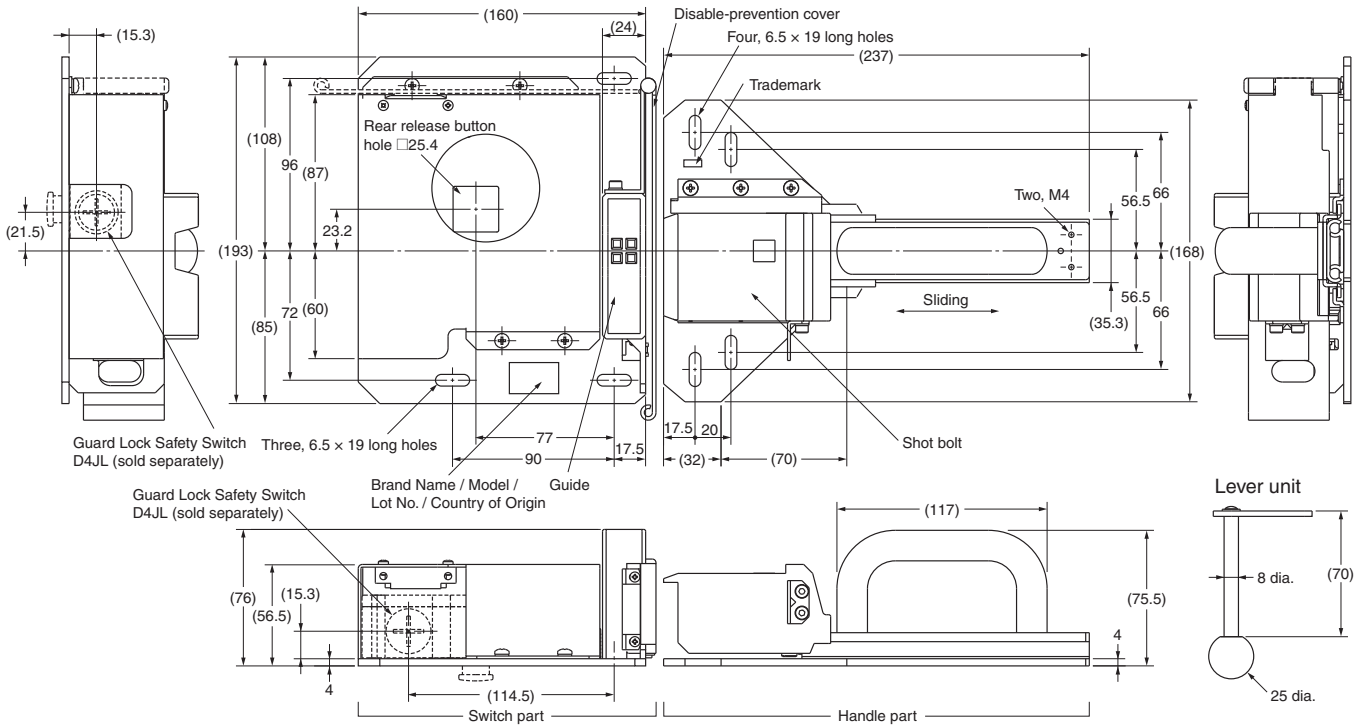


Note: Unless otherwise specified, a tolerance of ± 0.8 mm applies to all Switch dimensions and a tolerance of ± 0.4 mm applies to Operation Key dimensions.

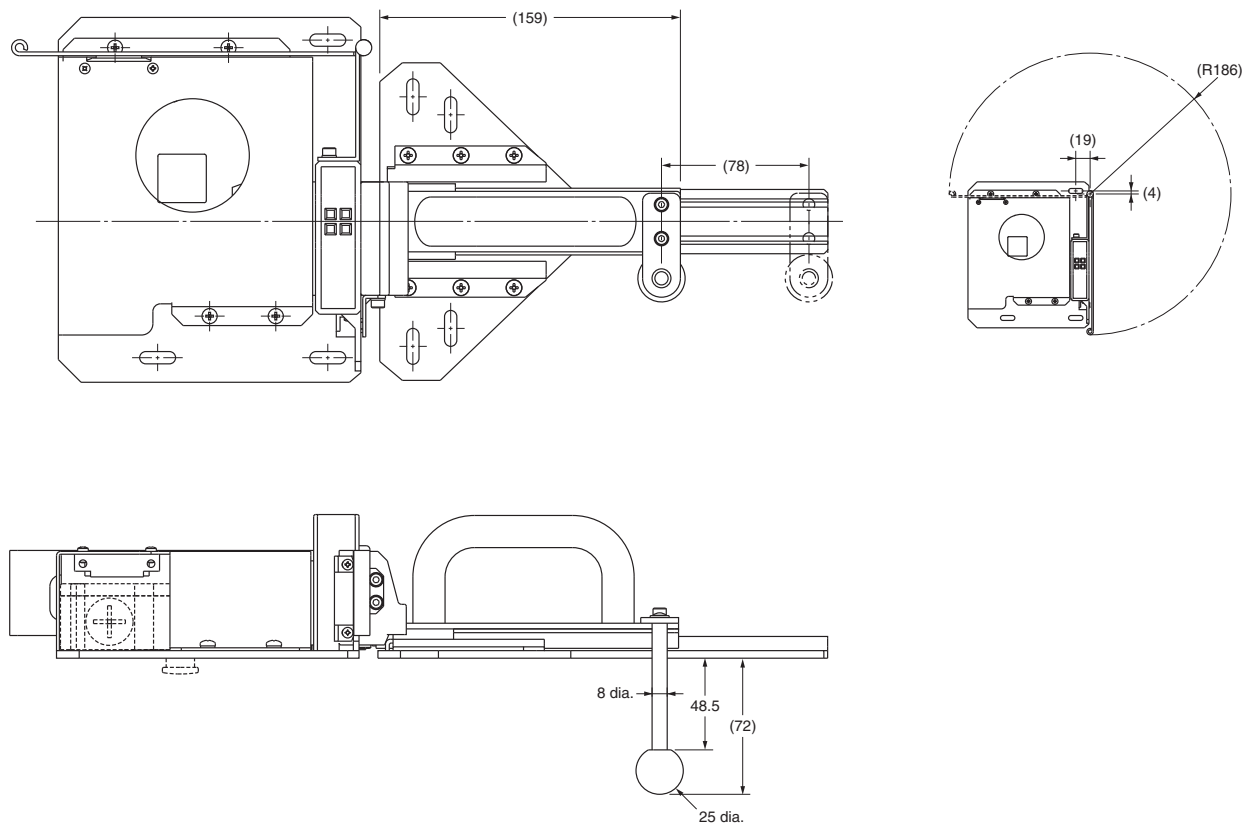
Slide Keys

D4JL-SK40

Open Door

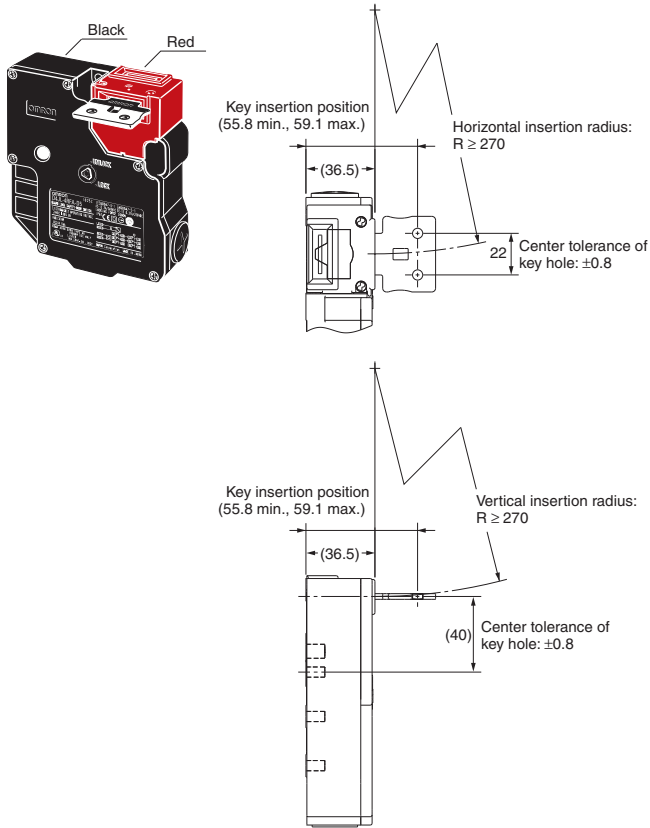


Closed Door

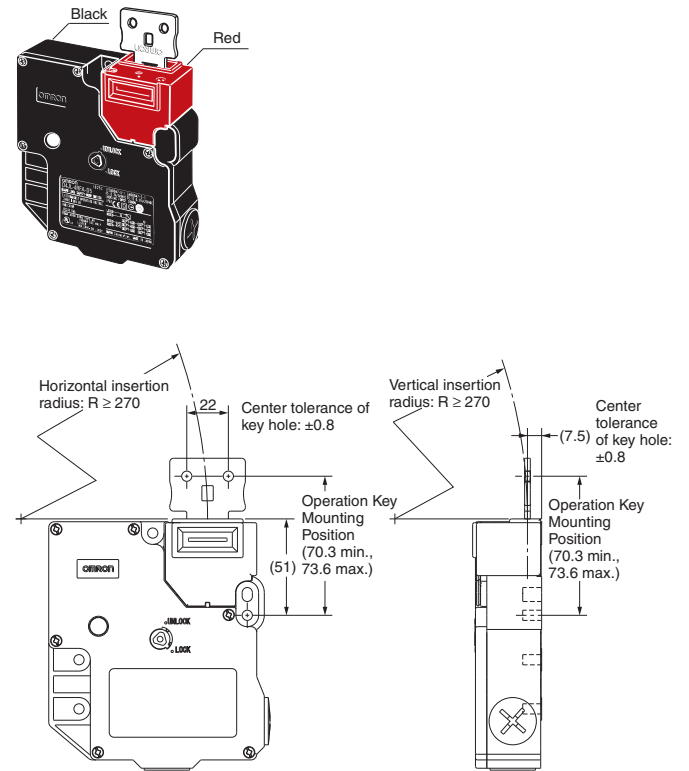


With Operation Key Inserted

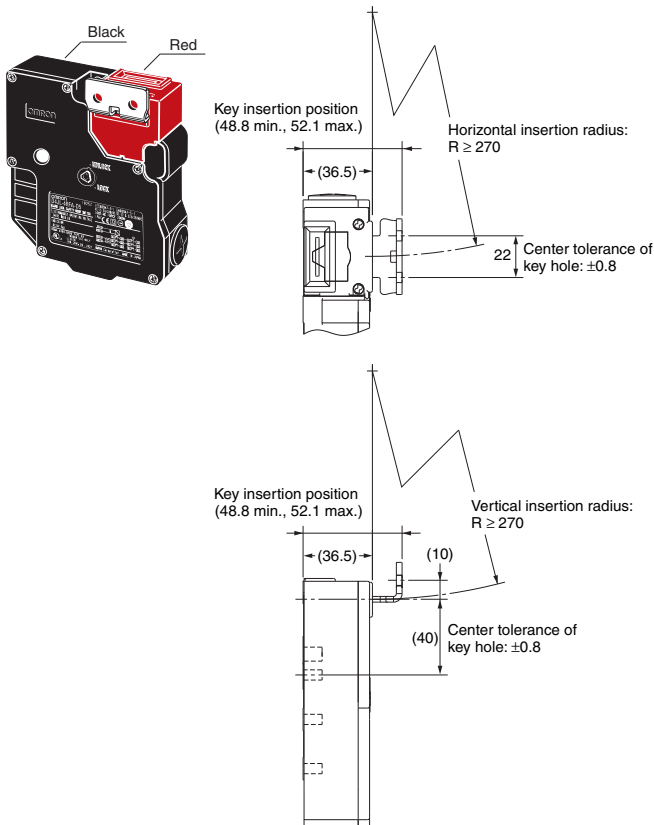
D4JL+D4JL-K1
(with Front-inserted Operation Key)



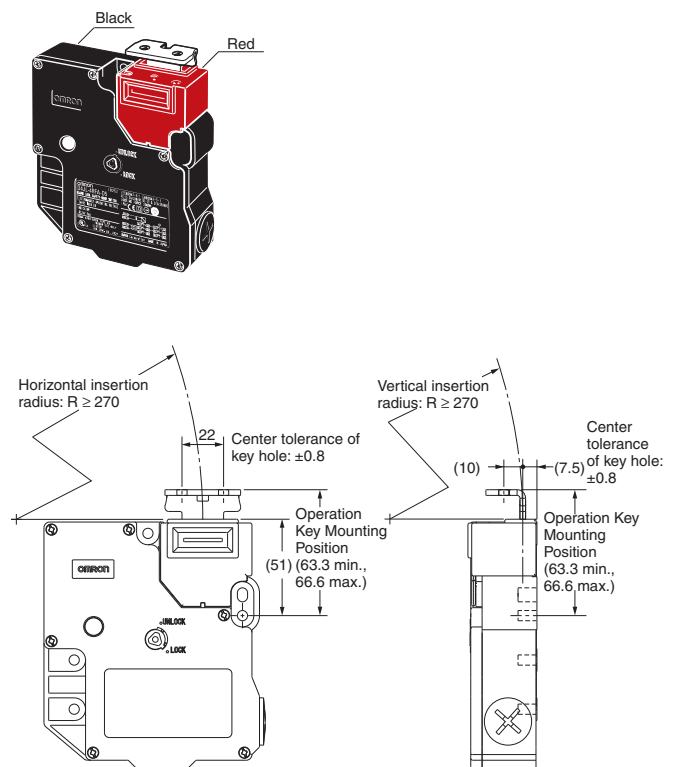
D4JL+D4JL-K1
(with Top-inserted Operation Key)



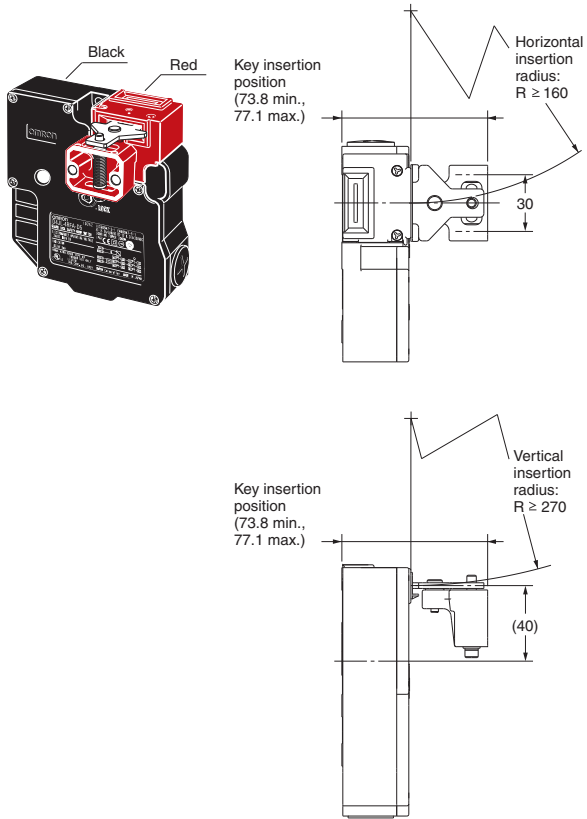
D4JL+D4JL-K2
(with Front-inserted Operation Key)



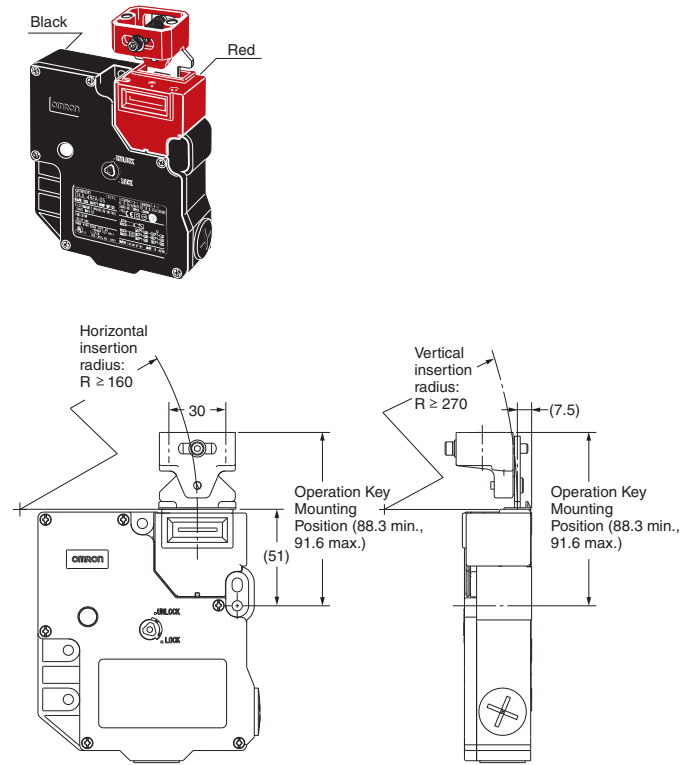
D4JL+D4JL-K2
(with Top-inserted Operation Key)



**D4JL + D4JL-K3
(with Front-inserted Operation key)**



**D4JL + D4JL-K3
(with Top-inserted Operation key)**



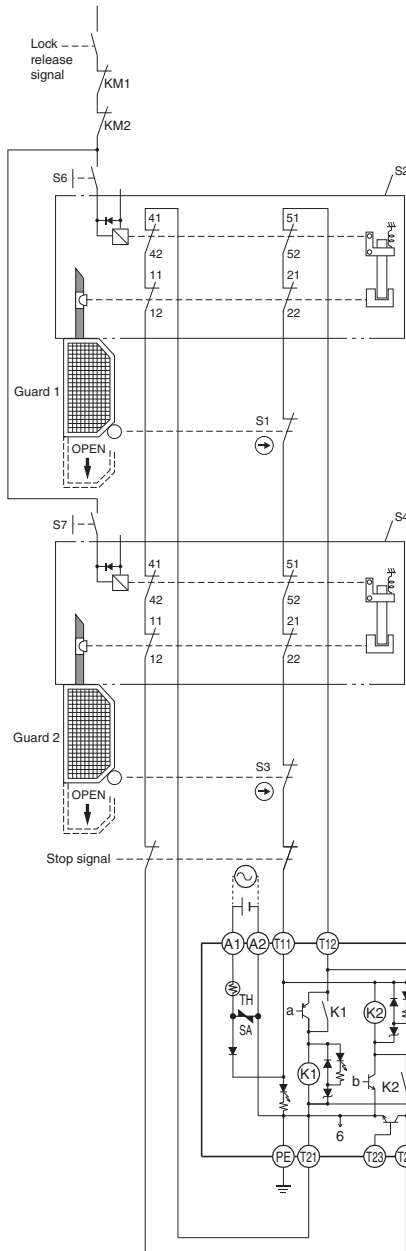
Application Examples

PL/safety category	Model	Stop category	Reset
PLd/3 equivalent	Guard Lock Safety-door Switch D4JL-□□□A-□□ (Mechanical Lock Type) Safety Relay Unit G9SA-321-T□ (24 VAC/VDC)	1	Manual

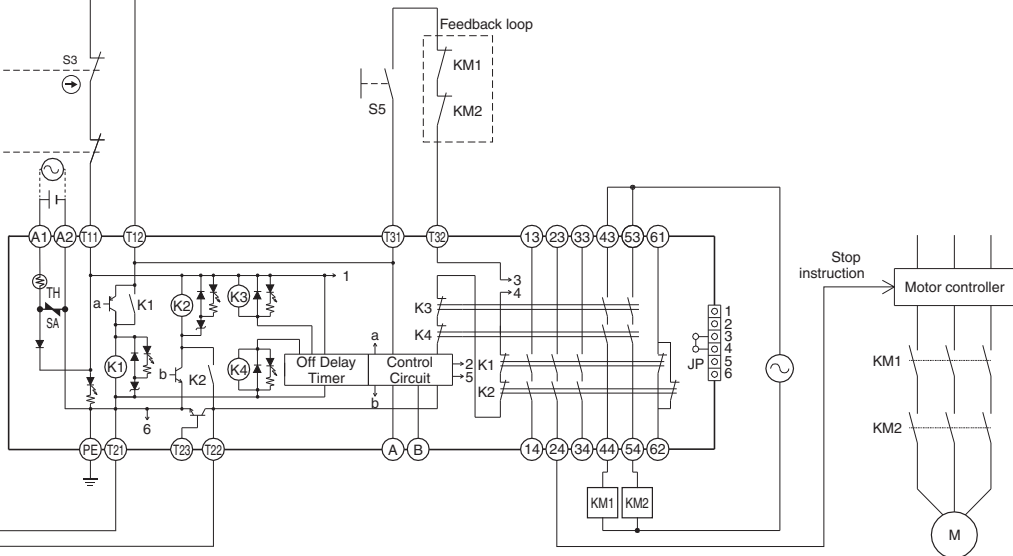
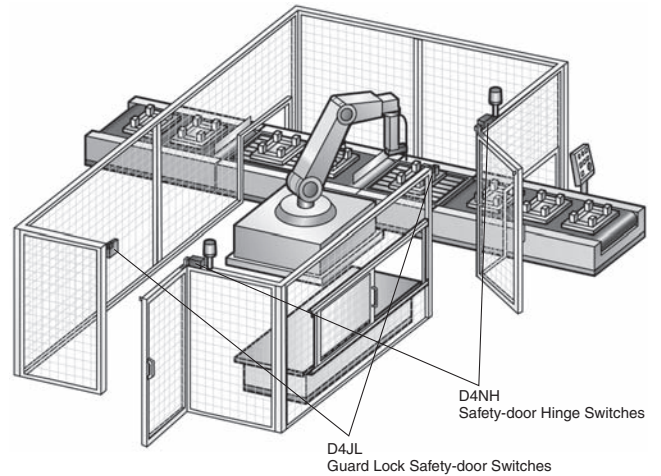
Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

●Application Overview

- The stop signal is sent to the motor controller.
- The power supply to the motor M is turned OFF after OFF-delay time.
- The lock release signal enables the guard 1 and guard 2 to be opened.
- The S1 and S2 monitor the guard 1, and the S3 and S4 monitor the guard 2. The power supply to the motor M is kept OFF while one of the guards is opened.
- The power supply to the motor M is turned ON again when the reset switch S5 is pressed while both guards are closed and locked.



Application Example Stopping a Robot on a Conveyor Line



- S1: Safety-door Switch with direct opening contact
- S2: Guard Lock Safety-door Switch
- S3: Safety-door Switch with direct opening contact
- S4: Guard Lock Safety-door Switch
- S5: Reset switch
- S6 and S7: Lock release switches
- KM1 and KM2: Magnetic contactors
- M: 3-phase motor

Note: 1. When the release button is pressed on rear release models, the solenoid contacts are turned OFF.
2. With Trapped Key Models, the door will not lock when it is closed with the trapped key removed.

PL/safety category	Model	Stop category	Reset
PLe/4 equivalent	Guard Lock Safety-door Switch D4JL-□□□A-□□ (Mechanical Lock Type) Flexible Safety Unit G9SX-BC202 (24 VDC) Flexible Safety Unit G9SX-AD322-T15 (24 VDC)	1	Manual

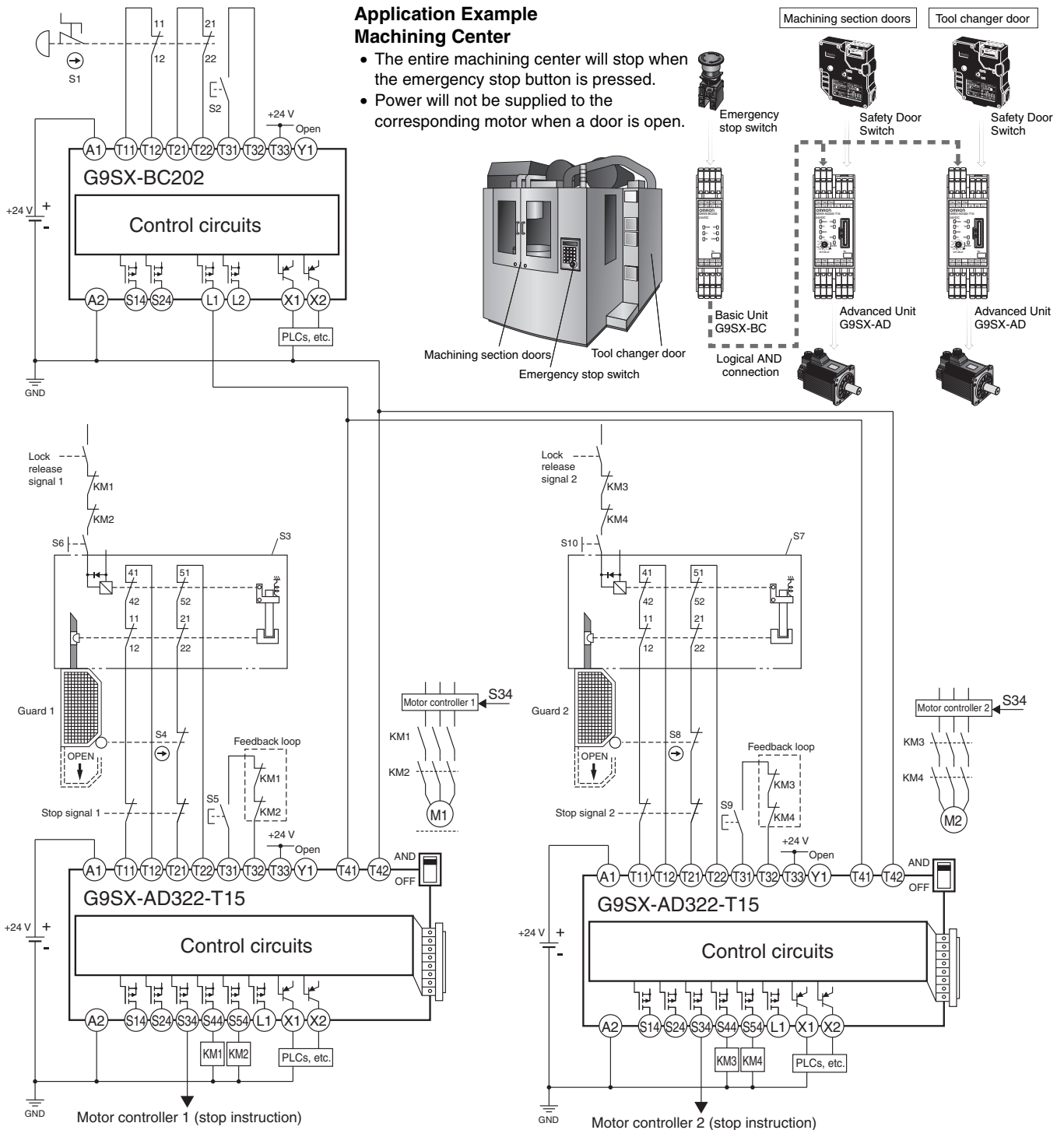
Note: 1. The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.
2. The above PL is the evaluation result concerning the guard 1. The PL for emergency stop switch, guard 2, and other safety functions must be separately evaluated.

Application Overview

- The stop signal 1 is sent to the motor controller 1.
- The power supply to the motor M1 is turned OFF after OFF-delay time.
- The lock release signal 1 enables the guard 1 to be opened.
- The S3 and S4 monitor the guard 1, and the power supply to the motor M1 is kept OFF while the guard 1 is opened.
- The power supply to the motor M1 is turned ON when the reset switch S5 is pressed while the guard 1 is closed and locked.

**Application Example
Machining Center**

- The entire machining center will stop when the emergency stop button is pressed.
- Power will not be supplied to the corresponding motor when a door is open.



S1: Emergency stop switch
 S3 and S7: Guard Lock Safety-door Switches
 S2, S5, and S9: Reset switches
 S6 and S10: Lock release switches

S4 and S8: Safety Limit Switches with direct opening contacts
 KM 1, KM 2, KM3, and KM4: Magnetic contactors
 M1 and M2: 3-phase motors

Safety Precautions


Be sure to read the precautions for **All Safety Door Switches** in the website at: <http://www.ia.omron.com/>.


Indication and Meaning for Safe Use


⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, is likely to result in serious injury or may result in death. Additionally there may be severe property damage.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.
Precautions for Correct Use	Supplementary comments on what to do or avoid doing, to prevent failure to operate, or undesirable effect on product performance.

<Guard Lock Safety-door Switch D4JL>


⚠ DANGER


Injury may occasionally occur. Always check to make sure that the safety functions operate correctly before using the machine. The safety functions may not operate correctly because of wiring mistakes, setting mistakes, or Switch malfunction, causing some machines to continue operating in situations where they should be stopped. 

Injury may occasionally occur. If the machine is used with the release key in the UNLOCK position, the electromagnetic lock may not operate, causing some machines to continue operating in situations where they should be stopped. Be sure to put the release key in the LOCK position before using the machine. Also, check the condition of the lock and safety circuits. 

Injury may occasionally occur. When the electromagnetic lock function or Switch function is damaged, some machines may continue operating in situations where they should be stopped. Do not use the electromagnetic lock function of the Switch in place of a door lock. Always provide a lock separate from the Switch, attach a warning seal to prevent people from using excessive force to open the door when it is locked, or provide an indicator lamp to show the locked/unlocked status of the door. 

⚠ CAUTION

Electric shock may occasionally occur. Do not use metal connectors or metal conduits. 

Do not dismantle the operation key from the door intentionally and insert it to the switch with the door open. Machine may start operating and injury or death may be caused. 

Precautions for Safe Use

Installation Environment

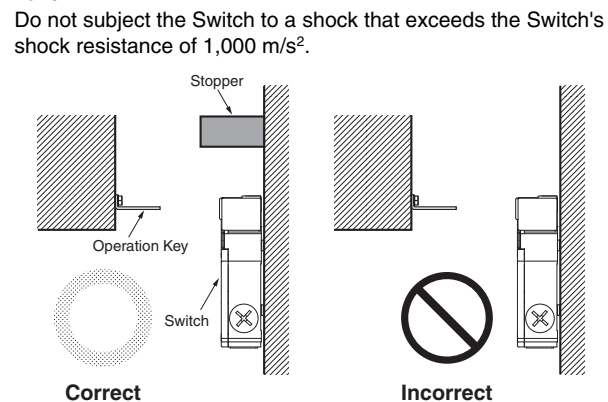
- Do not use the Switch submerged in oil or water or in locations continuously subject to splashes of oil or water. Doing so may result in oil or water entering the Switch. (The IP67 degree of protection of the Switch specifies the amount of water penetration after the Switch is submerged in water for a certain period of time.)

Wiring

- Do not switch circuits for two or more standard loads (250 VAC, 3 A) at the same time. Doing so may adversely affect insulation performance.
- Keep the electrical load below the rated value.
- Do not use screws longer than 9 mm when using metal connectors. Otherwise it may result in electric shock.
- Do not use metal conduits. Damage to the conduit opening may result in an improper seal or electric shock.
- Always attach the cover after completing wiring and before using the Switch. Do not supply power when the cover is not attached. Electric shock may occur if the Switch is used without the cover attached.

Installation

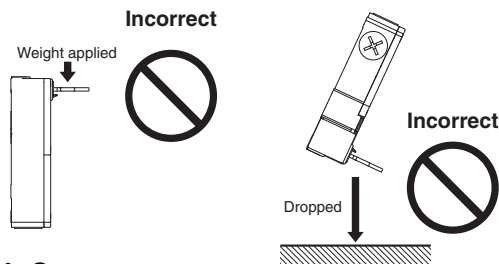
- Be careful not to drop the switch, or the switch will not fully exhibit its ability.
- Make sure the Switch is mounted securely to prevent it from falling off. Otherwise injury may result.
- Do not use the Switch as a stopper. Be sure to install a stopper as shown in the following illustration when mounting the Switch and adjust the stopper so that the Operation Key is within the setting zone.



Precautions for Correct Use

Operation Key

- Use only the designated Operation Key. The Head has been designed so that operation is not possible with a screwdriver or other tools. Using anything other than the designated Operation Key may damage the Switch or affect machine safety.
- Do not operate the Switch with anything other than the special OMRON Operation Key, otherwise the Switch may break or the safety of the system may not be maintained.
- Do not impose excessive force on the Operation Key while the Key is inserted into the Switch or drop the Switch with the Operation Key inserted. Doing either of these may deform the Key or break the Switch.

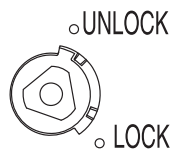


Switch Contacts

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.

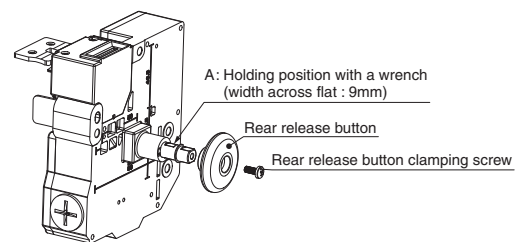
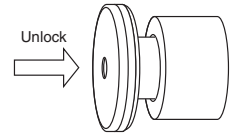
Release Key

- The release key is used to unlock the Switch in case of emergency or if the power supply to the Switch stops.
- If the release key setting is changed from LOCK to UNLOCK using the enclosed release key, the lock will be released and the safety door can be opened (mechanical lock models only).
- After setting the release key to UNLOCK to, for example, change the head direction or perform maintenance, be sure to return it to the LOCK setting before resuming operation.
- The release key is set in the unlock position at the factory for the D4JL-□□□A-□5, D4JL-□□□A-□6, D4JL-□□□A-□7-□□ and D4JL-□□□A-□8-01-SJ and in the lock position for the D4JL-□□□G-□5.
- If the release key is set to UNLOCK when the Switch is used for the door of a machine room to ensure the safety of people performing adjustment work inside, the door will not be locked when the door is closed and no power will be supplied to the equipment.
- Do not use the release key to start or stop machines.
- The auxiliary lock must be released using the release key only by authorized personnel.
- Do not impose a force exceeding 1 N·m on the release key screws. The release key may be damaged and may not operate properly.
- To prevent the release key from being used by unauthorized personnel, set it to LOCK and seal it with sealing wax.



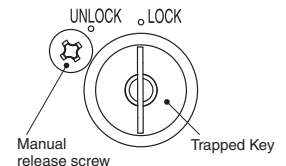
Rear Release Button

- The rear release button is used for emergency escapes when someone locks a worker in the work area (hazardous area).
- The door can be unlocked by pressing the rear release button.
- After the rear release button is used to unlock the door, pull the button out to restore it to its original state. If the button is left pressed in, the door will not lock when the door is closed and power will not be supplied to the equipment.
- Mount the Switch so that the rear release button can be operated by a worker inside the work area (hazardous area).
- For the D4JL-□□□A-□8-01-SJ, attach the enclosed rear release button with the rear release button attachment screw. When you attach the rear release button, use a wrench to hold it in the specified position and tighten the screw to the applicable torque.



Trapped Key

- The trapped key is released when power is supplied to the solenoid. Turn the trapped key to the UNLOCK position and remove the key to unlock the door. The door cannot be unlocked solely by supplying power to the solenoid. As long as a worker has the trapped key with him when he enters the work area (hazardous area), he cannot be locked inside by another worker.
- Do not impose a force exceeding 1 N·m when operating the key. Otherwise, the Switch may be damaged and may not operate properly.



Attaching a Cover

- Make sure the release key is set to the LOCK position before covering the D4JL.
- When attaching a cover, be sure that the seal rubber is in place and that there is no foreign material present. If the cover is attached with the seal rubber out of place or if foreign material is stuck to the rubber, a proper seal will not be obtained.
- Do not use any screws to connect the cover other than the specified ones. The seal characteristics may be reduced.
- Use one of the following methods when covering a Trapped Key Switch.
 - When the Operation Key is removed (door open):
 - Cover with the trapped key removed (UNLOCK).
 - When the Operation Key is inserted (door closed):
 - Cover with the trapped key inserted (LOCK).