Guard Lock Safety-door Switch/Slide key

D4JL/D4JL-SK40

CSM_D4JL_D4JL-SK40_DS_E_10_3

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

⚠ Be sure to read the *"Safety Precautions"* on page 23.



Guard Lock Safety-door Switches



Slide Keys

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

Features

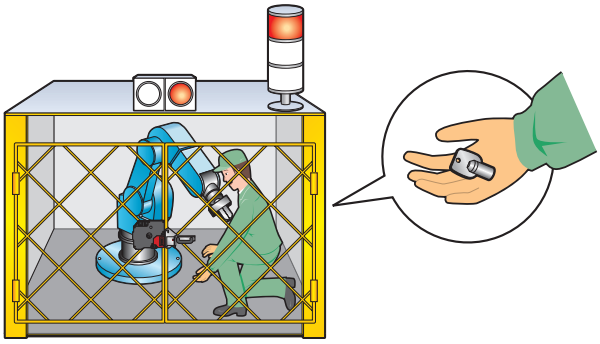
Plastic Guard Lock Safety-door Switches Holding Force of 3,000 N

Suitable for large, heavy doors.

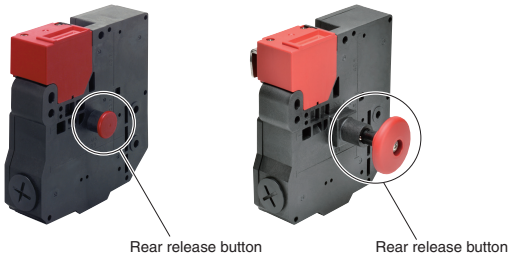


Wide variations to protect workers who enter hazardous areas.

- **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.



D4JL-□□□A-06　　D4JL-□□□A-□8-01-SJ

- **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 Outlet**
   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 tool is included.

***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 Outlet**
   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 Outlet**
   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

Release key type	Indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit outlet	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

Release key type	Indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit outlet	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

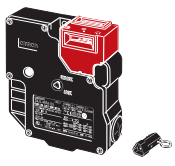
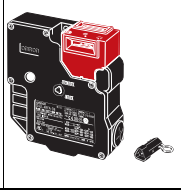
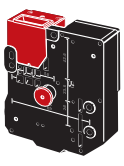
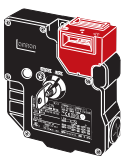
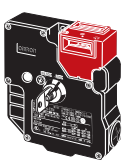
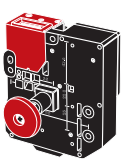
Release key type	Indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit outlet	Model
Trapped key *1	Green	Mechanical lock Solenoid release	2NC/1NO+2NC/1NO	G1/2	D4JL-2NFA-C7-01
				M20	D4JL-4NFA-C7-01
			2NC/1NO+3NC	G1/2	D4JL-2PFA-C7-01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

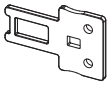
Trapped Key + Rear Release Button type

Release key type	Indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit outlet	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		Front 	Rear 		Front 	Rear 

Operation Keys

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

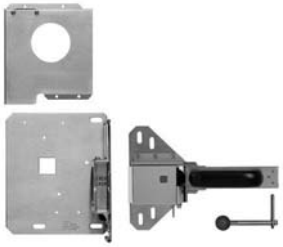
Type	Model
Adjustable mounting (horizontal) 	D4JL-K3

Slide Keys

Appearance	Specifications	Contents	Model	Applicable Door Switch
	Weight: 3,400 g Mechanical durability: 20,000 operations min.	Slide Key: 1 (Disable-prevention cover and Operation Key D4JL-K2 are already mounted on Slide Key) D4JL mounting tool: 1 Inner lever: 1 Inner lever mounting screws: 2 Door Switch mounting one-way screws: 3 Switch protective cover: 1 Switch protective cover screws: 4	**D4JL-SK40**	D4JL-□□F□-□6 D4JL-□□FA-□8-01-SJ rear release button type

Note: 1. The Door Switch is not included. Select the Door Switch depending on the necessary number of contacts and the conduit outlet.
2. Perform risk assessment for the equipment in question, configure relay units and other safety circuits, and use properly.
3. Ask your OMRON representative for information on the D4JL-SK30.

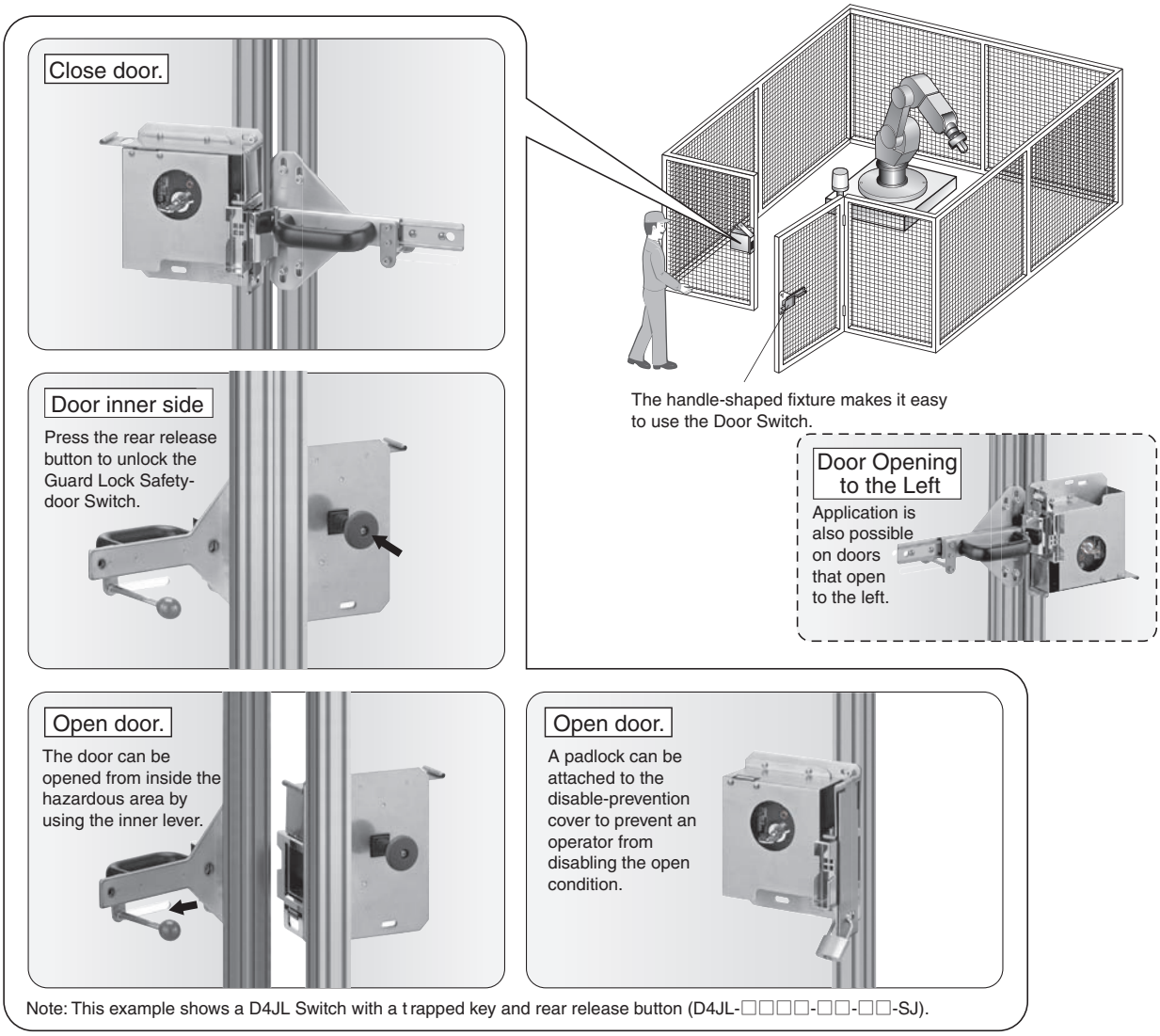
D4JL-SK40
Configuration


D4JL-SK40


D4JL model
with Trapped Key +
Rear Release Button type



For safety measures on large doors that are potentially dangerous because their movement cannot be immediately stopped.



Note: This example shows a D4JL Switch with a trapped key and rear release button (D4JL-□□□□-□□-□□-SJ).

Specifications

Standards and EC Directives

Conforms to the following EC Directives:

- Machinery Directive
- EN ISO 14119
- EN 60204-1
- GS-ET-19

Certified Standards

Certification body	Standard	File No.
TÜV SÜD	EN 60947-5-1 (certified direct opening)	Consult your OMRON representative for details.
UL ✻1	UL 508, CSA C22.2 No.14	E76675
CQC (CCC)	GB/T 14048.5	Consult your OMRON representative for details.
KOSHA ✻2	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.

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

Interlock type			Type 2 (EN ISO 14119)
Coding level			Low level coded (EN ISO 14119)
Degree of protection *1			IP67 (EN60947-5-1)
Durability *2	**Mechanical**		1,000,000 operations min.
		Trapped key	10,000 operations min.
		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 (Fzh) *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 (Uimp) (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.

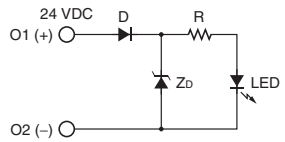
***6.** This value will vary with the switching frequency, environment, and reliability level. Confirm that correct operation is possible with the actual load beforehand.

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

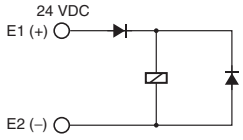
Connections

Internal Circuit Diagram

Indicator



Solenoid

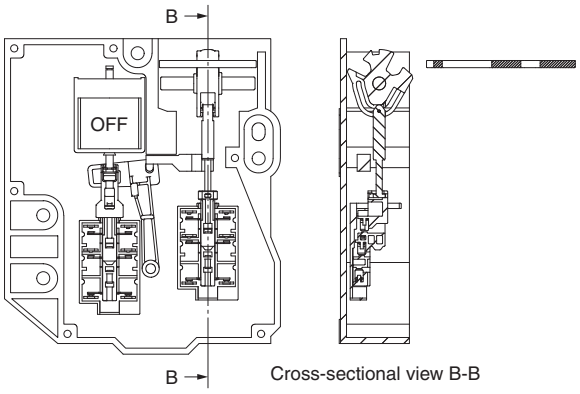


Operation Method

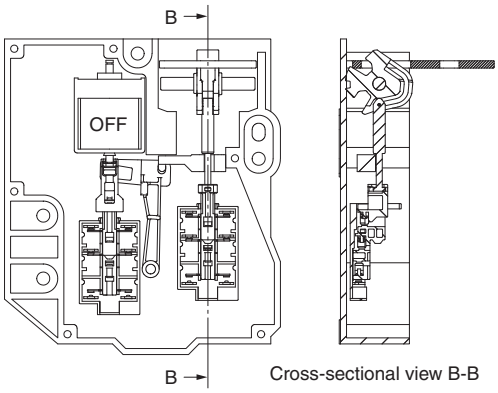
Operation Principles

Mechanical Lock Models

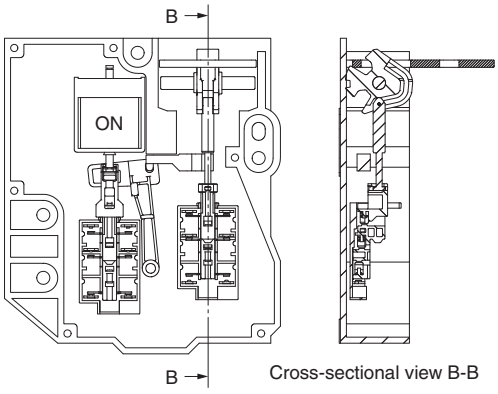
Operation Key removed.



Operation Key inserted: Door locked.

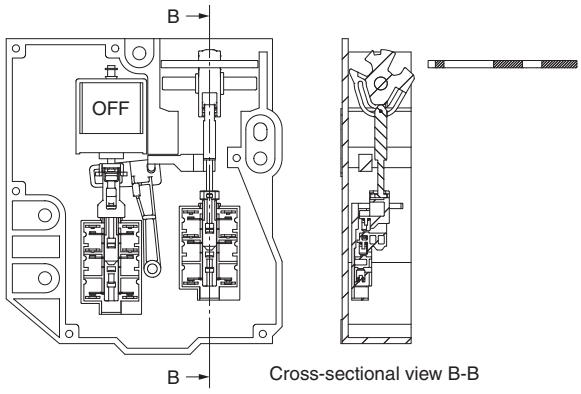


Solenoid ON: Door unlocked.

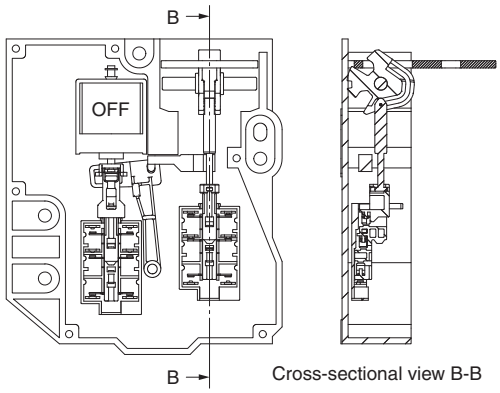


Solenoid Lock Models

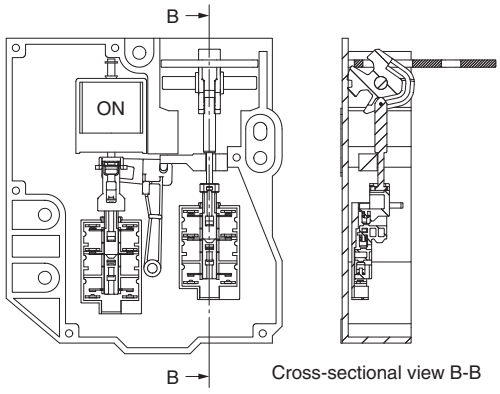
Operation Key removed.



Operation Key inserted: Door unlocked.

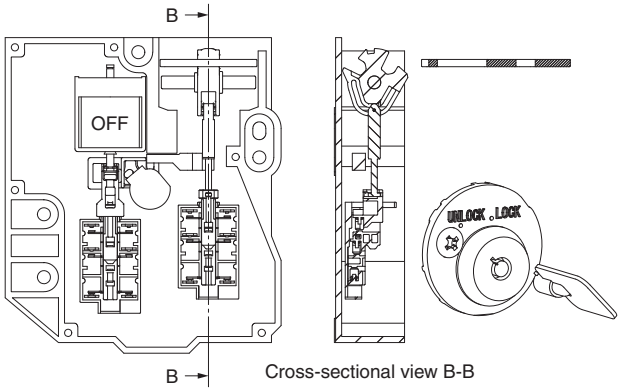


Solenoid ON: Door locked.

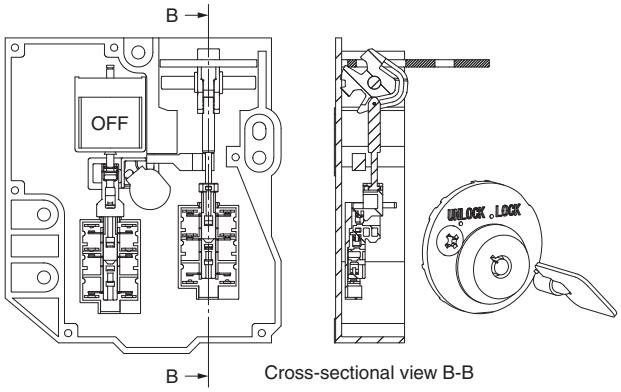


Trapped Key Models

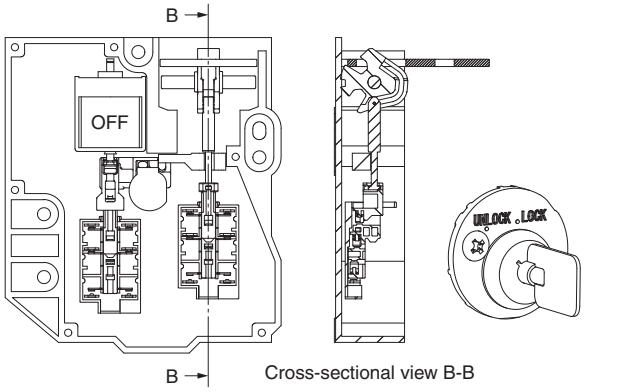
(1) Operation Key removed, solenoid OFF, and trapped key removed.



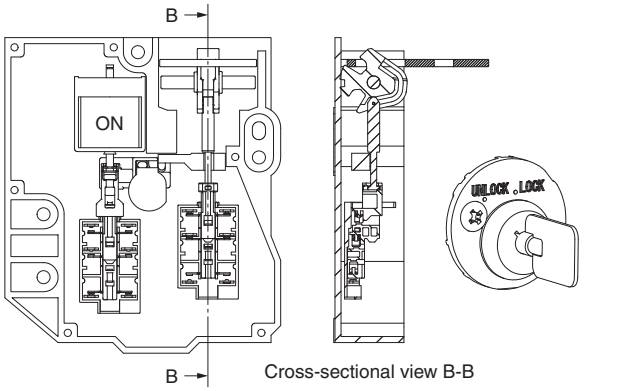
(2) Operation Key inserted, solenoid OFF, and trapped key removed. Status: Door unlocked.



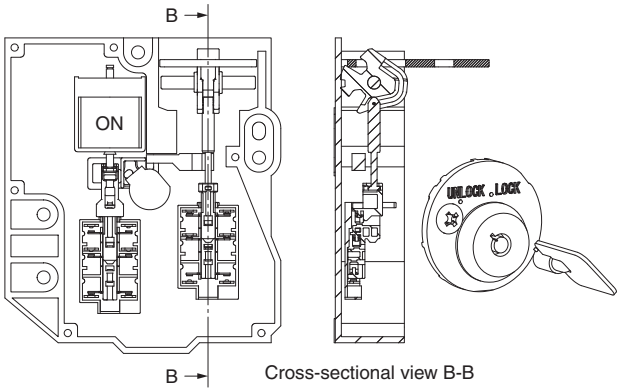
(3) Operation Key inserted, solenoid OFF, and trapped key inserted. Status: Door locked and trapped key cannot be removed.



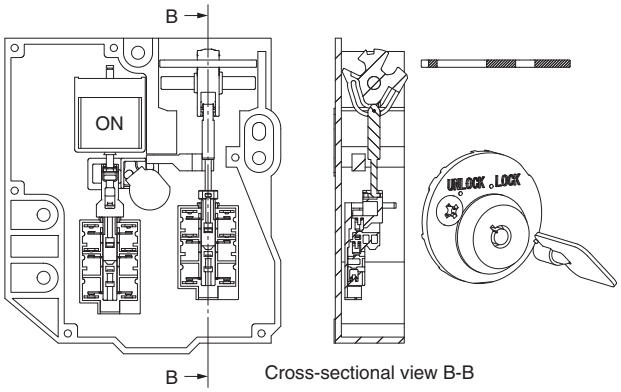
(4) Operation Key inserted, solenoid ON, and trapped key inserted. Status: Door locked and trapped key can be removed.



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

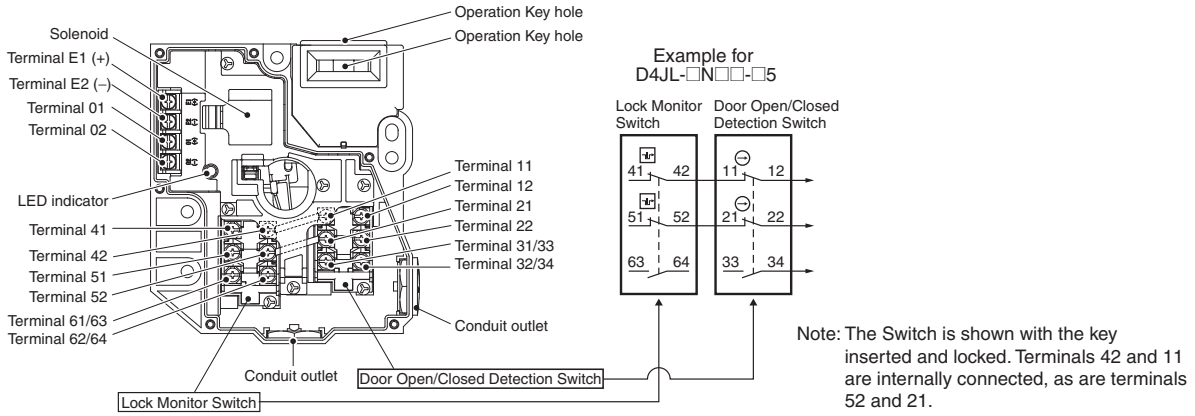


(6) Operation Key removed, solenoid ON, and trapped key removed.



Structure and Nomenclature

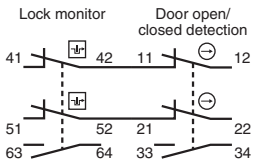
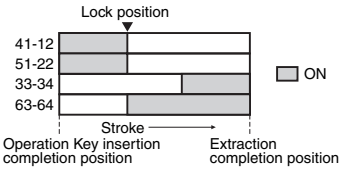
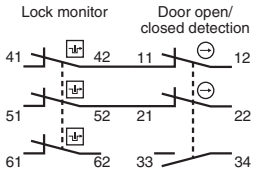
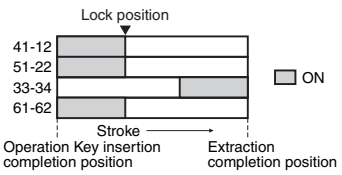
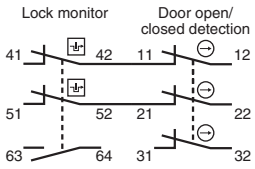
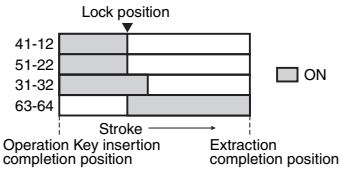
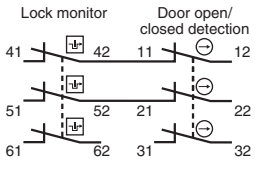
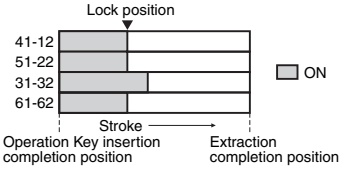
Structure (D4JL-□□□A-□5 and D4JL-□□□G-□5)



Note: The Switch is shown with the key inserted and locked. Terminals 42 and 11 are internally connected, as are terminals 52 and 21.

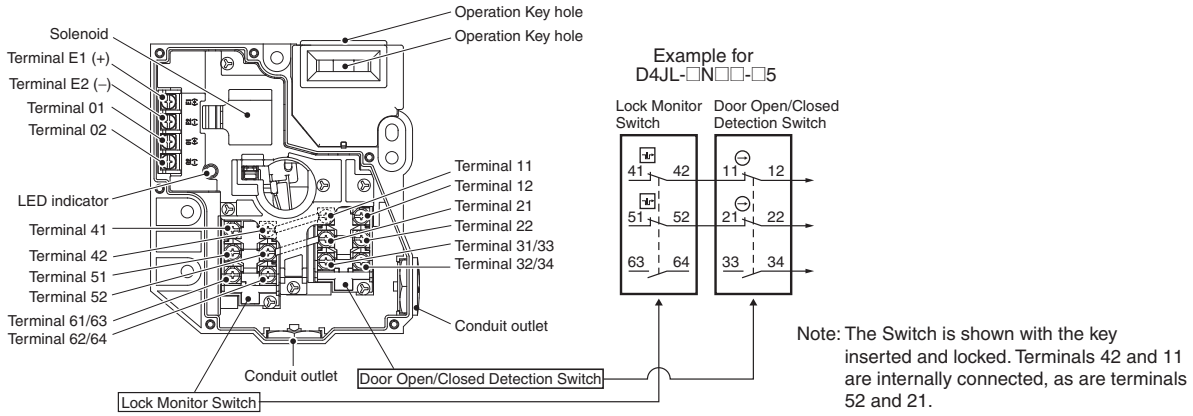
Model and Contact Configuration

Indicates conditions where the Key is inserted and the lock is applied. Terminals 42-11 and terminals 52-21 are connected internally.

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

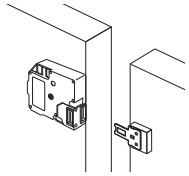
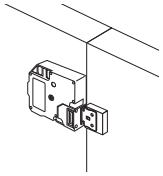
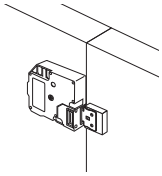
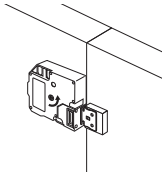
Structure (D4JL-□□□A-□5 and D4JL-□□□G-□5)



Note: The Switch is shown with the key inserted and locked. Terminals 42 and 11 are internally connected, as are terminals 52 and 21.

Operating Cycle Examples (for Standard Models)

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

Door condition		Condition 1	Condition 2	Condition 3		Turning the special release key
					Return to condition 1	
Terminal No. and function		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.
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	■		■		■

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

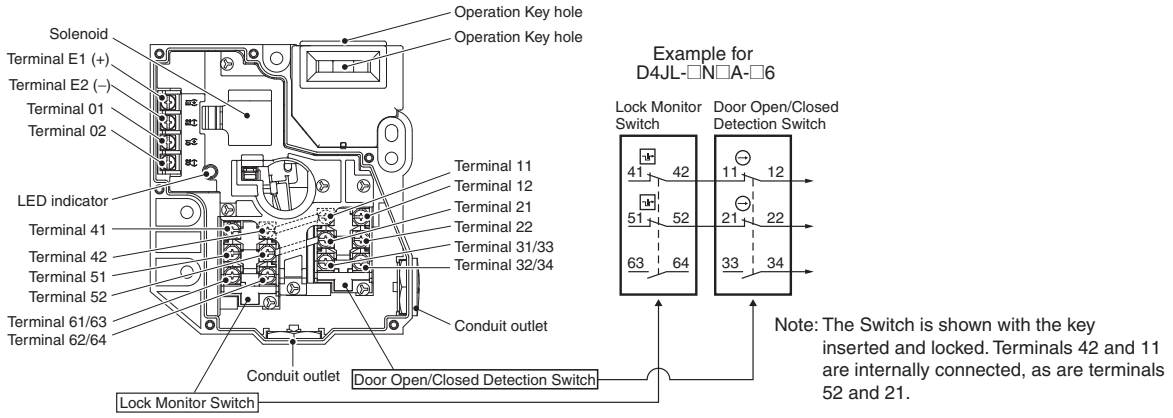
Door condition		Even when the door is closed, it does not lock until power is supplied to the solenoid.	Door closed. The door is locked.	Door closed. The door can be opened.
Terminal No. and function				
E1-E2	Solenoid ON		■	
41-12 (NC) 51-22 (NC)	Door open/closed detection and lock monitor contacts		■	
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.

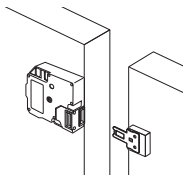
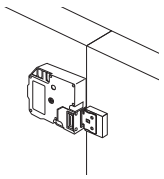
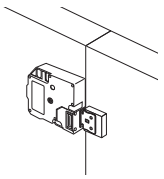
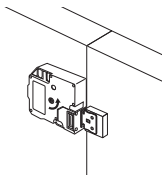
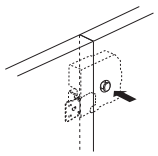
Structure (D4JL-□□□A-□6)



Note: The Switch is shown with the key inserted and locked. Terminals 42 and 11 are internally connected, as are terminals 52 and 21.

Operating Cycle Examples (for Models with Rear Release Buttons)

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

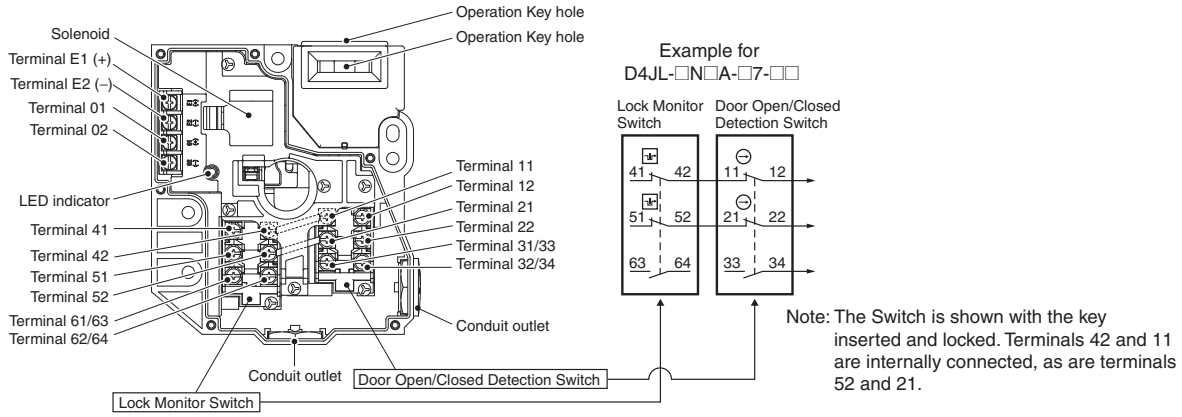
Door condition		Condition 1	Condition 2	Condition 3		Turning the special release key	Pressing the rear release button
		 Door open. The door will lock when the door closes.	 Door closed. The door is locked.	 Door closed. The door can be opened.	Return to condition 1	 Door closed. No power is supplied 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-□□)



Note: The Switch is shown with the key inserted and locked. Terminals 42 and 11 are internally connected, as are terminals 52 and 21.

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**	■	■		■	■	■

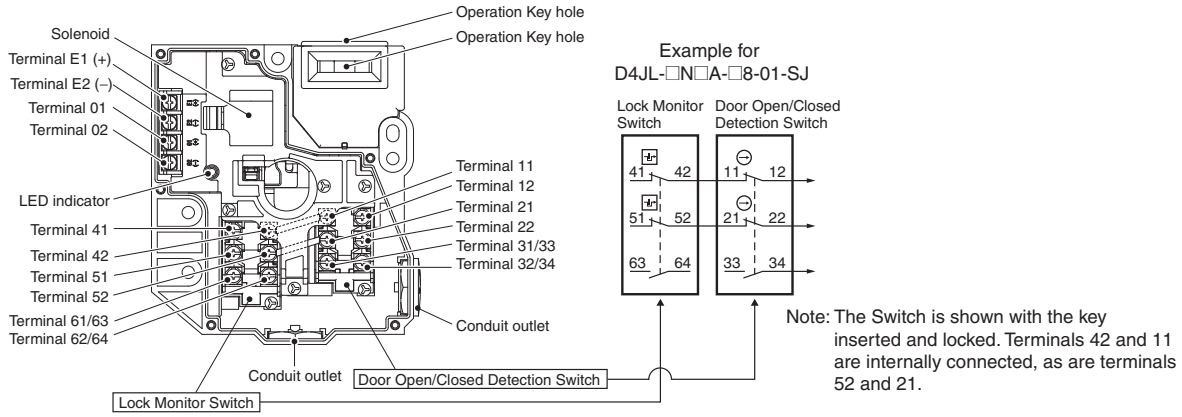
Return to condition 1

■ 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: 1. Door open/closed detection and lock monitor contact configuration depends on the model.
2. 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.

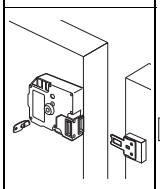
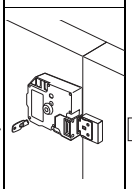
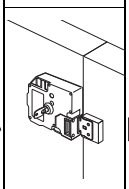
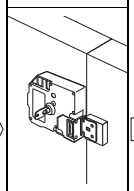
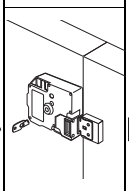
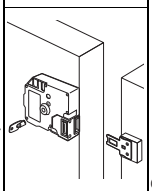
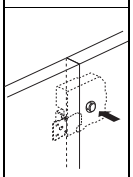
Structure (D4JL-□□□A-□8-01-SJ)



Note: The Switch is shown with the key inserted and locked. Terminals 42 and 11 are internally connected, as are terminals 52 and 21.

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
								Return to condition 1	
Terminal No. and function		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.		Door closed. No power is supplied to the solenoid. The door is unlocked manually.
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: 1. Door open/closed detection and lock monitor contact configuration depends on the model.

2. 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.

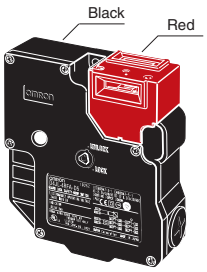
Dimensions

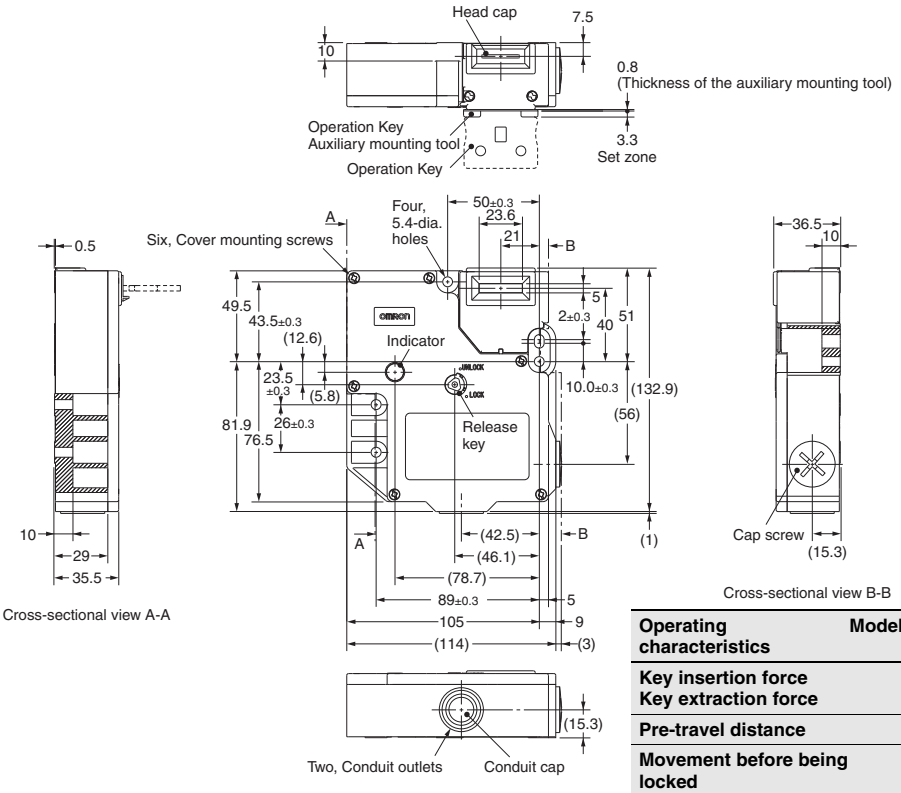
(Unit: mm)

Dimensions and Operating Characteristics

Switches

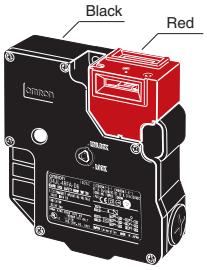
D4JL-□□F□-C5
D4JL-□□F□-D5

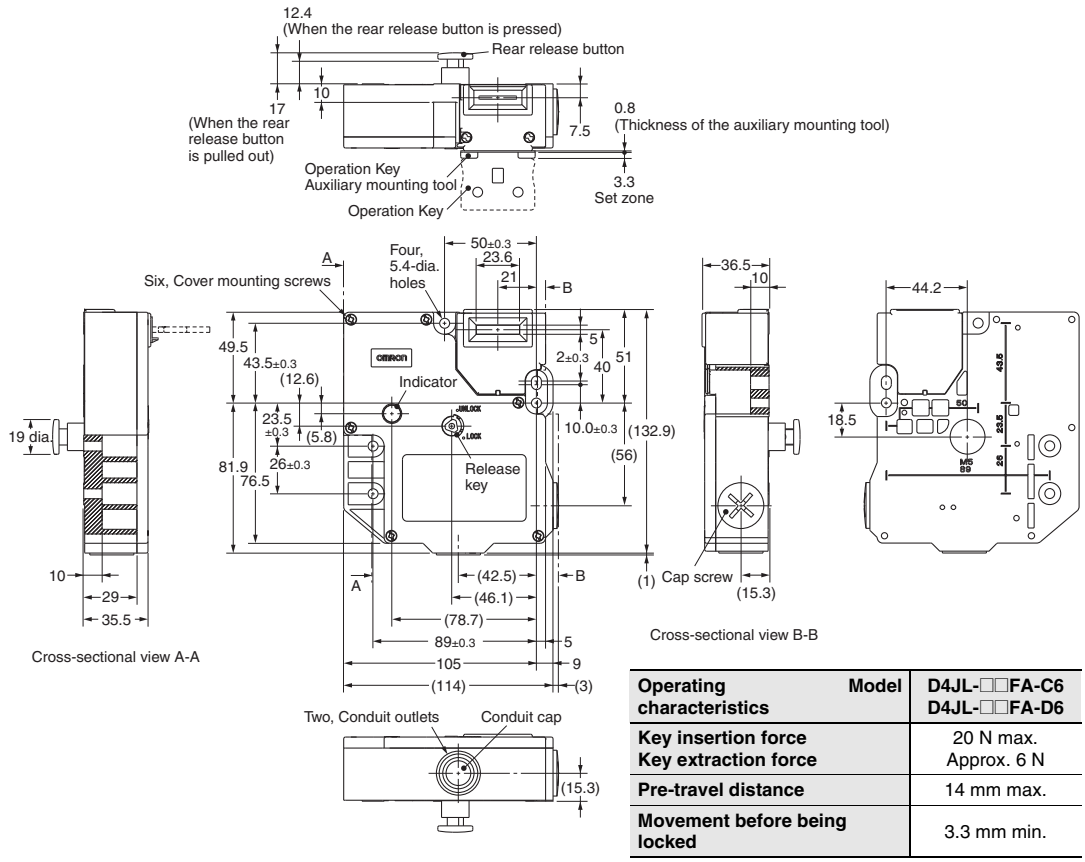




Operating characteristics \ Model	D4JL-□□F□-C5 D4JL-□□F□-D5
Key insertion force Key extraction force	20 N max. Approx. 6 N
Pre-travel distance	14 mm max.
Movement before being locked	3.3 mm min.

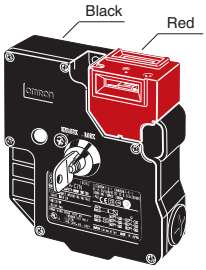
D4JL-□□FA-C6
D4JL-□□FA-D6

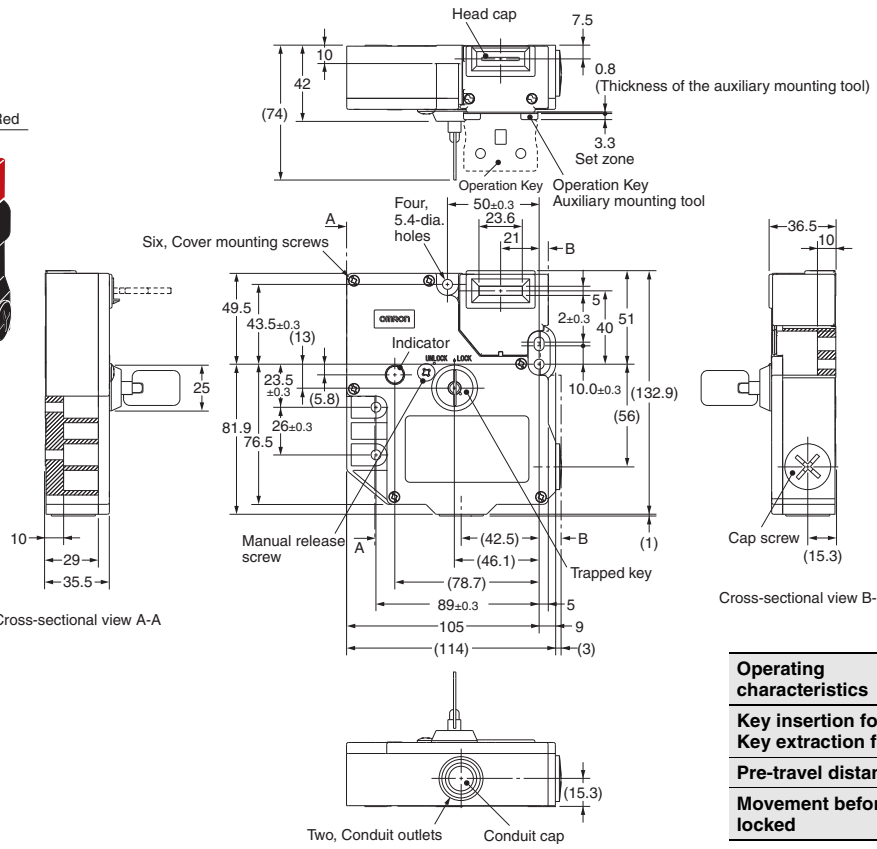




Operating characteristics \ Model	D4JL-□□FA-C6 D4JL-□□FA-D6
Key insertion force Key extraction force	20 N max. Approx. 6 N
Pre-travel distance	14 mm max.
Movement before being locked	3.3 mm min.

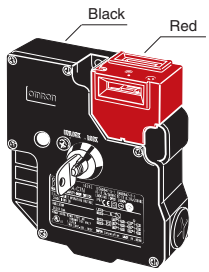
D4JL-□□FA-C7
D4JL-□□FA-D7





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

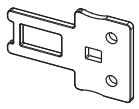
D4JL-2NFA-□8-01-SJ

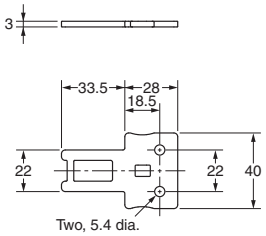


Operating characteristics / Model	D4JL-2NFA-□8-01-SJ
Key insertion force Key extraction force	20 N max. Approx. 6 N
Pre-travel distance	14 mm max.
Movement before being locked	3.3 mm min.

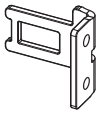
Operation Keys

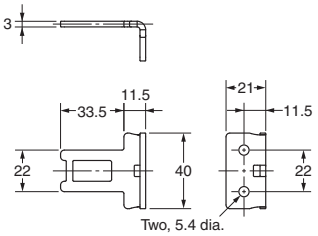
D4JL-K1





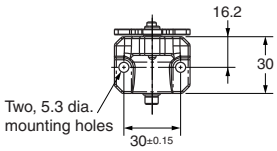
D4JL-K2

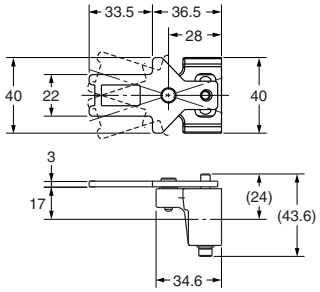




D4JL-K3





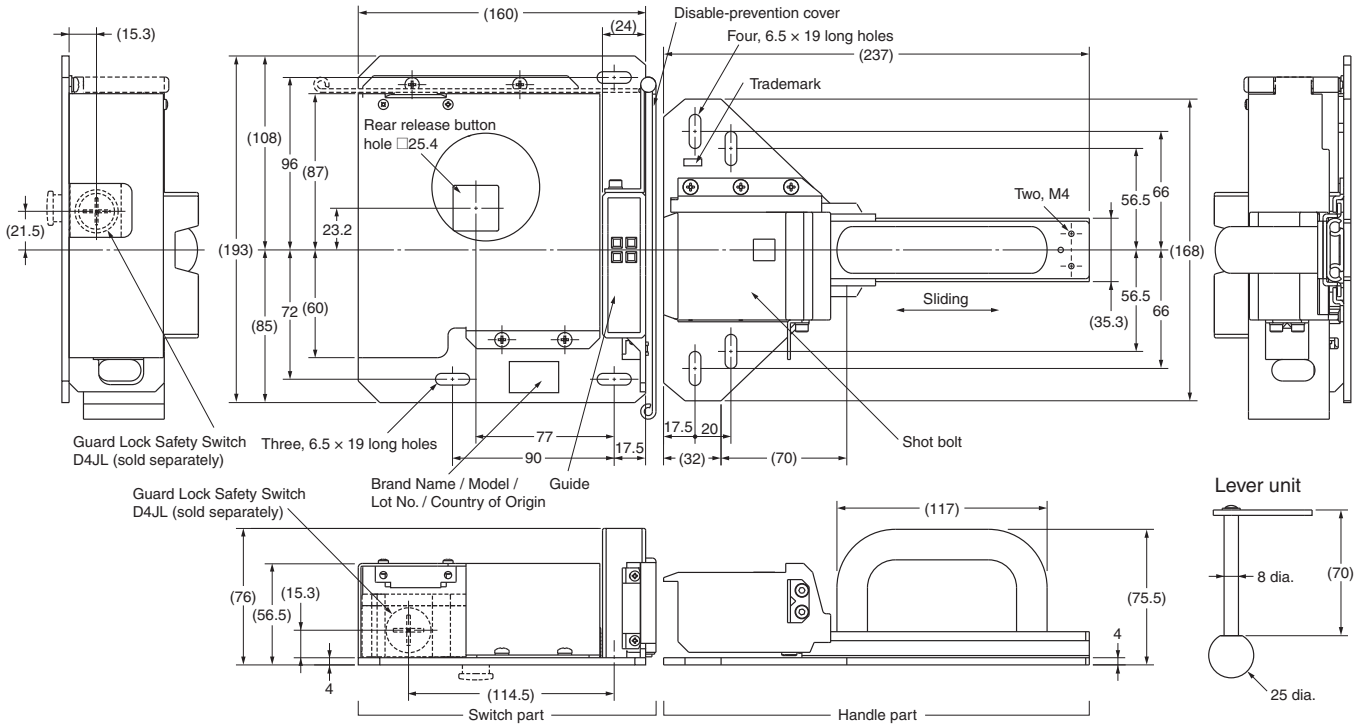


Note: Unless otherwise specified, a tolerance of ±0.8 mm applies to all Switch dimensions and a tolerance of ±0.4 mm applies to Operation Key dimensions.

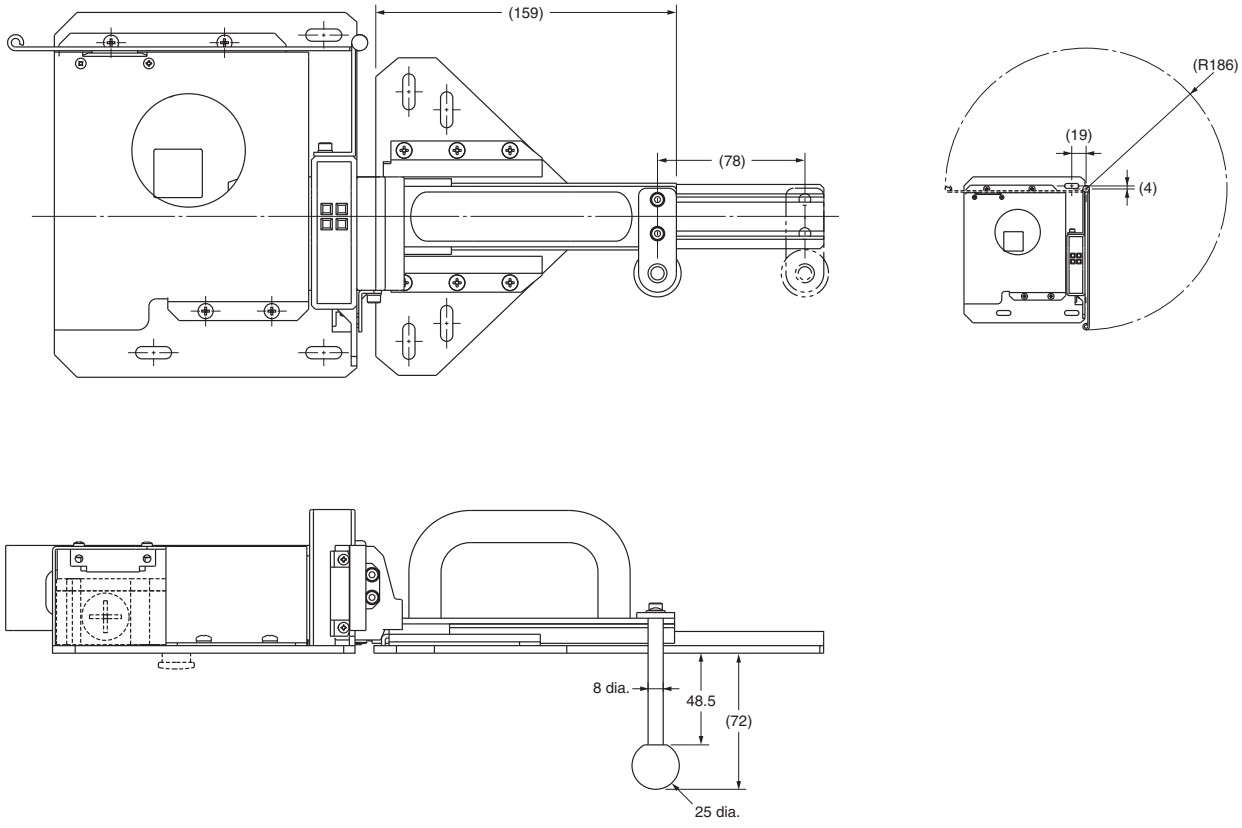
Slide Keys

D4JL-SK40

Open Door

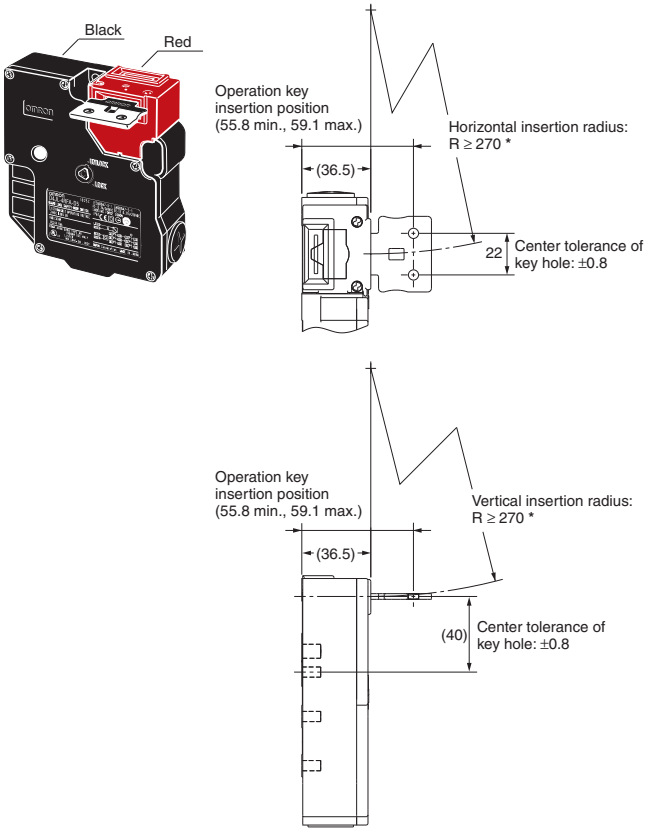


Closed Door

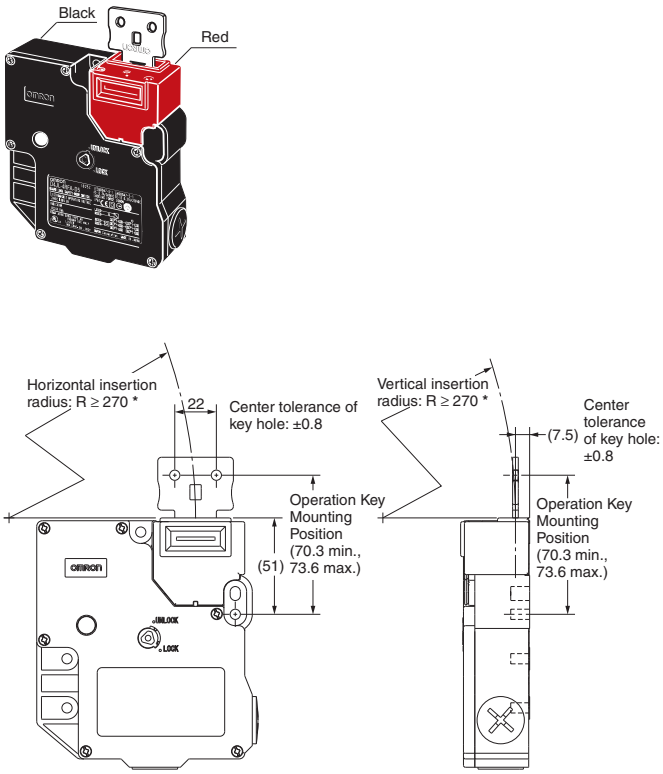


With Operation Key Inserted

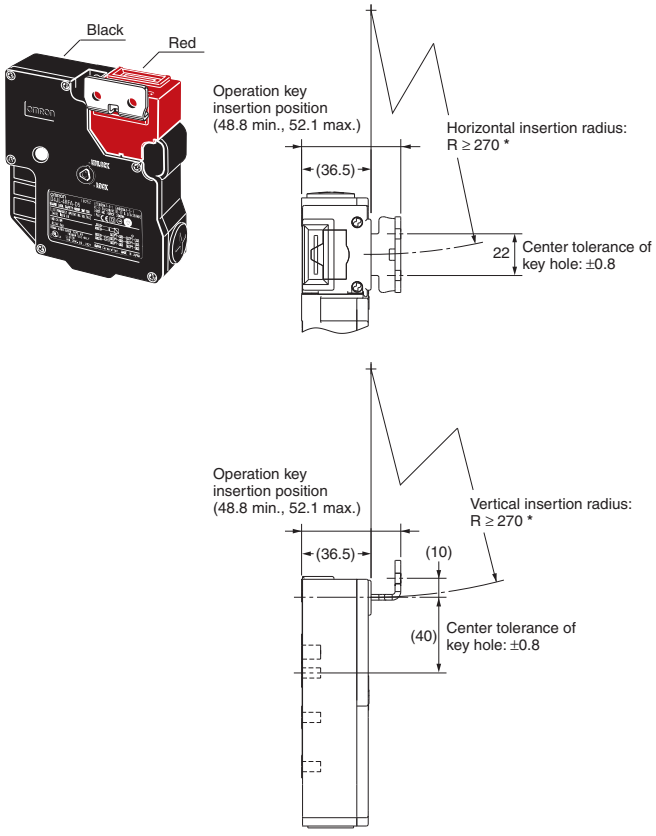
D4JL + D4JL-K1 (with Front-inserted Operation Key)



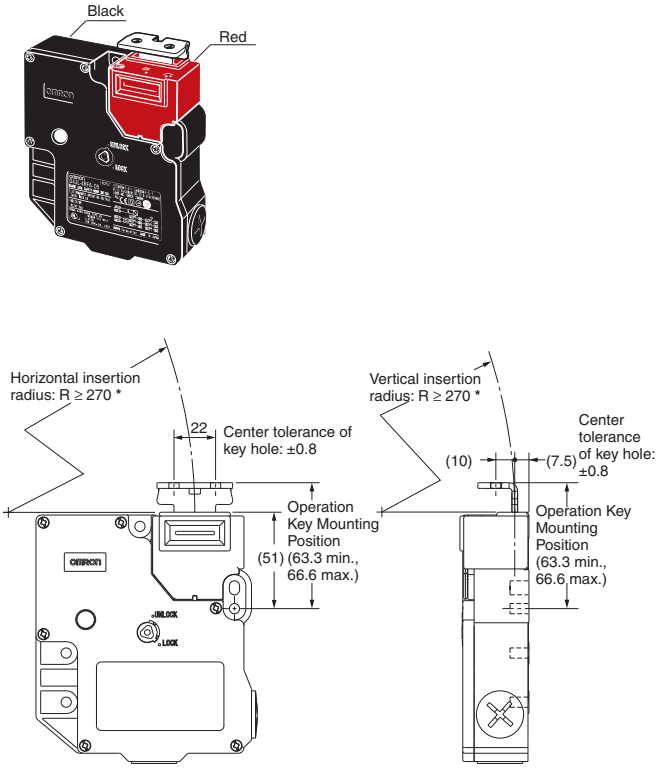
D4JL + D4JL-K1 (with Top-inserted Operation Key)



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

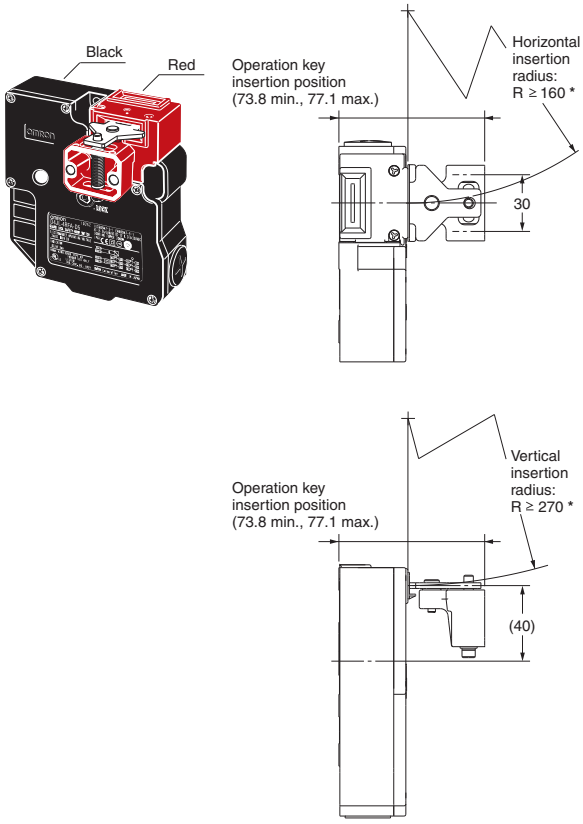


D4JL + D4JL-K2 (with Top-inserted Operation Key)

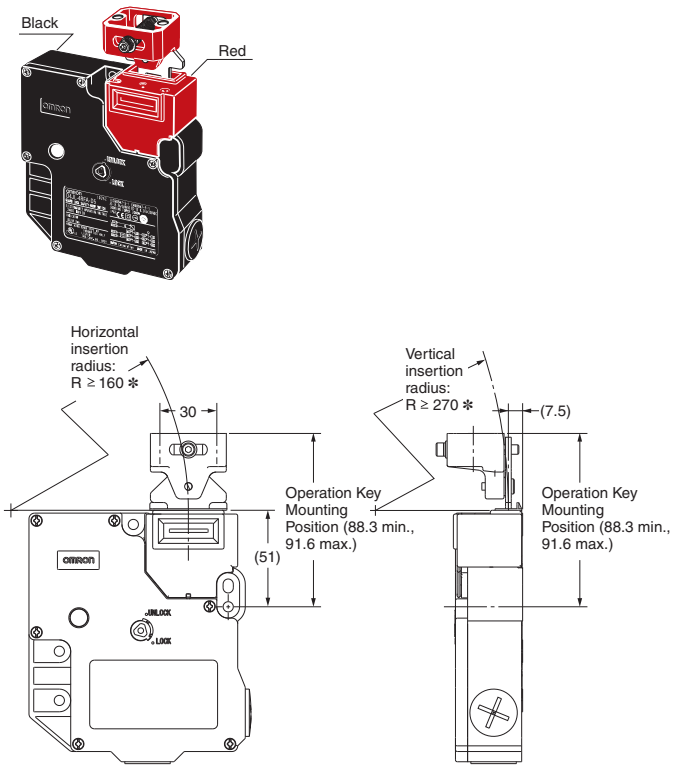


* Insertion radii apply when the rotational center of the Operation Key is in line with a line extending from the front or top Head surface.

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



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



* Insertion radii apply when the rotational center of the Operation Key is in line with a line extending from the front or top Head surface.

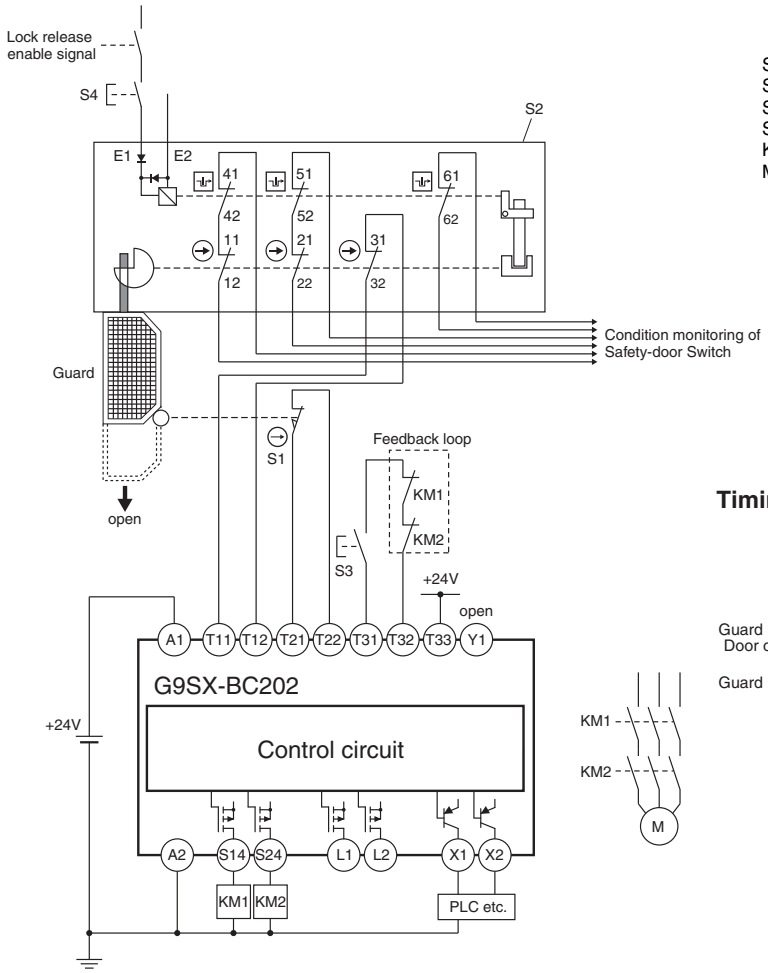
Application Examples

Highest achievable PL/ safety category	Model	Stop category	Reset
PLe/4 equivalent	Guard Lock Safety-door Switch D4JL-□RFA-□□ (Mechanical Lock Type) Safety Limit Switch D4N/D4F/D4B-N Emergency Stop Switch A22E/A165E Flexible Safety Unit G9SX-BC202	0	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.

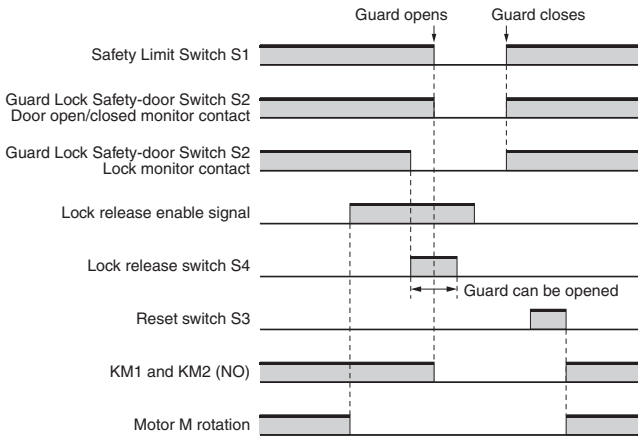
●Application Overview

- After the opening of the guard is permitted by turning ON of the lock release enable signal, the guard is opened by operating the lock release switch S4.
- The guard status is monitored by the Safety Limit Switch S1 and Guard Lock Safety-door Switch S2, and a state in which the power supply to the motor M is turned OFF must be maintained while the guard is open.
- When the guard is closed, lock status is ensured, and the reset switch S3 is pressed, the power supply to the motor M is permitted.



S1: Safety Limit Switch with direct opening mechanism
S2: Guard Lock Safety-door Switch
S3: Reset switch
S4: Lock release switch
KM1 and KM2: Magnetic contactor
M: Motor

Timing Chart



Note: The lock release enable signal must be configured so that it should turn ON after dangerous movement is stopped and safety is ensured for the door to open.

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 dismount 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

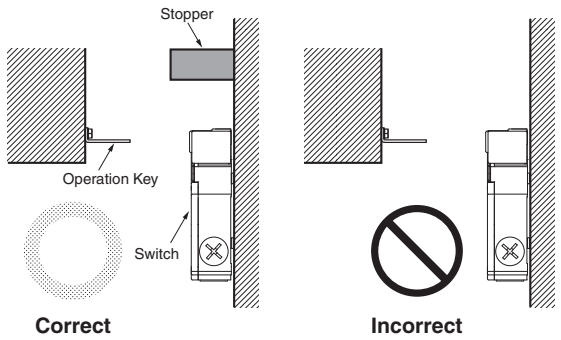
- Do not use the Switch submersed in oil or water or in locations continuously subject to splashes of oil or water. Doing so may result in oil or water entering the Switch. (The IP67 degree of protection of the Switch specifies the amount of water penetration after the Switch is submerged in water for 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.
- For metal cable glands, use a cable gland with the screw length of 9 mm or less. Otherwise it may result in electric shock.
- Do not use metal conduits. Damage to the conduit outlet 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

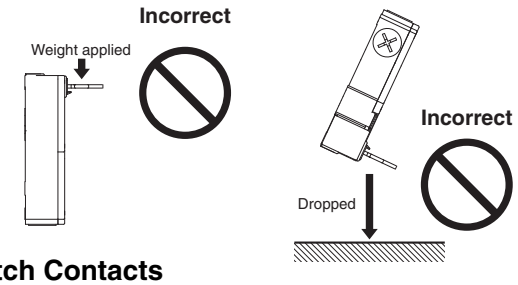
- Be careful not to drop the switch, or the switch will not fully exhibit its ability.
- Make sure the Switch is mounted securely to prevent it from falling off. Otherwise injury may result.
- Do not use the Switch as a stopper. Be sure to install a stopper as shown in the following illustration when mounting the Switch and adjust the stopper so that the Operation Key is within the setting zone.
  Do not subject the Switch to a shock that exceeds the Switch's shock resistance of 1,000 m/s^2.



Precautions for Correct Use

Operation Key

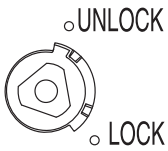
- Use only the designated Operation Key. The Head has been designed so that operation is not possible with a screwdriver or other tools. Using anything other than the designated Operation Key may damage the Switch or affect machine safety.
- Do not operate the Switch with anything other than the special 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

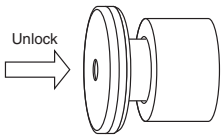
The Switch contacts can be used with either standard loads or microloads. Once the contacts have been used to switch a load, however, they cannot be used to switch smaller loads. The contact surfaces will become rough once they have been used and contact reliability for smaller loads may be reduced.

Release Key

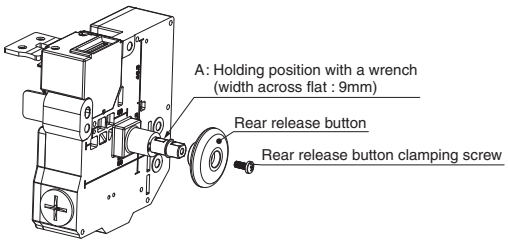


- The release key is used to unlock the Switch in case of emergency or if the power supply to the Switch stops.
- If the release key setting is changed from LOCK to UNLOCK using the enclosed release key, the lock will be released and the safety door can be opened (mechanical lock models only).
- When a Switch with a solenoid lock is in a locked state (i.e., when the solenoid is ON), do not change the release key from the LOCK to the UNLOCK position. Internal parts may be damaged.
- 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.

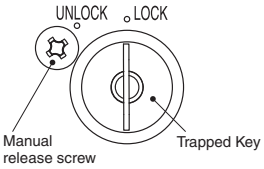
Rear Release Button



- 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



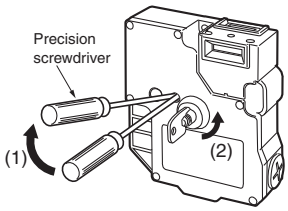
- The trapped key is released when power is supplied to the solenoid. Turn the trapped key to the UNLOCK position and remove the key to unlock the door.
  The door cannot be unlocked solely by supplying power to the solenoid.
  As long as a worker has the trapped key with him when he enters the work 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).

Manual Release

- Manual release is used to unlock the Switch when power cannot be supplied to the solenoid, such as when power is interrupted or the equipment is being repaired.
  1. Use a Phillips screwdriver to remove the manual release screw. Use a precision screwdriver to press down the lever inside the Switch far enough to release the trapped key.
  2. The door is unlocked when the trapped key is turned to the UNLOCK position and removed.
- Do not use manual release to stop machines.
- After the Switch has been manually released, re-install the specified screw on the Switch with the appropriate torque.



Hinged Doors

If the Switch is mounted too close to the hinge, the force imposed on the lock will be much larger than for locations far from the hinge and the lock may be damaged. Mount the Switch close to the handle.

Solenoid Lock Models

The solenoid lock locks the door only when power is supplied to the solenoid. The door will be unlocked if the power supply to the solenoid stops. Therefore, do not use the solenoid lock models for machines that may be operating and dangerous even after the machine stops operating.

Mounting Methods

Appropriate Tightening Torque

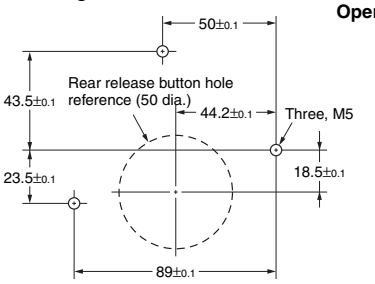
Be sure to tighten each screw of the Switch properly. Loose screws may result in malfunction.

Type	Appropriate tightening torque
Terminal screw	0.6 to 0.8 N·m
Cover mounting screw	0.7 to 0.9 N·m
Manual release screw	0.6 to 0.8 N·m
Operation Key mounting screw	2.4 to 2.8 N·m
Switch mounting screw	3.2 to 3.8 N·m
Cable gland	1.8 to 2.2 N·m
Cap screw	1.3 to 1.7 N·m
Rear release button clamping screw	1.1 to 1.3 N·m

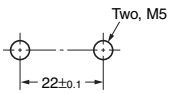
Switch and Operation Key Mounting

- Mount the Switch and Operation Key securely to the applicable tightening torque with M5 screws and flat or spring washers. To ensure safety, use screws that cannot be easily removed or another means to prevent the Switch and Operation Key from easily being removed.

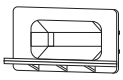
Mounting Holes for Switches



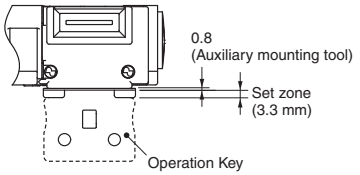
Mounting Holes for Operation Keys



- Do not operate the Switch with anything other than the special OMRON Operation Key. Otherwise, the Switch may be damaged and the safety of the system may not be maintained.
- Ensure that the alignment offset between the Operation Key and the key hole does not exceed ±0.8 mm. If the Operation Key is offset or at an angle, accelerated wear or damage to the Switch may result.
- When inserting the Operation Key, install the provided mounting auxiliary tool in the key hole and use the tool to position the key in the key hole center and set zone.
- Remove the mounting auxiliary tool from the Switch after the Operation Key is properly inserted.



- Observe the specified insertion radius for the Operation Key and insert it in a direction perpendicular to the key hole.



- 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.
- Attach the enclosed cap head to any Operation Key hole that is not used.

Securing Doors

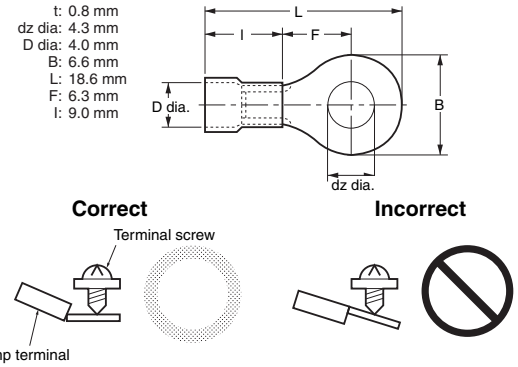
When the door is closed (with the Operation Key inserted), the Operation Key may exceed the set zone because of, for example, the door's own weight, machine vibration, or the door cushion rubber. Then, when an attempt is made to open the door, it may result in damage or malfunction. Also, it may not be possible to unlock the Switch if there is weight placed on the Operation Key. Do not rely on the Switch to substitute for a door locking device. Secure the door with a stopper so that the Operation Key remains within the set zone.

Wiring

- Do not wire the Switch while power is being supplied. Doing so may result in electric shock.
- Do not let particles, such as small pieces of lead wire, enter the switch body when wiring.
- Make sure that the wiring does not hide the LED indicator when wiring E1/E2 or O1/O2.
- When connecting to the terminals via insulating tube and M3.5 crimp terminals, arrange the crimp terminals so that they do not rise up onto the case or the cover.
- Applicable lead wire size: AWG22 to AWG18 (0.3 to 0.75 mm^2). Use lead wires of an appropriate length. Not doing so may result in excess length causing the cover to rise and not fit properly.
- Do not pull on the lead wires with excessive force. Doing so may disconnect them.
- Do not push crimp terminals into gaps in the case interior. Doing so may cause damage or deformation of the case.

[Reference] Crimp Terminals

Manufacturer	Model
J.S.T. Mfg Co.	FN1.25-M4 (F Type) N1.25-M4 (Straight Type)



Processing the Conduit Outlet

- Use a recommended cable gland and tighten it with the appropriate tightening torque. The case may be damaged if an excessive tightening torque is applied.
- Use a cable conforming to the diameter of the cable gland to be used.
- Attach a conduit cap to the unused conduit outlet when wiring and tighten it to a suitable torque. The conduit cap is provided with the Switch.

Cable Gland

- Use a commercially available cable gland.
- Use a cable gland with a screw section not exceeding 9 mm to prevent interference with the built-in switch.

Other Precautions

- The solenoid will heat when it carries current. Do not touch it.

<Slide Keys D4JL-SK40>

⚠ CAUTION

Incorrect operation may cause injury. Also, the product is designed to be mounted so that it slides horizontally.
Do not mount the product in a vertically sliding configuration. (excluding the D4NS-SK01)



Precautions for Safe Use

- Do not drop the Switch. Doing so may prevent the Switch from functioning to full capacity.
- Mount the Switch securely to prevent it from falling. Otherwise, injuries may occur.
- Do not attempt to disassemble or modify the Switch. Doing so may cause the Switch to malfunction.
- Make sure that the gap between the short bolt and guide is (±3 mm. Otherwise, excessive wear or damage may cause malfunction.
- To ensure safety, do not operate the Switch with anything other than a Slide Key.
- Be careful to avoid pinching your hand when operating the Switch.
- Be sure to mount the Switch protective cover. Otherwise, your hand may be injured by being pinched between the shot bolt and Switch when closing the door with your hand on the Switch.
- When opening the door, be sure to lower the disable-prevention cover into position, attach a padlock, or take other steps to prevent other people from operating the Switch.
- The durability of the Switch is greatly influenced by the switching conditions. Always test the Switch under actual working conditions before application and use it in a switching circuit for which there are no problems with performance.
- The user must not maintain or repair equipment incorporating the Switch. Contact the manufacturer of the equipment for any maintenance or repairs required.
- Do not shut the door while the shot bolt is extended. The Switch may be damaged, preventing proper operation.
- Do not apply excessive force in the direction of the slide. This may damage the product and cause it to malfunction.

Precautions for Correct Use

- Insert the slide handle until the red operation indicator is completely displayed in the operation display window.



- Loose screws may result in malfunction. Use washers and tighten the screws to the specified torques. Also, when mounting the Switch to a door for disable-prevention purposes, purchase and use tamper-resistant screws.

Tightening Torque

Slide Key mounting screw (M6)	6.0 to 7.0 N·m
Switch mounting screw (included with product)	3.2 to 3.8 N·m
Switch protective cover mounting screw (included with product)	1.2 to 1.4 N·m
Lever mounting screw (included with product)	1.2 to 1.4 N·m

Technical Specifications

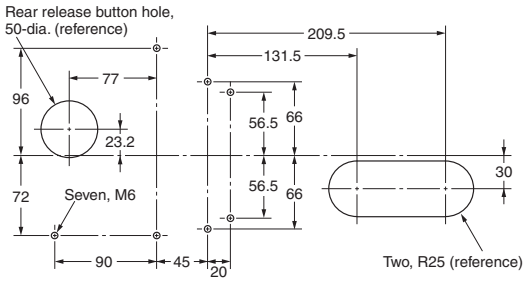
	D4JL-SK40
Ambient operating temperature	–10 to 55°C (with no icing)
Ambient operating humidity	95% max.
Mechanical durability	20,000 operations min.
Weight	Approx. 3.4 kg (not including D4JL Guard Lock Safety-door Switch)

- Do not store the Switch where corrosive gases (e.g., H^2S, SO^2, NH^3, HNO^3, or CL^2) or dust are present, or in locations subject to high temperature or humidity.
- Perform maintenance inspections periodically.
- This product is for use only with OMRON Safety-door Switches. Do not use it with door switches made by other manufacturers.

Mounting Holes

(Unit: mm)

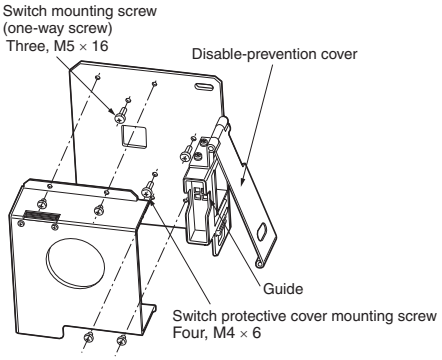
D4JL-SK40



Assembly

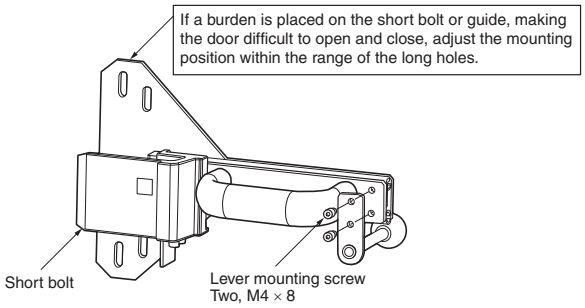
Switch part

D4JL-SK40

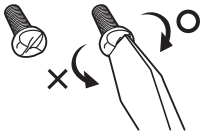


Handle part

D4JL-SK40



- Use the supplied special screws to mount the operation key and D4JL Guard Lock Safety-door Switch.
- To tighten the screws, use the tip of a flat-head screwdriver on the screw heads as shown in the following figure.



Note: The special screws are designed so that they cannot be turned counter-clockwise using a flat-head screwdriver.

- The special screws cannot be removed once they are tightened.

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