



**Instruction Sheet**

Please read all instructions before using to ensure proper use and application of the switch. Save this instruction sheet for future reference.

- If the force exceeding holding force is imposed on the operation key, the lock mechanism may break and the equipment in the machine room will start operating.
- Though the switch body is protected from the ingress of dust or water, avoid the ingress of foreign substance through the key hole on the head. Otherwise, wear in short time or break may be caused.
- Do not drop the switch. Excessive shock and vibration can cause malfunction or other damage to switch characteristics. Do not disassemble the internal switch, there are no user serviceable parts inside.

● Release key

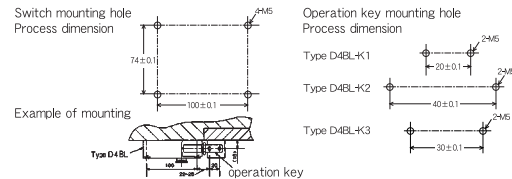
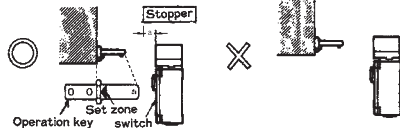
- The release key is used to unlock the switch in case of emergency or if the power supply to the switch fails.
- In the case of mechanical lock type, rotate the release key to "Unlock" from "Lock" so that locking will be released and the door can be open. When release key is set to "Unlock", the door will not be locked and no power will be supplied to machine even if the door is closed.



- The safety of operator working in machine room is ensured.
- Do not use the release key to start or stop the machine.
- Only authorized person must use release key.
- To prevent the release key from being used by unauthorized personnel, set it to LOCK and seal it with sealing wax. After the release key operation should be restored to its sealed before restart.
- Confirm position of the release key is under "Lock" when assembling the cover in the main body.

● Stopper

- Do not use the switch as a stopper. Be sure to install a stopper as shown in the following illustration to prevent edge of operation key from hitting the switch directly. Do not apply shock over the shock resistance 1000m/s<sup>2</sup> on the switch.



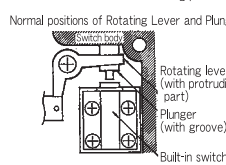
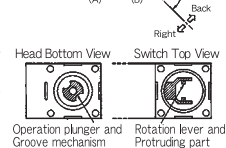
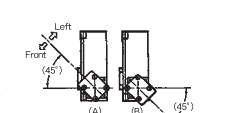
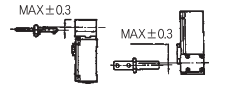
● Mounting of operation key

- Operation key must be mounted onto the door such that it and entrance of switch head may match each other with the tolerance of ±0.3 mm.
- Do not use Model D4BS operation key for D4BL. It is not compatible.

● Head direction change

- As shown right in (A) and (B), the head can be mounted and dismounted by rotating the head by 45°.

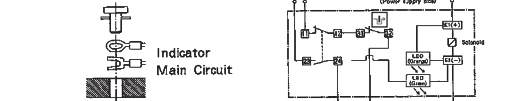
- To change the direction of the head, make sure that the protruding part of the rotating lever engages with the groove of the plunger. Then turn the head clockwise or counterclockwise to the desired direction. At that time, make sure that the groove of the head is not set when the plunger is rotated by 45°, the groove of the plunger presses the rotating lever. The head, plunger, or the built-in switch may be damaged as a result. Do not let foreign substances invade the switch during direction change. Make sure that the mechanical lock and solenoid release work properly in mounting the head.



● Indicators  
Lighting of indicators

| Condition   | Operation mode                                      |      |        |        |
|-------------|-----------------------------------------------------|------|--------|--------|
|             | Door condition solenoid                             | Open | Closed | Closed |
| 1NC/1NO+1NC | Indicator/Wiring<br>Orange / E1-E2<br>Green / 24-E2 | ○    | ×      | ○      |
| 2NC+1NC     | Indicator/Wiring<br>Orange / E1-E2<br>Green / 22-E2 | ×    | ○      | ○      |
| 2NC+2NC     | Indicator/Wiring<br>Orange / E1-E2<br>Green / 22-E2 | ×    | ×      | ○      |

Note: ○ ..... Lighted × ..... off  
Indicators must be wired to designated terminals with main circuit as illustration.



● Handling of conduit opening

- To assure IP67 protection, use the OMRON type SC-□M series for connectors. As alternatives for PG13.5 conduit size, type ABS-08PG13.5 or ABS-12PG13.5 manufactured by NIPPON FLEX may be used. Apply sealing tape between connector and conduit opening so that the enclosure will conform to IP67. Use a cable with a diameter suitable for the connector. For unused conduit opening, apply a cap screw provided and tighten it to the specified torque.

■ Others

- Do not touch the solenoid when the power is supplied, or else solenoid will radiate heat.

■ Technical specifications

- Conformity : Machine Directive, EN ISO14119
- Approval : EN60947-5-1, GS-ET-19, UL508, CSA C22.2 No14, GB/T14048.5
- Utilization category : AC-15
- Rating voltage : 250VAC(without indicator), 115VAC(with LED)
- Rating current : 3A(without indicator), 6A(with LED)
- Direct opening travel : 20 mm min.
- Direct opening minimum force : 19.61N
- Minimum actuator travel : 23 mm
- Maximum speed of actuation : 0.5m/sec
- Minimum speed of actuation : 0.05m/sec

Original instruction

**Declaration of Conformity**

OMRON declares that D4BL is in conformity with the requirements of the following EU Directives and UK Legislations:

- Machinery Directive 2006/42/EC
- RoHS Directive 2011/65/EU
- 2008 No 1597 Machinery (Safety), 2012 No 3032 RoHS

**CAUTION** Not following a precaution given as a "Caution" can result in injury to people or damage to the product or system.

**CAUTION**

Do not dismount the operation key from the door intentionally and insert it to the switch with the door open. Do not operate with the shock damper, which is installed into the switch head when the switch is shipped. Machine may start operating and injury or death may be caused.

NOTICE

- Do not disassemble or touch inside under power-on.
- Install the operation key so that it will not hit the operator when the door open. Injury may be caused.
- When operating limit switch as a part of a safety circuit or an emergency stop circuit to prevent injury, operate the NC contacts that have direct-opening function in positive mode. For safety, tighten the switch body and operation key with one-way screws or equivalents. Or install a switch protection cover and warning label for safety to prevent easy removal of the switch.
- Connect the fuse to the switch in series to prevent it from short circuit damage. The value of the breaking current of the fuse must be calculated by multiplying rated current by 150 to 200%. When using the switch with EN ratings, use 10A fuse, type gI or gG that complies with IEC60269.
- Do not put the electric power when wiring.
- Do not use the switch where explosive gas, ignitable gas, or any other harmful gases may be present.
- Keep the electrical load below the rated value.
- Never wire to a wrong terminal.
- Be sure to evaluate the switch under actual working conditions after installation.

● Solenoid lock type

- The solenoid lock type locks the door only when power is supplied to the solenoid. The door will be unlocked if the power supply to the solenoid fails. Do not use solenoid lock type for machines that continue to move for a while even after the machine power is off.

■ Environment

1. Make sure to the check influence of the environment when using the switch under the ambient condition of oil and chemicals. Certain kinds of oil and chemicals may adversely affect sealing properties, which may cause faulty contacts, faulty insulation, electric shock hazard or the burning.
2. Do not use the switch under any of the conditions mentioned below.
  - Frequent temperature changes.
  - High humidity or where dew condensation may be generated.
  - Where the switch is subjected to severe vibration.
  - Where the processing trash or dust is directly sprayed.

- The durability of the switch is seriously affected by the number of electrical and mechanical actuations. Evaluate the switch under actual working conditions before permanent installation. Be sure to keep the frequency of operations within specifications.

■ Mounting

- Tightening torque  
Adequate tightening torque are as follows and tighten within the range.

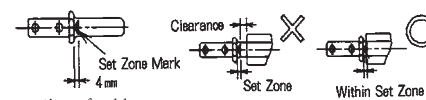
|                             |                  |            |
|-----------------------------|------------------|------------|
| Switch mounting hole        | 4.90 to 5.88 N·m | M5 screw   |
| Switch cover screw          | 1.18 to 1.37 N·m | M4 screw   |
| Cable gland                 | 1.77 to 2.16 N·m |            |
| Cap screw                   | 1.27 to 1.67 N·m |            |
| Head screw                  | 0.78 to 0.98 N·m | M3.5 screw |
| Operation key mounting hole | 2.35 to 2.75 N·m | M5 screw   |
| Terminal screw              | 0.59 to 0.78 N·m | M3 screw   |

● Mounting of the switch and operation key

- Four pieces of M5 bolt and spring washer are used for mounting the switch body. When operation key mounted, two pieces of M5 bolt are used.
- Do not use the operation key other than dedicated Omron's. Otherwise switch may be damaged.

● Fixation of the door

- When the door is closed (operation key is inserted), the door (operation key) may return back beyond the set zone mark by the weight of a door, bumper rubber of a door, etc. The door must be fixed by a hook or the like in order to stay in the set zone mark.



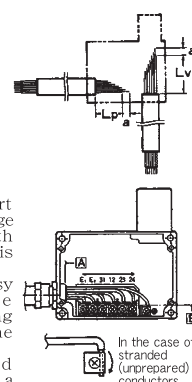
● Connection of cable

- Cable and conductor  
Adequate conductor: AWG 20 to 18 (UL Style 2464)
- Stripped dimension

| Terminal No. | Lp(mm) | Lv(mm) | a(mm) |
|--------------|--------|--------|-------|
| E 1          | 30 ± 2 | 80 ± 2 | 8 ± 1 |
| E 2          | 35 ± 2 | 75 ± 2 |       |
| 31           | 45 ± 2 | 60 ± 2 |       |
| 12           | 55 ± 2 | 50 ± 2 |       |
| 23(21)       | 65 ± 2 | 45 ± 2 |       |
| 24(22)       | 70 ± 2 | 35 ± 2 |       |
| Earth        | 90 ± 2 | 50 ± 2 |       |

● Connection of conductors

- As shown in the illustration, insert the cable to the conduit opening, edge of the external insulation sheath reaching the line A or B, which is inner surface of metal enclosure.
- As shown in the illustration, for easy wiring conductors should be connected in sequence beginning with the terminal nearest to the conduit opening.
- In the case of wiring stranded conductors, firstly twist the wires a few times, secondly insert them under the right part of the pressure plate as the illustration.



- Maximum frequency of actuation : 30 operation/min.
- Short circuit protective device : Use 10A fuse, type gI or gG (IEC60269)
- Holding force (Fzh) : 700N (EN ISO 14119)
- Enclosure rating : IP67
- Level of coding : Low
- Dispose in accordance with applicable regulations.
- Maintenance and repairs  
Please mention in machine manufacturer's instruction manual that the user must not repair nor maintain the switch and must contact machine manufacturer for them.

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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