# Safety Limit Switch
# D4B-□N

CSM_D4B-_N_DS_E_5_1

## Snap-action contact with certified direct opening operation certification ⊖. Maintenance, seal, and resistance to shock increased and direct opening mechanism added. Three-conduit switches and 2NC switches are also available.

- Direct opening mechanism (NC contacts only) added to enable opening contacts when faults occur, such as fused contacts.
- Safety of lever settings ensured using a mechanism that engages a gear between the operating position indicator plate and the lever.
- Equipped with a mechanism that indicates the applicable operating zone, as well as push-button switching to control left and right motion.
- Head seal structure strengthened to improve seal properties (TÜV: IEC IP67, UL: NEMA 3, 4, 4X, 6P, and 13).
- Wide standard operating temperature range: –40 to 80°C (standard type).
- Models with gold-plated contacts added to the series to enable handling microloads.
- Certified standards: UL, CSA, EN (TÜV), and CCC.

**Note:** Contact your sales representative for details on models with safety standard certification.



⚠ Be sure to read the *"Safety Precautions"* on page 14 and the *"Precautions for All Safety Limit Switches"* .

## Model Number Structure

### Model Number Legend

**D4B-□□□□N**
**1 2 3**

**1. Conduit size**
1: PG13.5 (1-conduit)
2: G1/2 (PF1/2) (1-conduit)
3: 1/2-14NPT (1-conduit)
4: M20 (1 conduit)
5: PG13.5 (3-conduit)
6: G1/2 (PF1/2) (3-conduit)
7: 1/2-14NPT (3-conduit)
8: M20 (3-conduit)

**2. Built-in Switch**
1: 1NC/1NO (snap-action)
3: 1NC/1NO (snap-action) gold-plated contacts
5: 1NC/1NO (slow-action) ✻
6: 1NC/1NO (slow-action) gold-plated contacts ✻
A: 2NC (slow-action)
B: 2NC (slow-action) gold-plated contacts
✻ Excluding D4B-□□81N and D4B-□□87N models.

**3. Actuator**
00: Switch box (without head)
11: Roller lever (resin roller)
15: Roller lever (stainless steel roller)
1R: Roller lever (conventional D4B-compatible)
16: Adjustable roller lever
17: Adjustable rod lever
70: Top plunger
71: Top roller plunger
81: Coil spring
87: Plastic rod

# Ordering Information

## Set Model Numbers

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

### Safety Limit Switches (with Direct Opening Mechanism)

| Actuator | Conduit openings | 1NC/1NO (Snap-action) | | 1NC/1NO (Slow-action) | | 2NC (Slow-action) | |
|---|---|---|---|---|---|---|---|
| | | Model | Direct opening | Model | Direct opening | Model | Direct opening |
| Roller lever (resin roller)  | Pg13.5 | D4B-1111N | ⊖ | D4B-1511N | ⊖ | D4B-1A11N | ⊖ |
| | G1/2 (PF1/2) | D4B-2111N | | D4B-2511N | | D4B-2A11N | |
| | 1/2-14NPT | D4B-3111N | | D4B-3511N | | D4B-3A11N | |
| | M20 | D4B-4111N | | D4B-4511N | | D4B-4A11N | |
| | Pg13.5 (3-conduit) | D4B-5111N | | D4B-5511N | | D4B-5A11N | |
| | G1/2 (3-conduit) | D4B-6111N | | D4B-6511N | | D4B-6A11N | |
| | 1/2-14NPT (3-conduit) | D4B-7111N | | D4B-7511N | | D4B-7A11N | |
| | M20 (3-conduit) | D4B-8111N | | D4B-8511N | | D4B-8A11N | |
| Roller lever (stainless steel roller)  | Pg13.5 | D4B-1115N | ⊖ | D4B-1515N | ⊖ | D4B-1A15N | ⊖ |
| | G1/2 (PF1/2) | D4B-2115N | | D4B-2515N | | D4B-2A15N | |
| | 1/2-14NPT | D4B-3115N | | D4B-3515N | | D4B-3A15N | |
| | M20 | D4B-4115N | | D4B-4515N | | D4B-4A15N | |
| | Pg13.5 (3-conduit) | D4B-5115N | | D4B-5515N | | D4B-5A15N | |
| Top plunger  | Pg13.5 | D4B-1170N | ⊖ | D4B-1570N | ⊖ | D4B-1A70N | ⊖ |
| | G1/2 (PF1/2) | D4B-2170N | | D4B-2570N | | D4B-2A70N | |
| | 1/2-14NPT | D4B-3170N | | D4B-3570N | | D4B-3A70N | |
| | M20 | D4B-4170N | | D4B-4570N | | D4B-4A70N | |
| | Pg13.5 (3-conduit) | D4B-5170N | | D4B-5570N | | D4B-5A70N | |
| | G1/2 (3-conduit) | D4B-6170N | | D4B-6570N | | D4B-6A70N | |
| | 1/2-14NPT (3-conduit) | D4B-7170N | | D4B-7570N | | D4B-7A70N | |
| | M20 (3-conduit) | D4B-8170N | | D4B-8570N | | D4B-8A70N | |
| Top roller plunger  | Pg13.5 | D4B-1171N | ⊖ | D4B-1571N | ⊖ | D4B-1A71N | ⊖ |
| | G1/2 (PF1/2) | D4B-2171N | | D4B-2571N | | D4B-2A71N | |
| | 1/2-14NPT | D4B-3171N | | D4B-3571N | | D4B-3A71N | |
| | M20 | D4B-4171N | | D4B-4571N | | D4B-4A71N | |
| | Pg13.5 (3-conduit) | D4B-5171N | | D4B-5571N | | D4B-5A71N | |
| | G1/2 (3-conduit) | D4B-6171N | | D4B-6571N | | D4B-6A71N | |
| | 1/2-14NPT (3-conduit) | D4B-7171N | | D4B-7571N | | D4B-7A71N | |
| | M20 (3-conduit) | D4B-8171N | | D4B-8571N | | D4B-8A71N | |

## General-purpose Limit Switches

| Actuator | Conduit openings | 1NC/1NO (Snap-action) | | 1NC/1NO (Slow-action) | | 2NC (Slow-action) | |
|---|---|---|---|---|---|---|---|
| | | Model | Direct opening | Model | Direct opening | Model | Direct opening |
| Adjustable roller lever  | Pg13.5 | D4B-1116N | --- | D4B-1516N | --- | D4B-1A16N | --- |
| | G1/2 (PF1/2) | D4B-2116N | | D4B-2516N | | D4B-2A16N | |
| | 1/2-14NPT | D4B-3116N | | D4B-3516N | | D4B-3A16N | |
| | Pg13.5 (3-conduit) | D4B-5116N | | D4B-5516N | | D4B-5A16N | |
| | G1/2 (3-conduit) | D4B-6116N | | D4B-6516N | | D4B-6A16N | |
| | 1/2-14NPT (3-conduit) | D4B-7116N | | D4B-7516N | | D4B-7A16N | |
| Adjustable rod lever  | Pg13.5 | D4B-1117N | --- | D4B-1517N | --- | D4B-1A17N | --- |
| | G1/2 (PF1/2) | D4B-2117N | | D4B-2517N | | D4B-2A17N | |
| | 1/2-14NPT | D4B-3117N | | D4B-3517N | | D4B-3A17N | |
| | Pg13.5 (3-conduit) | D4B-5117N | | D4B-5517N | | D4B-5A17N | |
| | G1/2 (3-conduit) | D4B-6117N | | D4B-6517N | | D4B-6A17N | |
| | 1/2-14NPT (3-conduit) | D4B-7117N | | D4B-7517N | | D4B-7A17N | |
| Coil spring (non-directional)  | Pg13.5 | D4B-1181N | --- | --- | | D4B-1A81N | --- |
| | G1/2 (PF1/2) | D4B-2181N | | | | D4B-2A81N | |
| | 1/2-14NPT | D4B-3181N | | | | D4B-3A81N | |
| | Pg13.5 (3-conduit) | D4B-5181N | | | | D4B-5A81N | |
| | G1/2 (3-conduit) | D4B-6181N | | | | D4B-6A81N | |
| | 1/2-14NPT (3-conduit) | D4B-7181N | | | | D4B-7A81N | |
| Plastic rod (non-directional)  | Pg13.5 | D4B-1187N | --- | | | D4B-1A87N | --- |
| | G1/2 (PF1/2) | D4B-2187N | | | | D4B-2A87N | |
| | 1/2-14NPT | D4B-3187N | | | | D4B-3A87N | |
| | Pg13.5 (3-conduit) | D4B-5187N | | | | D4B-5A87N | |
| | G1/2 (3-conduit) | D4B-6187N | | | | D4B-6A87N | |
| | 1/2-14NPT (3-conduit) | D4B-7187N | | | | D4B-7A87N | |

**Note: 1.** In addition to the above models, models compatible with the previous D4B Switches (with standard rotary levers) are available.
Model number examples: D4B-1□1RN(Pg13.5) or D4B-2□1RN(PF1/2)

**2.** Consult your OMRON representative for products.

## Replacement Parts

### Switch Boxes

| Built-in switch \ Conduit | 1-conduit type | | | 3-conduit type | | |
|---|---|---|---|---|---|---|
| | PG13.5 | G1/2 | 1/2-14NPT | PG13.5 | G1/2 | 1/2-14NPT |
| 1NC/1NO (Snap-action) | D4B-1100N | D4B-2100N | D4B-3100N | D4B-5100N | D4B-6100N | D4B-7100N |
| 1NC/1NO (Slow-action) | D4B-1500N | D4B-2500N | D4B-3500N | D4B-5500N | D4B-6500N | D4B-7500N |
| 2NC (Slow-action) | D4B-1A00N | D4B-2A00N | D4B-3A00N | D4B-5A00N | D4B-6A00N | D4B-7A00N |

### Operating Heads

| Actuator | Type | Model |
|---|---|---|
| Side rotary ✻ | Standard | D4B-0010N |
| Top plunger | Plain | D4B-0070N |
| | Top roller plunger | D4B-0071N |
| Flexible-rod | Coil spring | D4B-0081N |
| | Plastic rod | D4B-0087N |

✻ The Lever is not included with the Side Rotary Operating Head.

### Levers

| Actuator | Length (mm) | Diameter of roller | Model |
|---|---|---|---|
| Standard | 31.5 | 17.5 dia. | D4B-0001N |
| Stainless steel roller lever | 31.5 | 17.5 dia. | D4B-0005N |
| Adjustable roller lever | 25 to 89 | 19 dia. | D4B-0006N |
| Adjustable rod lever | 145 max. | --- | D4B-0007N |
| Interchangeable with D4B-0001 | 33.7 | 19 dia. | D4B-000RN |

**Note:** Other types of lever are also available.

# Specifications

## Standards and EC Directives

### Conforms to the following EC Directives:

- Machinery Directive
- Low Voltage Directive
- EN1088
- EN50041

### Certified Standards

**Snap-action Models**

| Certification body | Standard | File No. |
|---|---|---|
| TÜV Rheinland | EN60947-5-1 (certified direct opening mechanism) GS-ET-15 | J9851083 |
| | EN60947-5-1 (uncertified direct opening mechanism) | J50005477 ✻ |
| UL | UL508 | E76675 |
| CSA | C22.2 No. 14 | LR45746 |
| CQC (CCC) | GB14048.5 | 2003010305077612 |

✻ Adjustable roller lever, adjustable rod lever, coil spring, and plastic rod models only.

**Slow-action Models**

| Certification body | Standard | File No. |
|---|---|---|
| TÜV Rheinland | EN60947-5-1 (certified direct opening mechanism) GS-ET-15 | J9851083 |
| | EN60947-5-1 (uncertified direct opening mechanism) | J50005477 ✻ |
| UL | UL508 | E76675 |
| CSA | C22.2 No. 14 | LR45746 |
| CQC (CCC) | GB14048.5 | 2003010305077612 |

✻ Adjustable roller lever, adjustable rod lever, coil spring, and plastic rod models only.

## Certified Standard Ratings

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

| Item | Utilization category | AC-15 |
|---|---|---|
| Rated operating current ($I_e$) | | 2 A |
| Rated operating voltage ($U_e$) | | 400 V |

**Note:** As protection against short-circuiting, use either a gI-type or gG-type 10 A fuse that conforms to IEC60269.

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

**A600**

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

## Ratings

| Rated voltage (V) | Non-inductive load (A) | | | | Inductive load (A) | | | |
|---|---|---|---|---|---|---|---|---|
| | Resistive load | | Lamp load | | Inductive load | | Motor load | |
| | NC | NO | NC | NO | NC | NO | NC | NO |
| 125 VAC | 10 | | 3 | 1.5 | 10 | | 5 | 2.5 |
| 250 | 10 | | 2 | 1 | 10 | | 3 | 1.5 |
| 400 | 10 | | 1.5 | 0.8 | 3 | | 1.5 | 0.8 |
| 8 VDC | 10 | | 6 | 3 | 10 | | 6 | |
| 14 | 10 | | 6 | 3 | 10 | | 6 | |
| 30 | 6 | | 4 | 3 | 6 | | 4 | |
| 125 | 0.8 | | 0.2 | 0.2 | 0.8 | | 0.2 | |
| 250 | 0.4 | | 0.1 | 0.1 | 0.4 | | 0.1 | |

**Note: 1.** The above values are continuous currents.
**2.** Inductive loads have a power factor of 0.4 or higher (AC) or a time constant of 7 ms or lower (DC).
**3.** Lamp loads have a inrush current of 10 times the normal current.
**4.** Motor loads have a inrush current of 6 times the normal current.

| | |
|---|---|
| **Inrush current** | 30 A max. |

## Characteristics

| | | |
|---|---|---|
| **Degree of protection ✻1** | | IP67 (EN60947-5-1) |
| **Durability ✻2** | **Mechanical** | 30,000,000 operations min. (snap-action)<br>10,000,000 operations min. (slow-action) |
| | **Electrical** | 500,000 operations min. (10 A resistive load at 250 VAC) |
| **Operating speed** | | 1 mm/s to 0.5 m/s |
| **Operating frequency** | **Mechanical** | 120 operations/minute |
| | **Electrical** | 30 operations/minute |
| **Contact resistance** | | 25 mΩ max. |
| **Minimum applicable load ✻4** | | General load 180 mA resistive load at 5 VAC<br>Gold-clad contact 20 mA resistive load at 5 VAC<br>(N-level reference value) |
| **Rated insulation voltage ($U_i$)** | | 600 V (EN60947-5-1) |
| **Rated frequency** | | 50/60 Hz |
| **Protection against electric shock** | | Class I (with ground terminal) |
| **Pollution degree (operating environment)** | | 3 (EN60947-5-1) |
| **Impulse withstand voltage (EN60947-5-1)** | **Between terminals of same polarity** | 2.5 kV (snap-action)/4 kV (slow-action) |
| | **Between terminals of different polarity** | 4 kV (slow-action) |
| | **Between each terminal and ground** | 4 kV |
| **Insulation resistance** | | 100 MΩ min. (at 500 VDC) between terminals of the same polarity and between each terminal and non-current-carrying part |
| **Contact gap** | | 2 × 2 mm min. (slow-action)<br>2 × 0.5 mm min. (snap-action) |
| **Vibration resistance** | **Malfunction** | 10 to 55 Hz, 0.75 mm single amplitude |
| **Shock resistance** | **Destruction** | 1,000 m/s$^2$ min. |
| | **Malfunction** | 300 m/s$^2$ min. |
| **Conditional short-circuit current** | | 100 A (EN60947-5-1) |
| **Conventional enclosed thermal current ($I_{the}$)** | | 20 A (EN60947-5-1) |
| **Ambient operating temperature** | | –40 to 80°C (with no icing) ✻3 |
| **Ambient operating humidity** | | 95% max. |
| **Weight** | | Approx. 250 g |

**Note: 1.** The above values are initial values.
**2.** The above values may vary depending on the model. Consult your OMRON sales representative for details.

✻**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.

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

✻**3.** –20 to 80°C for the flexible-rod type.

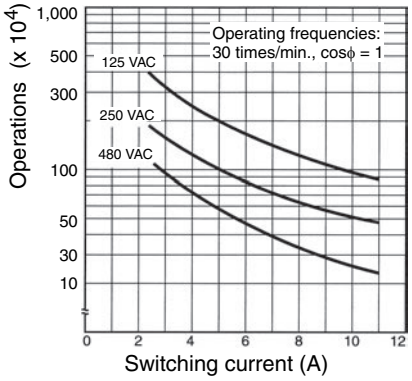
✻**4.** The above values may vary depending on switching frequency, environmental condition, and relativity level, consult your OMRON sales representative.

# Engineering Data

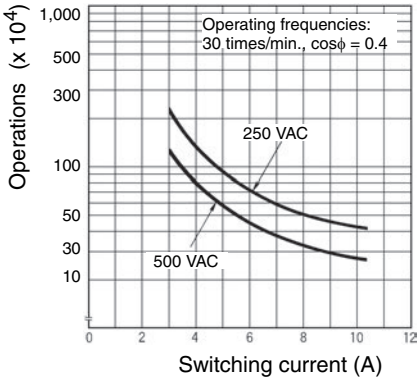
## Electrical Durability (Snap-action)

(Ambient temperature: 5 to 30°C, ambient humidity: 40 to 70%)

**(cosϕ = 1)**



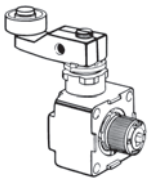

**(cosϕ = 0.4)**

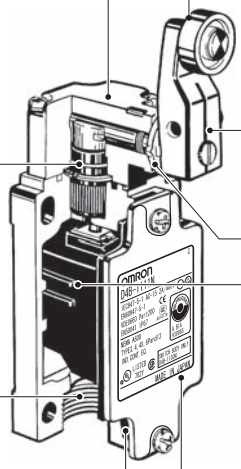



# Structure and Nomenclature

## Structure

The roller lever switch employs a system which allows selection of operation on only one side (left or right) or both sides without the use of any tools.





**Head**
Can be connected in any of four directions (except for Roller Plunger Models, which can be connected at either of 2 directions that differ by 90°)

**Roller**
Nylon rollers used for superior resistance to wear.

**Lever (Form Lock Structure)**
The lever has an operating position indication plate and grooves that mate every 90° to prevent slipping between the rotary axis and lever.

**The operating position indicator plate**

**Built-in Switch**
Direct opening mechanism used for NC contact to separate contact for faults, such as contact welding. The heights of the NC and NO terminals are different to enable easier wiring.

**Seal Ring**
Sealing properties improved by using a X ring and bearing-free structure.

**Conduit Opening**
Models are available with a wide range of conduits.

| Size / Box | 1-conduit model | 2-conduit model |
|---|---|---|
| Pg13.5 | Yes | Yes |
| G1/2 | Yes | Yes |
| 1/2-14NPT | Yes | Yes |

**Note:** NBR is used for rubber parts.

**Cover**

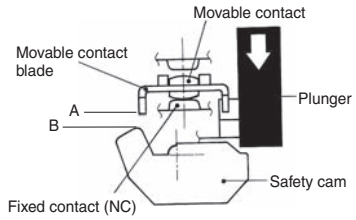
**Ground Screw**
Ground screws are provided on all models for increased safety.

# Direct Opening Mechanism

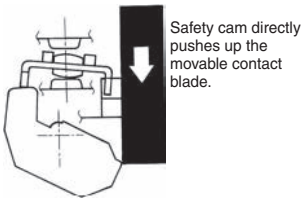
## 1NO/1NC Contact (Snap-action)

Conforms to EN60947-5-1 Direct Opening ⊖ (Only NC contact has a direct opening mechanism.)

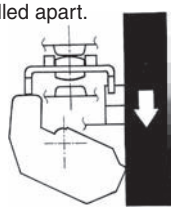
1. When contact welding occurs.




2. When contacts are being pulled apart.

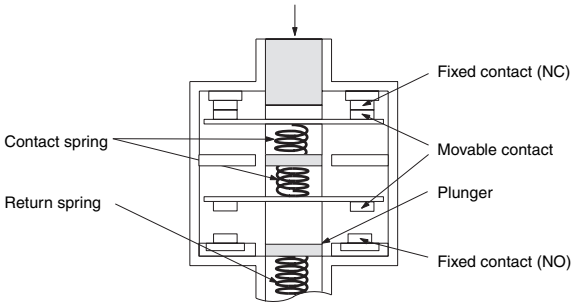



3. When contacts are completely pulled apart.



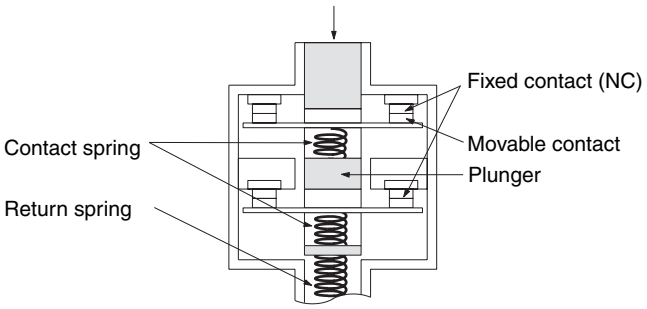
## 1NC/1NO Contact (Slow-action)

Conforms to EN60947-5-1 Direct Opening ⊖
(Only NC contact has a direct opening mechanism.)
When contact welding occurs, the contacts are separated from each other by the plunger being pushed in.

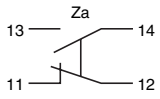
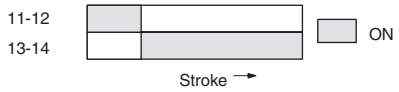
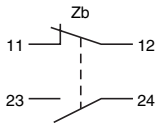
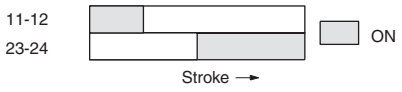
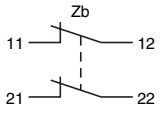
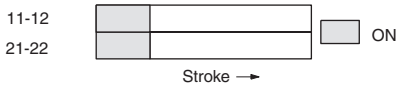



## 2NC Contact (Slow-action)

Conforms to EN60947-5-1 Direct Opening ⊖
(Both NC contacts have a direct opening mechanism.)
When contact welding occurs, the contacts are separated from each other by the plunger being pushed in.




# Contact Form

| Model | Contact | Contact form | Diagrams | Explanation |
|---|---|---|---|---|
| D4B-□1□N | 1NC/1NO (Snap-action) |   |   | Only NC contact 11-12 has a certified direct opening mechanism. ⊖<br>Terminal numbers 11-12 and 13-14 cannot be used as unlike poles. |
| D4B-□5□N | 1NC/1NO (Slow-action) |   |   | Only NC contact 11-12 has a certified direct opening mechanism. ⊖<br>Terminal numbers 11-12 or 23-24 can be used as unlike poles. |
| D4B-□A□N | 2NC (Slow-action) |   |   | Both NC contacts 11-12 and 21-22 have a certified direct opening mechanism. ⊖<br>Terminal numbers 11-12 and 21-22 can be used as unlike poles. |

**Note:** Terminal numbers are according to EN50013; contact symbols are according to IEC60947-5-1.

# Dimensions and Operating Characteristics

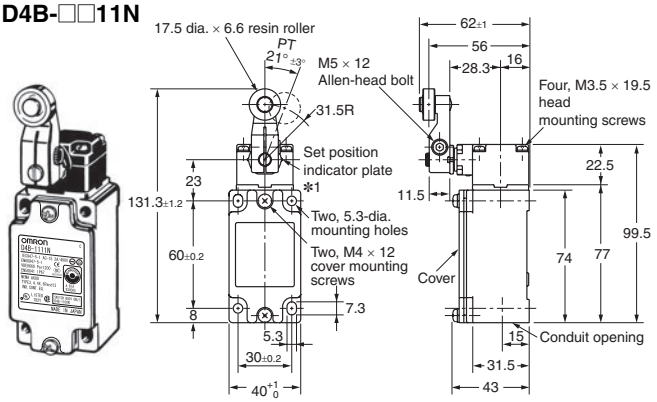
(Unit: mm)

**Note:** Omitted dimensions are the same as those for the Roller Lever Type Models
D4B-1□□□N and D4B-5□□□N have a PG13.5 conduit opening. D4B-2□□□N and D4B-6□□□N have a G1/2 conduit opening.
D4B-3□□□N and D4B-7□□□N have a 1/2-14NPT conduit opening.

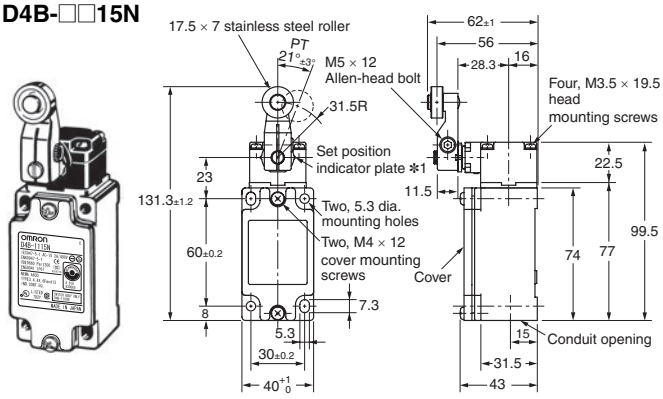
## Switches

### 1-conduit Models

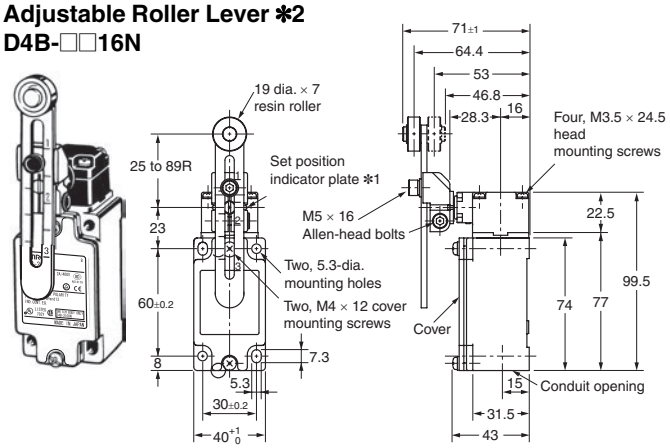
**Roller Lever**
**D4B-□□11N**



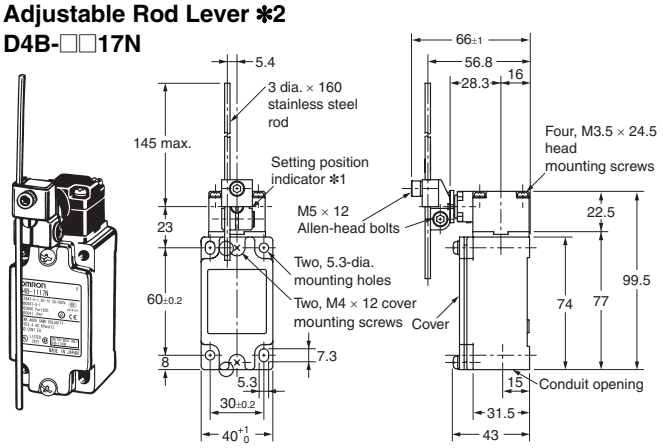

**Roller Lever (Stainless Steel Roller)**
**D4B-□□15N**




**Adjustable Roller Lever ✻2**
**D4B-□□16N**




**Adjustable Rod Lever ✻2**
**D4B-□□17N**

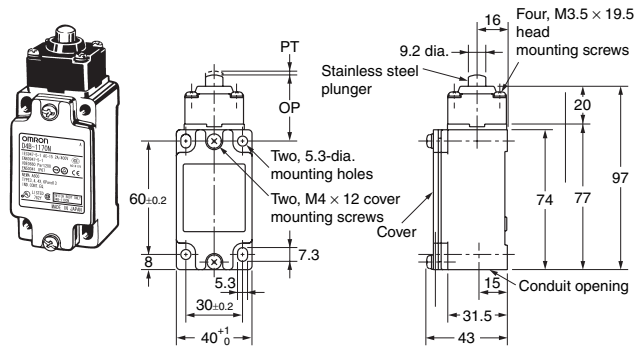



**Note:** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
**✻1.** The lever can be set to any desired position by turning the operating position indicator.
**✻2.** In terms of construction, the Switch is a General-purpose Limit Switch rather than a Safety Limit Switch.

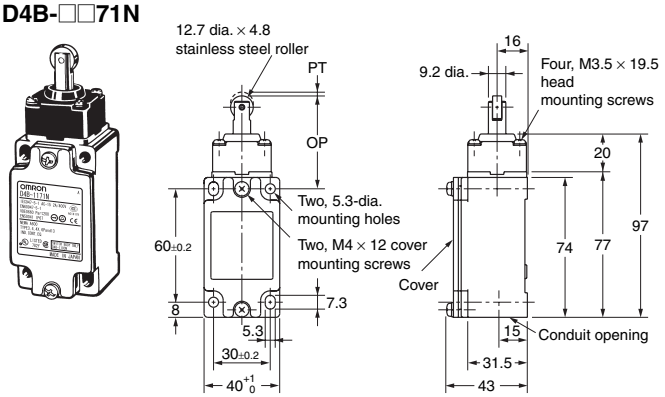
| Operating characteristics | Model | D4B-□□11N | D4B-□□15N | D4B-□□16N ✻1 | D4B-□□17N ✻2 |
|---|---|---|---|---|---|
| Operating force | OF max. | 9.41N | 9.41N | 9.41N | 2.12N |
| Release force | RF min. | 1.47N | 1.47N | 1.47N | 0.29N |
| Pretravel | PT | 21°±3° | 21°±3° | 21°±3° | 21°±3° |
| | PT (2nd) ✻3 ✻5 | (45°) | (45°) | (45°) | (45°) |
| Overtravel | OT min. | 50° | 50° | 50° | 50° |
| Movement differential | MD max. ✻4 | 12° | 12° | 12° | 12° |
| Direct opening travel | DOT min. ✻3 ✻6 | 35° | 35° | 35° | 35° |
| | ✻4 ✻6 | 55° | 55° | 55° | 55° |
| Direct opening force | DOF min. ✻6 | 19.61N | 19.61N | 19.61N | 19.61N |
| Total travel | TT ✻5 | (75°) | (75°) | (75°) | (75°) |

**Note:** Variation occurs in the simultaneity of contact opening/closing operations of 2NC contacts. Check contact operation.
**✻1.** The operating characteristics of these Switches were measured with the roller level set at 31.5 mm.
**✻2.** The operating characteristics of these Switches were measured with the rod level set at 140 mm.
**✻3.** Only for slow-action models.
**✻4.** Only for snap-action models.
**✻5.** Reference values.
**✻6.** Must be provided to ensure safe operation.

### Top Plunger
### D4B-□□70N




### Top Roller Plunger
### D4B-□□71N

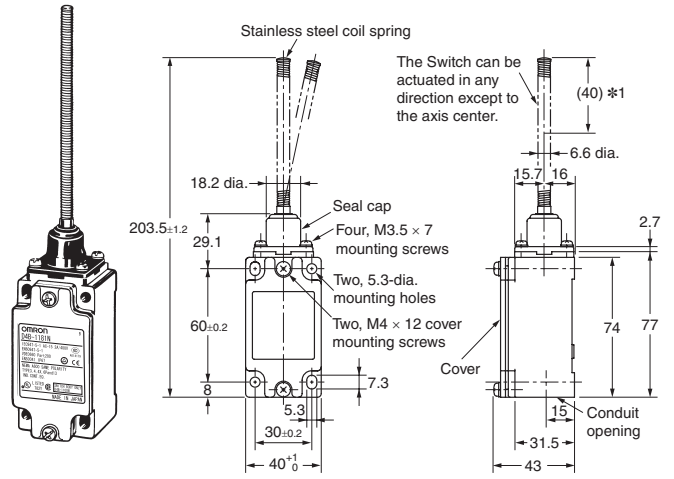



**Note:** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

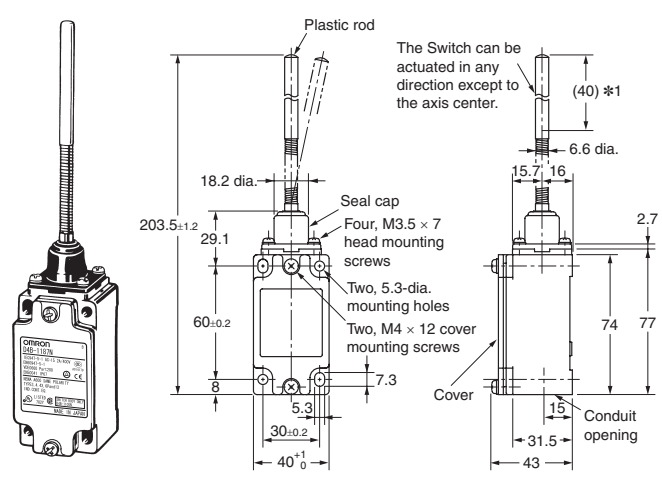
| Operating characteristics | Model | D4B-□□70N | D4B-□□71N |
|---|---|---|---|
| **Operating force** | **OF max.** | 18.63 N | 18.63 N |
| **Release force** | **RF min.** | 1.96 N | 1.96 N |
| **Pretravel** | **PT max.** | 2 mm | 2 mm |
| | **PT (2nd) ✻1 ✻3** | (3 mm) | (3 mm) |
| **Overtravel** | **OT min.** | 5 mm | 5 mm |
| **Movement differential** | **MD max. ✻2** | 1 mm | 1 mm |
| **Direct opening travel** | **DOT min. ✻4** | 3.2 mm | 3.2 mm |
| **Direct opening force** | **DOF min. ✻4** | 49.03 N | 49.03N |
| **Total travel** | **TT ✻3** | (7 mm) | (7 mm) |
| **Free position** | **FP max.** | 38 mm | 51 mm |
| **Operating position** | **OP** | 35±1 mm | 48±1 mm |

**Note:** Variation occurs in the simultaneity of contact opening/closing operations of 2NC contacts. Check contact operation.
**✻1.** Only for slow-action models.
**✻2.** Only for snap-action models.
**✻3.** Reference values.
**✻4.** Must be provided to ensure safe operation.

### Coil Spring (Non-directional) ✻2
### D4B-□□81N




### Plastic Rod (Non-directional) ✻2
### D4B-□□87N



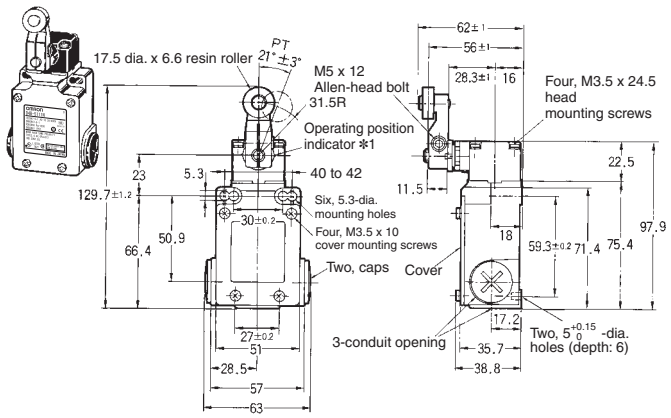

**Note:** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
**✻1.** Be sure to adjust the dog to within 40 mm from the top end of the coil spring.
**✻2.** In terms of construction, the Switch is a General-purpose Limit Switch rather than a Safety Limit Switch.

| Operating characteristics | Model | D4B-□□81N | D4B-□□87N |
|---|---|---|---|
| **Operating force** | **OF max.** | 1.47 N | 1.47 N |
| **Pretravel** | **PT max.** | 15° | 15° |

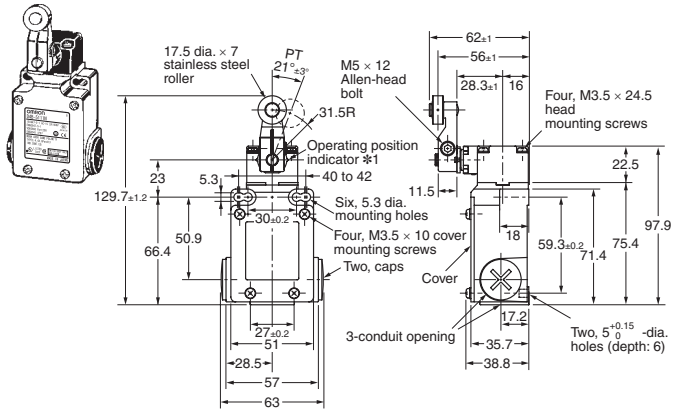
**Note:** Variation occurs in the simultaneity of contact opening/closing operations of 2NC contacts. Check contact operation.

## 3-conduit Switches

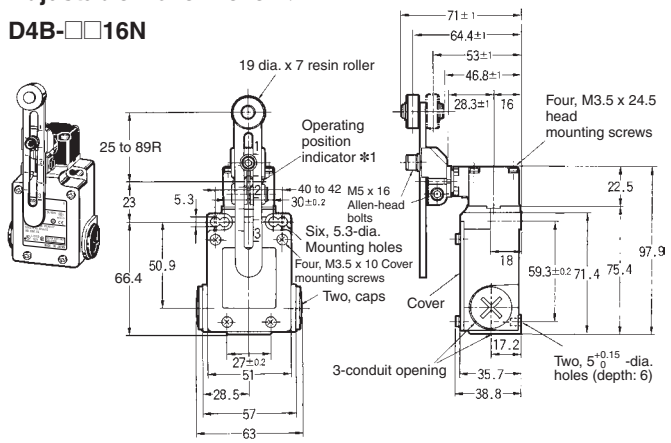
### Roller Lever
**D4B-□□11N**



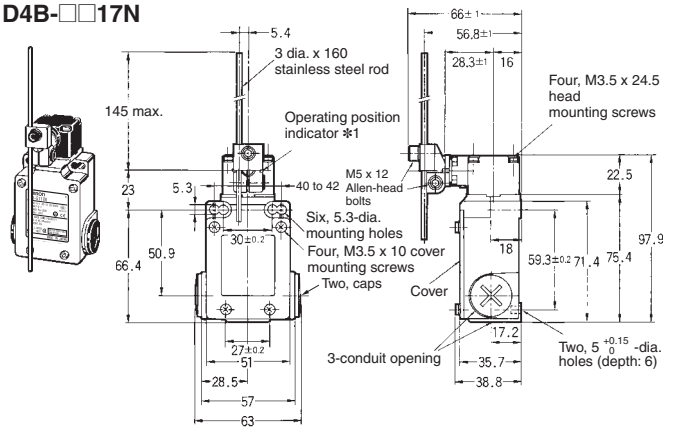

### Roller Lever
**D4B-□□15N**




### Adjustable Roller Lever ✻2
**D4B-□□16N**




### Adjustable Rod Lever ✻2
**D4B-□□17N**

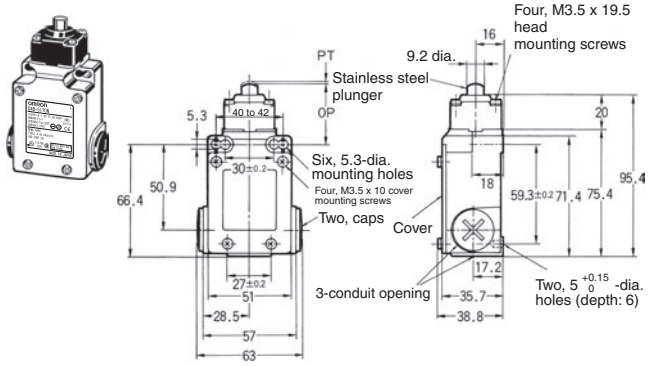



**Note:** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
**✻1.** The lever can be set to any desired position by turning the operating position indicator.
**✻2.** In terms of construction, the Switch is a General-purpose Limit Switch rather than a Safety Limit Switch.

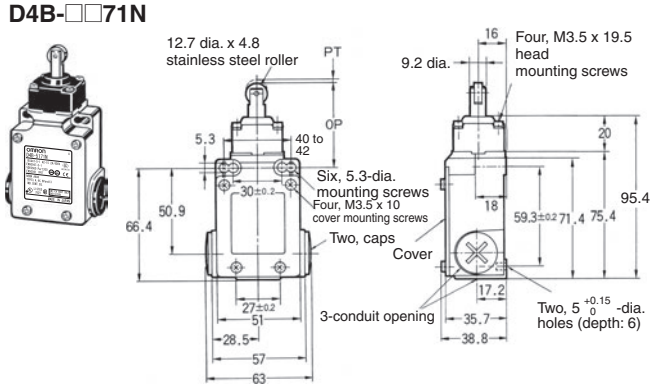
| Operating characteristics | Model | D4B-□□11N | D4B-□□15N | D4B-□□16N ✻1 | D4B-□□17N ✻2 |
|---|---|---|---|---|---|
| Operating force | OF max. | 9.41 N | 9.41 N | 9.41 N | 2.12 N |
| Release force | RF min. | 1.47 N | 1.47 N | 1.47 N | 0.29 N |
| Pretravel | PT | 21°±3° | 21°±3° | 21°±3° | 21°±3° |
| | PT (2nd) ✻3 ✻5 | (45°) | (45°) | (45°) | (45°) |
| Overtravel | OT min. | 50° | 50° | 50° | 50° |
| Movement differential | MD max. ✻4 | 12° | 12° | 12° | 12° |
| Direct opening travel | DOT min. ✻3 ✻6 | 35° | 35° | 35° | 35° |
| | ✻4 ✻6 | 55° | 55° | 55° | 55° |
| Direct opening force | DOF min. ✻6 | 19.61 N | 19.61 N | 19.61 N | 19.61 N |
| Total travel | TT ✻5 | (75°) | (75°) | (75°) | (75°) |

**Note:** Variation occurs in the simultaneity of contact opening/closing operations of 2NC contacts. Check contact operation.
**✻1.** The operating characteristics of these Switches were measured with the roller level set at 31.5 mm.
**✻2.** The operating characteristics of these Switches were measured with the rod level set at 140 mm.
**✻3.** Only for slow-action models.
**✻4.** Only for snap-action models.
**✻5.** Reference values.
**✻6.** Must be provided to ensure safe operation.

### Top Plunger
**D4B-□□70N**




### Top Roller Plunger
**D4B-□□71N**

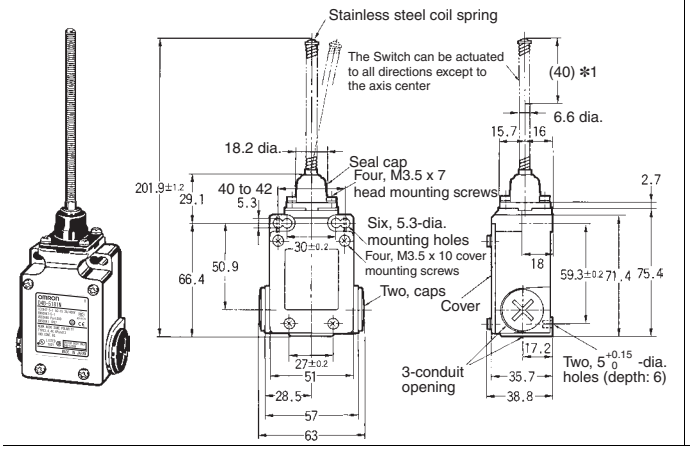



**Note:** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

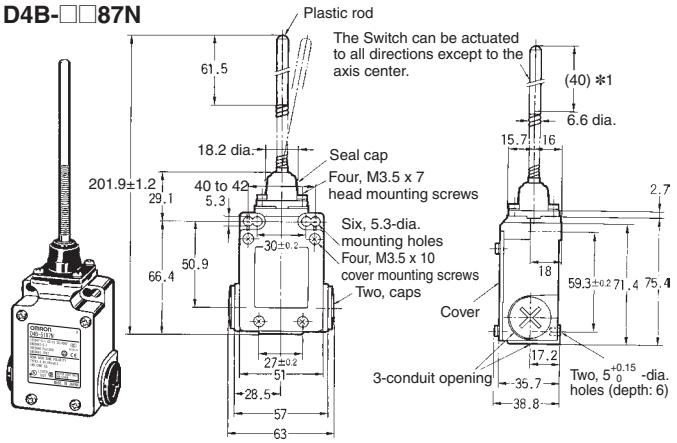
| Operating characteristics | Model | D4B-□□70N | D4B-□□71N |
|---|---|---|---|
| Operating force | OF max. | 18.63 N | 18.63 N |
| Release force | RF min. | 1.96 N | 1.96 N |
| Pretravel | PT max. | 2 mm | 2 mm |
| | PT (2nd) ✻1 ✻3 | (3 mm) | (3 mm) |
| Overtravel | OT min. | 5 mm | 5 mm |
| Movement differential | MD max. ✻2 | 1 mm | 1 mm |
| Direct opening travel | DOT min. ✻4 | 3.2 mm | 3.2 mm |
| Direct opening force | DOF min. ✻4 | 49.03 N | 49.03N |
| Total travel | TT ✻3 | (7 mm) | (7 mm) |
| Free position | FP max. | 38 mm | 51 mm |
| Operating position | OP | 35±1 mm | 48±1 mm |

**Note:** Variation occurs in the simultaneity of contact opening/closing operations of 2NC contacts. Check contact operation.
✻1. Only for slow-action models.
✻2. Only for snap-action models.
✻3. Reference values.
✻4. Must be provided to ensure safe operation.

### Coil Spring ✻2
**D4B-□□81N**




### Plastic Rod ✻2
**D4B-□□87N**



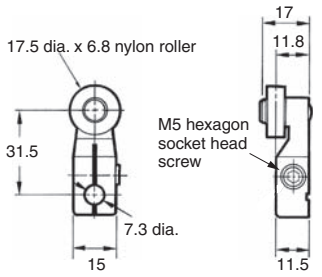

**Note:** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
✻1. Be sure to adjust the dog to within 40 mm from the top end of the coil spring.
✻2. In terms of construction, the Switch is a General-purpose Limit Switch rather than a Safety Limit Switch.

| Operating characteristics | Model | D4B-□□81N | D4B-□□87N |
|---|---|---|---|
| Operating force | OF max. | 1.47 N | 1.47 N |
| Pretravel | PT max. | 15° | 15° |

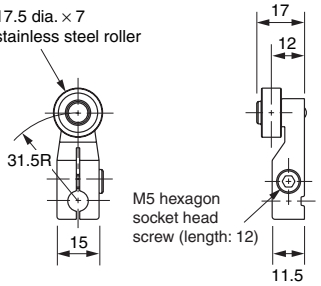
**Note:** Variation occurs in the simultaneity of contact opening/closing operations of 2NC contacts. Check contact operation.

## Levers (Applicable for Roller Lever Models only)

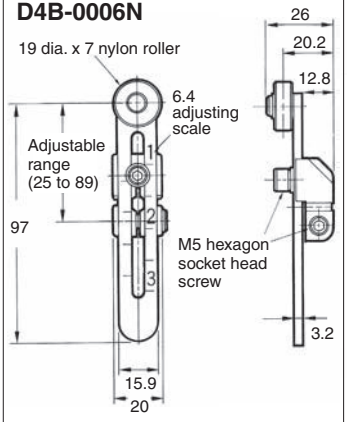
### Roller Lever
**D4B-0001N**



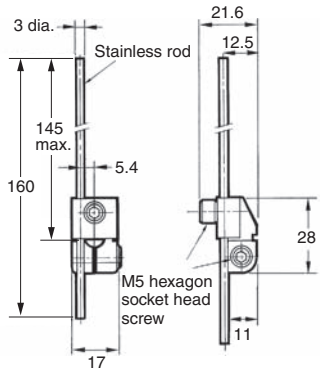

### Roller Lever (Stainless Steel Roller)
**D4B-0005N**



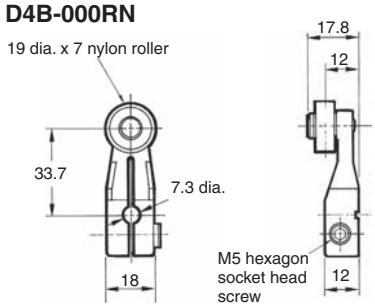

### Adjustable Roller Lever
**D4B-0006N**



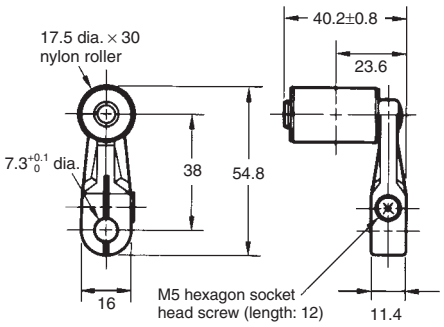

### Adjustable Rod Lever
**D4B-0007N**




### Roller Lever (Compatible with Previous D4B Model)
**D4B-000RN**

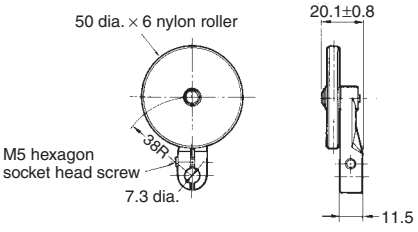



### Roller Lever
**WL-1A118**



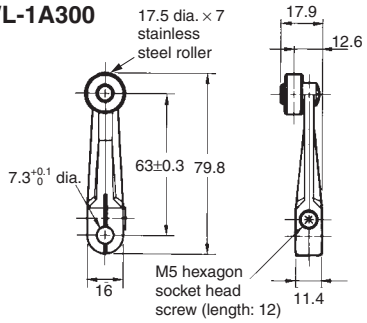

**Note:** Reverse the indicator plate when mounting.

### Roller Lever
**WL-1A106**



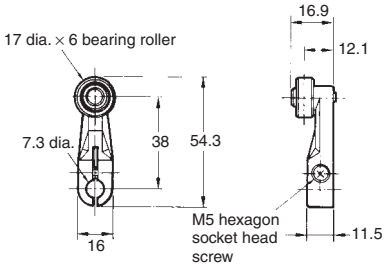

**Note:** Reverse the indicator plate when mounting.

### Roller Lever
**WL-1A300**




**Note:** Reverse the indicator plate when mounting.

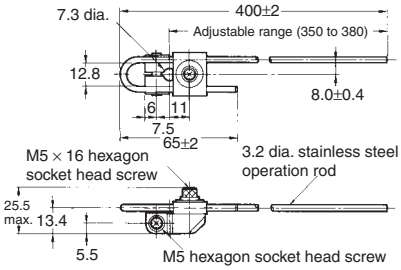
### Roller Lever
**WL-1A400**




**Note:** Reverse the indicator plate when mounting.

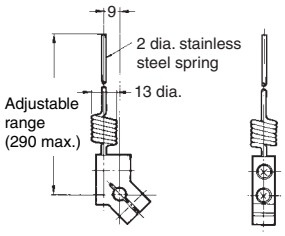
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### Adjustable Rod Lever
**WL-3A100**



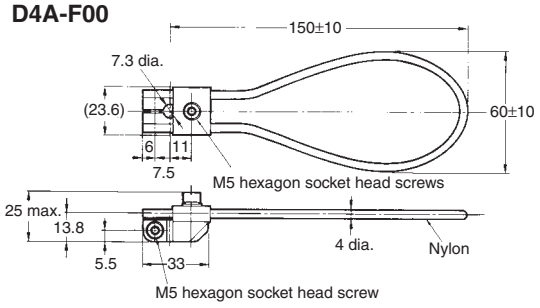

**Note:** Reverse the indicator plate when mounting.

### Spring Rod Lever
**WL-4A201**




**Note:** Reverse the indicator plate when mounting.

### Resin Loop Lever
**D4A-F00**




**Note:** Reverse the indicator plate when mounting.

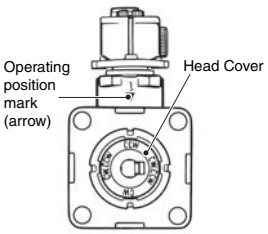
**Note: 1.** Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
**2.** Safety Limit Switch specifications are satisfied with D4B-□□□□N Levers only (example: D4B-0001N).
The D4B-0006N Adjustable Roller Lever and D4B-0007N Adjustable Rod Lever, however, cannot be used. Do not order them for a Side Rotary Operating Head.

# Application Precaution

## Changing the Operating Direction

### Switches with Roller Levers

The operating direction of the lever can be easily changed without using any tools. It can be set to clockwise operation (CW) or counterclockwise (CCW) operation.
Use the procedure given at the right to change the operating direction.

| Operating section (on back of Head) | Operating procedure |
|---|---|
|  | **1.** Remove the four Head set screws and remove the Head from the Switch Box. |
| | **2.** Turn the bottom of the Head toward you, press in the Head Cover shown in the diagram at the left, and turn the Cover clockwise or counterclockwise.<br>**Note:** The factory setting is for "CW.CCW." |
| | **3.** The "CW" setting is for clockwise operation and the "CCW" setting is for counterclockwise operation. Set the Cover to the desired position. |

# Safety Precautions

**Refer to the *"Precautions for All Switches"* and *"Precautions for All Safety Limit Switches".***

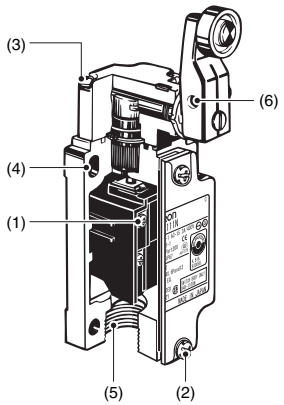
## Precautions for Safe Use

- 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 interior. (The IP67 degree of protection specification for the Switch refers to water penetration while the Switch is submersed in water for a specified period of time.)
- Always attach the cover after completing wiring and before using the Switch. Also, do not turn ON the Switch with the cover open. Doing so may result in electric shock.

## Precautions for Correct Use

### Appropriate Tightening Torque

Be sure to tighten each screw of the D4B-□N properly, otherwise the D4B-□N may malfunction.




| | Type | Appropriate tightening torque |
|---|---|---|
| 1 | M3.5 terminal screw | 0.59 to 0.78 N·m |
| 2 | Cover mounting screw ✻ | 1.18 to 1.37 N·m |
| 3 | Head mounting screw | 0.78 to 0.88 N·m |
| 4 | M5 body mounting screw | 4.90 to 5.88 N·m |
| 5 | Connector | 1.77 to 2.16 N·m |
| 6 | Lever Mounting Screws (Roller Levers) | 4.90 to 5.88 N·m |
| --- | Cap screw (for three-conduit models) | 1.27 to 1.67 N·m |

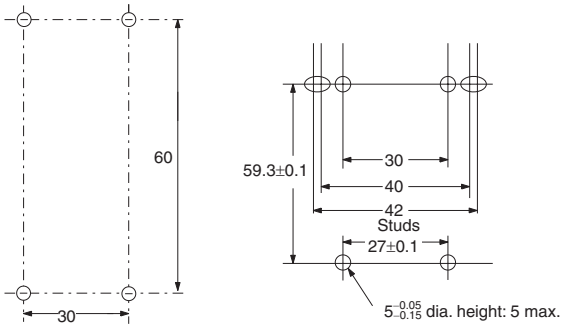
✻ Apply a tightening torque of 0.78 to 0.88 N·m to three-conduit models.

### Mounting

Use four M5 screws with washers to mount the standard model. Be sure to apply the proper torque to tighten each screw. The 3-conduit models can be mounted more securely by using the four screws plus two $5^{-0.05}_{-0.15}$ mm diameter studs, each of which has a maximum height of 4.8 mm as shown below.

### Mounting Dimensions (M5)

**Standard Model** **3-conduit Model**




### Changes in Actuator Mounting Position

- To change the angle of the lever, loosen the Allen-head bolts on the side of the lever.
- The operating position indicator plate ✻ has protruding parts which engage with the lever, thus allowing changes to the lever position by 90°.
- The back of the operating position indicator plate ✻ has no protruding parts. If this plate is turned over and attached, any angle within a 360° range can be set. Do not turn over the plate, however, when using the D4B-□N as a switch with a certified direct opening mechanism. For an SUVA- or BIA-certified application, make sure that the lever engages with the operating position indicator plate securely so that the lever will not slip.

✻ The operating position indicator plate: Refer to page 7.

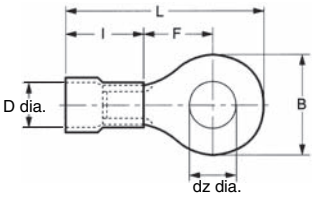
### Changes in Head Mounting Position

By removing the screws on the four corners of the head, the head can be reset in any of four directions. Make sure that no foreign materials will penetrate through the head.

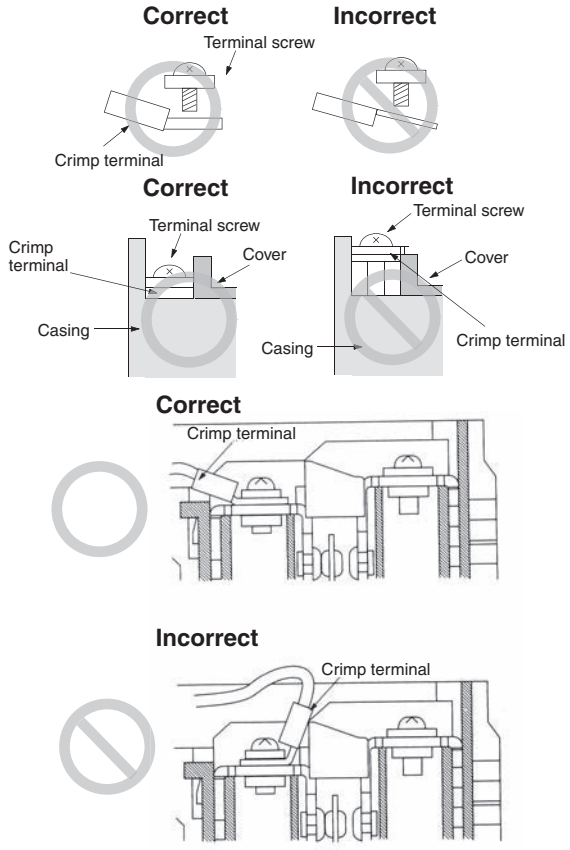
## Wiring

Do not connect the bare lead wires directly to the terminals but be sure to connect each of them by using an insulation tube and M3.5 round crimp terminals and tighten each terminal screw within the specified torque range.
The proper lead wire is 20 to 14 AWG (0.5 to 2.5 mm$^2$) in size.

dz dia.: 3.7 mm
D dia.: 4.5 mm
B: 7.0 mm
L: 20.2 mm
F: 7.7 mm
I: 9.0 mm




Make sure that all crimp terminals come into contact with the casing or cover as shown below, otherwise the cover may not be mounted properly or the D4B-□N may malfunction.

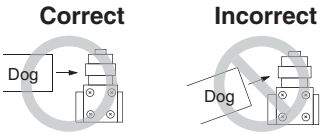



## Conduit Opening

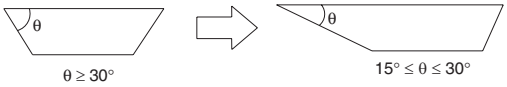
- Make sure that each connector is tightened within the specified torque range.
  The casing may be damaged if the connector is tightened excessively.
- If the 1/2-14NPT is used, cover the cable and conduit end with sealing tape in order to ensure IP67.
- The Pg13.5 connector must be Nippon Flex's ABS-08 Pg13.5 or ABS-12 Pg13.5.
- Use an OMRON SC-series Connector (sold separately) that is suited to the cable in diameter.
- Properly attach the provided conduit cap to the unused conduit opening and securely tighten the cap screw within the specified torque when wiring the D4B-□N.

## Others

- The load for the actuator (roller) of the Switch must be imposed on the actuator in the horizontal direction, otherwise the actuator or the rotating axis may be deformed or damaged.




- When using a long lever model like the D4B-□□16N or D4B-□□17N, the Switch may telegraph. To avoid telegraphing, take the following precautions.
  1. Set the lever to operate in one direction.
  2. Modify the rear end of the dog to an angle of 15° to 30° as shown below or to a secondary-degree curve.



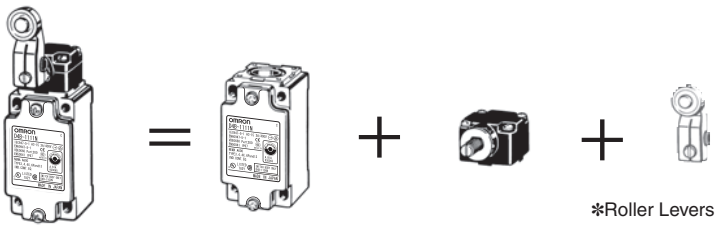

  3. Modify the circuit so as not to detect the wrong operating signals.

# Ordering Method

The D4B-□N uses a block mounting method. Switches can be ordered either as sets or as individual parts. If a set is ordered, the Switch will be shipped with all parts assembled.

**Note:** For Switches with Roller Levers, do not order just the Head and Lever, or just the Switch Box and Lever.

| | | Individual model numbers | | | | |
|---|---|---|---|---|---|---|
| Set model number | = | Switch Box | + | Head | + | Lever ✻ |
| Example: D4B-2111N | = | D4B-2100N | + | D4B-0010N | + | D4B-0001N |




✻Roller Levers only.

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- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

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## Disclaimers

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It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

### DIMENSIONS AND WEIGHTS

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