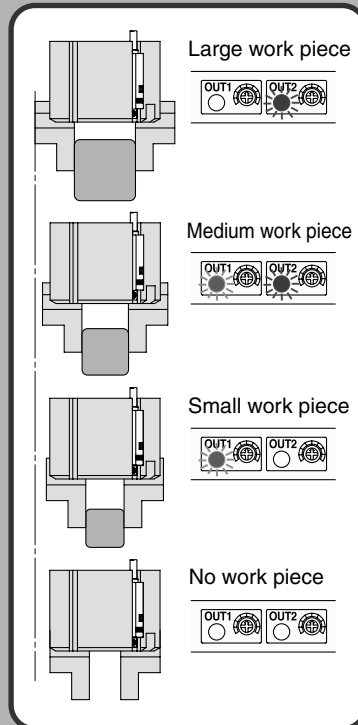
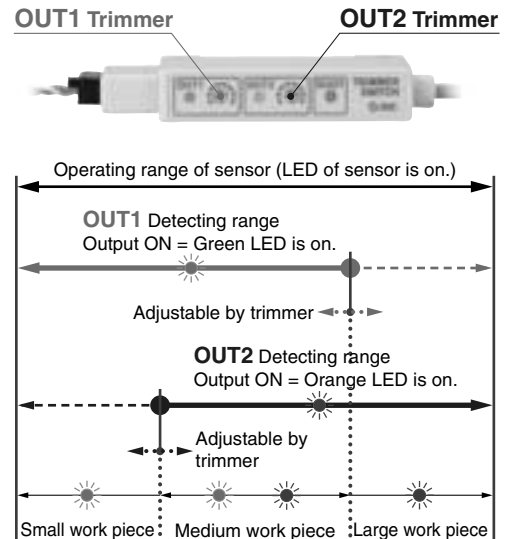


Trimmer Auto Switch

Series **D-□7K/D-R□K**



OUT1 and OUT2 are adjustable separately.

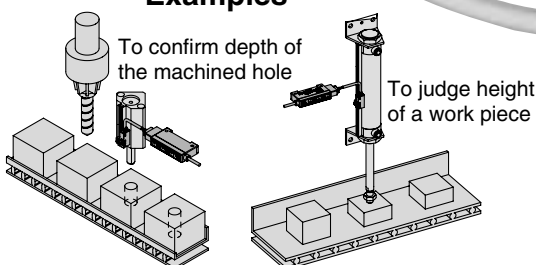


Minimum width to detect
0.5 mm
With one switch, various sized work pieces can be detected by the difference of more than 0.5 mm.
* From 0.5 mm to detectable width dependent on applied actuator.

One auto switch allows work pieces to be distinguished easily.



Examples



- **Can be mounted on a standard actuator.**
Direct mounting / Rail mounting
- **Two mounting types (Amplifier unit)**
DIN rail mounting / Direct mounting
- **Joining of connector**
Sensor and amplifier can be connected without restriction.
- **IP67 (Sensor unit)**
IP40 for amplifier

D-□

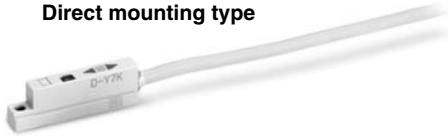
Trimmer Auto Switch

Series **D-□7K/D-R□K**



Sensor unit

Direct mounting type



Rail mounting type

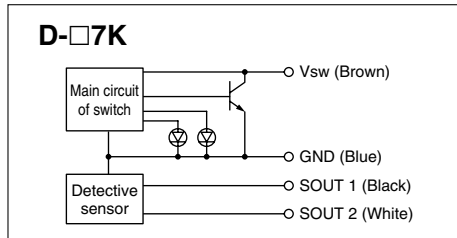


Amplifier unit

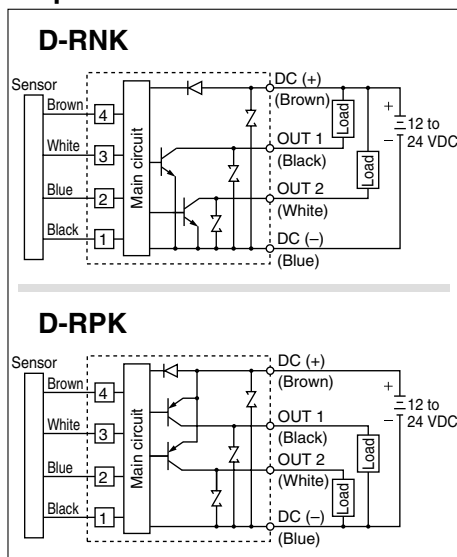


Internal Circuit

Sensor Unit



Amplifier Unit



Specifications

Sensor Unit

Model	D-F7K	D-Y7K
Mounting	Rail mounting	Direct mounting
Applicable amplifier unit	D-RNK, D-RPK	
Indicator light	Operating position: Red light is ON. Proper operating range: Green light is ON.	
Electrical entry	Grommet	
Lead wire	Oilproof heavy-duty vinyl cord $\phi 3.5$ 0.14 mm ² 4 cores 3 m With one e-con connector ^{Note)}	
Impact resistance	980 m/s ²	
Insulation resistance	50 M Ω or more (500 VDC Mega) between lead wire and case	
Withstand voltage	1000 VAC for 1 min. (between lead wire and case)	
Ambient temperature	-10 to 60°C	
Enclosure	IP67	
Mass	58 g (with connector)	
Standard	CE marking	

Note) The e-con connector is not attached to the lead wire. They will be supplied loose in the same shipment.

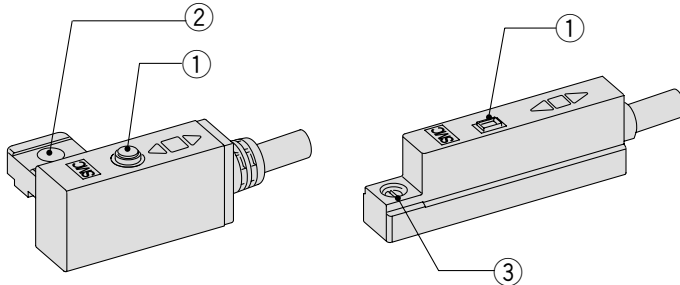
Amplifier Unit (with Sensor Unit)

PLC: Programmable Logic Controller

Model	D-RNK	D-RPK
Applicable sensor unit	D-F7K, D-Y7K	
Application	For relay and PLC	
Power supply voltage	12 to 24 VDC	
Current consumption	40 mA or less	
Output specification	NPN open collector 2 outputs	PNP open collector 2 outputs
Load voltage	28 VDC or less	—
Load current	80 mA or less/1 output	
Internal voltage drop	1.5 V or less	
Leakage current	100 μ A or less/1 output	
Response time	1 ms or less	
Indicator light	READY: Red LED illuminates when the piston position detected. (When the sensor is connected). OUT 1: Green LED illuminates when turned ON. OUT 2: Orange LED illuminates when turned ON.	
Electrical entry	Connection to sensor	e-con connector
	Power supply/output cable	Grommet
Lead wire	Oilproof heavy-duty vinyl cord $\phi 3.5$ 0.14 mm ² 4 cores 3 m	
Impact resistance	98 m/s ²	
Insulation resistance	50 M Ω or more (500 VDC Mega) between lead wire and case	
Withstand voltage	1000 VAC for 1 min. (between lead wire and case)	
Ambient temperature	-10 to 60°C	
Enclosure	IP40	
Mass	70 g	
Standard	CE marking	

Descriptions

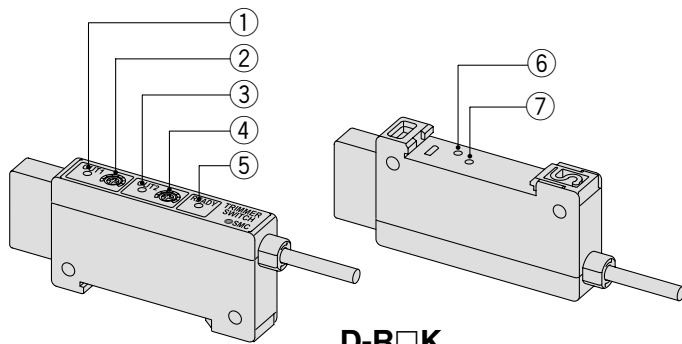
Sensor unit



D-F7K

D-Y7K

Amplifier unit



D-R□K

Sensor Unit

1	Indicator light	Red light turns ON when sensor detects the magnet field. Green light is ON during the proper operating range to detect the magnetic field (including most sensitive position).
2	ø3.2 mounting hole	
3	M2.5 x 4L slotted set screw	Fixes the sensor to the actuator.

Amplifier Unit

1	Output (OUT1) indication: Green	Illuminates when OUT1 outputs.
2	OUT1 adjusting trimmer	Adjusts the output range of OUT1 when sensor unit detects the magnetic field.
3	Output (OUT2) indication: Orange	Illuminates when OUT2 outputs.
4	OUT2 adjusting trimmer	Adjusts the output range of OUT2 when sensor unit detects the magnetic field.
5	Confirmation of detection at sensor unit (READY): Red	Illuminates when sensor unit is detecting the magnetic field. While its lighting, output ranges of OUT1 and OUT2 are adjustable.
6	Offset adjusting trimmer (ADJ)	Adjusts the sensor unit at the time of connection. Once adjusts, no need to re-adjust as long as the sensor unit is not replaced. Adjustment must be undertaken while the sensor unit is removed from the actuator. Refer to the operation manual for details.
7	Confirmation of offset adjustment (OFFSET): Red	Illuminates when offset adjustment is completed.

Refer to the operation manual for how to adjust/set.

Applicable Actuators and Operation Range (Angle)

The operating ranges are provided as guidelines including the hysteresis and are not guaranteed value. Please consult with SMC for alternative actuators other than those shown below.

Sensor Unit D-Y7K

Air Gripper

(mm or °)

Model		Bore size										
		10	12	16	20	25	32	40	50	63	80	100
Parallel gripper	MHZ2	4.0	—	5.0	7.0	7.0	8.0	8.5	—	—	—	—
Parallel gripper	MHZL2	6.0	—	7.0	10.0	11.0	—	—	—	—	—	—
Wide opening	MHL2	7.0	—	8.0	8.5	10.5	11.0	12.5	—	—	—	—
Parallel gripper	MHS2 (2 finger)	—	—	—	—	—	6.5	7.0	7.5	8.5	—	—
Parallel gripper	MHS3 (3 finger) MHS (L) 3	—	—	—	—	—	6.5	7.0	7.5	8.0	—	—
Parallel gripper	MHS4 (4 finger)	—	—	—	—	—	6.5	7.0	7.5	8.5	—	—
Angular gripper	MHC2	30° to -10°	—	30° to -10°	30° to -10°	22.5° to -10°	—	—	—	—	—	—
180° opening/closing	MHW2	—	—	—	88° to -5°	54° to -6°	58° to -5°	41° to -5°	30° to -4°	—	—	—

Note) The operating range for grippers is measured when both ends are open.

Air Cylinder

Compact guide cylinder	MGP	—	3.5	5.0	4.5	4.5	5.5	5.5	5.5	5.5	5.5	6.0
Double power non-rotating cylinder	MGZ	—	—	—	—	—	—	5.5	6.5	6.5	—	—
Air cylinder	CA2	—	—	—	—	—	—	4.0	4.0	6.0	6.0	6.0

Sensor Unit D-F7K

Air Cylinder

(mm)

Model		Bore size													
		10	12	16	20	25	32	40	50	63	80	100	125	140	160
Air cylinder	CJ2	4.0	—	4.5	—	—	—	—	—	—	—	—	—	—	—
Air cylinder	CM2	—	—	—	3.5	3.5	3.5	3.5	—	—	—	—	—	—	—
Compact cylinder	CQ2	4.5	4.5	5.5	5.5	5.0	5.5	5.5	5.5	6.0	5.5	6.0	7.5	7.5	7.5
Compact cylinder guide rod type	CQM	—	—	—	—	—	5.5	5.5	5.5	—	—	—	—	—	—
Plate cylinder	MU	—	—	—	—	5.5	6.5	6.5	6.5	6.5	—	—	—	—	—
3 position cylinder	RZQ	—	—	—	—	—	6.0	6.5	7.0	7.5	—	—	—	—	—
Rotary clamp cylinder	MK/MK2	—	—	—	5.0	5.0	6.5	6.0	6.0	6.5	—	—	—	—	—

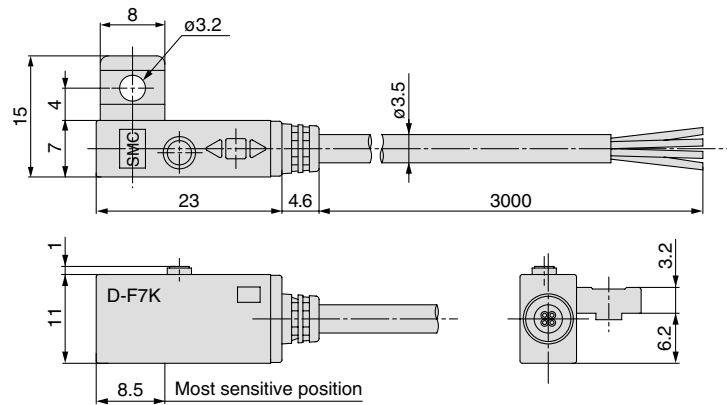
Series D-□7K/D-R□K

Dimensions

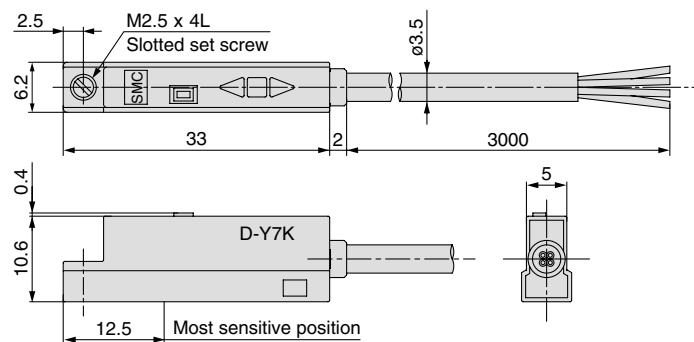
(mm)

Sensor unit

D-F7K

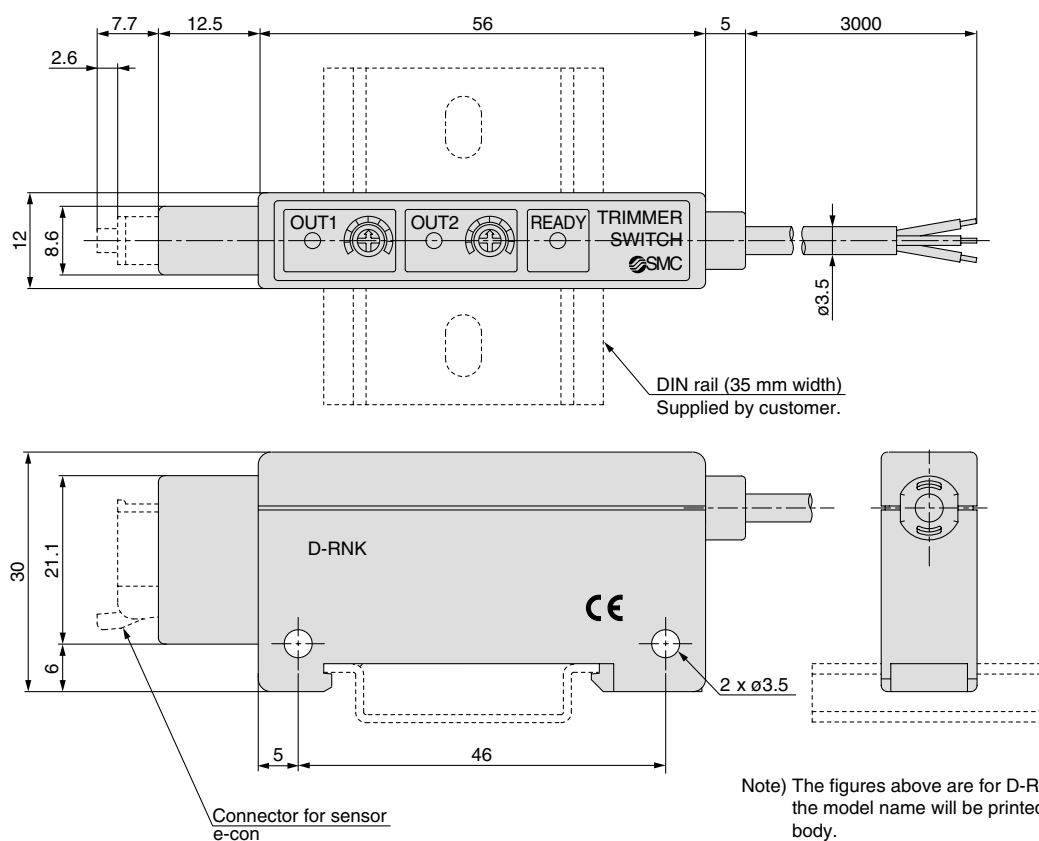


D-Y7K



Amplifier unit

D-R□K



Note) The figures above are for D-RNK. For D-RPK, the model name will be printed instead on the body.



Trimmer Auto Switch

Specific Product Precautions 1

Be sure to read before handling.

Refer to front matters 54 and 55 for Safety Instructions and pages 8 to 11 for the Auto Switch Common Precautions.

Design and Selection

Warning

1. Confirm the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications of current load, voltage, temperature or impact.

2. Cautions for use in an interlock circuit.

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to avoid trouble by providing a mechanical protection function, or by also using another switch (sensor) together with the trimmer auto switch. Also perform periodic maintenance and confirm proper operation.

Caution

1. Take precautions when multiple cylinders are used close together.

When more than 2 trimmer auto switch cylinders are used in close proximity, maintain a minimum actuator interval of 40 mm or more. (When the allowable interval is indicated for each cylinder series, use the specified values.) Magnetic field interference may cause the trimmer auto switches to malfunction.

2. Keep the wiring as short as possible.

Use a wire 3 m or shorter between the sensor and amplifier. Although wire length of power supply/output cable should not affect switch function, use a wire 100 m or shorter.

3. Take precautions for the internal voltage drop of the switch.

Auto switches may not operate properly depending on the connected equipment.

4. Take measures for rotational stoppage of the piston rod.

Take measures for rotational stoppage of the piston rod when designing by guide, etc. Or use non-rotating type SMC products. The operation may be unstable.

Mounting and Adjustment

Caution

1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (980 m/s² or more for sensor unit and 98 m/s² or more for amplifier unit) while handling.

Although the trimmer auto switch body may not be damaged, the inside of the trimmer auto switch could be damaged and cause a malfunction.

Wiring

Caution

1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from applying bending stress or stretching forces to the lead wires.

2. Be sure to connect the connector for sensor to the amplifier before power is applied.

3. Do not allow short circuit of loads.

Output is automatically stopped when the protection circuit is working, as the output unit registers any excess current flow, if loads are short circuited. Should this occur, shut off the power supply, remove the cause of this excess current flow and switch on the power again. Take special care to avoid reverse wiring between the power supply line (brown) and the output line (black, white).

4. Avoid incorrect wiring.

If the connections are reversed (power supply line + and power supply line -), the trimmer auto switches will be protected by a protection circuit. However, if the power supply line (-) is connected to the black, white wire, the trimmer auto switches will be damaged.

Operating Environment

Warning

1. Never use in an atmosphere with explosive gases.

The structure of trimmer auto switches is not designed to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

Caution

1. Do not use in an area where a magnetic field is generated.

Trimmer auto switches will malfunction or magnets inside actuators will become demagnetized.

2. Do not use in an environment where the trimmer auto switch will be continually exposed to water.

Although the sensor units of trimmer auto switches satisfy the IEC standard IP67 structure, do not use trimmer auto switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside trimmer auto switches may cause malfunction.

(Amplifier part D-RNK and RPK: IP40)

3. Do not use in an environment with oil or chemicals.

Please consult with SMC if trimmer auto switches will be used in an environment with coolant, cleaning solvent, various oils or chemicals. If trimmer auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.

4. Take measures against freezing when operating at 5°C or less.



Trimmer Auto Switch Specific Product Precautions 2

Be sure to read before handling.

Refer to front matters 54 and 55 for Safety Instructions and pages 8 to 11 for the Auto Switch Common Precautions.

Maintenance

Warning

1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected trimmer auto switch malfunction.

- 1) Secure and tighten trimmer auto switch mounting screws.
If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.
- 2) Confirm that there is no damage to lead wires.
To prevent faulty insulation, replace trimmer auto switches or repair lead wires, etc., if damage is discovered.

Other

Caution

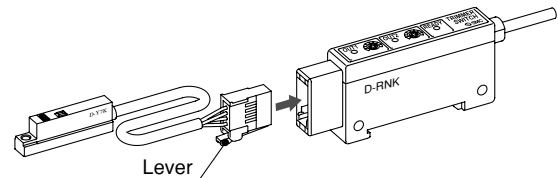
1. Please consult with SMC concerning water resistance, elasticity of lead wires, and usage at welding sites, etc.

Wiring

Caution

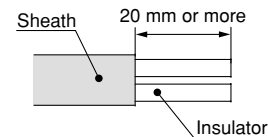
1. Connection and removal of connector

- Hold the lever and connector body with two fingers and insert the connector straight into the pin until it is locked with a click sound.
- To remove the connector, pull it out straight while pressing the lever with one finger.



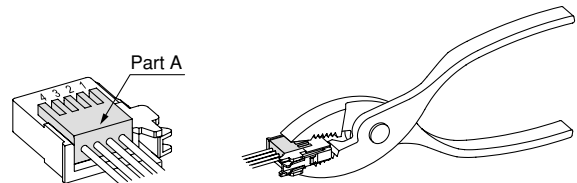
2. Connection of sensor connector

- Cut the sensor lead wire as illustrated to the right.
- Referring to the table below, insert each lead wire of the cable at the position marked with a number corresponding to the color of the lead wire.



Connector no.	Wire core color
1	Black (SOUT1)
2	Blue (GND)
3	White (SOUT2)
4	Brown (Vsw)

- Confirm that the numbers on the connector match the colors of the lead wires and that they are inserted to the bottom. Press part A by hand for temporary fixing.
- Press in the central part of Part A vertically with a tool such as pliers.
- A sensor connector cannot be taken apart for reuse once it is crimped. If the lead wire arrangement is incorrect or if the wire insertion fails, use a new sensor connector.



- Use a sensor connector, ZS-28-CA-3 (1 pc.) or e-con connectors as shown below.

Manufacturer	Part no.
Sumitomo 3M Limited	37104-3122-000FL
Tyco Electronics AMP K.K.	1473562-4
OMRON Corporation	XN2A-1430

- For detailed information about e-con connectors, please consult with the manufacturers of the respective connectors.



Trimmer Auto Switch Specific Product Precautions 3

Be sure to read before handling.

Refer to front matters 54 and 55 for Safety Instructions and pages 8 to 11 for the Auto Switch Common Precautions.

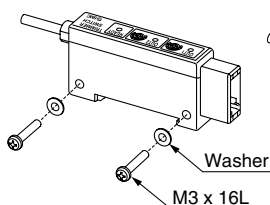
Mounting of Amplifier Unit

⚠ Caution

- Use mounting screws (M3 x 16L) or DIN rail (35 mm width). (DIN rail part no.: ISA-2-1 to 7)
- Adjust offset before mounting of the amplifier unit.

1. Mounting with screws

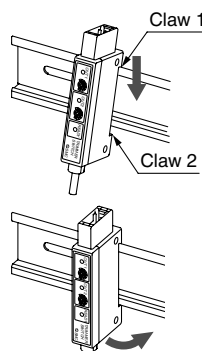
- Tighten two M3 x 16L mounting screws at a tightening torque of 0.5 to 0.7 N-m.
- Mounting surface should be flat and even. A bumpy or uneven mounting surface can result in damage to the case.



2. Mounting and removal to DIN rail

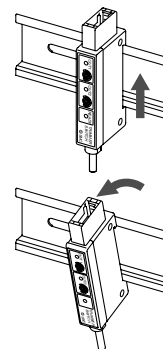
Mounting

- Hook the claw 1 of the amplifier body to the upper part of DIN rail, press down and push horizontally until the claw 2 is locked with a click sound.



Removal

- To remove from the DIN rail, push the amplifier body upward and then pull it horizontally to release from the claw 1 side.



- In the case of mounting to the DIN rail, SMC recommends the following end plates: as detailed in the table on the right. Consult each manufacturer for the handling and details of end plate.

Manufacturer	Part no.
OMRON Corporation	PFP-M
IDEAL Corporation	BNL6

3. Refer to each applicable actuator's catalog for the mounting of sensor unit.