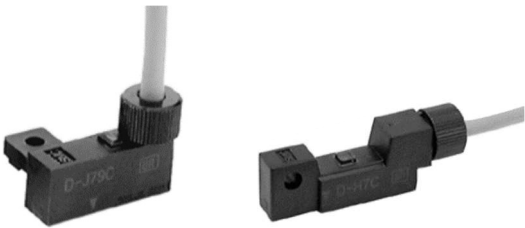




ORIGINAL INSTRUCTIONS

Instruction Manual
Auto switch (Solid state) with connector
D-J79C# / D-H7C#



The intended use of the auto switch is to detect and control the position of an actuator using magnetic detection.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)^{*)}, and other safety regulations.

^{*)} ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. Part 1: General requirements.
ISO 10218-1: Robotics - Safety requirements - Part 1: Industrial robots.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

	Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Warning

- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.
- This product is class A equipment intended for use in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted or radiated disturbances.
- Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for all Safety Instructions.

Warning

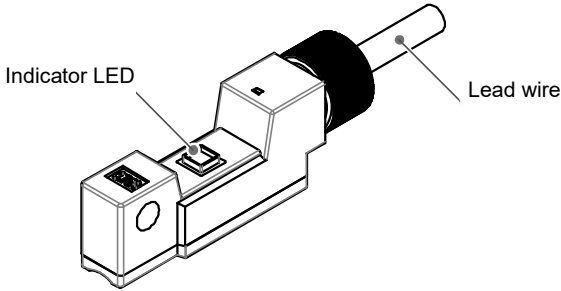
- Special products (-X or -####) might have specifications different from those shown in the Specifications section. Contact SMC for specific drawings.

2 Specifications

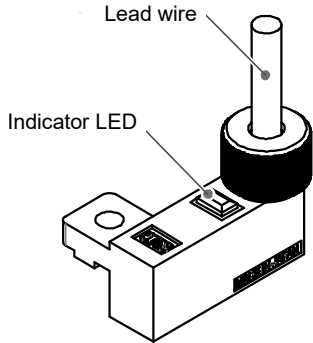
Model No.	D-J79C	D-H7C
Wiring type	2-wire	
Output	–	
Applicable load	24 VDC Relay / PLC	
Power supply voltage	–	
Current consumption	–	
Load voltage	24 VDC (10 to 28 VDC)	
Load current	5 to 40 mA	
Internal voltage drop	4 V or less	
Leakage current	0.8 mA or less at 24 VDC	
Operating time	1 ms or less	
Indicator LED	Operating range: Red LED is ON	
Electrical entry	Connector	
Lead wire	Oilproof heavy-duty vinyl cord φ3.4 mm, 0.15 mm ² , 2-wires	
Insulation resistance	50 MΩ or more at 500 VDC mega (between case and cable)	
Withstand voltage	1000 VAC 1 minute (between case and cable)	
Ambient temperature	-10 to 60 °C	
Enclosure	IP67 to IEC 60529 (JISC0920)	
Standard	CE / UKCA	

3 Name and function of parts

- D-H7C



- D-J79C



4 Installation

4.1 Installation

Warning

Do not install the product unless the safety instructions have been read and understood.

4.2 Design and Selection

- 1) Confirm the specifications.
Read the specifications carefully and use the product correctly. The product may be damaged or malfunction if it is used outside of the specification range.
- 2) Take precautions when multiple actuators are used close together.
When multiple auto switch actuators are used in close proximity, magnetic field interference may cause the switches to malfunction. Maintain a minimum actuator separation of 40 mm.
- 3) Pay attention to the length of time that a switch is ON at an intermediate stroke position.
When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be short and the load may not operate correctly. The maximum detectable piston speed is:

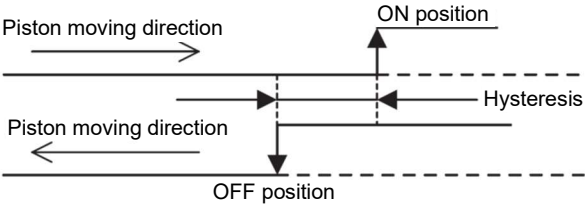
$$V \text{ (mm/s)} = \frac{\text{Auto switch operating range (mm)}}{\text{Load operating time (ms)}} \times 1000$$

- 4) Keep wiring as short as possible
Although long wire length does not affect the switch function, it is recommended to keep it to 100 m or less.
- 5) Do not use a load that generates surge voltage.
Although a surge protection diode is connected at the output side of a solid state auto switch, damage may still occur if the surge is applied repeatedly. When a load such as a relay or solenoid which generates surge is directly driven, use a switch with built in surge protection.
- 6) Caution for use in an interlock circuit
When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system by providing a mechanical protection function, or by using another switch (sensor) together with the auto switch.

- 7) Perform periodic maintenance and confirm proper operation.
Ensure sufficient clearance for maintenance activities.
When designing an application, be sure to allow sufficient clearance for maintenance and inspections.

4.3 Mounting and Adjustment

- 1) Do not drop or bump the product.
Do not drop, bump or apply excessive impact (1000 m/s² or more) while handling. Although the body of the switch may not appear damaged, the inside of the switch could be damaged and cause a malfunction.
- 2) Do not carry an actuator by the auto switch lead wires.
This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.
- 3) Mount switches using the correct tightening torque.
The tightening torque of the mounting screw is important.
If a switch is tightened beyond the tightening torque range, the mounting screw, mounting bracket or switch may be damaged.
On the other hand, tightening below the tightening torque range may allow the switch to slip out of position.
- 4) Mount a switch at the centre of the operating range.
Adjust the auto switch mounting position so that the piston is at the centre of the operating range (the range in which the switch is ON).
The mounting position shown in the catalogue indicates the optimum position at the end of stroke. If mounted at the end of the operating range (around the borderline of ON and OFF) operation may be unstable.
- 5) The auto switch ON and OFF position operates with a hysteresis. If the hysteresis causes a problem, please consult with SMC.



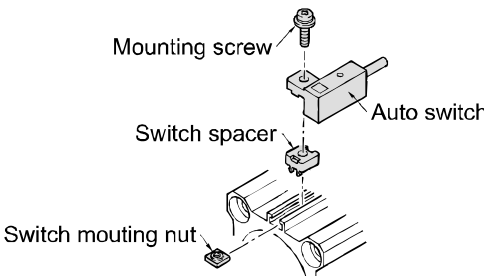
4 Installation (continued)

4.4 Mounting

Each actuator has a specified mounting bracket type. Mounting depends on the actuator type and bore size. Please refer to the actuator catalogue for details.
When an auto switch is mounted for the first time, ensure that the actuator is the type with a magnet built-in, and prepare a mounting bracket corresponding to the actuator.

• D-J79C mounting

1. Slide the auto switch mounting nut into the mounting rail and set it at the auto switch mounting position.
2. Fit the convex part of the auto switch mounting arm into the concave part of the mounting rail. Then slide the switch over the nut.
(CDQ2 series: Fit the convex part of the auto switch mounting arm through the auto switch spacer into the concave part of the mounting rail).
3. Push the auto switch mounting screw lightly into the mounting nut through the hole in the auto switch mounting arm.
4. After reconfirming the detecting position, tighten the mounting screw to secure the auto switch.
Tightening torque of M3 screw should be 0.5 to 0.7 N·m.
5. Modification of the detecting position should be made according to step 3.



• D-H7C mounting

1. For CDJ2 series: Place a mounting bracket on the cylinder tube.
For CDM2 series: Wrap the auto switch mounting band around the cylinder where the auto switch will be mounted without bending the reinforcing plates.
2. For CDJ2 series: Place the auto switch between the band mounting holes, then adjust the position of the mounting holes of the auto switch to those of the mounting band.
For CDM2: Hook the bent part of the auto switch mounting band reinforcing plates onto the upper surface of the switch bracket. Bend the base of the auto switch mounting band reinforcing plates until the through holes of the switch bracket, the through holes of the auto switch mounting band, and the holes of the M3 female thread are aligned.
Adjust the switch bracket so that both ends of the auto switch mounting band are inserted into the inner walls on both sides of the switch bracket.
3. Lightly thread the auto switch mounting screw through the mounting hole into the threaded hole in the band fitting.

-
- Auto switch
- Mounting screw
- Mounting band

- Set the actuator at the stroke end.
- Set the switch in the area where the auto switch Red LED is ON (detection end position).
- Based on dimensions A and B in the actuator catalogue, set the switch position. Tighten the mounting screw to the required torque.

- 4) Do not allow short circuit of loads.
The auto switch does not have built-in short circuit protection. Note that if a load is short circuited, the switch will be instantly damaged because of excess current flow into the switch.
- 5) Avoid incorrect wiring.
If wiring is incorrect the switch will be damaged.

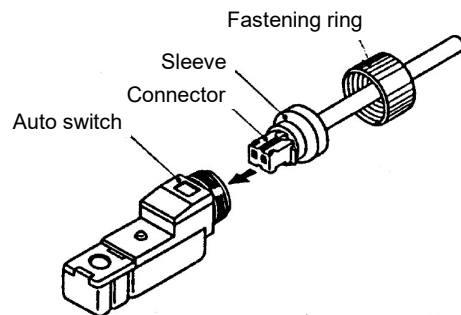
The diagram illustrates the internal wiring of a relay module. On the left, a vertical box labeled "Main circuit switch" contains a switch and a fuse. The switch is connected to the "Brown OUT(+)" terminal (labeled "(Red)") and the "Blue OUT(-)" terminal (labeled "(Black)"). A relay coil is connected between the "Brown OUT(+)" terminal and the "Blue OUT(-)" terminal. A load is connected between the "Brown OUT(+)" terminal and the "Blue OUT(-)" terminal. A power supply is connected to the "Brown OUT(+)" terminal and the "Blue OUT(-)" terminal.

The diagram illustrates the internal wiring of a relay module. On the left, a box labeled "Main circuit switch" contains a switch and a diode. The switch is connected to the "Brown OUT(+)" terminal (labeled "(Red)") and the "Blue OUT(-)" terminal (labeled "(Black)"). A power supply is connected to the "Brown OUT(+)" terminal and the "Blue OUT(-)" terminal. A load is connected to the "Blue OUT(-)" terminal and the "Blue OUT(-)" terminal.

4 Installation (continued)

Switch Model number	Lead wire with connector	Combined switch / cable
D-***CN	-	D-####CN
	D-LC05 (0.5 m)	D-####C
	D-LC30 (3 m)	D-####CL
	D-LC50 (5 m)	D-####CZ

- Insert the lead wire connector into the auto switch until the sleeve contacts with the switch.
- Ensure that the projected part of the connector engages with the groove of the inserted portion.
- Tighten the fastening ring.
- Ensure that the fastening ring is correctly tightened to prevent water from entering the product.



Warning

- Do not use in an environment where oil, corrosive gases, chemicals, salt water or steam are present.
- Do not install in a location subject to vibration or impact in excess of the product specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product specification.
- Do not use in an area where a magnetic field is generated. Auto switches can malfunction or magnets inside actuators can become demagnetized.
- Do not use in an environment where the auto switch will be continually exposed to water.
- Do not use in an environment with temperature cycles.
- Avoid accumulation of iron waste or close contact with magnetic substances. A large amount of accumulated iron waste such as machining chips or spatter may cause the auto switch to malfunction.

5 How to Order

6 Outline dimensions

Refer to the catalogue or operation manual on the SMC website (URL: <https://www.smcworld.com>) for Outline dimensions.

7 Troubleshooting

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graph TD
    A[Problem occurs] --> B[Problem condition]
    B -- "Stays ON (sometimes OFF)" --> C[Indication Led is ON]
    B -- "Stays OFF (sometimes ON)" --> D[Indication LED is ON]
    C -- "Stays OFF" --> E[Source voltage or load voltage]
    C -- "Normal" --> F[Normal]
    C -- "Stays ON" --> G[Stays ON]
    D -- "Normal" --> H[Normal]
    D -- "Abnormal" --> I[Abnormal]
    E -- "Normal" --> J[Replace auto switch]
    E -- "Abnormal" --> K[Abnormal]
    J -- "Normal" --> L[Normal]
    J -- "Abnormal" --> M[Abnormal]
    I --> N[ ]
    K --> O[ ]
    L --> P[ ]
    M --> Q[ ]
    N --> R[ ]
    O --> S[ ]
    P --> T["(A)"]
    Q --> U["(B)"]
    R --> V["(C)"]
    S --> W["(D)"]
    T --> X["(B)"]
    U --> Y["(B)"]
    V --> Z["(A)"]
    W --> AA["(C)"]

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- (A) = Auto switch output failure (replace)
(B) = Check wiring and correct fault
(C) = Auto switch failure.
(D) = Replace actuator. Detectable magnetic field inadequate (or no magnet)

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.
 - 1) Securely tighten switch mounting screws. If screws become loose or the mounting position is dislocated, re-tighten them after readjusting the mounting position.
 - 2) Confirm that there is no damage to lead wires. To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.
- After the power has been disconnected, regarding the actuator operation set up, the contents of the program may be maintained by the customer application. Take care to confirm safety when the power is re-connected, and the actuator operation is resumed, because the operation may have stopped in an unstable condition.

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

URL: <https://www.smcworld.com> (Global) <https://www.smceu.com> (Europe)
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