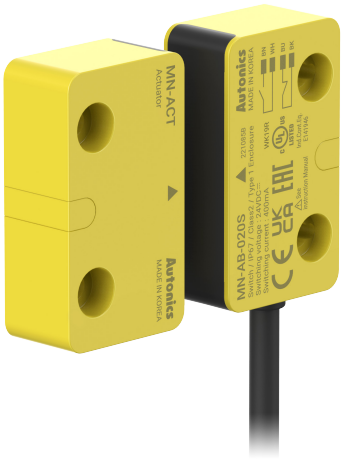
# Magnetic Non-contact Switch




## MN Series

PRODUCT MANUAL

**For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.**
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

## Features

- Non-powered magnetic detection method
- Two wiring specifications of cable / cable connector type
- Available to install at back-forth / right-left moving door
- IP67 protection structure (IEC standard)

## Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

**⚠ Warning** Failure to follow instructions may result in serious injury or death.

01. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**
    Failure to follow this instruction may result in personal injury, economic loss or fire.
02. **Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
    Failure to follow this instruction may result in explosion or fire.
03. **Do not disassemble or modify the unit.**
    Failure to follow this instruction may result in fire.
04. **Do not connect, repair, or inspect the unit while the load is connected to a power source.**
    Failure to follow this instruction may result in fire.
05. **Check 'Connections' before wiring.**
    Failure to follow this instruction may result in fire.

**⚠ Caution** Failure to follow instructions may result in injury or product damage.

01. **Use the unit within the rated specifications.**
    Failure to follow this instruction may result in fire or product damage.
02. **Use a dry cloth to clean the unit, and do not use water or organic solvent.**
    Failure to follow this instruction may result in fire.
03. **Make cable length as short as possible.**
    Failure to follow this instruction may result in malfunction.
04. **Do not install the switch and actuator on the magnetic object.**
    **Use bolt and nut of stainless steel or nonmagnetic material, when installing the switch and actuator.**
    Failure to follow this instruction may result in malfunction or affect sensing distance.
05. **Do not use a load over the range of rated relay specification.**
    Failure to follow this instruction may result in fire, relay broken, contact melt, insulation failure or contact failure.

## Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Use the switch with the dedicated actuator. Do not use the switch with another actuator randomly.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000m
  - Pollution degree 3
  - Installation category II

## Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

**MN - ❶ - ❷**

**❶ Contact**
AB: 1 × N.O. + 1 × N.C.
2A: 2 × N.O.

**❷ Cable**
020: Cable type
W: Cable connector type

## Product Components

- Product
- Instruction manual

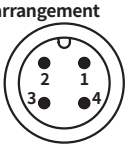
## Sold Separately

- M12 Connector cable: CIDH4-□, CLDH4-□

## Connection

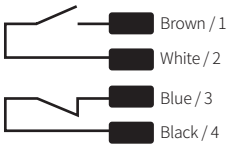
| Pin | Color | Function | |
|---|---|---|---|
| | | 1 × N.O. + 1 × N.C. | 2 × N.O |
| 1 | Brown | Normally Open | Normally Open |
| 2 | White | | |
| 3 | Blue | Normally Closed | Normally Open |
| 4 | Black | | |

**• M12 connector pin arrangement**

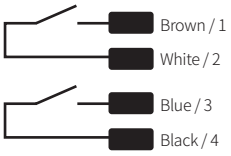



## Internal Circuit

**■ 1 × N.O. + 1 × N.C.**

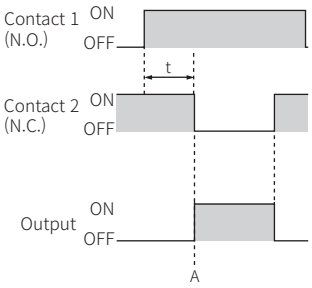



**■ 2 × N.O.**

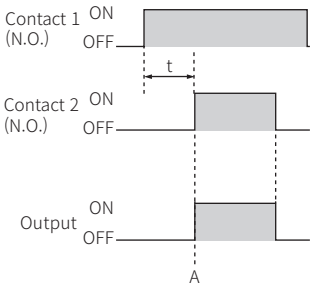



## Timing Diagram

**■ 1 × N.O. + 1 × N.C.**




**■ 2 × N.O.**




- t: two contacts timing gap, A: Output signal ON, with both contacts ON
- Both contacts must change output status, before it can be reset.
  Compliance with this sequence must be monitored by the safe evaluation unit.

## Specifications

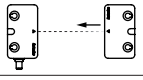
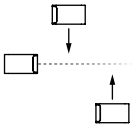
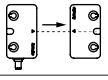
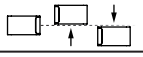
| Model | | MN-AB-□ | MN-2A-□ |
|---|---|---|---|
| Contact | | 1 × N.O. + 1 × N.C. | 2 × N.O. |
| Operating distance 01) | OFF→ON | ≥ 5 mm | |
| | ON→OFF | ≤ 15 mm | |
| Certification | | CE UKCA cULus EAC | |
| Unit weight (package) | | Cable type: ≈ 92.6 g (≈ 106.5 g)<br>Cable connector type: ≈ 47.2g (≈ 61.0g) | |

01) Rated at the ambient temperature of 23 °C. It can be differ up to ±20 % according to the ambient temperature.

| | |
|---|---|
| Switching voltage | ≤ 24 VDC⎓ |
| Switching current | ≤ 400 mA |
| Life expectancy | ≥ 1 billion times (with low load) |
| Vibration | 1.0 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours |
| Vibration (malfunction) | 1.0 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes |
| Shock | 300 m/s² (≈ 30 G) in each X, Y, Z direction for 3 times |
| Shock (malfunction) | 300m/s² (≈ 30 G) in each X, Y, Z direction in output ON/OFF status for 3 times |
| Ambient temperature | -10 to 55 °C, storage: -20 to 60 °C<br>(a non freezing or condensation environment) |
| Ambient humidity | 35 to 85 %RH, storage : 35 to 85 %RH<br>(a non freezing or condensation environment) |
| Protection structure | IP67 (IEC standard) |
| Connection | Cable type / Cable connector type |
| Cable | Ø 5 mm, 4-wire<br>cable type: 2 m, cable connector type: 0.3 m |
| Wire | AWG24 (0.08 mm), 40-core, core diameter: Ø 1.11 mm |
| Connector | M12 connector |
| Material | Body/CAP: PC |

## Operating Distance

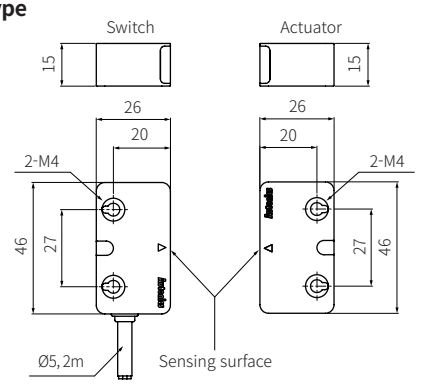
- Operating distance represents the distance between the sensing surface of switch and that of actuator.
- Operating distance can be differed according to the moving direction of actuator from the switch.
  (at ambient temperature of 23 °C)
- The operating distance may be affected by metal or magnetic substances which is placed closely to the switch.

| Operation status | Moving direction | | Operating distance |
|---|---|---|---|
| OFF → ON | Front-Back |  | ≥ 5 mm |
| | Left-Right |  | ≥ 5 mm |
| ON → OFF | Front-Back |  | ≤ 15 mm |
| | Left-Right |  | ≤ 15 mm |

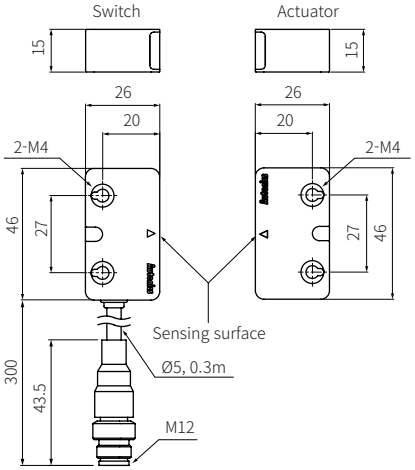
## Dimensions

• Unit: mm, For the detailed dimensions of the product, follow the Autonics web site.

■ **Cable type**

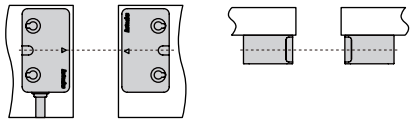



■ **Cable connector type**

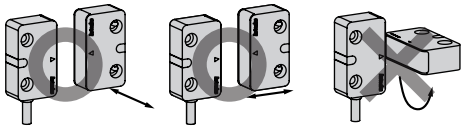



## Cautions during Installation

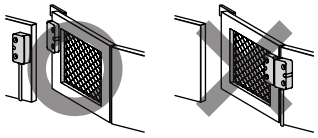
- Install the product according to the rated specifications, environment, and place.
- Tighten the screw of M4×20 mm with the tightening torque of 0.8 N·m.
- Installing more than 2 magnetic non-contact switches closely may result in malfunction due to mutual interference.
- Do not impact on the switch and excessively bend the cables.
- Install the switch to the position where the sensing surface of the switch and the actuator be exactly parallel.



- Install the switch to the direction as below with the consideration of moving directions of the actuator.



- Install the switch and actuator with a gap of minimum 1 mm between them.
- Install the switch at the adjoining wall of the guard door and the actuator at guard door.



## Sold Separately: M12 Connector Cable

• For detailed information, refer to the 'M8/M12 Connector Cable' manual.

| Appearance | Power | Connector 1 | Connector 2 | Length | Feature | Model |
|---|---|---|---|---|---|---|
|  | DC | M12 (Socket-Female) 4-pin | 4-wire | 2 m | Oil resistant PVC | CIDH4-2 |
| | | | | 3 m | | CIDH4-3 |
| | | | | 5 m | | CIDH4-5 |
| | | | | 7 m | | CIDH4-7 |
|  | DC | M12 (Socket-Female) 4-pin | 4-wire | 2 m | Oil resistant PVC c UL us | CIDH4-2-A |
| | | | | 3 m | | CIDH4-3-A |
| | | | | 5 m | | CIDH4-5-A |
| | | | | 7 m | | CIDH4-7-A |
|  | DC | M12 (Socket-Female) 4-pin, L type | 4-wire | 2 m | Oil resistant PVC | CLDH4-2 |
| | | | | 3 m | | CLDH4-3 |
| | | | | 5 m | | CLDH4-5 |
| | | | | 7 m | | CLDH4-7 |
|  | DC | M12 (Socket-Female) 4-pin, L type | 4-wire | 2 m | Oil resistant PVC c UL us | CLDH4-2-A |
| | | | | 3 m | | CLDH4-3-A |
| | | | | 5 m | | CLDH4-5-A |
| | | | | 7 m | | CLDH4-7-A |