

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

MN - ① - ②

1 Contact
AP: 1 × NC + 1 × NC

AB: 1 × N.O. + 1 × N.C.
2A: 2 × N.O.

2 Cable

020: Cable type

W: Cable connector type

Product Components	
1	Product A
2	Product B
3	Product C
4	Product D
5	Product E
6	Product F
7	Product G
8	Product H
9	Product I
10	Product J
11	Product K
12	Product L
13	Product M
14	Product N
15	Product O
16	Product P
17	Product Q
18	Product R
19	Product S
20	Product T
21	Product U
22	Product V
23	Product W
24	Product X
25	Product Y
26	Product Z
27	Product AA
28	Product AB
29	Product AC
30	Product AD
31	Product AE
32	Product AF
33	Product AG
34	Product AH
35	Product AI
36	Product AJ
37	Product AK
38	Product AL
39	Product AM
40	Product AN
41	Product AO
42	Product AP
43	Product AQ
44	Product AR
45	Product AS
46	Product AT
47	Product AU
48	Product AV
49	Product AW
50	Product AX
51	Product AY
52	Product AZ
53	Product BA
54	Product BB
55	Product BC
56	Product BD
57	Product BE
58	Product BF
59	Product BG
60	Product BH
61	Product BI
62	Product BJ
63	Product BK
64	Product BL
65	Product BM
66	Product BN
67	Product BO
68	Product BP
69	Product BQ
70	Product BR
71	Product BS
72	Product BT
73	Product BU
74	Product BV
75	Product BW
76	Product BX
77	Product BY
78	Product BZ
79	Product CA
80	Product CB
81	Product CC
82	Product CD
83	Product CE
84	Product CF
85	Product CG
86	Product CH
87	Product CI
88	Product CJ
89	Product CK
90	Product CL
91	Product CM
92	Product CN
93	Product CO
94	Product CP
95	Product CQ
96	Product CR
97	Product CS
98	Product CT
99	Product CU
100	Product CV
101	Product CW
102	Product CX
103	Product CY
104	Product CZ
105	Product DA
106	Product DB
107	Product DC
108	Product DD
109	Product DE
110	Product DF
111	Product DG
112	Product DH
113	Product DI
114	Product DJ
115	Product DK
116	Product DL
117	Product DM
118	Product DN
119	Product DO
120	Product DP
121	Product DQ
122	Product DR
123	Product DS
124	Product DT
125	Product DU
126	Product DV
127	Product DW
128	Product DX
129	Product DY
130	Product DZ
131	Product EA
132	Product EB
133	Product EC
134	Product ED
135	Product EE
136	Product EF
137	Product EG
138	Product EH
139	Product EI
140	Product EJ
141	Product EK
142	Product EL
143	Product EM
144	Product EN
145	Product EO
146	Product EP
147	Product EQ
148	Product ER
149	Product ES
150	Product ET
151	Product EU
152	Product EV
153	Product EW
154	Product EX
155	Product EY
156	Product EZ
157	Product FA
158	Product FB
159	Product FC
160	Product FD
161	Product FE
162	Product FF
163	Product FG
164	Product FH
165	Product FI
166	Product FJ
167	Product FK
168	Product FL
169	Product FM
170	Product FN
171	Product FO
172	Product FP
173	Product FQ
174	

- Product
- Instruction manual

Sold Separately

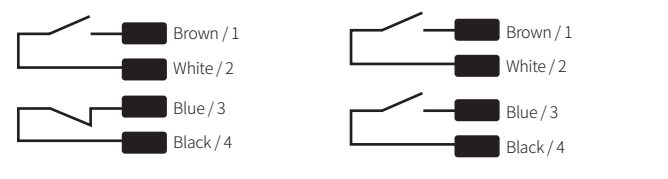
- M12 Connector cable: CIDH4-□, CLDH4-□

Connection

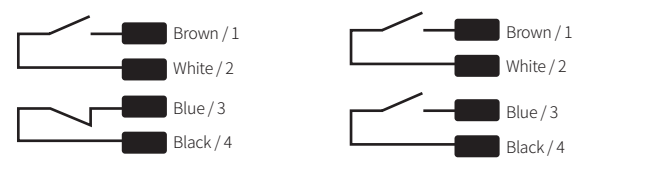
Pin	Color	Function	
		$1 \times \text{N.O.} + 1 \times \text{N.C.}$	$2 \times \text{N.O.}$
1	Brown	Normally Open	Normally Open
2	White		
3	Blue	Normally Closed	Normally Open
4	Black		

Internal Circuit	
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■ 1 × N.O. + 1 × N.C. ■ 2 × N.O.

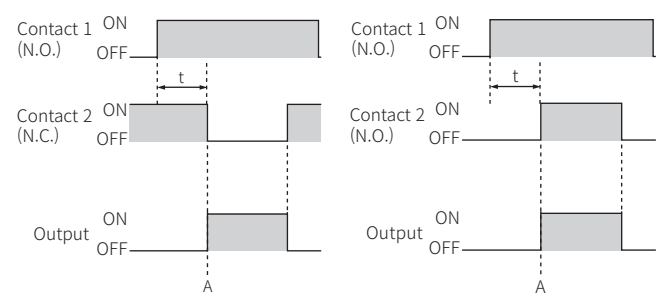


■ 1 × N.O. + 1 × N.C. ■ 2 × N.O.

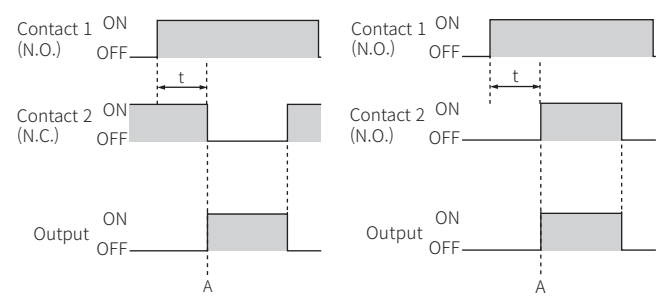


Timing Diagram

■ 1 × N.O. + 1 × N.C. ■ 2 × N.O.



■ 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

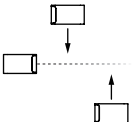
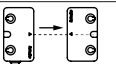
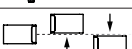
Model		MN-AB-□	MN-2A-□
Contact		1 × N.O. + 1 × N.C.	2 × N.O.
Operating distance (1)	OFF→ON	≥ 5 mm	
	ON→OFF	≤ 15 mm	
Certification		     	
Unit weight (package)		Cable type: ≈ 92.6 g (≈ 106.5 g) Cable connector type: ≈ 47.2 g (≈ 61.0g)	

01) Rated at the ambient temperature of 23 °C. It can be differ up to $\pm 20\%$ 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/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	300m/s ² (≈ 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 (a non freezing or condensation environment)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (a non freezing or condensation environment)
Protection structure	IP67 (IEC standard)
Connection	Cable type / Cable connector type
Cable	Ø 5 mm, 4-wire 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

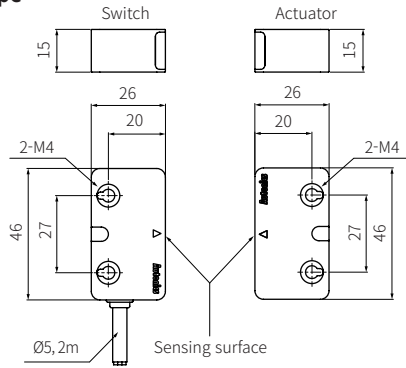
- Operating distance represents the distance between the sensing surface of switch and that of actuator.
- Operating distance can be differed according to the moving direction of actuator from the switch.
(at ambient temperature of 23 °C)
- The operating distance may be affected by metal or magnetic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

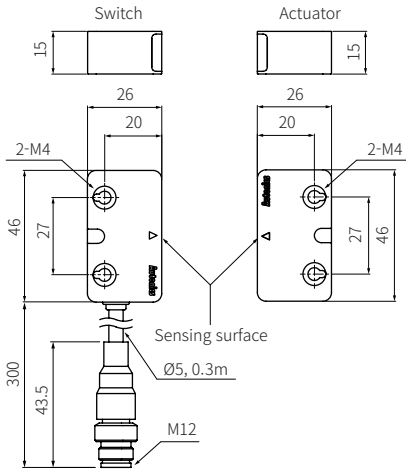
Dimensions

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

■ Cable type

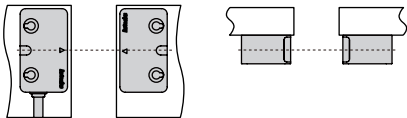


■ Cable connector type

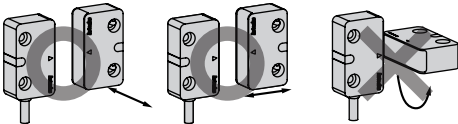


Cautions during Installation

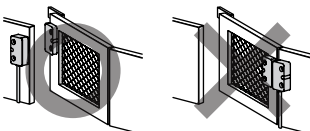
- Install the product according to the rated specifications, environment, and place.
- Tighten the screw of M4×20 mm with the tightening torque of 0.8 N·m.
- Installing more than 2 magnetic non-contact switches closely may result in malfunction due to mutual interference.
- Do not impact on the switch 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	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	CLDH4-2-A
				3 m		CLDH4-3-A
				5 m		CLDH4-5-A
				7 m		CLDH4-7-A