

## HS7A-DMC Magnetic Safety Switches

### Key features:

- Compact size and easy positioning.
- Combination with proprietary relay modules achieves safety category 4 (EN954-1).
- Compact size (7 × 16 × 51mm)
- Positioning for installation is easy.
- Up to 36 sets can be connected.  
(safety relay module: HR1S-DME)
- Degree of protection: IP67



### Part Numbers

#### HS7A Non-contact Magnetic Interlock Switches

| Contact Configuration | Cable Length | LED     | Part Number   | Applicable Safety Relay Module |
|-----------------------|--------------|---------|---------------|--------------------------------|
| 1NO + 1NC             | 2m           | Without | HS7A-DMC5902  | HR1S-D□                        |
|                       |              | With    | HS7A-DMC5912  |                                |
|                       | 5m           | Without | HS7A-DMC5905  |                                |
|                       |              | With    | HS7A-DMC5915  |                                |
|                       | 10m          | Without | HS7A-DMC59010 |                                |
|                       |              | With    | HS7A-DMC59110 |                                |
| 2NO                   | 2m           | Without | HS7A-DMC7902  | HR1S-AF□                       |
|                       |              | With    | HS7A-DMC7912  |                                |
|                       | 5m           | Without | HS7A-DMC7905  |                                |
|                       |              | With    | HS7A-DMC7915  |                                |
|                       | 10m          | Without | HS7A-DMC79010 |                                |
|                       |              | With    | HS7A-DMC79110 |                                |

### Accessory

| Name     | Part Number |
|----------|-------------|
| Actuator | HS9Z-ZC1    |



One HS9Z-ZC1 is supplied with each HS7A-DMC non-contact interlock switch.

### Maximum Number of Connectable Non-contact Interlock Switches per Input of Safety Relay Module

| Non-contact Interlock Switch | HS7A-DMC59□□ |          | HS7A-DMC79□□ |          |
|------------------------------|--------------|----------|--------------|----------|
|                              | Without LED  | With LED | Without LED  | With LED |
| HR1S-D□                      | 6            | 3        | —            | —        |
| HR1S-AF□                     | —            | —        | 6            | 1        |



The HS7A-DMC non-contact interlock switch is supplied with an HS9Z-ZC1 actuator.  
The contact configuration in the table above shows the contact status when the non-contact interlock switch is not activated.

### HR1S Safety Relay Modules for Non-contact Interlock Switches

| Safety Relay Module | Voltage                                           | Number of Inputs | Max. Number of Connectable Non-contact Interlock Switches |
|---------------------|---------------------------------------------------|------------------|-----------------------------------------------------------|
| HR1S-DMB□32         | 24V DC –20 to +20%                                | 2                | 12                                                        |
| HR1S-DME□32         |                                                   | 6                | 36                                                        |
| HR1S-AF□30B         | 24V AC –15 to +10% 50/60 Hz<br>24V DC –15 to +10% | 1                | 6                                                         |

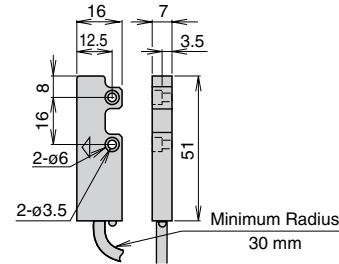


Safety category 3 can be achieved when connecting two or more non-contact interlock switches per one input.  
When connecting multiple non-contact interlock switches (HS7A-DMC790□), use HR1S-AF51□.  
(HS7A-DMC791□ cannot be connected in multiple numbers.)

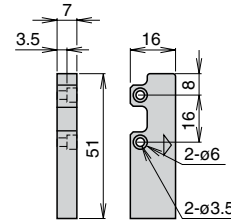
## Specifications

|                             |                                                            |                                      |
|-----------------------------|------------------------------------------------------------|--------------------------------------|
| Applicable Standards        | IEC/EN 60947-5-1<br>UL508 (UL listed)<br>CSA C22.2, No. 14 |                                      |
| Operating Temperature       | -25 to 85°C (no freezing)                                  |                                      |
| Relative Humidity           | 30 to 85% RH (no condensation)                             |                                      |
| Storage Temperature         | -40 to +85°C (no freezing)                                 |                                      |
| Pollution Degree            | 3                                                          |                                      |
| Electric Shock Protection   | Class II (IEC 60536)                                       |                                      |
| Degree of Protection        | IP67 (IEC 60529)                                           |                                      |
| Shock Resistance            | 300 m/s <sup>2</sup> (11 ms) (IEC 60068-2-7)               |                                      |
| Vibration Resistance        | 100 m/s <sup>2</sup> (10 to 150 Hz) (IEC 60068-2-6)        |                                      |
| Rated Voltage (Ue)          | 24V DC                                                     |                                      |
| Rated Current (Ie)          | 100 mA                                                     |                                      |
| Repeat Accuracy             | 10% maximum                                                |                                      |
| Maximum Operating Frequency | 150 Hz                                                     |                                      |
| Voltage Drop                | I = 10 mA                                                  | 0.1V (without LED) / 2.4V (with LED) |
|                             | I = 100 mA                                                 | 1V (without LED) / 4.2V (with LED)   |
| Housing Material            | PBT                                                        |                                      |
| Housing Color               | Red                                                        |                                      |
| Cable                       | AWG23 × 4<br>Cable length: 2m, 5m, 10m                     |                                      |
| Weight (approx.)            | HS7A-DMC: 100g (cable length: 2m)<br>HS9Z-ZC1: 9g          |                                      |

**Dimensions (mm)**  
**HS7A-DMC**  
**(Non-contact Interlock Switch)**



**HS9Z-ZC1 (Actuator)**

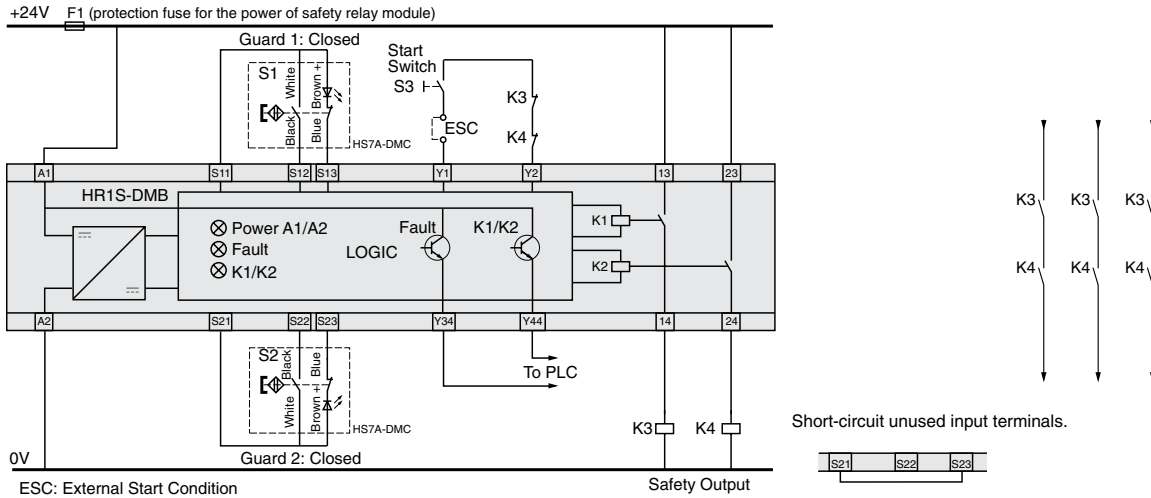


## Example Wiring Diagram

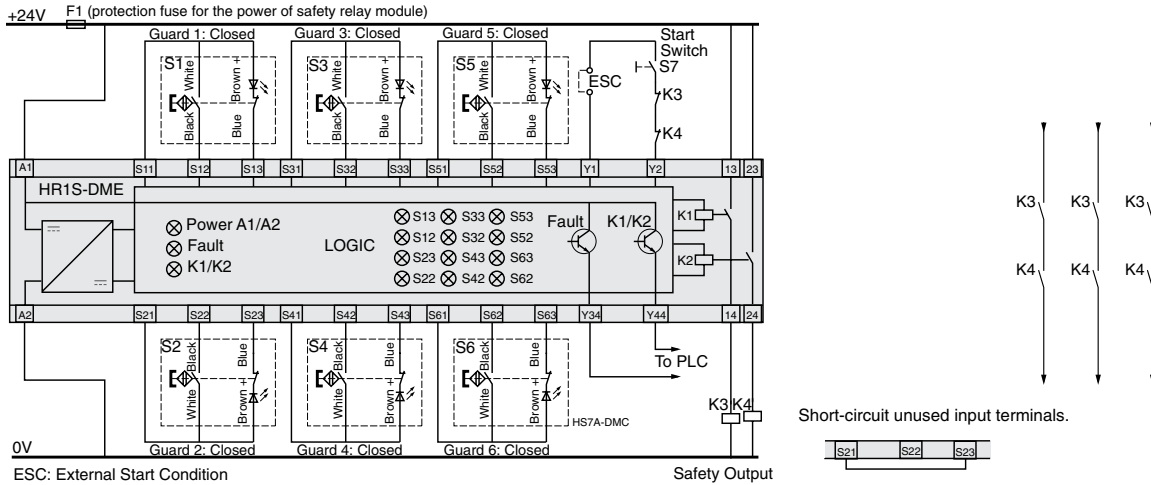


The following diagrams show the contact statuses when the non-contact interlock switches are activated by the actuators.

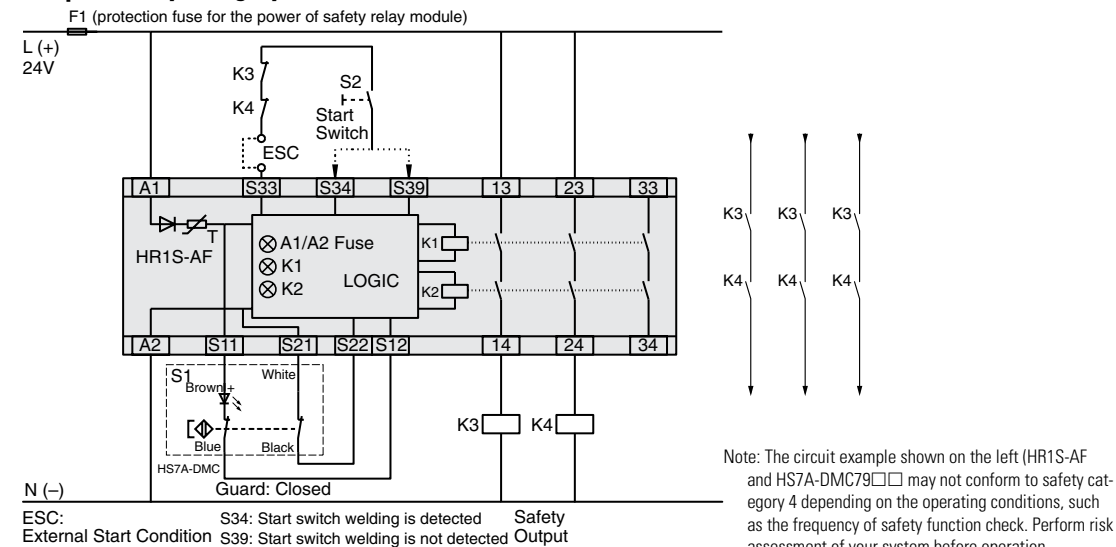
### Example: Safety Category 4 (ISO 13849-1) Circuit, HR1S-DMB + HS7A-DMC591 (1NO+1NC) + HS9Z-ZC1



### Example: Safety Category 4 (EN 13849-1) Circuit, HR1S-DME + HS7A-DMC591 (1NO+1NC) + HS9Z-ZC1

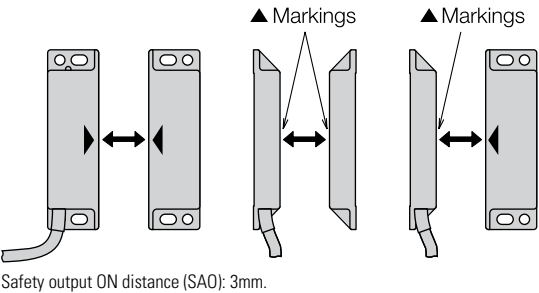


### Example: Safety Category 4 (EN 13849-1) Circuit, HR1S-DME + HS7A-DMC591 (1NO+1NC) + HS9Z-ZC1



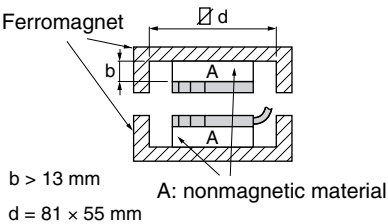
Operating Instructions

Operating Direction

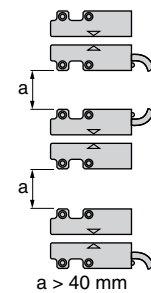


Precautions for Installation

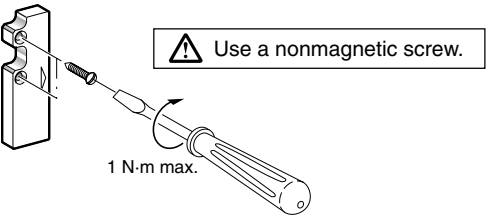
When installing on a ferromagnet



Close mounting



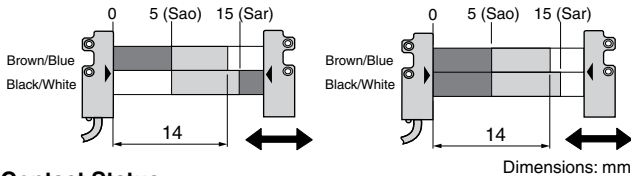
Tightening Torque



Operation Chart

HS7A-DMC59□□(1NO+1NC)

HS7A-DMC79□□(2NO)



Contact Status

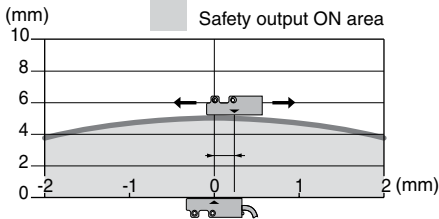
|    |                    |
|----|--------------------|
| ■  | Contact Closed (1) |
| □  | Contact Open (0)   |
| ■□ | Transient State    |

Sao: Assured operating distance where the safety output is sure to turn on.

Sar: Assured release distance where the safety output is sure to turn off.

Note: When the transfer time between the actuator's Sao-Sar is 500 ms or longer, the time lag is detected as an error.

Operation Area



## HS7A-DMP Magnetic Safety Switches

### Key features:

- Three-contact models.  
Auxiliary contacts enable PLCs to monitor the door status.
- Operation signals from auxiliary contacts can be read directly by controllers such as PLCs, allowing for monitoring HS7A-DMP non-contact interlock switches.
- Ideal for installation on guard doors where positioning is difficult.
- Conformable up to safety category 4 (EN ISO 13849-1)  
(Combining with proprietary safety relay module achieves safety category 4.)
- A maximum of 36 sets can be connected (safety relay module: HR1S-DME)
- Degree of protection: IP67



The HS7A-DMP non-contact interlock switches can be used as interlock switches when used in combination with safety relay modules specified by IDEC.

### Part Numbers

#### HS7A Non-contact Interlock Switches

| Contact Configuration | Cable Length | LED     | Ordering Type No. | Applicable Safety Relay Module |
|-----------------------|--------------|---------|-------------------|--------------------------------|
| 1NO+2NC               | 2m           | Without | HS7A-DMP5002      | HR1S-D□                        |
|                       |              | With    | HS7A-DMP5012      |                                |
|                       | 5m           | Without | HS7A-DMP5005      |                                |
|                       |              | With    | HS7A-DMP5015      |                                |
| 2NO+1NC               | 2m           | Without | HS7A-DMP7002      | HR1S-AF□                       |
|                       |              | With    | HS7A-DMP7012      |                                |
|                       | 5m           | Without | HS7A-DMP7005      |                                |
|                       |              | With    | HS7A-DMP7015      |                                |



The HS7A-DMP non-contact interlock switch is supplied with an HS9Z-ZP1 actuator.  
The contact configuration in the table above shows the contact status when the non-contact interlock switch is not activated.

### Accessory

| Name     | Part Number |
|----------|-------------|
| Actuator | HS9Z-ZP1    |



One HS9Z-ZP1 is supplied with each HS7A-DMP non-contact interlock switch.

### Maximum Number of Connectable Non-contact Interlock Switches per Input of Safety Relay Module

| Non-contact Interlock Switch | HS7A-DMP50□□ |          | HS7A-DMP70□□ |          |
|------------------------------|--------------|----------|--------------|----------|
|                              | Without LED  | With LED | Without LED  | With LED |
| HR1S-DM□                     | 6            | 3        | —            | —        |
| HR1S-AF□                     | —            | —        | 6            | 1        |

### HR1S Safety Relay Modules for Non-contact Interlock Switches

| Safety Relay Module | Number of Inputs | Max. Number of Connectable Non-contact Interlock Switches |
|---------------------|------------------|-----------------------------------------------------------|
| HR1S-DMB□           | 2                | 12                                                        |
| HR1S-DME□           | 6                | 36                                                        |
| HR1S-AF□            | 1                | 6                                                         |

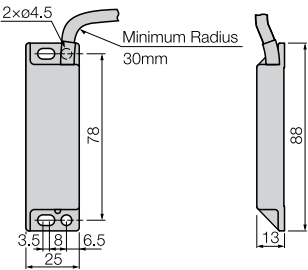


When connecting multiple non-contact interlock switches (HS7A-DMP700□), use HR1S-AF□.  
(HS7A-DMP701□ cannot be connected in multiple numbers.)

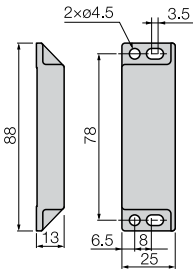
Specifications

|                             |                                                            |                                      |
|-----------------------------|------------------------------------------------------------|--------------------------------------|
| Applicable Standards        | IEC/EN 60947-5-1<br>UL508 (UL listed)<br>CSA C22.2, No. 14 |                                      |
| Operating Temperature       | -25 to 85°C (no freezing)                                  |                                      |
| Relative Humidity           | 35 to 85% RH (no condensation)                             |                                      |
| Storage Temperature         | -40 to +85°C (no freezing)                                 |                                      |
| Pollution Degree            | 3                                                          |                                      |
| Electric Shock Protection   | Class II (IEC 60536)                                       |                                      |
| Degree of Protection        | IP67 (IEC 60529)                                           |                                      |
| Shock Resistance            | 300 m/s <sup>2</sup> (11 ms) (IEC 60068-2-7)               |                                      |
| Vibration Resistance        | 100 m/s <sup>2</sup> (10 to 150 Hz) (IEC 60068-2-6)        |                                      |
| Rated Voltage (Ue)          | 24V DC                                                     |                                      |
| Rated Current (Ie)          | 100 mA                                                     |                                      |
| Repeat Accuracy             | 10% maximum                                                |                                      |
| Maximum Operating Frequency | 150 Hz                                                     |                                      |
| Voltage Drop                | I = 10 mA                                                  | 0.1V (without LED) / 2.4V (with LED) |
|                             | I = 100 mA                                                 | 1V (without LED) / 4.2V (with LED)   |
| Electrical Durability       | 1,200,000 operations minimum                               |                                      |
| Housing Material            | PBT                                                        |                                      |
| Housing Color               | Red                                                        |                                      |
| Cable                       | AWG23 × 6<br>Cable length: 2m, 5m                          |                                      |
| Weight (approx.)            | HS7A-DMP: 180g (cable length: 2 m)<br>HS9Z-ZP1: 50g        |                                      |

Dimensions (mm)  
HS7A-DMP□□□□  
(Non-contact  
Interlock Switch)



HS7A-ZP1 (Actuator)

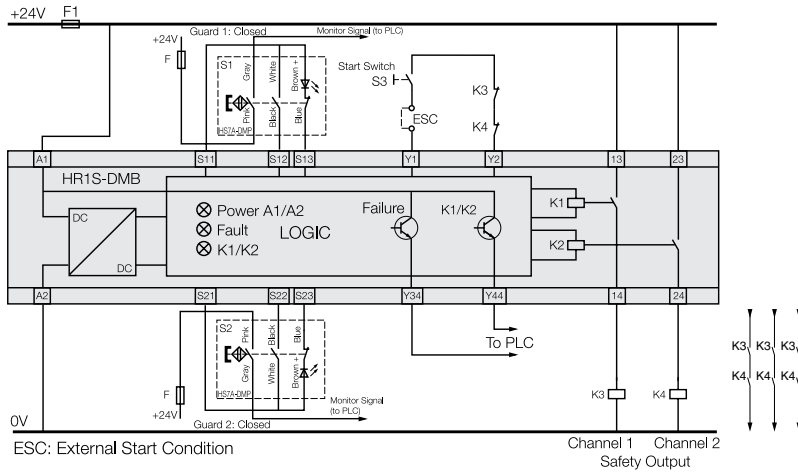


## Example Wiring Diagram

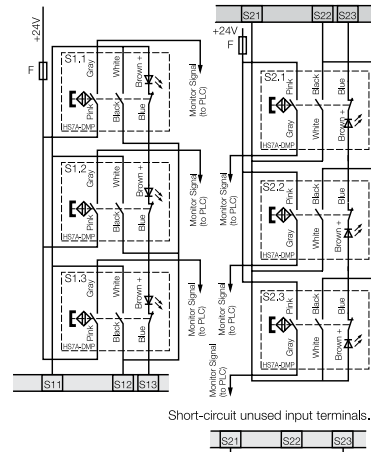


The following diagrams show the contact statuses when the non-contact interlock switches are activated by the actuators.

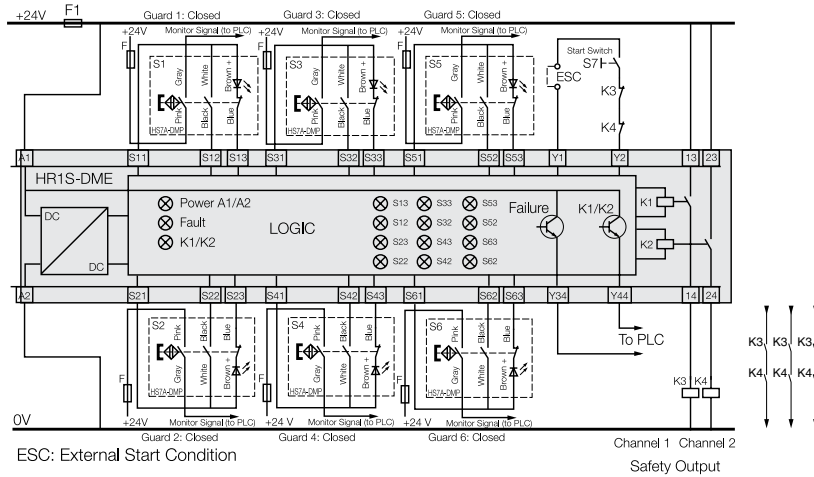
### Example: Safety Category 4 (ISO 13849-1) Circuit HR1S-DMB + HS7A-DMP50 (1N0+2NC) + HS9Z-ZP1



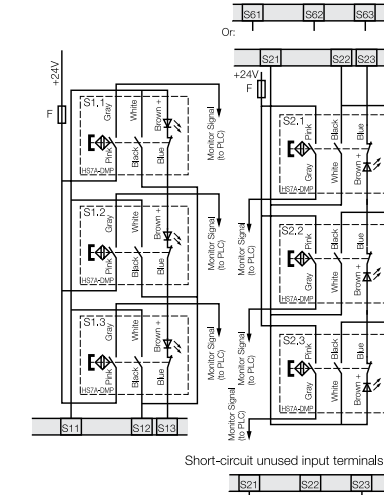
### Example: Safety Category 3 (EN ISO 13849-1) Circuit HR1S-DMB



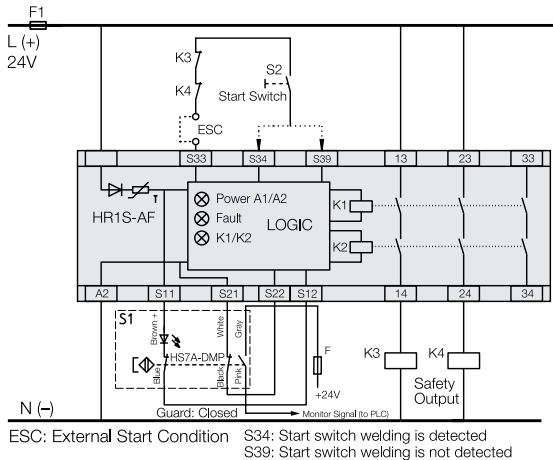
### Example: Safety Category 4 (ISO 13849-1) Circuit HR1S-DME + HS7A-DMP50 (1N0+2NC) + HS9Z-ZP1



### Example: Safety Category 3 (ISO 13849-1) Circuit HR1S-DME



### Example: Safety Category 4 (ISO 13849-1) Circuit HR1S-AF + HS7A-DMP70 (2N0+1NC) + HS9Z-ZP1



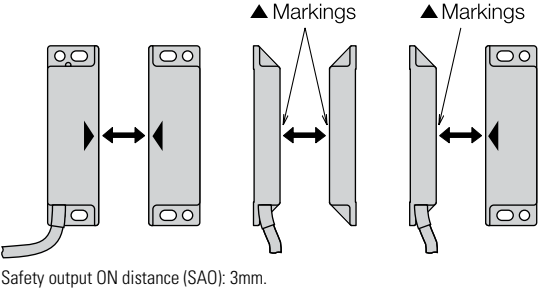
F1: Protection fuse for the power of safety relay module

F: Protection fuse for monitor signal contacts (max. 500mA gG (gL))

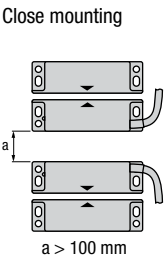
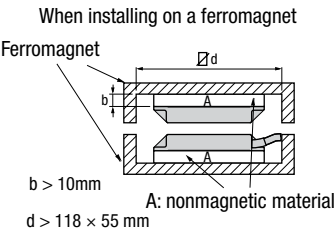
Note: The circuit example shown on the left (HR1S-AF and HS7A-DMP70) may not conform to safety category 4 depending on the operating conditions, such as the frequency of safety function check. Perform risk assessment of your system before operation.

Operating Instructions

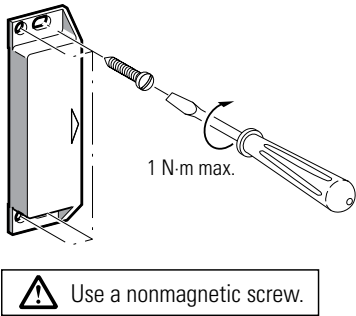
Operating Direction



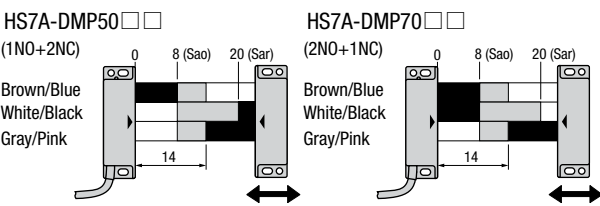
Precautions for Installation



Tightening Torque



Operation Chart



Contact Status

|     |                    |
|-----|--------------------|
| ■   | Contact closed (1) |
| □   | Contact open (0)   |
| ■ □ | Transient area     |

Sao: Assured operating distance where the safety output is sure to turn on.

Sar: Assured release distance when the safety output is sure to turn off.

Note: When the transfer time between the actuator's Sao-Sar is 500 ms or longer, the time lag is detected as an error.

Operation Area

