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	

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 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.)

Accessory

Name	Part Number
Actuator	HS9Z-ZC1

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

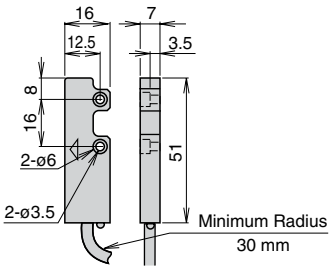
Maximum Number of Connectable Non-contact Interlock Switches per Input of Safety Relay Module

Non-contact Interlock Switch	HS7A-DMC59☐☐		HS7A-DMC79☐☐	
	Without LED	With LED	Without LED	With LED
HR1S-D☐	6	3	–	–
HR1S-AF☐	–	–	6	1

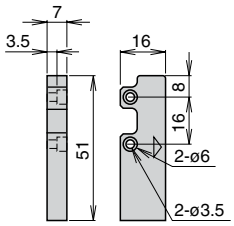
Specifications

Applicable Standards		IEC/EN 60947-5-1 UL508 (UL listed) 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^2 (11 ms) (IEC 60068-2-7)
Vibration Resistance		100 m/s^2 (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 Cable length: 2m, 5m, 10m
Weight (approx.)		HS7A-DMC: 100g (cable length: 2m) HS9Z-ZC1: 9g

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



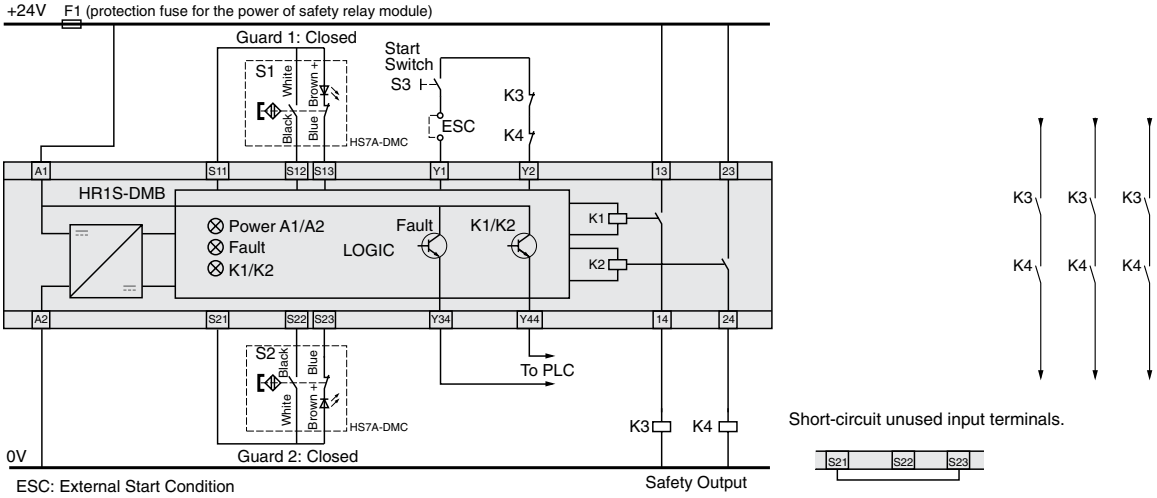
HS9Z-ZC1 (Actuator)



Example Wiring Diagram

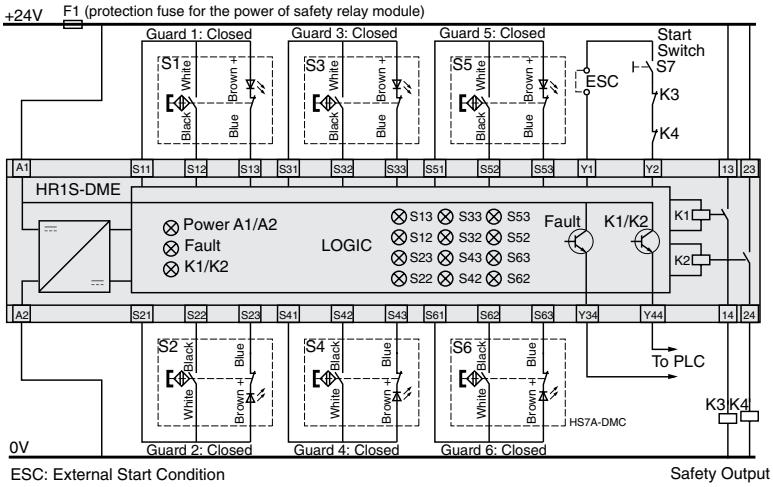
The following diagrams show the contact statuses when the non-contact interlock switches are activated by the actuators.

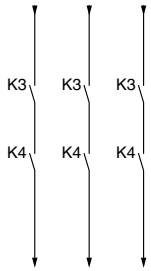
Example: Safety Category 4 (ISO 13849-1) Circuit, HR1S-DMB + HS7A-DMC591□ (1NO+1NC) + HS9Z-ZC1



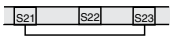
Short-circuit unused input terminals.

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

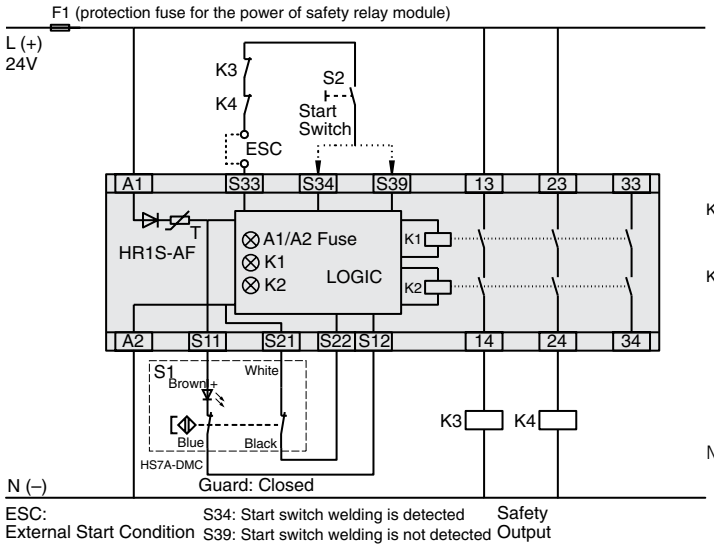


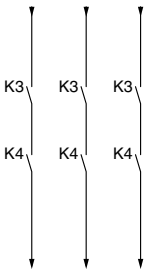


Short-circuit unused input terminals.



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

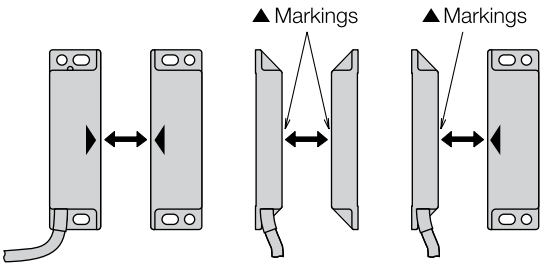




Note: The circuit example shown on the left (HR1S-AF and HS7A-DMC79□□ may not conform to safety category 4 depending on the operating conditions, such as the frequency of safety function check. Perform risk assessment of your system before operation.

Operating Instructions

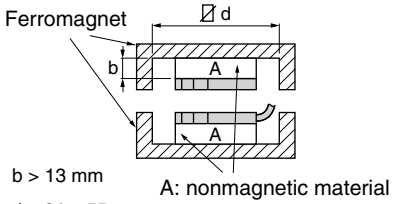
Operating Direction



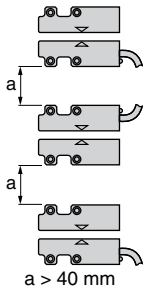
Safety output ON distance (SAO): 3mm.

Precautions for Installation

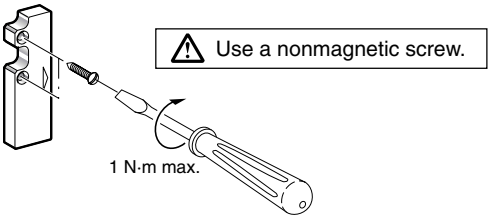
When installing on a ferromagnet



Close mounting

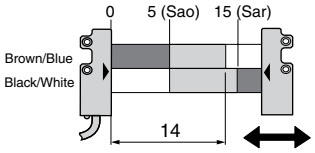


Tightening Torque

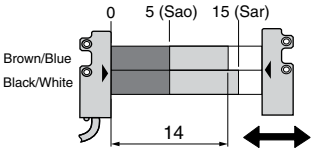


Operation Chart

HS7A-DMC59□□(1NO+1NC)



HS7A-DMC79□□(2NO)



Dimensions: mm

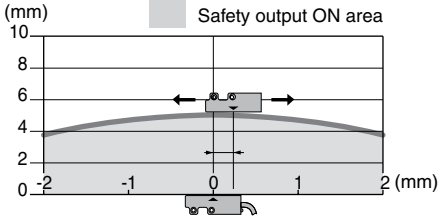
Contact Status

	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.

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.)

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

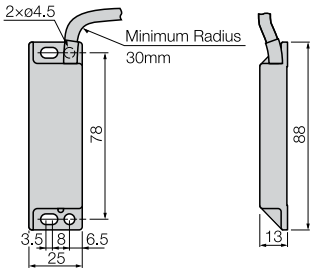
Non-contact Interlock Switch	HS7A-DMP50☐☐		HS7A-DMP70☐☐	
	Without LED	With LED	Without LED	With LED
HR1S-DM☐	6	3	–	–
HR1S-AF☐	–	–	6	1

Specifications

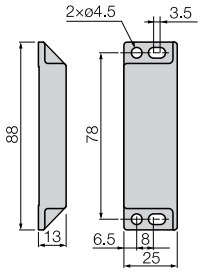
Applicable Standards		IEC/EN 60947-5-1 UL508 (UL listed) CSA C22.2, No. 14
Operating Temperature		–25 to 85°C (no freezing)
Relative Humidity		35 to 85% RH (no condensation)
Storage Temperature		–40 to +85°C (no freezing)
Pollution Degree		3
Electric Shock Protection		Class II (IEC 60536)
Degree of Protection		IP67 (IEC 60529)
Shock Resistance		300 m/s^2 (11 ms) (IEC 60068-2-7)
Vibration Resistance		100 m/s^2 (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 Cable length: 2m, 5m
Weight (approx.)		HS7A-DMP: 180g (cable length: 2 m) HS9Z-ZP1: 50g

Dimensions (mm)

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



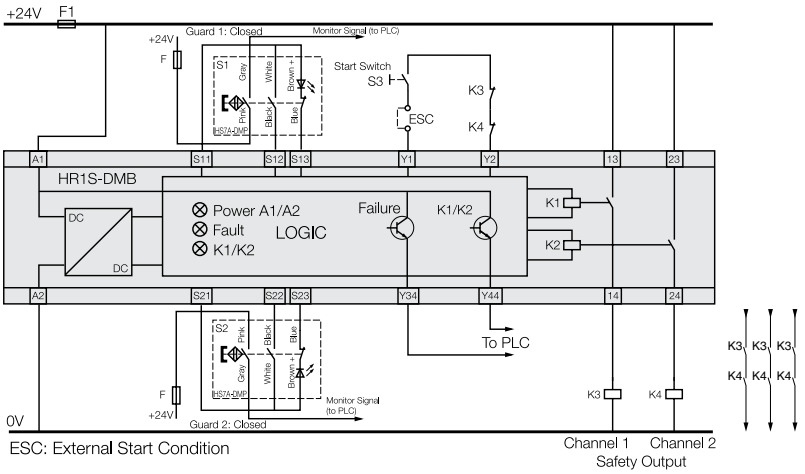
HS7A-ZP1 (Actuator)



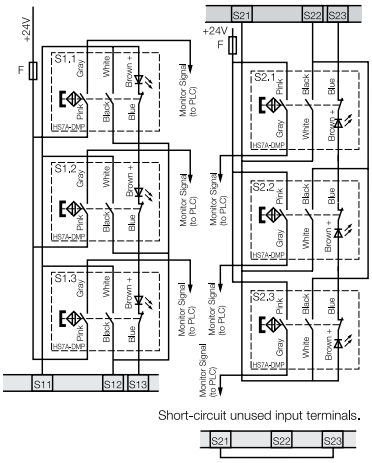
Example Wiring Diagram

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

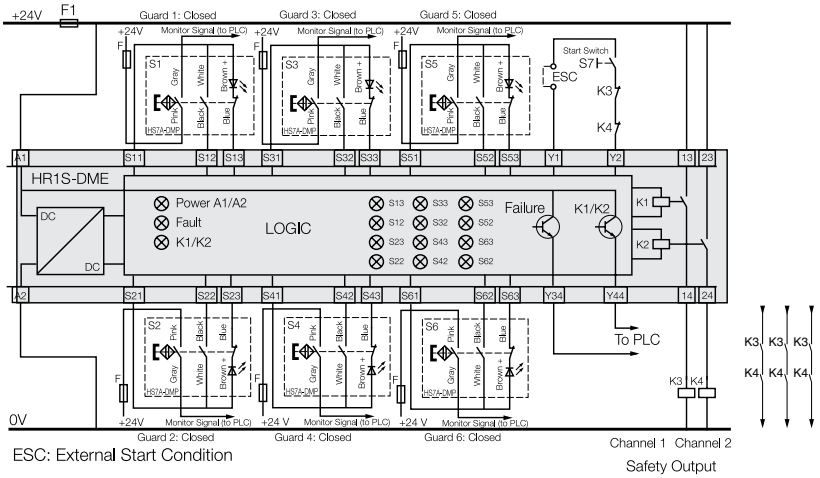
Example: Safety Category 4 (ISO 13849-1) Circuit HR1S-DMB + HS7A-DMP50□□ (1NO+2NC) + HS9Z-ZP1



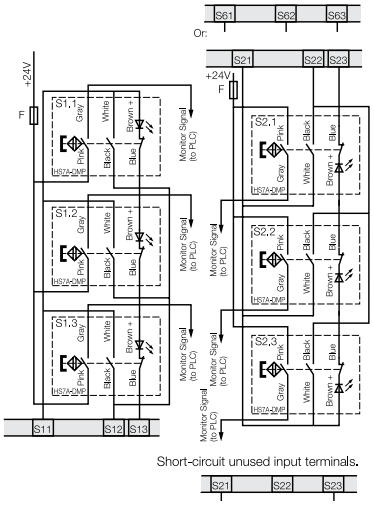
Example: Safety Category 3 (EN ISO 13849-1) Circuit HR1S-DMB



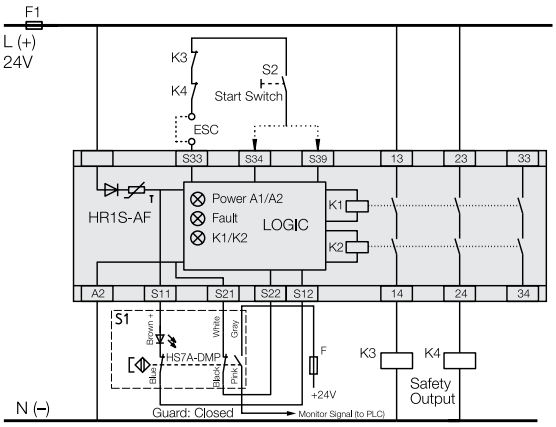
Example: Safety Category 4 (ISO 13849-1) Circuit HR1S-DME + HS7A-DMP50□□ (1NO+2NC) + HS9Z-ZP1



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



Example: Safety Category 4 (ISO 13849-1) Circuit HR1S-AF + HS7A-DMP70□□ (2NO+1NC) + HS9Z-ZP1



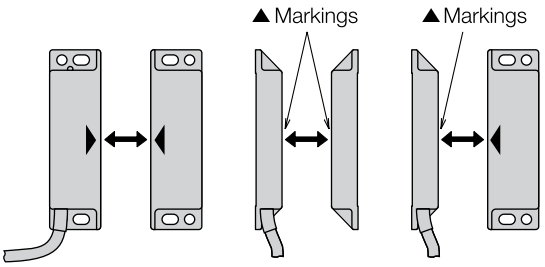
F1: Protection fuse for the power of safety relay module

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

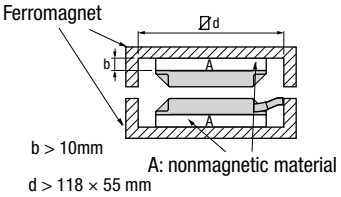
Operating Direction



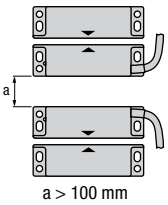
Safety output ON distance (SAO): 3mm.

Precautions for Installation

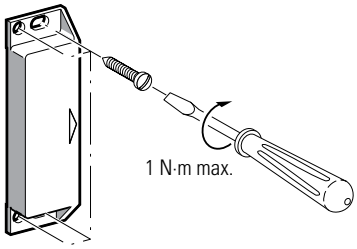
When installing on a ferromagnet



Close mounting



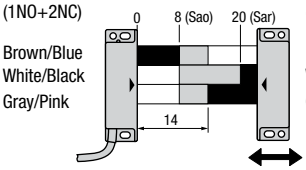
Tightening Torque



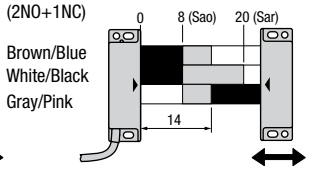
⚠ Use a nonmagnetic screw.

Operation Chart

HS7A-DMP50□□ (1NO+2NC)



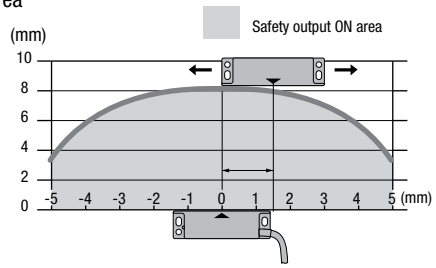
HS7A-DMP70□□ (2NO+1NC)



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