

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 24V DC –15 to +10%	1	6

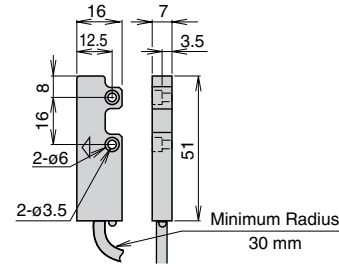


Safety category 3 can be achieved when connecting two or more non-contact interlock switches per one input.
When connecting multiple non-contact interlock switches (HS7A-DMC790□), use HR1S-AF51□.
(HS7A-DMC791□ cannot be connected in multiple numbers.)

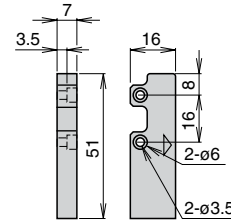
Specifications

Applicable Standards	IEC/EN 60947-5-1 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)

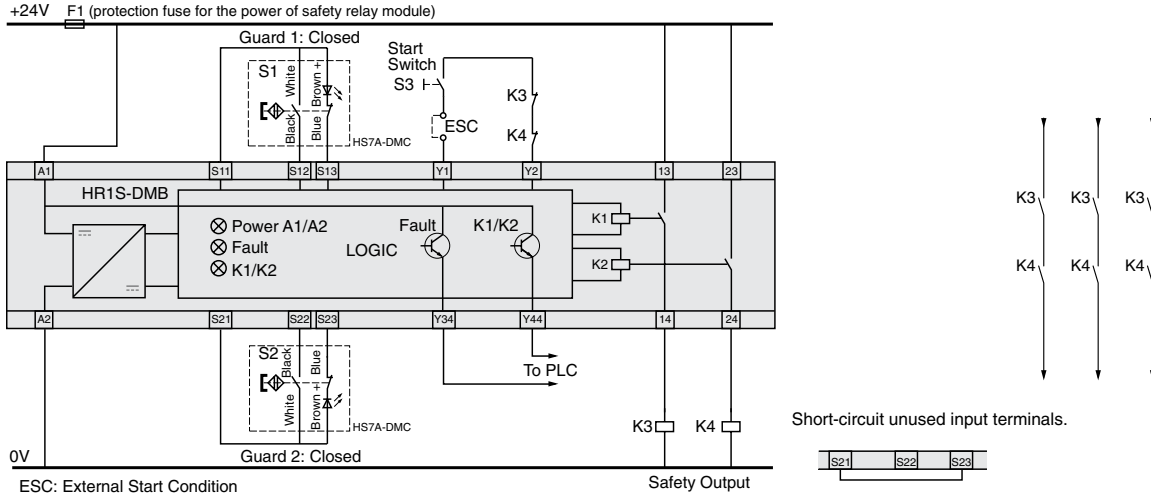


Example Wiring Diagram

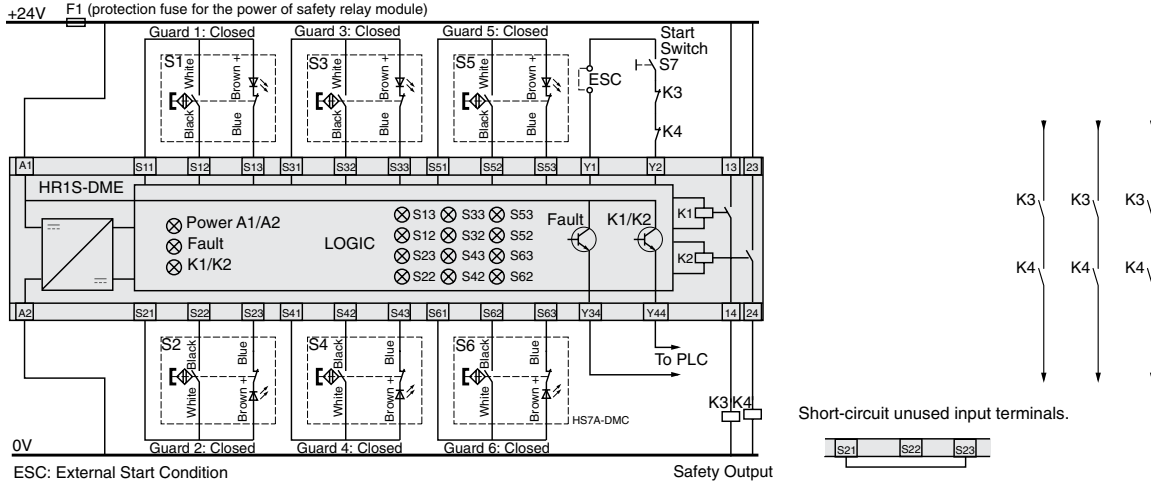


The following diagrams show the contact statuses when the non-contact interlock switches are activated by the actuators.

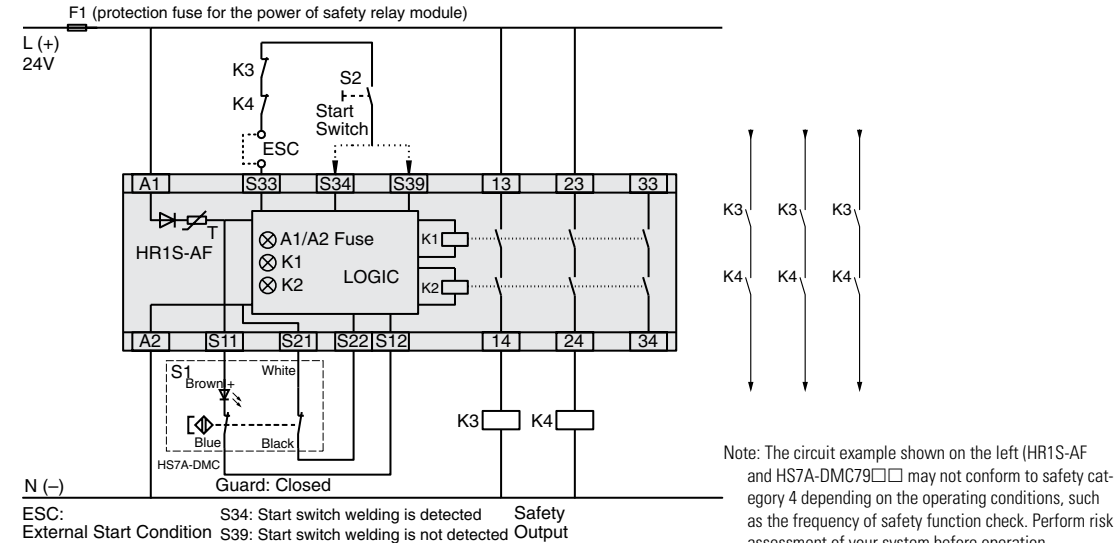
Example: Safety Category 4 (ISO 13849-1) Circuit, HR1S-DMB + HS7A-DMC591 (1NO+1NC) + HS9Z-ZC1



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

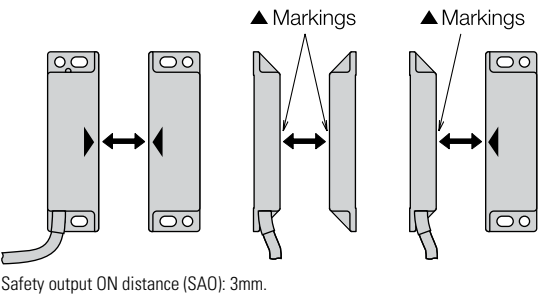


Example: Safety Category 4 (EN 13849-1) Circuit, HR1S-DME + HS7A-DMC591 (1NO+1NC) + HS9Z-ZC1



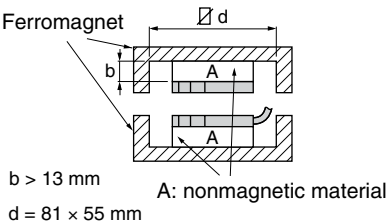
Operating Instructions

Operating Direction

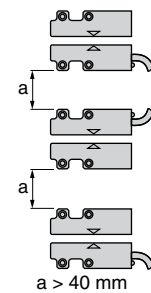


Precautions for Installation

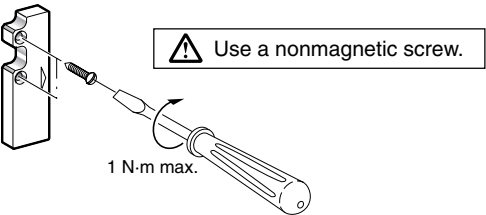
When installing on a ferromagnet



Close mounting



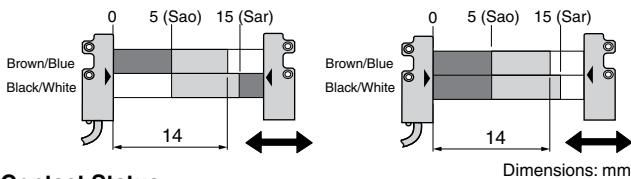
Tightening Torque



Operation Chart

HS7A-DMC59□□(1NO+1NC)

HS7A-DMC79□□(2NO)



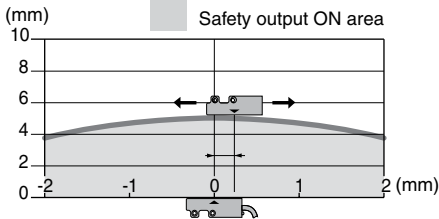
Contact Status

■	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

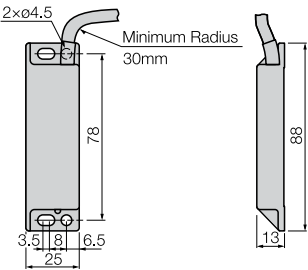


When connecting multiple non-contact interlock switches (HS7A-DMP700□), use HR1S-AF□.
(HS7A-DMP701□ cannot be connected in multiple numbers.)

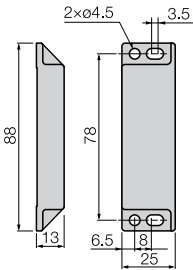
Specifications

Applicable Standards	IEC/EN 60947-5-1 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)

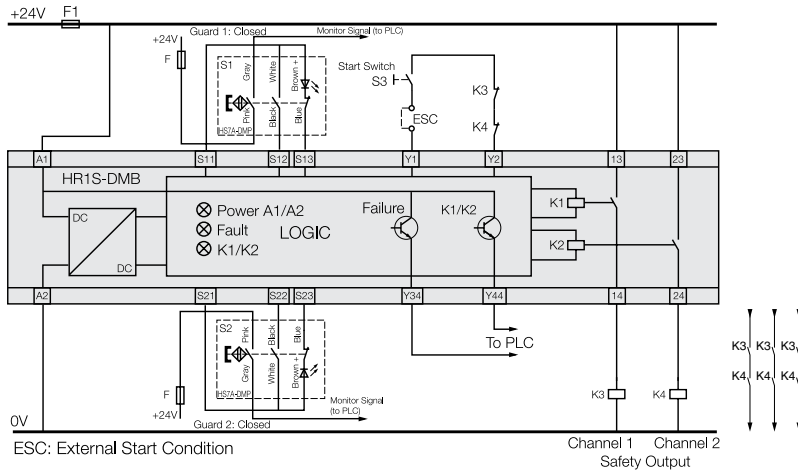


Example Wiring Diagram

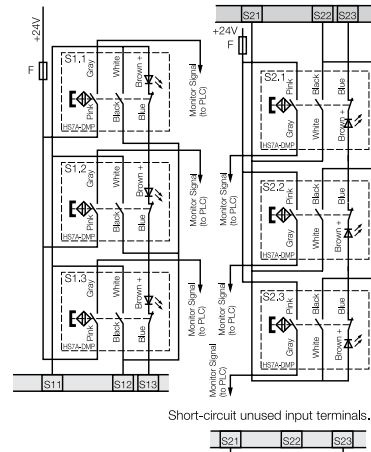


The following diagrams show the contact statuses when the non-contact interlock switches are activated by the actuators.

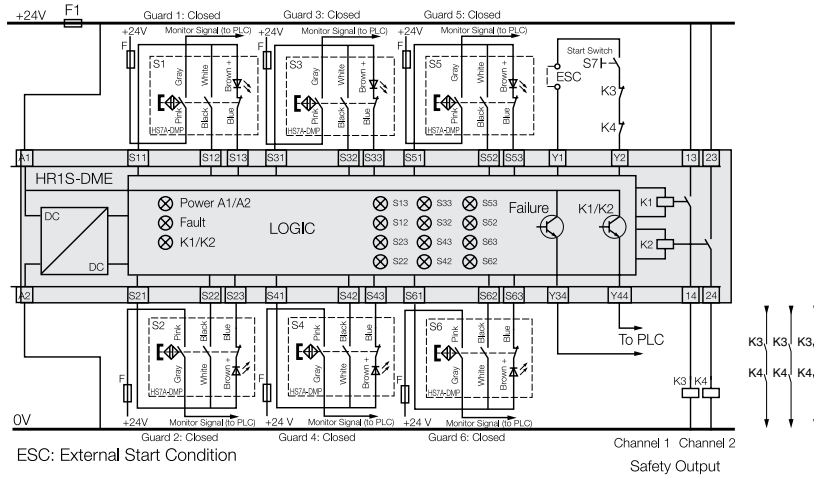
Example: Safety Category 4 (ISO 13849-1) Circuit HR1S-DMB + HS7A-DMP50 (1N0+2NC) + HS9Z-ZP1



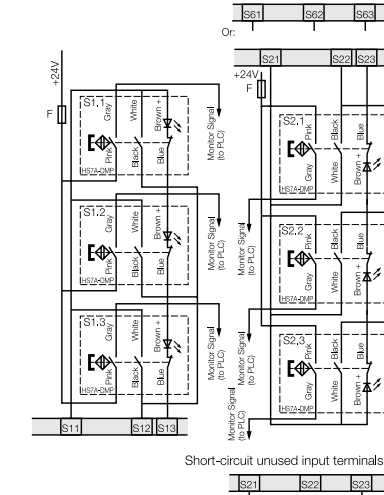
Example: Safety Category 3 (EN ISO 13849-1) Circuit HR1S-DMB



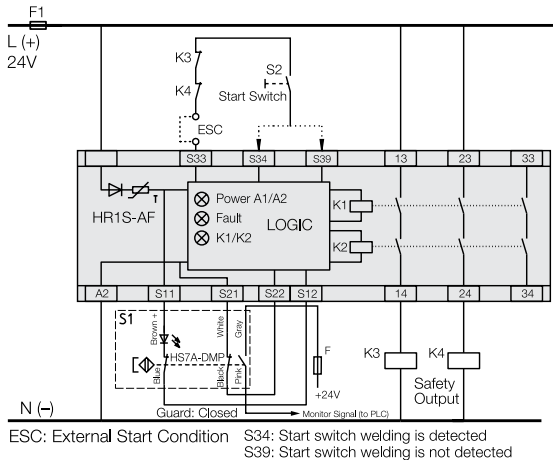
Example: Safety Category 4 (ISO 13849-1) Circuit HR1S-DME + HS7A-DMP50 (1N0+2NC) + HS9Z-ZP1



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



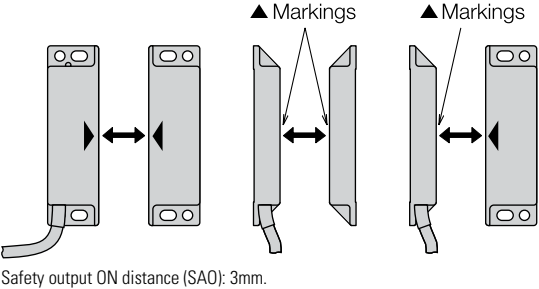
F1: Protection fuse for the power of safety relay module

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

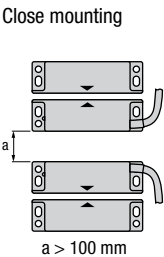
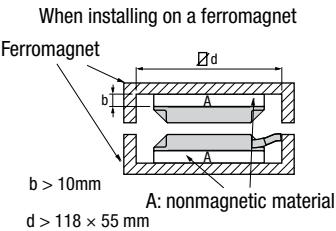
Note: The circuit example shown on the left (HR1S-AF and HS7A-DMP70) may not conform to safety category 4 depending on the operating conditions, such as the frequency of safety function check. Perform risk assessment of your system before operation.

Operating Instructions

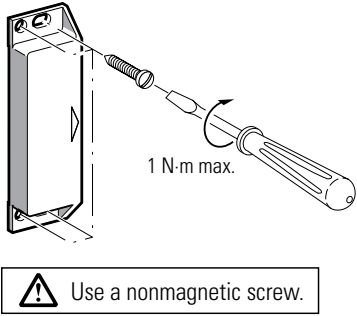
Operating Direction



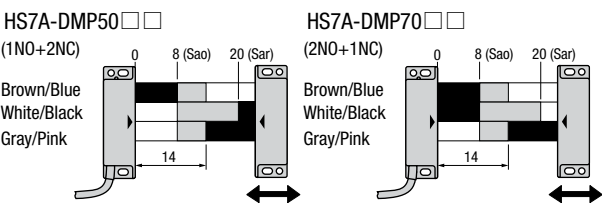
Precautions for Installation



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

