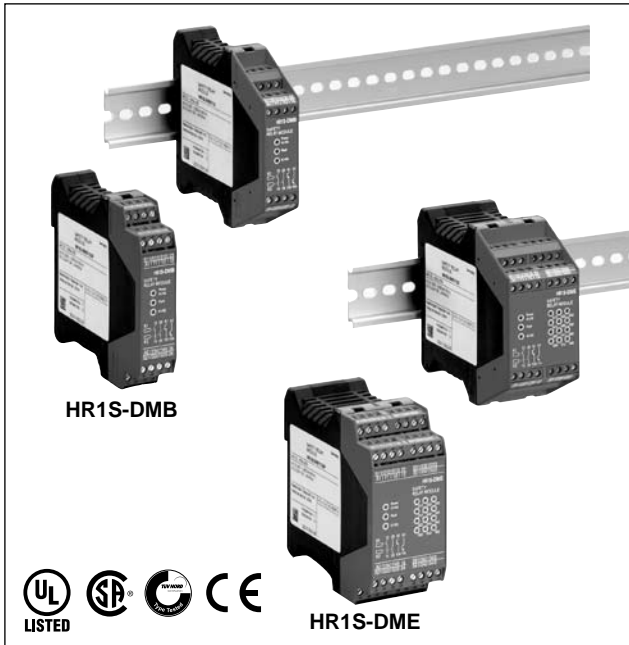


HR1S-DMB/DME Safety Relay Modules



Specifications

Operating Temperature	-10 to +55°C (no freezing)		
Degree of Protection	Terminal: IP20, Housing: IP40		
Rated Power Voltage	24V DC (-20 to +20%)		
Power Consumption	HR1S-DMB: 2.5W maximum (24V DC) HR1S-DME: 3.5W maximum (24V DC)		
Overcurrent Protection	Electronic		
Control Circuit Voltage	24V DC		
Applicable Performance Level (PL)	e (EN ISO 13849-1)		
Safety Category	4 (EN ISO 13849-1)		
Safety Integrity Level (SIL)	3 (EN 62061)		
Response Time	20 ms maximum		
Input Synchronization Time	500 ms (between two non-contact interlock switches)		
Overvoltage Category	III		
Pollution Degree	2		
Rated Insulation Voltage	300V		
Maximum Input Resistance	100Ω (per input point)		
No. of Outputs	Safety Circuit		
	Time Delay Circuit		
Auxiliary Circuit	Contact	—	
	Transistor	2NO	
Output Contact Ratings	Safety Circuit	AC-15	C300 (Ue = 230V AC / Ie = 0.75A)
		DC-13	Ue = 24V DC / Ie = 1.5A
	Time Delay Circuit	AC-15	—
		DC-13	—
	Auxiliary Circuit	AC-15	—
		DC-13	—
Transistor Circuit	24V/20 mA		
Minimum Applicable Load	17V/10 mA (initial value)		
Operation Frequency	1200 operations/hour maximum		
Rated Current	Output total 12A maximum		
Wire Size	HR1S-DMB1132: 0.14 to 2.5 mm ²		
	HR1S-DME1132: 0.2 to 2.5mm ²		
	HR1S-DMB1132P: 0.2 to 2.5mm ²		
	HR1S-DME1132P: 0.2 to 2.5mm ²		
Weight	HR1S-DMB: 180g		
	HR1S-DME: 250g		

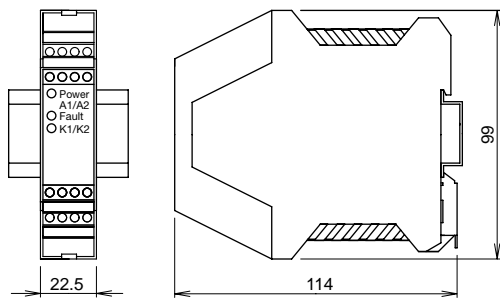
Part No.	Voltage	Terminal Style	Input
HR1S-DMB1132	24V DC -20 to +20%	Integrated terminal block	2
HR1S-DMB1132P		Removable terminal block	
HR1S-DME1132		Integrated terminal block	6
HR1S-DME1132P		Removable terminal block	

- Package quantity: 1
- For the maximum number of connectable non-contact interlock switches, see Cat No. EP1453-0.

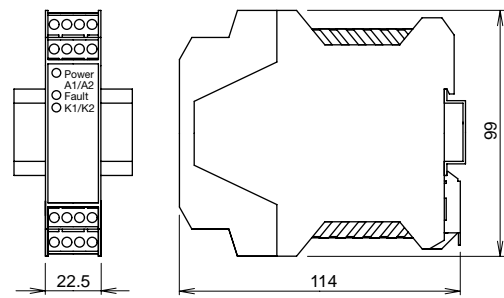
- Use a 4A fuse (Type gL) for power fuse protection.
- Use a 4A (Type gL) or a 6A fast blow fuse for output fuse protection.

Dimensions

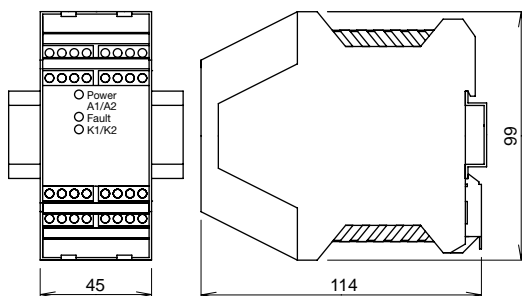
HR1S-DMB1132



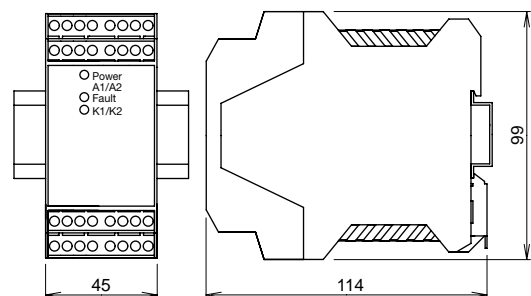
HR1S-DMB1132P



HR1S-DME1132



HR1S-DME1132P



All dimensions in mm.

HR1S-DMB/HR1S-DME Safety Relay Modules

LED Indication

HR1S-DMB

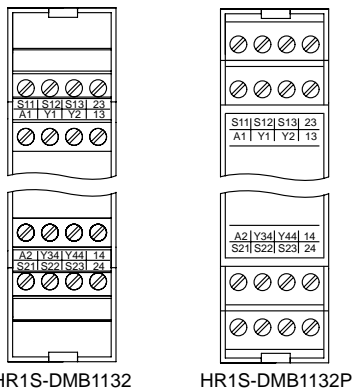
- Power A1/A2:
Turns on when power circuit is normal.
Turns off when power is interrupted or the electronic fuse blows.
- Fault:
Turns on when the HR1S fails (see failure causes on page 18).
- K1/K2:
Turns on when K1/K2 relays operate.

HR1S-DME

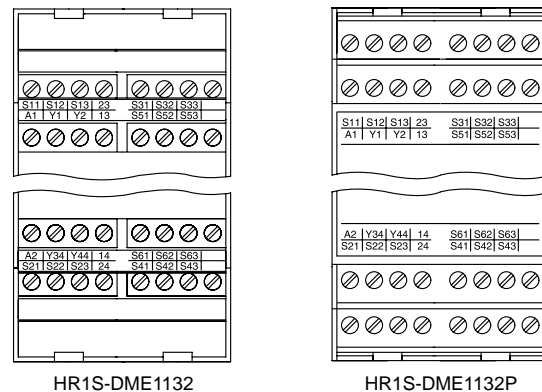
- Power A1/A2:
Turns on when power circuit is normal.
Turns off when power is interrupted or the electronic fuse blows.
- Fault:
Turns on when the HR1S fails (see failure causes on page 18).
- K1/K2:
Turns on when K1/K2 relays operate.
- S13: NO contact of non-contact interlock switch 1
- S12: NC contact of non-contact interlock switch 1
- S23: NO contact of non-contact interlock switch 2
- S22: NC contact of non-contact interlock switch 2
- S33: NO contact of non-contact interlock switch 3
- S32: NC contact of non-contact interlock switch 3
- S43: NO contact of non-contact interlock switch 4
- S42: NC contact of non-contact interlock switch 4
- S53: NO contact of non-contact interlock switch 5
- S52: NC contact of non-contact interlock switch 5
- S63: NO contact of non-contact interlock switch 6
- S62: NC contact of non-contact interlock switch 6

Terminal Arrangement

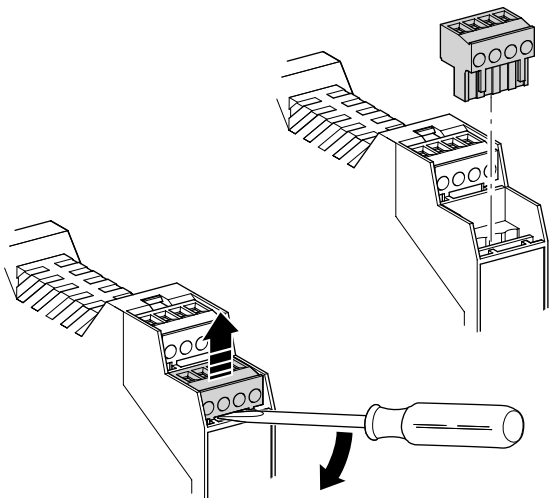
HR1S-DMB



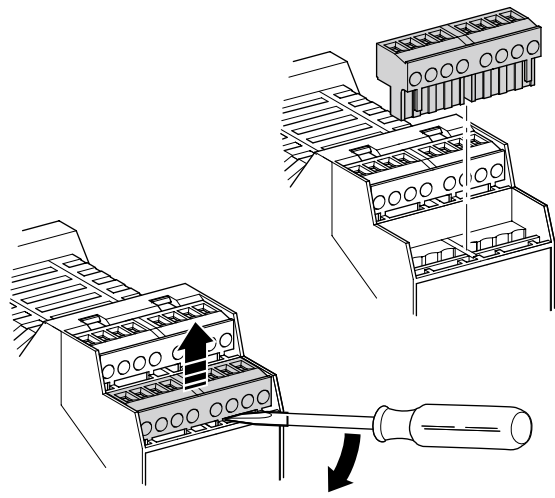
HR1S-DME



- The terminal block of the HR1S-DMB□□□□P can be removed and installed as shown below, allowing for easy installation and replacement of modules.



- The terminal block of the HR1S-DME□□□□P can be removed and installed as shown below, allowing for easy installation and replacement of modules.



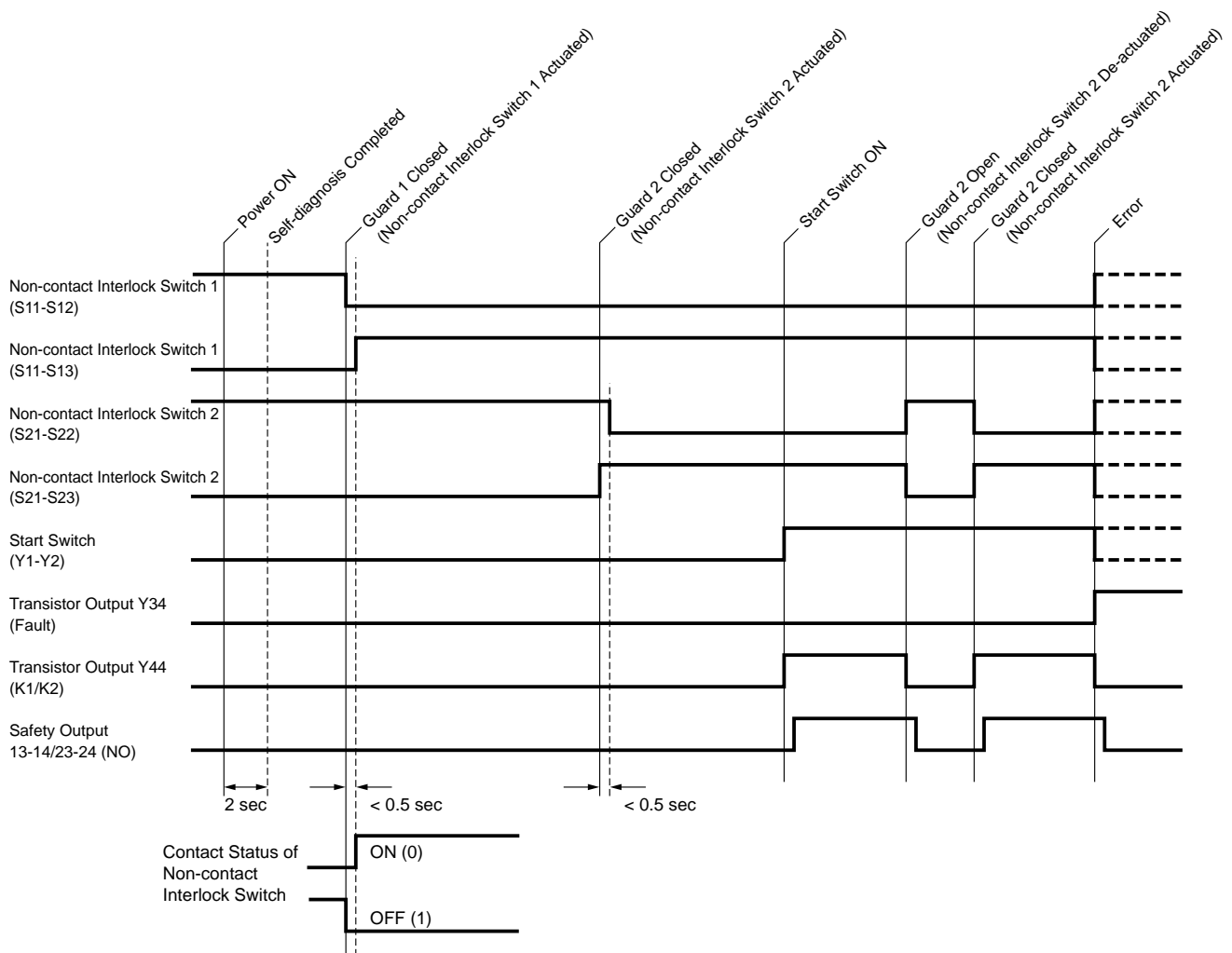
HR1S-DMB/HR1S-DME Safety Relay Modules

Causes of Fault LED Indication

LED2: Fault	Fault Type	Fault Cause	Measures
	Internal Fault	Fault of the internal circuit	Replace the safety relay module.
	External Fault	Short circuit of the +24V power supply and input terminal	Remove the short circuit and reboot.
	External Fault	Short-circuit of the non-contact interlock switch wiring	Correct the wiring of the non-contact interlock switch and reboot.
	Synchronization time excess of switch contact input	Synchronization for the NO contact and NC contact of the non-contact interlock switch (HS7A) is 0.5 seconds or longer.	Open and close the door again.
		Fault of the non-contact interlock switch (HS7A)	Replace the non-contact interlock switch.

- External fault: 1-sec ON, 1-sec OFF
- Synchronization time excess: 30-sec ON, 30-sec OFF

HR1S-DMB/HR1S-DME Safety Relay Module Operation Chart



HR1S-DMB/DME Safety Relay Modules

Residual Risk (EN292-1, 5.5)

The wiring diagrams in this catalog have been tested under actual operating conditions. The HR1S safety relay module can be used in a safety circuit by connecting to the safety equipment compliant to applicable standards. Consider residual risk in the following circumstances.

1. When circuits other than described in this catalog are used.

2. When the applicable standards of machine operation are not observed. Or, when machine is not adjusted or maintained properly (observe the maintenance schedule strictly).

3. When the contacts of relays and contactors for connecting with safety outputs are not of the forced guide type compliant with EN 50205.

Instructions

HR1S Safety Relay Modules

- Do not disassemble the safety relay modules. Do not damage the seal.
- Negligence to observe the following instructions may cause accidents that result in death or serious injuries.
 - **Connect the wires according to the wiring diagrams shown in this catalog.**
 - **Connect the wires according to the applicable standards.**
 - **The contacts of relays and contactors to connect with safety outputs must be of the forced guided type compliant with EN 50205.**
 - **When maintaining or adjusting the machines, observe the maintenance schedule.**
- Turn the power off before installation, removal, wire connection, maintenance, or inspection of the safety relay module in order to avoid electric shock or fire. Otherwise death or serious injury may be caused.

HR1S-DMB/HR1S-DME

- Use 13-14 and 23-24 safety outputs for the safety equipment which constitutes the safety circuit compliant with EN 60204-4/EN418.
- Connect the 13-14 and 23-24 safety outputs in series when turning on/off the hazard source directly in the circuit of safety category 4.
- The safety relay module will perform self diagnosis for two seconds after powering on A1-A2 terminals. During self diagnosis, all LEDs will turn on, and Y34/Y44 outputs turn on.
- Safety outputs turn on when the non-contact interlock switch has been activated and the start input turns on. The safety outputs turn on only when the NO contact of the non-contact interlock switch turns on within 0.5 seconds after the NC contact has turned off.
- Short-circuit the unused inputs according to the wiring diagram.
- Connect a surge absorbing element to the input coil of the relay connected to the safety output.
- Use a 4A fuse (Type gL) or a 6A fast blow fuse for power and output fuse protection.

HR1S-AF

- For stop category 0 compliant with EN 60204-1/EN418, use the outputs of 13-14, 23-24, and 33-34.
- Connect a start switch to S33-S34 to detect contact welding and other failures. Contact welding cannot be detected if the start switch is connected to S33-S39, because the output circuit closes when the start switch closes.