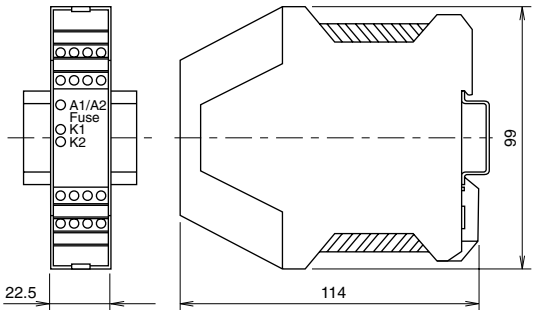
Safety Control Relay HR1S-AF

- 2NC safety input type, such as E-Stops or Interlock Switches
- EN ISO 13849-1 PLe, Safety Cat 4 compliant, and EN 62061 SIL 3
- Welding detection of start switch
- Fault diagnosis function with dual safety circuits.
- Internal relay operations can be monitored with LED Indicator.
- Finger-safe protection
- 22.5mm wide, 35mm DIN rail mounting
- UL listed, CSA certified, TÜV NORD approved

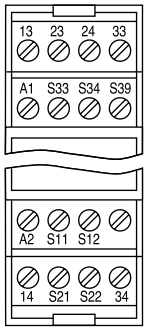
Part Numbers

Part Numbers	Terminal Style
HR1S-AF5130B	Integrated Terminal Block
HR1S-AF5130PB	Removable Terminal Block

Dimensions (mm)



Terminal Arrangement



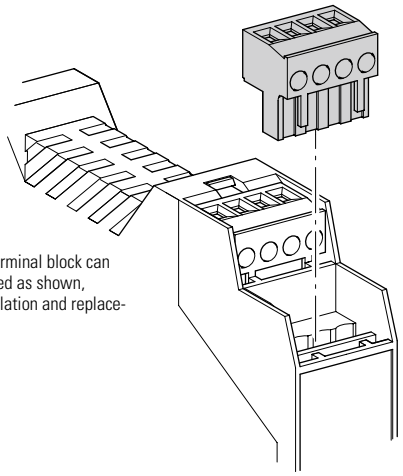
Specifications

Operating Temperature			–25 to +55°C (no freezing)
Degree of Protection			Terminal: IP20, Housing: IP40
Rated Power Voltage			24V AC (–15 to +10%) 50/60 Hz 24V DC (–15 to +10%)
Power Consumption			5 VA maximum (24V AC) 2.5W maximum (24V DC)
Overcurrent Protection			Electronic (Note)
Control Circuit Voltage			24V
Performance Level (PL)			e (EN ISO 13849-1)
Safety Category			4 (EN ISO 13849-1)
Safety Integrity Level (SIL)			3 (EN 62061)
Response Time			When S11-S12, S21-S22 are interrupted: 20 ms maximum When power is interrupted: 60 ms maximum
Input Synchronization Time			Unlimited
Overvoltage Category			III
Pollution Degree			2
Rated Insulation Voltage			300V
Maximum Input Resistance			90Ω
Safety Outputs	Instantaneous (Stop Cat 0)		3NO
Output Contact Ratings	Safety Circuit	AC-15	C300: Ue= 240VAC, Ie=0.75A
		DC-13	Ue=24VDC, Ie=2A
	Minimum Applicable Load		17V/10mA (initial value)
Operation Frequency			1200 operations/h maximum
Rated Current			Safety circuit output total: 18A maximum Each safety circuit output: 6A maximum
Wire Size			HR1S-AF5130B: 1 × 2.5 mm², 2 × 0.75 mm² maximum HR1S-AF5130PB: 1 × 2.5 mm², 2 × 1.5 mm² maximum
Weight			250g

Note: Short-circuit of S11 and S21 activates the overcurrent protection circuit, interrupting the power supply. The safety output turns off.
Normal status is restored when the short-circuit is removed.
Use a 4A fuse (Type gL) for power line protection.
Use a 4A fuse (Type gL) or a 6A fast blow fuse for output line protection.

LED Indicator

- A1/A2 Fuse:
  Turns on when power circuit is normal.
  Turns off when power is interrupted or the electronic fuse blows.
- K1: Turns on when K1 relay operates.
- K2: Turns on when K2 relay operates.

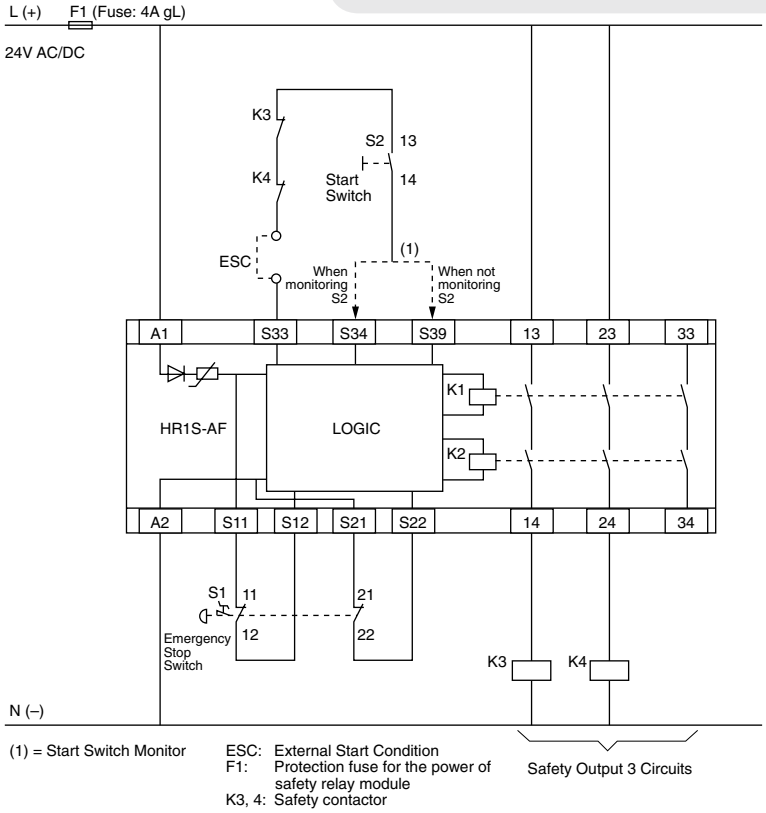


The HR1S-AF5130PB terminal block can be removed and installed as shown, allowing for easy installation and replacement of modules.

HR1S-AF Wiring Diagram

Safety Category 4 Example Circuit (using an emergency stop switch)

The Safety Category is achieved by the entire control system. Take any connected safety equipment and wiring into consideration.

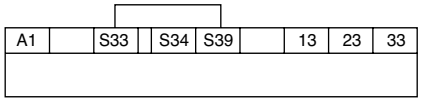


(1) = Start Switch Monitor

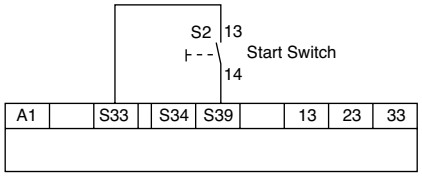
ESC: External Start Condition
F1: Protection fuse for the power of safety relay module
K3, 4: Safety contactor

Safety Output 3 Circuits

When not using a start switch (automatic start)

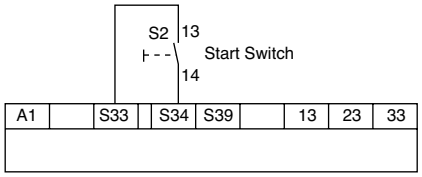


When not monitoring the start switch (welding of start switch cannot be detected)

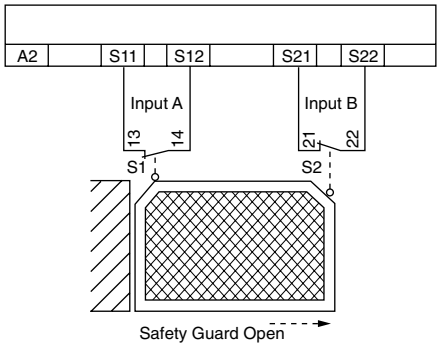


When monitoring the start switch

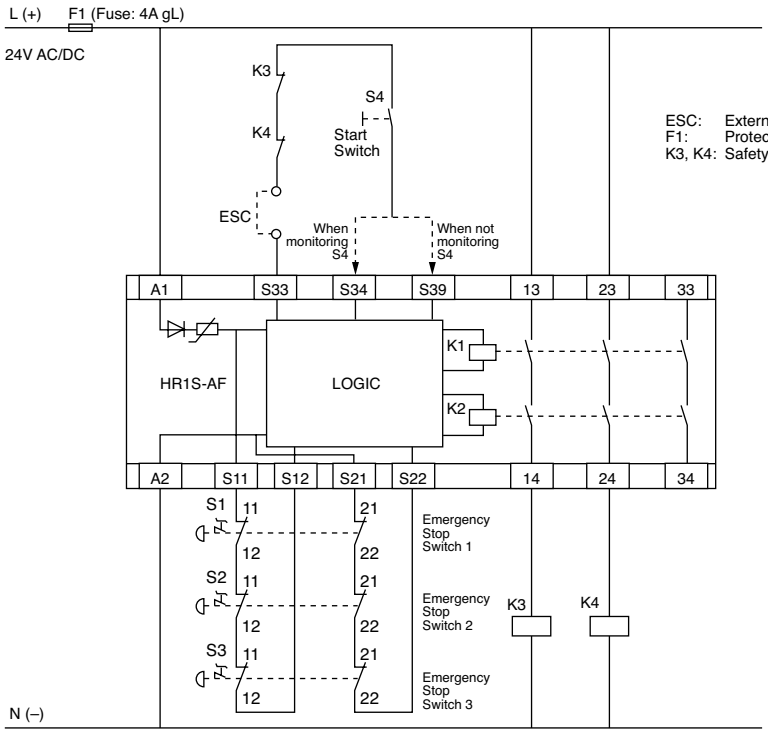
(detecting the OFF status of start switch)



Limit switch or interlock switch for guard opening/closing



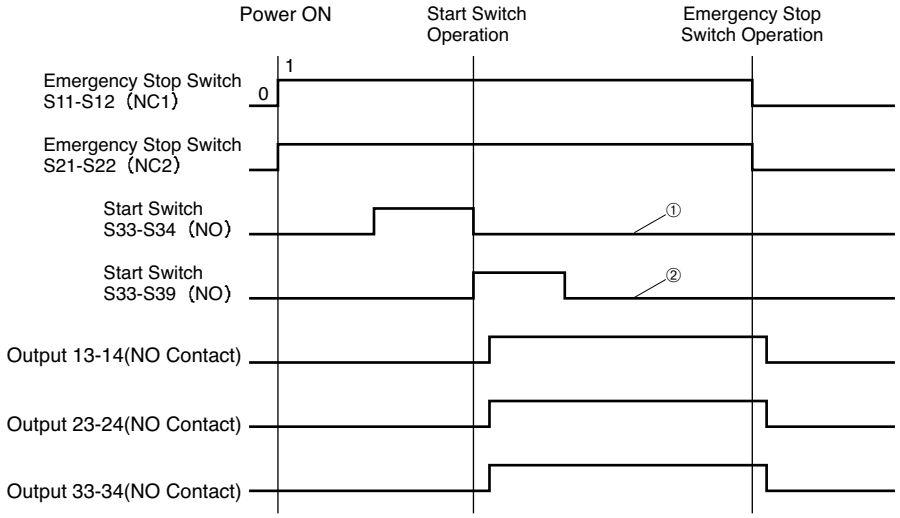
Safety Category 3 Example Circuit (using multiple emergency stop switches)



ESC: External Start Condition
F1: Protection fuse for the power of safety relay moc
K3, K4: Safety contactor

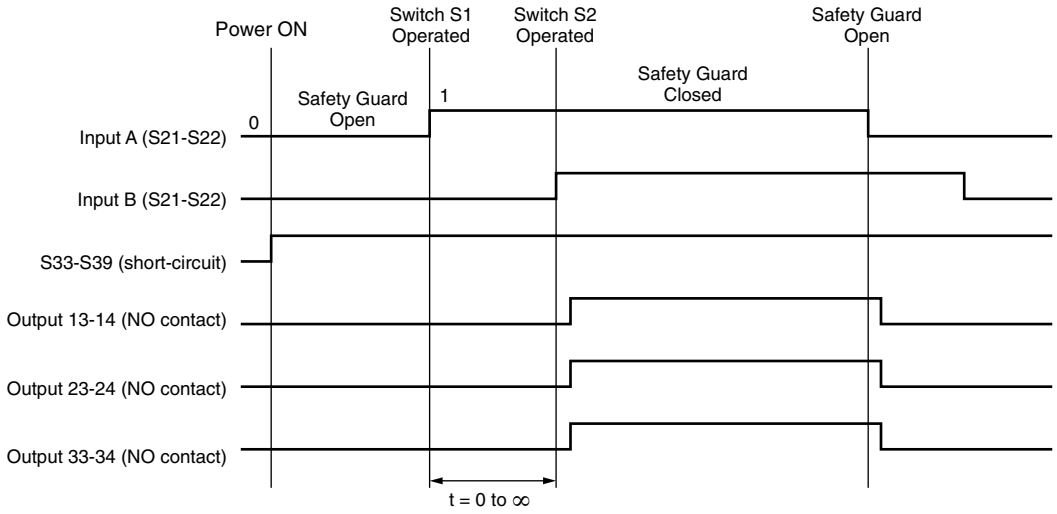
HR1S-AF Operation Chart

When Using the Emergency Stop Switch

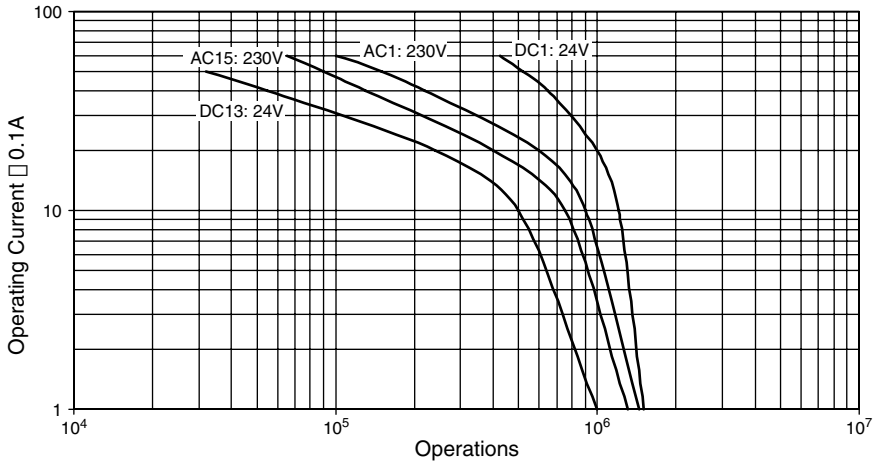


①When monitoring the start switch (detecting the OFF status of start switch)
②When not monitoring the start switch (contact welding of start switch cannot be detected)

When not Using the Safety Guard (Automatic Start)



Output Contact Electrical Life



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