

SAFE-ESTOP



22.5 mm



SAFE-ESTOP is an all-purpose emergency stop device with three safe relay contacts for safe monitoring of one or two channel sensors, certified by TÜV Rheinland. Further applications for the SAFE-ESTOP include single or dual channel emergency stop circuits and guard monitoring on machines and plants according to EN ISO 13849-1, EN 62061 and EN 61508.

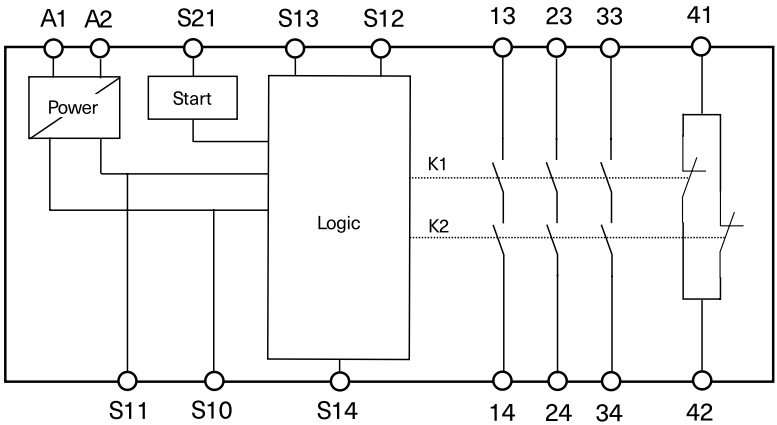
SAFE-ESTOP

Functional Safety Module | E-Stop monitoring up to SIL 3

Features

- 3 non-delayed safety contacts
- 1 non-delayed auxiliary contact
- Connection of:
 - Emergency stop buttons
 - Mechanical safety switches
 - Non-contact safety switches
 - Safety components with OSSD outputs
- Control: single or dual channel
- Feedback loop for external contactors or extension modules
- Cyclical monitoring of the output contacts
- LED indicator for power and status
- Automatic or manual start
- Short-circuit monitoring and ground fault monitoring
- Up to PL e, SILCL 3, category 4 (EN ISO 13849-1, EN 62061, EN 61508)

Function



The safety relay SAFE-ESTOP is designed for monitoring of safety circuits according to EN 60204-1, stop category 0 and can be used in safety-related applications up to safety category 4, PL e (EN ISO 13849-1) SILCL 3 (EN 62061, EN 61508).

ORDER DETAILS

Brand	SALZ Automation
Product Name	SAFE-ESTOP
Function	E-stop monitoring module with 3 N/O, 1 N/C up to SIL 3
Product SKU/Order No.	SA-SAFE-ES-01-00 (1 pc) SA-SAFE-ES-50-00 (50 pcs)



Operation Instructions

Applications

Depending on the application or the result of the risk assessment according to EN ISO 13849-1, the device must be wired as shown in Fig. 1 to Fig. 10.

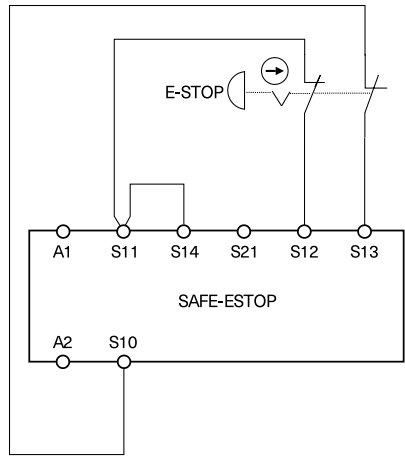


Fig. 1: Dual channel emergency stop with short circuit and ground fault monitoring (category 4, up to PL e/SIL 3)

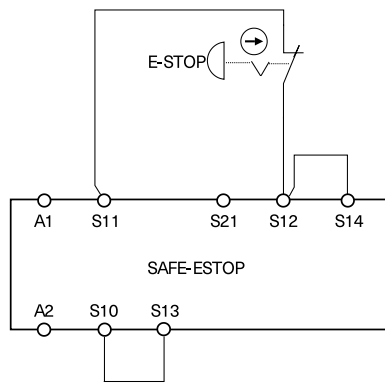


Fig. 2: Dual channel emergency stop with ground fault monitoring (category 3, up to PL d/SIL 2)

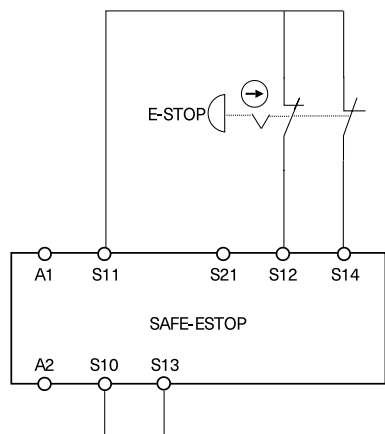


Fig. 3: Single channel emergency stop with ground fault monitoring (category 1, up to PL c/SIL 1)

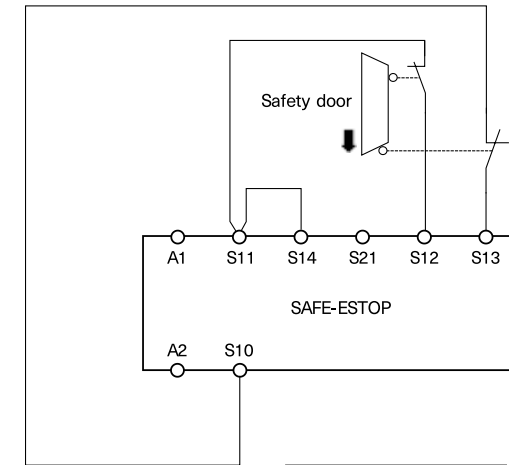


Fig. 4: Dual channel safety guard monitoring with short circuit and ground fault monitoring. (category 4, up to PL e/SIL 3)

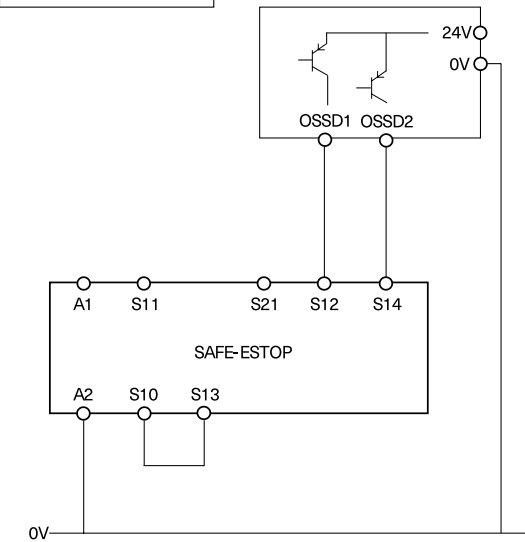


Fig. 5: Two channel emergency stop with PNP outputs/OSSD outputs with its own short circuit monitoring. (category 4, up to PL e/SIL 3)

PREREQUISITE: Signal generator meets requirements for PL e/SIL 3

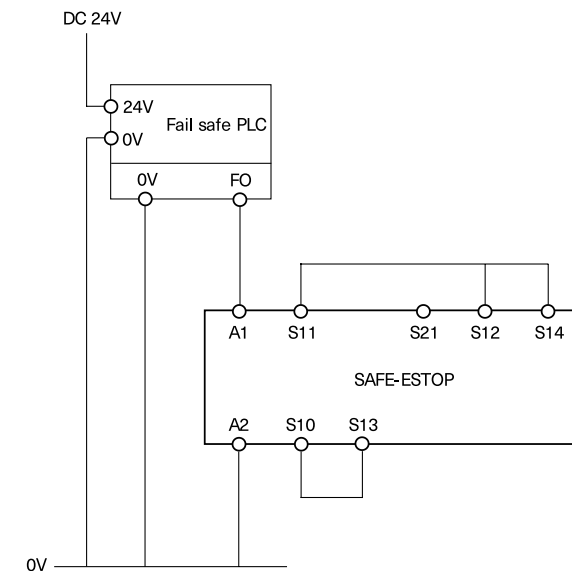


Fig. 6: Connecting to a safety PLC (category 4, up to PL e/SIL 3)

PREREQUISITE: Safe PLC output meets the required safety level and short circuit between PLC output and SAFE-ESTOP can be excluded (e.g. wiring inside an electrical installation space – see EN ISO 13849-2; Tab D4).

⚠ ATTENTION: Loss of functional safety!

For the applications according Fig. 5 and Fig. 6 the following is to be noted:

- Make sure that the ground potential of the signal generator and the SAFE-ESTOP is the same.
- It must be ensured that any switch-on pulses (light test) sent by the signal generator do not lead to a short activation of the safety relay and should therefore basically be deactivated.

Start Behaviour

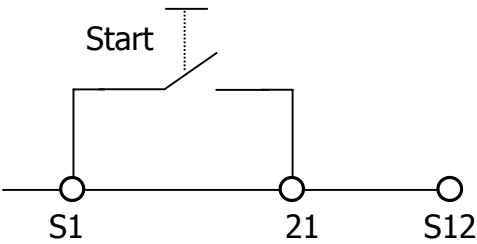


Fig. 7: Monitored manual start. It is monitored that the start button has been opened before the safety switch is closed.

PREREQUISITE: Power supply may not be interrupted.

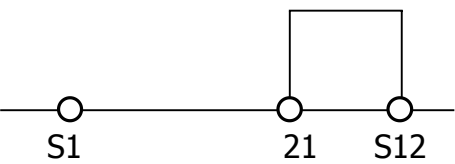


Fig. 8: Automatic start. Maximum allowable delay when closing the safety switches at S12 and S13/S14:

S12 before S13/S14: 200 ms
S13/S14 before S12: no limit

WARNING: Safety contacts will be activated immediately at power ON.

Feedback Loop

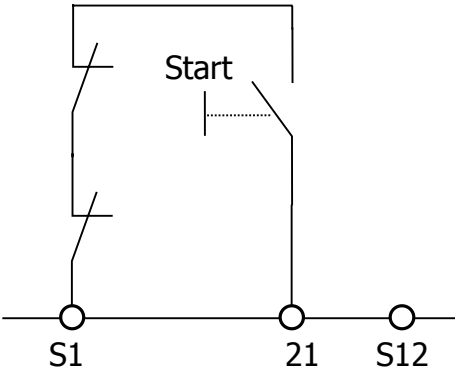


Fig. 9: Feedback loop for monitored manual start. The feedback loop monitors contactors or the expansion modules.

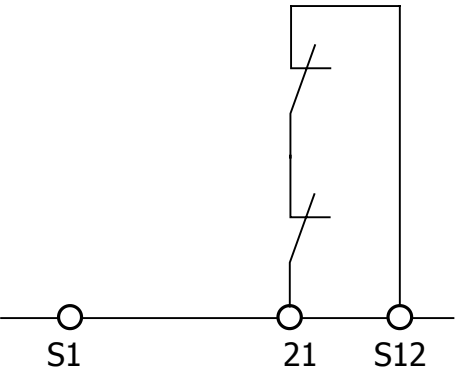


Fig. 10: Feedback loop for automatic start. The feedback loop monitors contactors or the expansion modules.

Technical Data

In compliance with	EN 60204-1; EN ISO 13849-1; IEC 62061; IEC 61508 Parts 1-2 and 4-7
Operating voltage	DC 24 V +/- 10 %
Power consumption	2.6 W
Inrush current	5 A (approx. 250 µs)
Pulse suppression (A1/S12/S14)	max. 3 ms (pulse width)/500 ms (pulse rate) max. 1 ms (pulse width)/500 ms (pulse rate)
Switch-off pulse/dark test	Note: It must be ensured that any switch-on pulses (light test) sent by the signal generator do not lead to a short activation of the safety relay and should therefore basically be deactivated.
Switch-on pulse/light test	
Safe contact configuration	3 non-delayed safety contacts (NO)
Auxiliary contacts	1 non-delayed auxiliary contact (NC)
Max. switching voltage	AC 250 V
Contact rating of safety contacts (I3-14, 23-24, 33-34) 6 switching cycles/min	AC: 250 V, 2000 VA, 8 A for resistive load 250 V, 3 A for AC-15
	DC: 30 V, 240 W, 8 A for resistive load 24 V, 3 A for DC-13
Thermal current Ith	Max. 5 A per contact (see total current limit curve)
Contact rating of auxiliary contact	AC: 250 V, 500 VA, 2 A for resistive load DC: 30 V, 60 W, 2 A for resistive load
Minimum contact load	5 V, 10 mA
External fuses	10 A gG (NO); 6 A gG (NC)
Max. switch-on delay	< 50 ms
Max. switch-off delay	Via A1: < 40 ms; Via S12 or S13/S14 < 20 ms
Recovery time	< 500 ms
Wire width	0.14 - 2.5 mm²
Tightening moment (Min./Max.)	0.5 Nm/0.6 Nm
Contact material	AgSnO ₂
Service Life	mech. approx. 1 x 10 ⁷
Rated impulse withstand voltage	2.5 kV (control voltage/contacts)
Dielectric strength	4 kV (DIN VDE 0110-1)
Rated insulation voltage	250 V
Degree of pollution/Overvoltage category	2/3 (DIN VDE 0110-0)
Protection	IP20
Temperature range Ambient	-15 °C to +55 °C
Temperature range Storage	-15 °C to +85 °C
Max. altitude	≤ 2000 m (above sea level)
Weight approx.	150 g
Mounting DIN rail according to EN 60715	TH35