Safety Relay
MSS-RT7A/B

The new generation of safety relays from MATTLE

- Dual channel operation
- Monitored Manual or Auto Start/Reset
- 2 Instant Safety output contacts
  1 Instant Auxiliary output contact
- 3 Delayed Safety output contacts
  2 Delayed Auxiliary output contacts
- 1 Instant Diagnostic output
  1 Delayed Diagnostic output
  1 Input Conditions Diagnostic output
- Configurable delay 0-30 seconds
- Easy fault diagnosis via 8 status LEDs
- Instant Contacts Up to
  PLe, SILCL 3, Category 4
- Delayed Contacts Up to
  PLe, SILCL 3, Category 3
- 24Vac/dc operation
- Emergency stop and guard interlock monitoring
- 45mm Housing with DIN rail mounting

The Mattle safety relay is designed to meet the latest safety standards and offer enhanced LED diagnostics and simplified wiring. Applications include safety interlock switches, emergency e-stop devices, door guard monitoring.

The MSS-RT7A/B internal logic uses force guided relays to achieve cross monitoring, this ensures that a single fault does not lead to the loss of the safety function and that all faults are detected at or before the next safety demand.



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Product Safety
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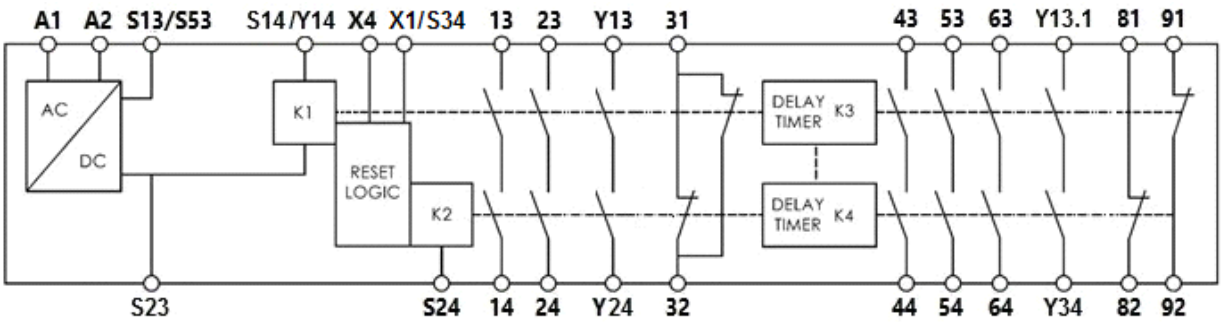
CE

Functional Description

When the control line inputs are closed and the start/reset condition has been met the safety output contacts close.
The safety relay outputs open when the inputs are de-activated or if there is a power failure. When dual channel inputs are used it is not necessary to synchronise switching of the input channels.

When operating in the monitored manual reset configuration the reset button must perform a make-then-break action before the safety relay will activate.
External device feedback contacts can be monitored via the reset loop.

Block Diagram and Connections



A1	Power Supply	X4	Auto Reset	53-54	Delayed Output Contact 2
A2	Power Supply	X1/S34	Manual Reset/ Dual Channel (Cat.3 Pld)	63-64	Delayed Output Contact 3
S13/S53	24Vd.c. Control /Reset Voltage	13-14	Safety Output Contact 1	Y13.1/Y34	Auxiliary Output (Stop 1)
S14/Y14	Control Line / Auxiliary (Door closed)	23-24	Safety Output Contact 2	31-32	Auxiliary Output Contact 1
S24	Control Line 2	Y13-Y24	Auxiliary Output (Stop 0)	81-82	Delayed Auxiliary Output Contact 1
S23	Control Line	43-44	Delayed Output Contact 1	91-92	Delayed Auxiliary Output Contact 2

Variants

Part No.	Description
6.1012	MSS-RT7A/B, AC/DC 24 V, (50-60Hz), Fixed screw terminals

Application Circuits

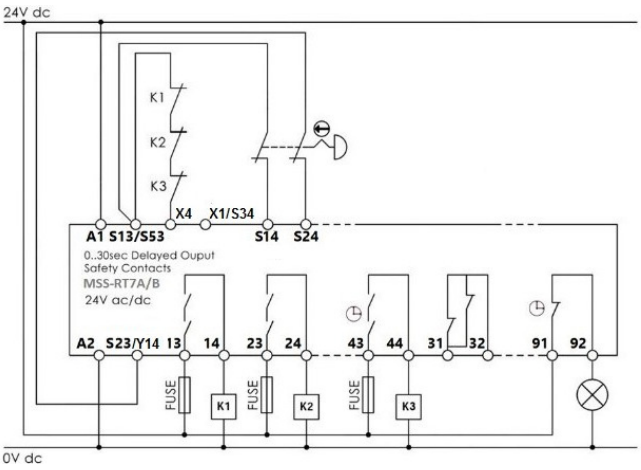


Fig.1 Dual Channel, E-Stop, Auto Reset

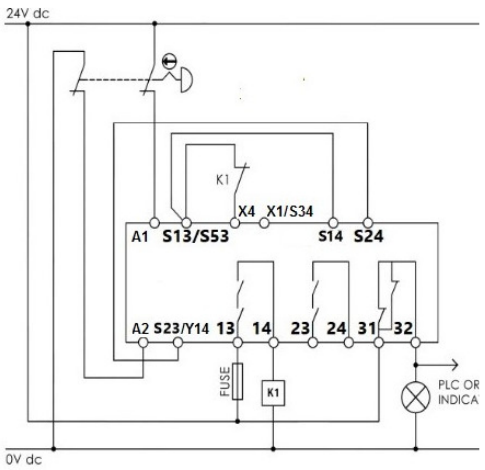


Fig.2 Single Channel, E-Stop, Auto Reset

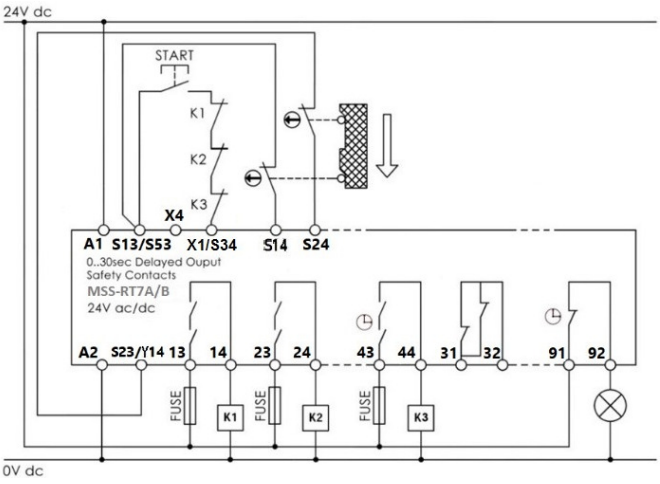


Fig.3 Dual Channel, Guard Interlock, Manual Reset

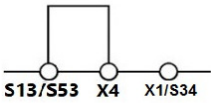


Fig.4 Auto Reset

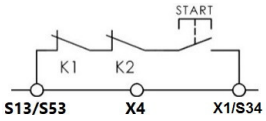


Fig.5 Manual Reset

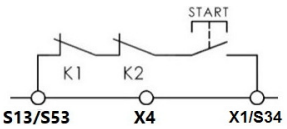


Fig.6 Contactor Feedback Check (Manual Reset)

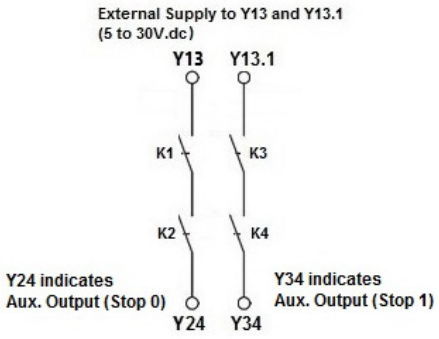
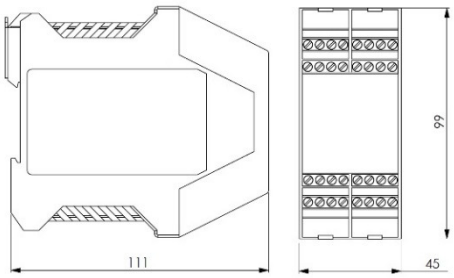


Fig.7 Diagnostic Outputs

Electrical Connection

- A power supply unit with electrical isolation from the mains supply must be connected.
- External fusing of each safety output contact is necessary, a 4A. slow-blow or 6A. quick action) must be provided.
- The maximum cabling and connecting resistance of control lines must not be exceed 300 ohms.

Dimensions



Diagnostic LEDs

POWER	Power to the safety relay.
RESET	Reset loop S13/S53-X1/S34 or S13/S53-X4 is closed.
CH1	Channel 1 – S13/S53-S23 is closed.
CH2	Channel 2 – S14/Y14-S24 is closed.
K1	Power to Internal relay K1.
K2	Power to Internal relay K2.
K3	Power to Internal relay K3
K4	Power to internal relay K4

Safety Characteristics

Characteristic Data according to **IEC 62061**

Safety Integrity Level	SIL3
PFH	2.3 E-09 (1/h) (2.3% of SIL3 (1 E-07 (1/h))
PFD_{av}	2.0 E-04 (1/h) (20% of SIL3 (1 E-03)

Characteristic Data according to **EN ISO 13849-1**

Performance Level	e
Category	4
$MTTF_d$	134a (High)
Diagnostic Coverage	99% (High)

Specification

Standards		EN/ISO13849-1; EN /SO13849-2; EN62061; UL508
Power supply Circuit		
Operating voltage		24V AC/DC
Operating voltage tolerance		-15% - +10%
Rated supply frequency		50Hz – 60Hz
Rated supply current		190mA
Power consumption	24V AC/DC	5W
Control Circuits		
Rated output voltage	S11	24V DC
Input current	S11.S14	100mA
Response time		100ms
Release time		25ms
Recovery time		Approx. 1s
Time delay range		0 – 30s
Output Circuits		
Rated output voltage		250VAC
Max. current per output		6A
Max. total current all outputs		6A
Safety contact breaking capacity	AC	230V, 4A for AC-15
	DC	24V, 30W, 2A, DC-13
Minimum contact load		10V 10mA
Min. contact fuses		4A Slow blow, 6A Fast blow
Contact material		$AgSnO_2$
Contact service life		10×10^6
General Data		
Rated impulse withstand voltage		4kV (Creepage and Clearance: Outputs -> Control Circuits: 5.5mm)
Rated insulation voltage		250V
Degree of protection		IP20
Temperature range		-20C + 55C
Degree of contamination		2
Overvoltage category		III
Weight		0.3kg
Mounting		Any position
Time delay range		0 – 30 Seconds

SAFETY WARNINGS



- **Installation should only be carried out by competent and authorised personnel and in accordance with the instructions in this manual.**
- **Only make electrical connections when the device is isolated from the main supply.**
- **If "Automatic Start" is selected be aware that safety output contacts will switch immediately after the power supply is connected.**
- **Opening the device will void the warranty. Never attempt to repair any device.**
- **Adhere to Safety Checks.**
- **DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.**

- **L'installation doit être effectuée par un personnel compétent et autorisé et en conformité avec les instructions de ce manuel.**
- **faites uniquement des connexions électriques lorsque l'appareil est isolé de l'alimentation principale.**
- **Si "Démarrage automatique" est sélectionné être conscient que les contacts de sortie de sécurité passeront immédiatement après l'alimentation est connectée.**
- **Ouverture de l'appareil annule la garantie. Ne jamais tenter de réparer tout appareil.**
- **Adhérer à des contrôles de sécurité.**
- **NE DÉFAITE PAS, SABOTAGE, OU DE CONTOURNER LA FONCTION DE SÉCURITÉ. MANQUEMENT À S'Y PEUT ENTRAÎNER LA MORT OU DES BLESSURES GRAVES**

Installation and Maintenance

Installation should as per EN 60204-1 in addition to any local regulations. The safety relay should be mounted inside a cabinet enclosure and on a 35mm DIN rail according to DIN EN 60715. No maintenance is required, there are no serviceable parts. (Refer to Safety Checks). The product is designed to be a component of a customised safety orientated control system. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. MATTLE, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by MATTLE.

UL508:
Pilot Duty R300, B300
Single contact must be used

250V AC/DC / 6,0A
Resistive
Single contact must be used

250V AC/DC / 6,0A
General Purpose
All contacts at once can be used.

USE COPPER OR COPPER-CLAD ALUMINUM CONDUCTORS
Terminal tightening torque 7 in/lbs (0.7Nm).
Maximum surround air temperature 40°C

Safety checks

1. Ensure the appropriate safety level is achieved for the application function.
2. The safety functions must be tested regularly. For applications were infrequent use is foreseeable, the system must have a manual function test. At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1 / ISO14119).

Declaration of Conformity

Manufacturer: Mattle Industrie – Produkte AG
Allmend strasse 8
CH – 8820 Fehraltorf
Switzerland

Product: Safety Emergency Stop Devices
Model types: MSS-RT7A/B

The above products conform to the safety requirements of the following directives and standards:

Machinery Directive 2006/42/EC
EMC Directive 2014/30/EC
Low Voltage Directive 2006/95/EC

EN 13849-1:2023
EN 13849-2:2012
EN 62061 :2021
EN 61508 (Parts 1-7) :2011-02
EN 60204-1:2018
EN 50178:1997

Third Party Certification: NB 0035
TUV Rheinland Industrie Service GmbH, Am Graven Stein, 51105, KOLN, Germany

CEO Markus Schoenbaechler (Fehaltorf, Switzerland)