Operating Manual

SRC30/EL

All-purpose safety emergency stop relay

Product 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 faultt monitoring
- Up to PL e, SIL 3, category 4
  (EN ISO 13849-1 / EN IEC 62061 / EN 61508)

Die deutsche Beschreibung ist verfügbar unter:
https://www.motrona.com/fileadmin/files/bedienungsanleitungen/SRC30EL_d.pdf

The English description is available at:
https://www.motrona.com/fileadmin/files/bedienungsanleitungen/SRC30EL_e.pdf

Version:	Description:
SRC30/EL version 1	First version pre-series – 17.03.2025/mbo

Table of Contents

1. Safety Instructions and Responsibility

1.1. General Safety Instructions

This operation manual is a significant component of the unit and includes important rules and hints about the installation, function and usage. Non-observance can result in damage and/or impairment of the functions to the unit or the machine or even in injury to persons using the equipment!

Please read the following instructions carefully before operating the device and observe all safety and warning instructions! Keep the manual for later use.

A pertinent qualification of the respective staff is a fundamental requirement in order to use this manual. The unit must be installed, connected and put into operation by a qualified electrician.

Liability exclusion: The manufacturer is not liable for personal injury and/or damage to property and for consequential damage, due to incorrect handling, installation and operation. Further claims, due to errors in the operation manual as well as misinterpretations are excluded from liability.

In addition, the manufacturer reserves the right to modify the hardware, software or operation manual at any time and without prior notice. Therefore, there might be minor differences between the unit and the descriptions in operation manual.

The raiser respectively positioner is exclusively responsible for the safety of the system and equipment where the unit will be integrated.

During installation or maintenance all general and also all country- and application-specific safety rules and standards must be observed.

If the device is used in processes, where a failure or faulty operation could damage the system or injure persons, appropriate precautions to avoid such consequences must be taken.

1.2. Use according to the intended purpose

The unit is intended exclusively for use in industrial machines, constructions and systems. Non-conforming usage does not correspond to the provisions and lies within the sole responsibility of the user. The manufacturer is not liable for damages which have arisen through unsuitable and improper use.
Please note that device may only be installed in proper form and used in a technically perfect condition (in accordance to the Technical Specifications). The device is not suitable for operation in explosion-proof areas or areas which are excluded by the EN 61010-1 standard.

1.3. Installation

The device is only allowed to be installed and operated within the permissible temperature range. Please ensure an adequate ventilation and avoid all direct contact between the device and hot or aggressive gases and liquids.

Before installation or maintenance, the unit must be disconnected from all voltage-sources. Further it must be ensured that no danger can arise by touching the disconnected voltage-sources.

Incoming as well as outgoing wires and wires for extra low voltages (ELV) must be separated from dangerous electrical cables (SELV circuits) by using a double resp. increased isolation.

All selected wires and isolations must be conformed to the provided voltage- and temperature-ranges. Further all country- and application-specific standards, which are relevant for structure, form and quality of the wires, must be ensured. Indications about the permissible wire cross-sections for wiring are described in the Technical Specifications.

Before first start-up it must be ensured that all connections and wires are firmly seated and secured in the screw terminals. All (inclusively unused) terminals must be fastened by turning the relevant screws clockwise up to the stop.

Overvoltages at the connections must be limited to values in accordance to the overvoltage category III.

1.4. EMC Guidelines

All motrona devices are designed to provide high protection against electromagnetic interference. Nevertheless you must minimize the influence of electromagnetic noise to the device and all connected cables.

Therefore the following measures are mandatory for a successful installation and operation:

- Cables for digital controls (digital I/O, relay outputs) must not exceed a length of 30 m and are allowed for in building operation only
- The device should be mounted in a metal enclosure with sufficient distance to sources of electromagnetic noise.
- Run signal and control cables apart from power lines and other cables emitting electromagnetic noise.

Please also refer to motrona manual “General Rules for Cabling, Grounding, Cabinet Assembly”. You can download that manual by the link
https://www.motrona.com/en/support/general-certificates.html

1.5. Cleaning, Maintenance and Service Notes

To clean the front of the unit please use only a slightly damp (not wet!), soft cloth. For the rear no cleaning is necessary. For an unscheduled, individual cleaning of the rear the maintenance staff or assembler is self-responsible.

During normal operation no maintenance is necessary. In case of unexpected problems, failures or malfunctions the device must be shipped for back to the manufacturer for checking, adjustment and reparation (if necessary). Unauthorized opening and repairing can have negative effects or failures to the protection-measures of the unit.

The device must be switched on and off at least once a year during continuous operation.

2. Introduction

SRC30/EL is an all-purpose emergency stop device with three safe relay contacts for safe monitoring of one or two channel sensors. The SRC30/EL is specially designed for the use as safety component in elevators according to EN 81-20 and EN 81-50, certified by TÜV Rheinland. Further applications for the SRC30/EL include single or dual-channel emergency stop circuits and guard monitoring on machines and plants according to EN ISO 13849-1, EN IEC 62061 and EN 61508.

3. Function

The safety emergency stop relay SRC30/EL is designed for the safe isolation of safety circuits in accordance with EN 60204-1 and thus performs the safety-related stop function up to PL e / SIL 3 in accordance with EN ISO 13849-1 / IEC 61508. If the emergency stop circuit (e.g. safety door or emergency stop button) is closed, the machine can be enabled via the SRC30/EL. When the safety function is requested via the emergency stop circuit (e.g. safety door open), the enable current paths of the SRC30/EL are opened immediately and thus safely switch off the machine. The redundant use of forcibly guided relays ensures that a single fault within the device does not lead to the loss of the safety function and that this is detected by cyclical selfmonitoring the next time the safety function is requested. The SRC30/EL can also be used as a certified safety component in elevators in accordance with EN 81-20.

3.1. Block diagram SRC30/EL

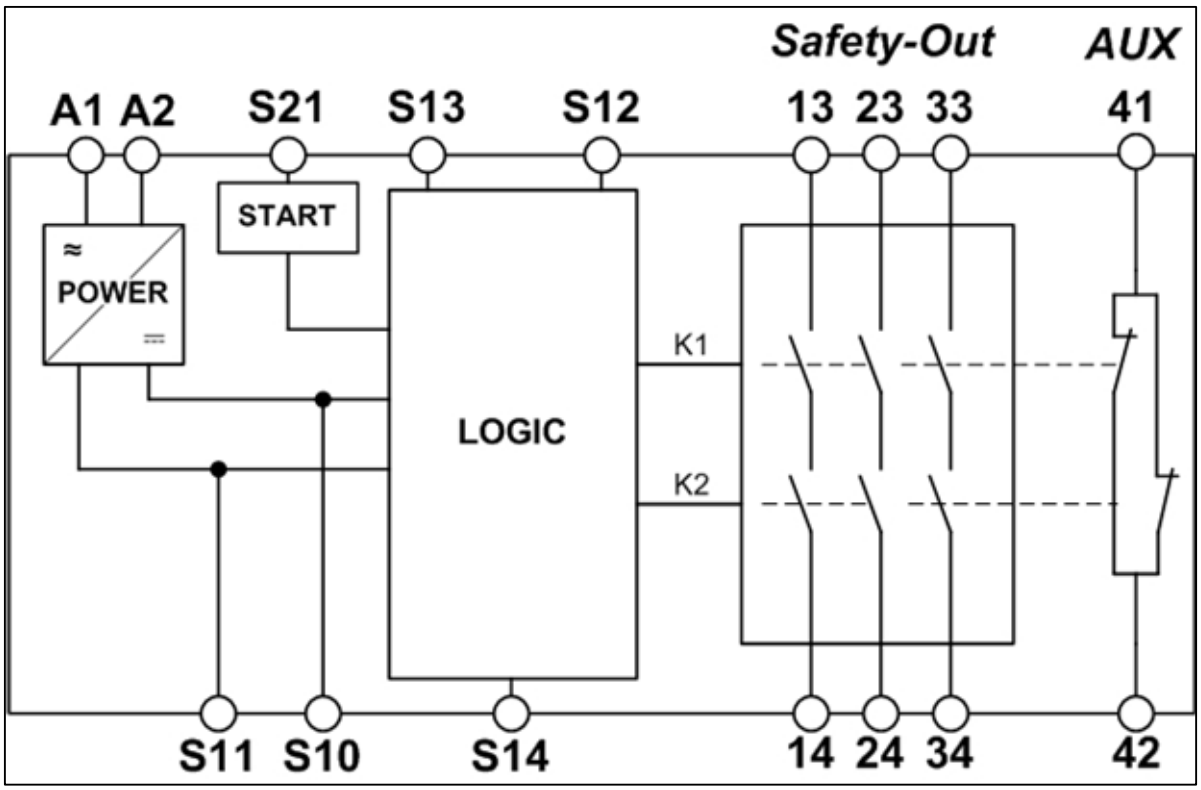


Fig. 1 Block diagram

A1: Spannungsversorgung
A2 : Spannungsversorgung
S11: Steuerspannung
S10: Ansteuerleitung

3.2. State diagram for SRC30/EL with manual start

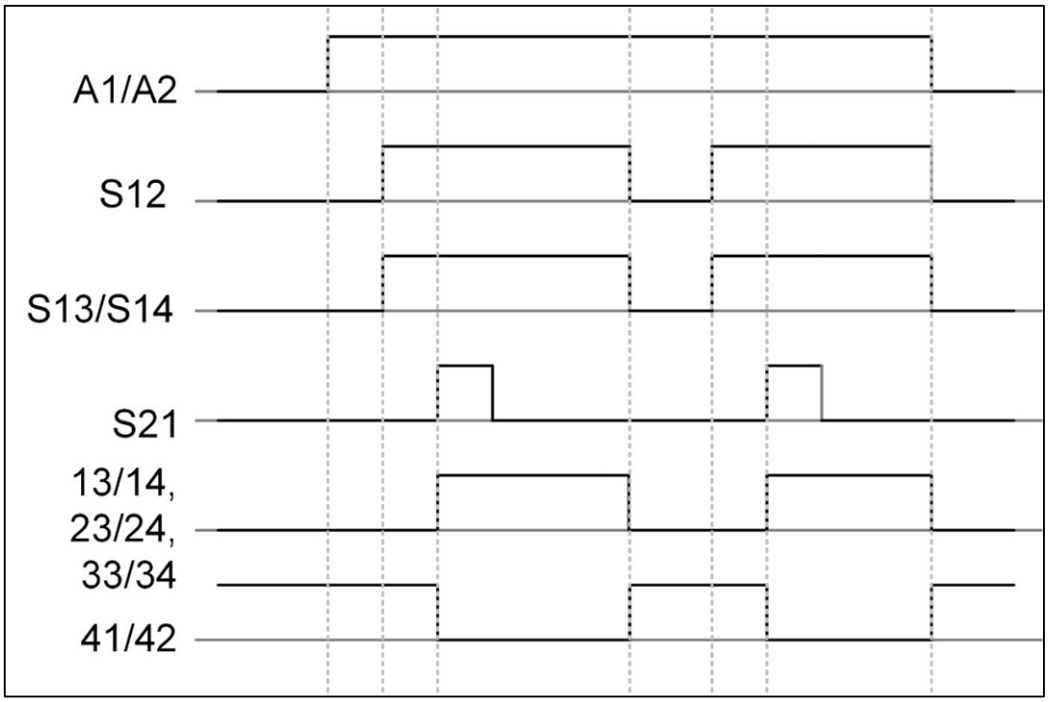


Fig. 2 State diagram

4. Installation

As per EN 60204-1, the device is intended for installation in control cabinets with a minimum degree of protection of IP54. The following should be noted:

- Mounting on 35 mm rail according to EN 60715
- Ensure sufficient heat dissipation in the control cabinet
- Minimum distance to adjacent devices according to the total current limit curve

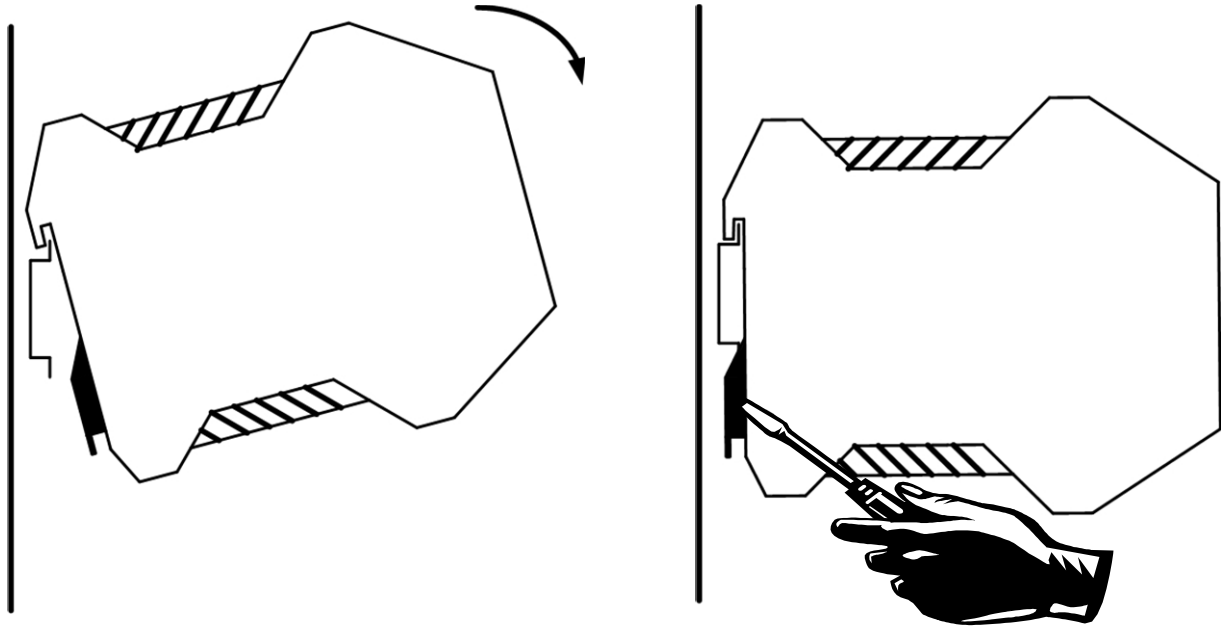


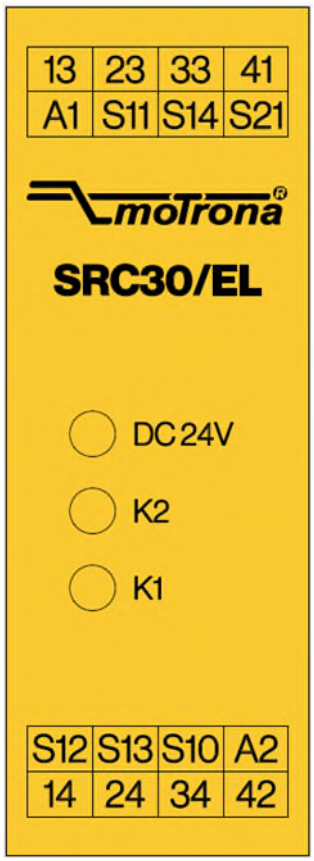
Fig. 3 Mounting / Demounting

5. Safety Instructions

- Installation and commissioning of the device must be performed **only by authorized personnel** and who has read and understood this operating instruction.
- Observe the country-specific regulations when installing the device.
- The electrical connection of the device is only allowed to be made with the device isolated.
- The wiring of the device must comply with the instructions in this operating instruction, otherwise there is a risk that the safety function will be lost.
- The contact protection and the insulation of the supply cables must be designed for the highest voltage to the device.
- It is not allowed to open the device, tamper with the device or bypass the safety devices
- All relevant safety regulations and standards are to be observed.
- The overall concept of the control system in which the device is incorporated must be validated by the user.
- Failure to observe the safety regulations can result in death, serious injury and serious damage.
- Note down the version of the product (see label "Ver.") and check it prior to every commissioning of a new device. If the version has changed, the overall concept of the control system in which the device is incorporated must be validated again by the user.

6. Electrical Connection

- A safety transformer according to EN 61558-2-6 or a power supply unit with electrical isolation from the mains must be connected.
- Observe the instructions in the section “Tech. Data”.
- If the device does not function after commissioning, it must be returned to the manufacturer unopened. Opening the device will void the warranty.
- The auxiliary contact 41-42 may not be used as a safety contact.
- Use adequate protective circuit for inductive loads (e.g. free-wheeling diode).



A1	Power supply
A2	Power supply
S11	Control voltage
S10	Control line
S21	Start control line
S13	Control line
S14	Control line
S12	Control line
13 - 14	Safety contact 1
23 - 24	Safety contact 2
33 - 34	Safety contact 3
41 - 42	Auxiliary contact

Fig. 4 Terminals

7. Applications

7.1. Emergency Stop Circuit

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. 5 to Fig. 16

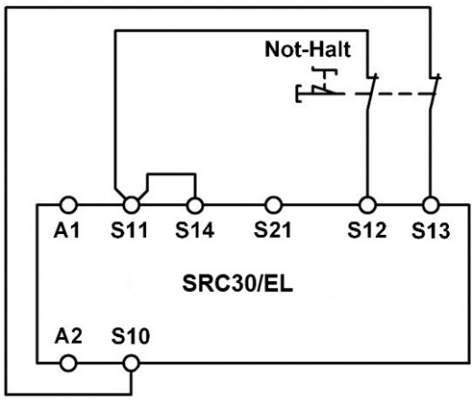


Fig. 5:
Dual channel emergency stop with short circuit and ground fault monitoring.
(category 4, up to PL e / SIL 3)

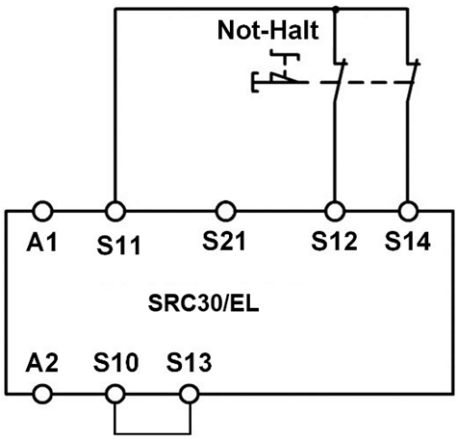


Fig. 6:
Dual channel emergency stop with ground faultt monitoring.
(category 3, up to PL d / SIL 2)

Note to Fig.6:
For applications according EN 81-20 a fault exclusion for short circuit between S12 and S14 is required.

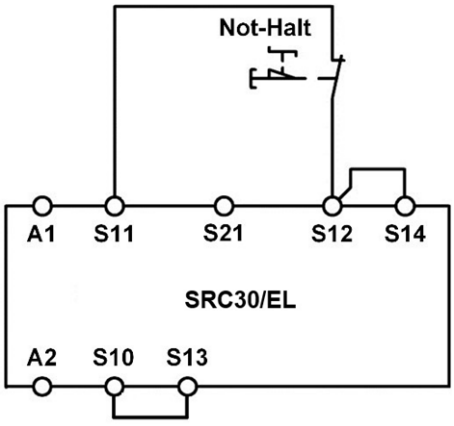


Fig. 7:
Single channel emergency stop with ground fault monitoring.
(category 1, up to PL c / SIL 1)

Note to Fig.7:
Not suitable for applications in elevators according to EN 81-20

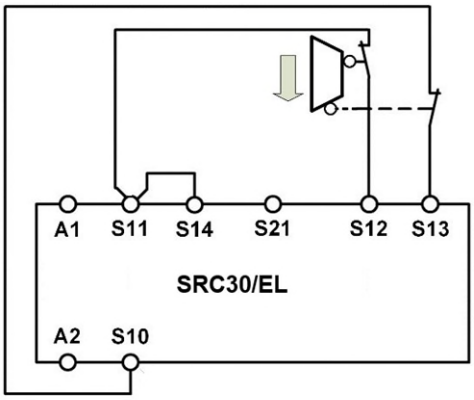


Fig. 8:
Dual channel safety guard monitoring with short circuit and ground fault monitoring.
(category 4, up to PL e / SIL 3)

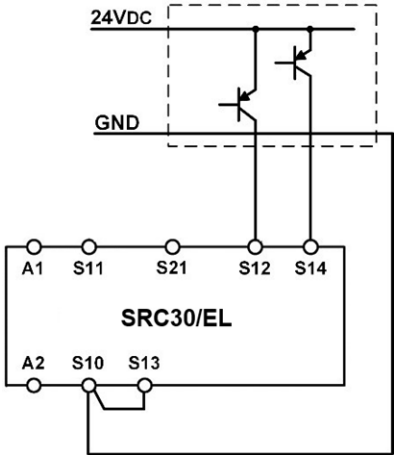


Fig. 9:
Two channel emergency stop with pnp-outputs/OSSD-outputs with its own short circuit monitoring.
(category 4, up to PL e / SIL 3)

Prerequisite Fig.9:
Signal generator meet requirements for PL e / SIL 3, too.

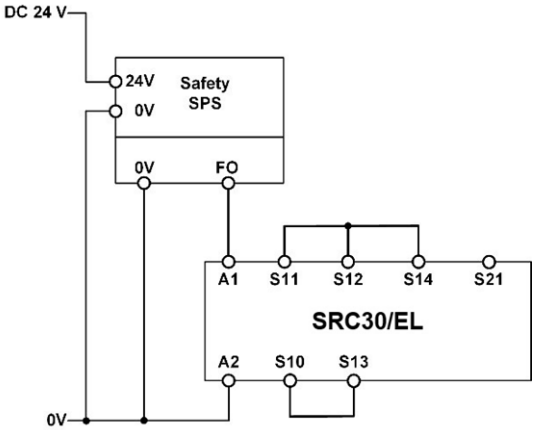


Fig. 10:
Connecting to a safety PLC
(category 4, up to PL e / SIL 3)

Prerequisite Fig. 10:
Safe PLC output meets the required safety level and short circuit between PLC output and SR3E 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. 9 and Fig. 10 the following is to be noted:

- Make sure that the ground potential of the signal generator and the SR3E 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.

7.2. Start Behavior

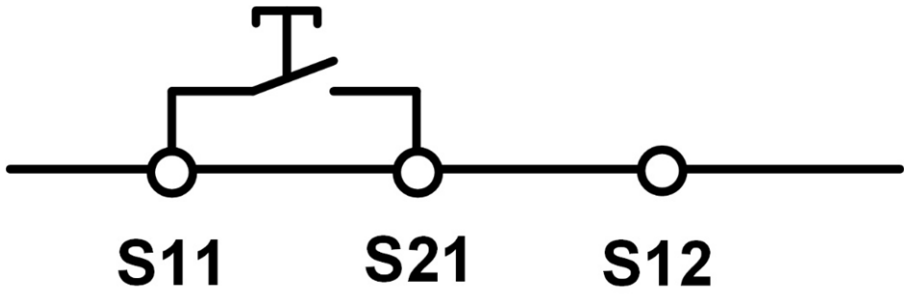


Fig. 11:
Monitored manual start.
It is monitored that the start button has been opened before the safety switch is closed.

Prerequisite Fig. 1:
Power supply may not be interrupted.

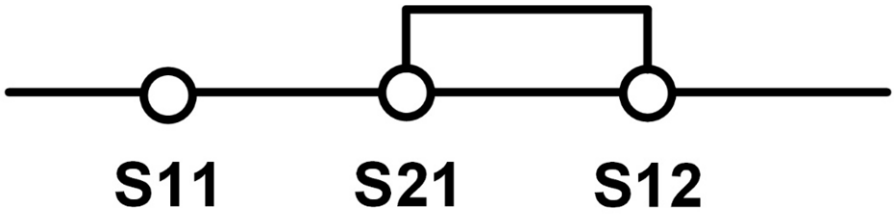


Fig. 12: Automatic start.
Maximum allowable delay when closing the safety switches at S12 and S13/S14:
S12 before S13/S14: 200ms
S13/S14 before S12: no limit

7.3. Feedback Loop

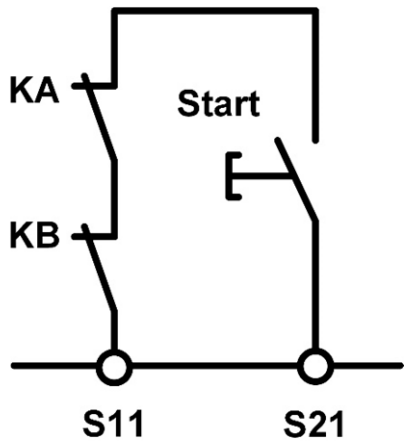


Fig. 13:
Feedback loop for monitored manual start.
The feedback loop monitors contactors or the expansion modules.

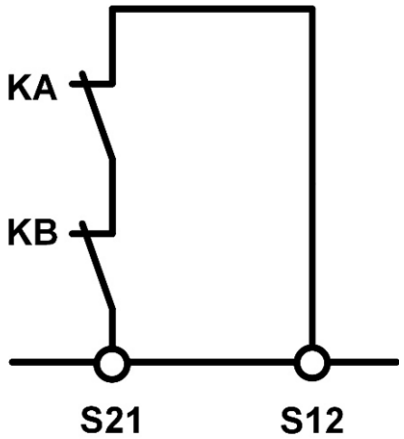


Fig. 14:
Feedback loop for automatic start.
The feedback loop monitors contactors or the expansion modules.

7.4. Power Supply and Safety Contacts

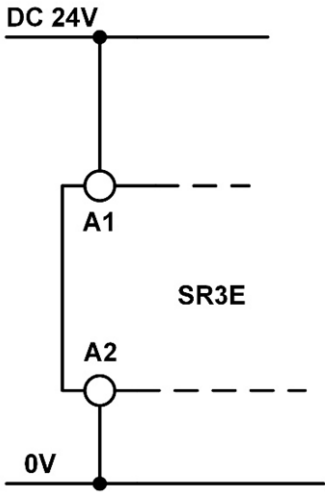


Fig. 15:
Power supply A1 and A2

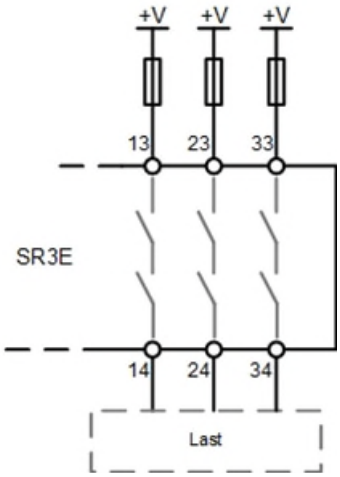


Fig. 16:
Connecting load to safety contacts. Voltage „+V" according to techn. data.

ATTENTION Fig.16:
Inductive loads should have adequate protection circuit such as a free-wheeling diode.

8. Commissioning Procedure

Advice: Follow the guidelines in "Electrical Connection" during the start-up.

1. Input circuit:

Depending on the risk evaluation choose one of the wiring diagrams in "Applications" (Fig. 5 to Fig. 10).

2. Choose start mode:

Wire the start circuit according to the examples in Fig. 11 or 12 to set the starting behavior.

Warning: If "Automatic start" is set, bear in mind that the safety contacts will switch immediately after the power supply is connected. If "Monitored manual start" is set, the start button must be opened after wiring.

3. Feedback loop:

If your application provides for external contactors or expansion modules, connect them to the device according to the examples in Fig. 13 or 14.

4. Power supply:

Connect the power supply to A1 and A2 (Fig. 15).

Caution: Power must not yet be activated.

5. Starting the device:

Switch on the operating voltage.

Warning: If the "Automatic start" starting behavior is set, the safety contacts will close immediately.
If the "Monitored manual start" starting behavior is set, close the start button to close the safety contacts. LEDs **Pwr, K1** and **K2** are lit.

6. Triggering safety function:

Open the emergency stop circuit by actuating the connected safety switch. The safety contacts open immediately.

7. Reyctivation:

Close the emergency stop circuit. If "Automatic start" is selected, the safety contacts will close immediately. If the "Monitored manual start" starting behavior is set, close the start button to close the safety contacts.

9. Check and Maintenance

No maintenance is required for the device itself.

But the following checks are regularly required to ensure proper and continuous functioning:

- Check the switch function
- Check for signs of manipulation and safety function bypassing
- Check if the device is mounted and connected securely
- Check for soiling

Check if the safety device is working properly, in particular:

- Every time after initial commissioning
- Every time after replacing a component
- After every fault in the safety circuit

According to CNB / M / 11.050, a request for the safety function is recommended at the following intervals:

- Once a month for applications up to PL e with Cat. 3 or Cat. 4 and SIL 3 with HFT = 1
- Once a year for applications up to PL d with Cat. 3 and SIL 2 with HFT = 1

10. What to do in Case of a fault?

Device does not switch on:

- Check the wiring by comparing it to the wiring diagrams.
- Check the safety switch for correct function and adjustment.
- Check whether the emergency stop circuit is closed.
- Check whether the start button (manual start) is closed.
- Is the feedback loop closed?
- Check the operating voltage at A1 and A2.

Device cannot be switched on after an emergency stop:

- Emergency stop circuit was closed again
- Was the start button opened before closing of the emergency stop circuit (manual start)?
- Is the feedback loop closed?

If the fault still exists, perform the steps listed under “Commissioning Procedure”. If these steps do not remedy the fault either, return the device to the manufacturer.

11. Safety Characteristics

11.1. Safety Characteristics according to EN ISO 13849-1

Load per contact	≤ 1 A	≤ 2 A	≤ 3 A
Use duration T_{10d} [years]	20	20	20
Category	4	4	4
PL	e	e	e
PFHd [1/h]	1,2E-08	1,2E-08	1,2E-08
nop [Cycles per year]			
AC-15 / DC-13	≤ 55.000 / ≤ 350.000	≤ 42.500 / ≤ 100.000	≤ 42.500 / ≤ 15.000

11.2. Safety Characteristics according to EN IEC 62061 / EN 61508 – High Demand

Load per contact	≤ 1 A	≤ 2 A	≤ 3 A
Use duration T_{10d} [years]	20	20	20
Proof-Test Intervall [years]	20	20	20
PFHd [1/h]	1,2E-10	1,2E-10	1,2E-10
SIL	3	3	3
nop [Cycles per year]			
AC-15 / DC-13	≤ 55.000 / ≤ 350.000	≤ 42.500 / ≤ 100.000	≤ 42.500 / ≤ 15.000

12. Technical Data

Power supply:	Operating voltage: Power consumption: Inrush current A1:	24 VDC ± 10 % 2,6 W 5 A (approx. 250 µs)
Pulse suppression (A1 / S12 / S14):	Switch-Off pulse / dark test: Switch -On pulse / light test:	max. 3 ms (pulse width) / 500 ms (pulse rate) max. 1 ms (pulse width) / 500 ms (pulse rate) 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.
Contact configuration:	Number of NO contact: Number of NC contact:	3 NO (Safety contacts) 1 NC (Auxiliary contact)
Switching voltage:		Max. AC 250 V
Contact rating of safety contacts: (13-14, 23-24, 33-34) 6 switching cycles / min	AC: DC:	250 V, 2000 VA, 8 A for resistive load 250 V, 3 A für AC-15 30 V, 240 W, 8 A for resistive load 24 V, 3 A für DC-13
Thermal current I_{th}		Max. 5 A per contact (see total current limit curve)
Contact rating of auxiliary contact (41-42)	AC: DC:	250 V, 500 VA, 2 A for resistive load 30 V, 60 W, 2 A for resistive load
Minimum contact load:		5 V, 10 mA
External fuses:	NO contact: NC contact:	10 A gG 6 A gG
Max. switch-on delay:		< 50 ms
Max. switch-off delay:	Activation via:	A1 < 40 ms; S12 or S13/S14 < 20 ms
Recovery time:		< 500 ms
Wire width:		0,14 - 2,5 mm^2
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 (EN 60664-1)
Rated insulation voltage:		250 V
Degree of pollution / Overvoltage category		2 / 3 (EN 60664-1)
Conformity and standards:	In compliance with:	EN 60204-1 EN ISO 13849-1 EN IEC 62061 EN 61508 Parts1-2 and 4-7 EN 81-20 EN 81-50
Housing:	Mounting: Protection: Weight:	DIN rail according to EN 60715 TH35 IP20 approx. 150g
Temperature range:	Ambient: Storage:	-15 °C ... +55 °C / +5 °F … 131 °F -15 °C ... +85 °C / +5 °F … 185 °F
Max. altitude:		≤ 2.000 m (above sea level)

12.1. Total Current Limit Curve

The max. permissible total current is shown in Fig. 17.

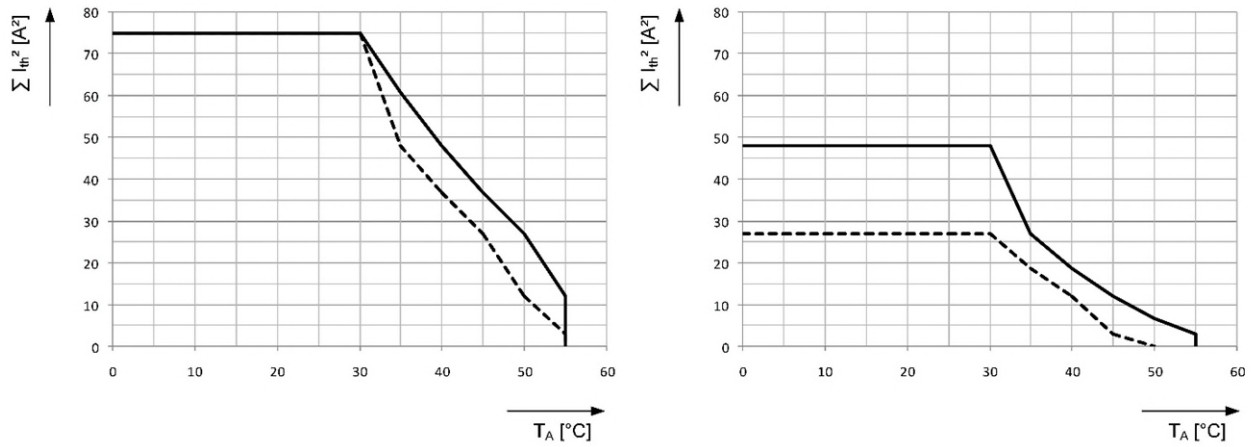


Fig. 17:
Total current limit depending on the ambient temperature

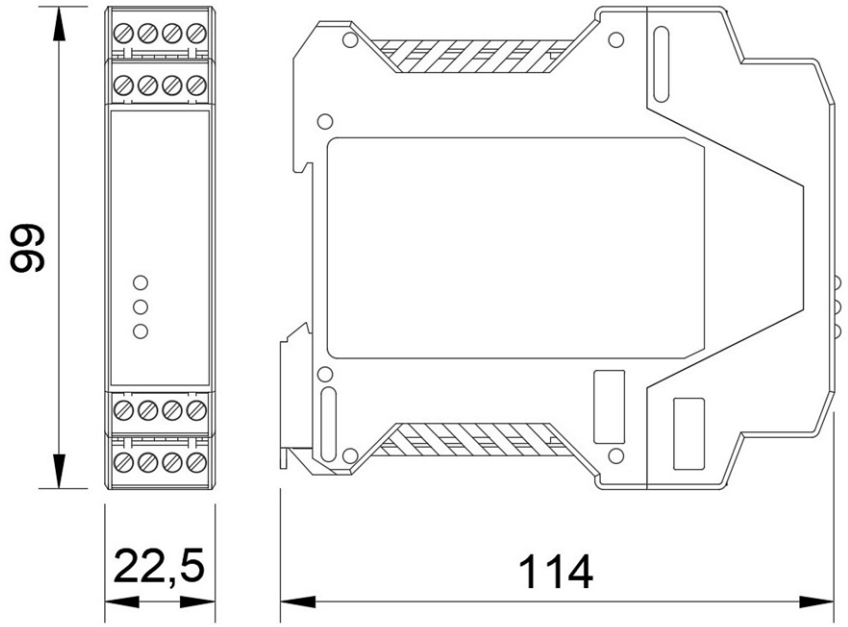
Left:
SRC30/EL with 5 mm clearance to adjacent devices, heated with same load

Right:
SRC30/EL with no clearance to adjacent devices, heated with same load

——— Nominal voltage DC 24 V
– – – – – – Overvoltage up to DC 26,4 V

Total current: $\sum I_{th}^2 = I_1^2 + I_2^2 + I_3^2$ (I_1, I_2, I_3: Current in contact paths 13-14, 23-24, 33-34)

13. Dimension



Plug-In Terminals

Note: Actual number of front LEDs may differ from the number shown in the drawing, depending on the variant.

14. Certificates

EG-Konformitätserklärung
EC Declaration of Conformity / Déclaration de conformité

motrona automation technology

Type SRC30/EL

Zertifikats-Nr. / No of Certificate / N° du certificat **01/208/4A/6147.00/25**

Sicherheits-Not-Halt-Schaltgerät	Safety emergency stop switching devices	Relais de sécurité d'arrêt d'urgence
Für die oben aufgelisteten Erzeugnisse bestätigen wir die Übereinstimmung mit den grundlegenden Anforderungen der europäischen Richtlinie(n):	This is to confirm that the above-mentioned products fulfil the basic requirements of the European guidelines:	Pour les produits listés ci-dessus, nous confirmons la conformité avec les exigences fondamentales de la directive européenne:
EMV 2014/30/EU	**EMC 2014/30/EU**	**CEM 2014/30/UE**
RoHS 2011/65/EU	**RoHS 2011/65/EU**	**RoHS 2011/65/EU**
Aufzüge und Sicherheitsbauteile für Aufzüge 2014/33/EU	**Lifts and safety components for lifts 2014/33/EU**	**Ascenseurs et composants de sécurité pour ascenseurs 2014/33/EU**

Folgende Normen wurden in der jeweils aktuell gültigen Ausgabe angewandt:	The following standards were applied in the currently valid edition:	Les normes suivantes ont été appliquées dans l'édition en cours de validité:
EMV / EMC / CEM	**EN 12016:2013**	
RoHS	**EN IEC 63000 :2018**	
Aufzüge und Sicherheitsbauteile für Aufzüge Lifts and safety components for lifts Ascenseurs et composants de sécurité pour ascenseurs		**EN 81-50:2020 EN 81-20:2020**

Benannte Stelle / Notified body / Organisme notifié: Nr. 0035
TÜV Rheinland Industrie Service GmbH
Am Grauen Stein
51105 Köln / Germany

Gottmadingen, 24.02.2025

Scheibel

Michael Scheibel (Technischer Leiter)

motrona GmbH, Zeppelinstraße 16, DE - 78244 Gottmadingen, Tel. +49 (0) 7731 9332-0, info@motrona.com, www.motrona.com

UKCA Declaration of Conformity

motrona automation technology

Type SRC30/EL

Safety emergency stop switching devices

No of Certificate: **01/208/4A/6147.00/25**

We hereby declare that the above-mentioned products are in conformity with the following statutory requirements:

Safety regulations for the construction and installation of lifts
Electromagnetic Compatibility Regulations 2016
Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

We take full responsibility for the product compliance with these requirements.

The following standards were applied:

EN 81-50:2020 **EN 81-20:2020**
EN 12016:2013
EN IEC 63000:2018

Gottmadingen, 24.02.2025

Scheibel

Michael Scheibel

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EG-Konformitätserklärung

EC Declaration of Conformity / Déclaration de conformité

motrona automation technology

Type SRC30/EL

Zertifikats-Nr. / No of Certificate / N° du certificat **01/205/5998.00/25**

Sicherheits-Not-Halt-Schaltgerät	Safety emergency stop switching devices	Relais de sécurité d'arrêt d'urgence
Für die oben aufgelisteten Erzeugnisse bestätigen wir die Übereinstimmung mit den grundlegenden Anforderungen der europäischen Richtlinie(n):	This is to confirm that the above-mentioned products fulfil the basic requirements of the European guidelines:	Pour les produits listés ci-dessus, nous confirmons la conformité avec les exigences fondamentales de la directive européenne:
MR 2006/42/EG	**MD 2006/42/EG**	**DM 2006/42/EG**
EMV 2014/30/EU	**EMC 2014/30/EU**	**CEM 2014/30/UE**
RoHS 2011/65/EU	**RoHS 2011/65/EU**	**RoHS 2011/65/EU**

Folgende Normen wurden in der jeweils aktuell gültigen Ausgabe angewandt:	The following standards were applied in the currently valid edition:	Les normes suivantes ont été appliquées dans l'édition en cours de validité:
MR / MD / DM	**EN IEC 62061:2021** **IEC 61508 Parts 1-2 and 4-7:2010** **EN ISO 13849-1:2015**	
EMV / EMC / CEM	**EN 12016:2013**	
RoHS	**EN IEC 63000 :2018**	

Benannte Stelle / Notified body / Organisme notifié: Nr. 0035
TÜV Rheinland Industrie Service GmbH
Am Grauen Stein
51105 Köln / Germany

Gottmadingen, 24.02.2025

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UKCA Declaration of Conformity

motrona automation technology

Type SRC30/EL

Safety emergency stop switching devices

No of Certificate **01/205/5998.00/25**

We hereby declare that the above-mentioned products are in conformity with the following statutory requirements:

Safety of machines, machinery directive
Electromagnetic Compatibility Regulations 2016
Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

We take full responsibility for the product compliance with these requirements.

The following standards were applied:

EN IEC 62061:2021 **IEC 61508 Parts 1-2 and 4-7:2010** **EN ISO 13849-1:2015**
EN 12016:2013
EN IEC 63000:2018

Gottmadingen, 24.02.2025

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