ELMON

Sicherheitsschaltgerät / Safety Relais / Relais de sécurité

ASO Safety Solutions

ELMON *rail* 32-242



Betriebsanleitung (Original, Gültigkeit siehe letzte Seite)
ELMON *rail* 32-242 Sicherheitsschaltgerät Seite 3-12 Deutsch

Operating Manual (see last page for validity)
ELMON *rail* 32-242 Safety Relais Page 13-21 English

Manuel d´utilisation (Validité voir la dernière page)
ELMON *rail* 32-242 Relais de sécurité Page 22-31 Français

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We reserve the right to make technical and operationally relevant changes to the products and devices described in this documentation at any time and without prior notice.

2. General safety regulations and protective measures

- Manufacturers and users of the plant / machinery, for which the protective device is used, are themselves responsible for coordinating and observing all the relevant safety instructions and regulations.
- The protective device ensures operational safety in combination with the overriding controls, but not the safety of the entire plant / machinery. Before using the device a safety assessment of the entire plant / machinery in terms of the Machinery Directive 2006/42/EC or of the relevant product standard is required.
- The operating instructions must always be available at the location where the protective device is used. They must be read and applied thoroughly by everyone tasked with the operation, servicing and maintenance of the protective device.
- Installation and commissioning of the protective device may only be carried out by qualified staff, who are acquainted with these operating instructions and the relevant instructions on occupational safety and accident prevention. The directions contained in these operating instructions must be observed and adhered to without fail.
- The electrical engineering and professional society safety rules are to be observed.
- When working on the relay, it must be disconnected from the power supply, tested for zero potential and secured against reconnection.
- If the zero potential contacts of the safety relay contacts are supplied by an external hazardous voltage, this must also be switched off during work to the relay.
- The relay contains no components for servicing by the user. Unauthorised modifications and/or repairs to the relay will result in the cancellation of all guarantee or liability on the part of the manufacturer.
- The protective system must be tested at appropriate intervals by experts and must be documented in a comprehensible way at all times.

Safety instructions

- The relay allows operation from 24 V AC/DC. Connecting the operating voltage to the wrong terminals may damage the relay.
- The relay must be installed in a control box.
- Do not install in the immediate vicinity of an intense heat source.
- An adequate protective circuit must be provided with capacitive and inductive users.



For the standardised design of the safety system, the equipment must be tested for correct operation by experts at appropriate intervals. The testing must be comprehensibly documented at all times.

In the event of non-compliance or deliberate misuse, the manufacturer's liability lapses.

3. General and operational description

The relay is for evaluating sensors, including safety contact mats, safety contact strips and safety bumpers for making safe pinch and shear points.

Two separate signalling circuits can be connected to the relay, each controlling a switching output. The quiescent current monitor of the sensor is enabled by an integrated terminator in the sensor.

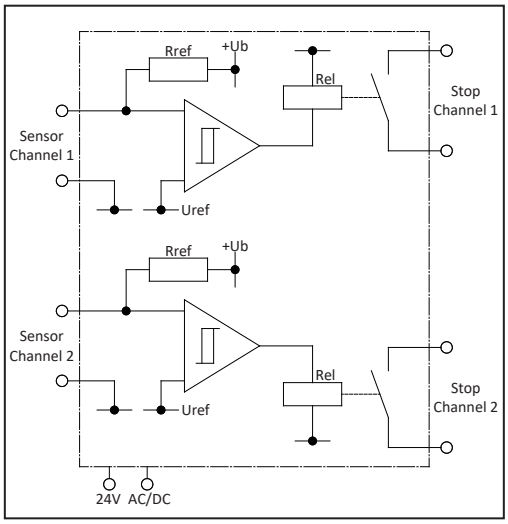
The relay monitors these two signalling circuits permanently for activation or breaking (cable break). If the expected quiescent current is flowing, the output relays are operated and the switch contacts are closed. If the sensor is activated or the sensor circuit is broken, the relay switch contacts open.

The relay is designed in accordance with EN ISO 13849-1:2008 for Category 3. To comply with Category 3 the relay is manufactured redundant and with two mutually activating forcibly guided safety relays.

The monitoring state of the sensor and the operating voltage supplied are shown by LEDs.

In the event of a fault alarm, all safety outputs are inactive.

The unit can be used in a household environment as well as an industrial environment up to an altitude of 2000m above mean sea level. The unit must not be operated in areas with major temperature changes.



ELMON rail 32-242 Block circuit diagram

4. Intended use

The relay is able to fulfil its safety task only if it is used for the purpose it was designed for.

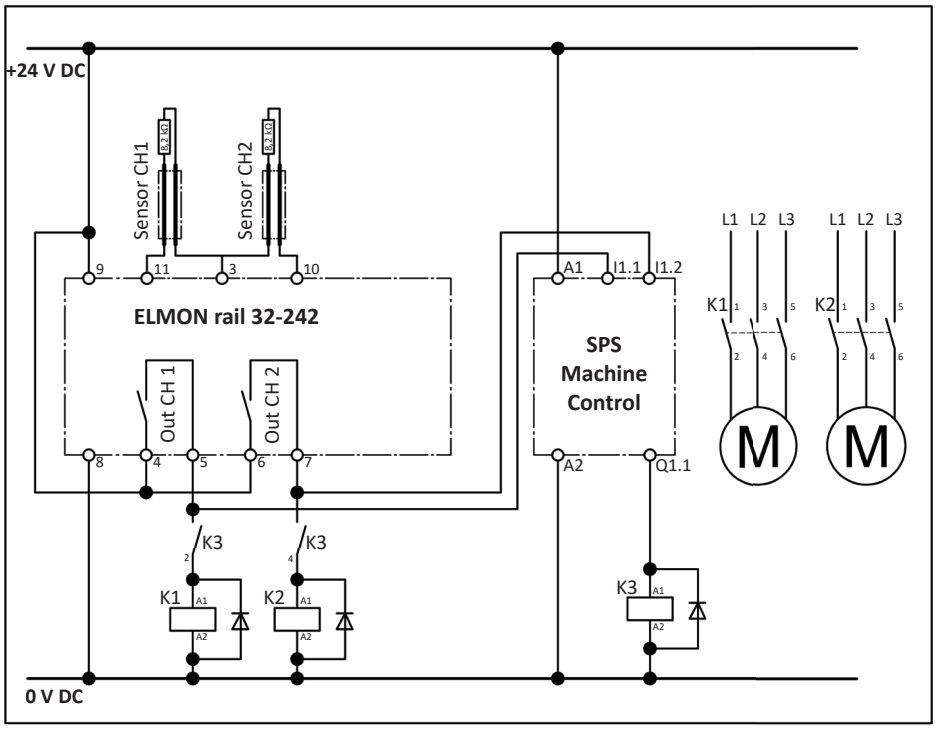
Appropriate utilisation of the relay is use as a protective device in combination with safety contact mats, safety bumpers and safety contact strips of 8.2 kΩ resistance to quiescent current monitoring.

Any utilisation beyond this does not constitute appropriate intended use. The manufacturer accepts no liability for damage arising from inappropriate use.

Use in special applications requires the approval of the manufacturer.

The use of the safety relais at heights above 2000 m above sea level or in potentially explosive areas is not approved.

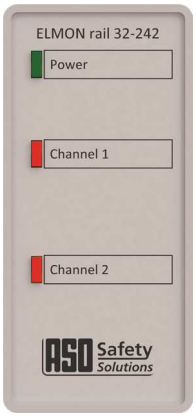
5. Verwendungsbeispiele



Circuit diagram in zero potential state. Sensor not activated.

6. Device overview

6.1 Signal displays



LED **Power** (green) Operation mode (on) Fault alarm (pulse)
LED **Channel 1** (red) Sensor activated (on) Sensor circuit broken (flashes rapidly) Fault self-lock (flashes slowly)
LED **Channel 2** (red) Sensor activated (on) Sensor circuit broken (flashes rapidly) Fault self-lock (flashes slowly)

English

If there is no fault alarm, the operating state is shown via the LED **Power** (on). When signalling a fault alarm the number of pulses emitted indicates the nature of the fault:

Pulse	Fault alarm
1	Supply voltage outside the available range
3	Output control **Stop Channel 1** faulty
4	Output control **Stop Channel 2** faulty
5	Data transfer between microcontrollers faulty
6	Error in testing signal input **(Channel 1 / Channel 2)**

6.2 Connection terminals

Pin **1 2**	(Not allocated)
Pin **3 11**	Signal input **Channel 1**
Pin **3 10**	Signal input **Channel 2**
Pin **4 5**	Relay output to **Channel 1** control
Pin **6 7**	Relay output to **Channel 2** control
Pin **8 9**	Supply voltage 24 V AC/DC



English

7. Mechanical mounting

The switching unit must be mounted correctly:

- In a dust-protected and moisture protected switch cabinet or casing.
- For use in an environment with contamination level 2.
- With a protection type of at least IP54.
- On a 35 mm DIN support rail according to EN 50 022.

The switching unit must not be installed in the immediate vicinity of an intense heat source.

The switching unit can be installed in any position.

The unit must not be operated in areas with major temperature changes.

8. Electrical connection

Connection to the wrong terminals may damage the relay.
Wiring laid in the open or outside the control box must be properly protected.
The signal wiring may not be connected parallel to the motor wiring or other power wiring.
The limits shown in the "Technical Data" for the supply voltage and relay switching capacity must be observed. Sufficient fuse protection must be provided on all output contacts with capacitive and inductive loads.

8.1 Supply voltage

The supply voltage is to be connected to the terminal pair **8 9** 24 V AC/DC. The supply wiring to the relay must be protected by a suitable circuit breaker. The supply voltage must meet the requirements for low voltage protection (SELV).

8.2 Sensor connection

Connect the sensor for Channel 1 to the terminal pair **3 11**. Connect the sensor for Channel 2 to the terminal pair **3 10**.

If a channel is not used, it must be fitted with an 8.2 kΩ resistance.

8.3 Connecting multiple sensors per sensor circuit

ASO sensors must not be connected in parallel.

One or more sensors can be connected to sensor input. For this purpose, the individual sensors are connected in series according to figure 1.

Safety edges SENTIR edge:

Up to five SENTIR edge may be connected in series. The maximum total length oft the SENTIR edge shall not exceed 100 m.
The length of one SENTIR edge may be up to 25 m.
The total cable length oft the in series connected SENTIR edge must not exceed 25 m.

Safety bumper SENTIR bumper:

Up to five SENTIR bumper may be connected in series. The maximum total length oft the SENTIR bumper shall not exceed 15 m.
The length of one SENTIR bumper may be up to 3 m.
The total cable length oft the in series connected SENTIR bumper must not exceed 25 m.

Safety contact mat SENTIR mat:

Up to ten SENTIR mat may be connected in series. The maximum total area shall not exceed 10 m².
The maximum size of an SENTIR mat is 1350 x 2350 mm. The total cable length oft the in series connected SENTIR mat must not exceed 25 m.

Before connecting the sensors that are connected in series, it is recommended that the resistance value of the arrangement is to be measured. The resistance must be 8.2 kΩ ± 500 Ω when the sensor is inactive and must not exceed 500 Ω when it is active.

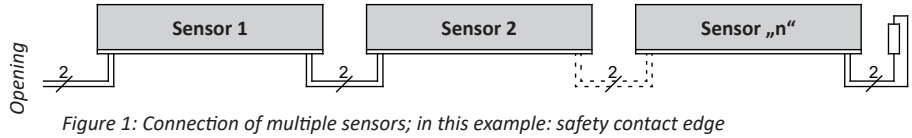


Figure 1: Connection of multiple sensors; in this example: safety contact edge

8.4 Connecting control circuits

The control circuit to be monitored for Channel 1 is to be connected to the terminal pair **4**, **5** and the corresponding control circuit for Channel 2 is to be connected to the terminal pair **6**, **7**.

The control circuits must be protected by a corresponding circuit breaker depending on the rated current or the rated current in the control circuits must be limited to the maximum value by other means.



The relay contact may only switch extra low voltages (30V). The switching of low voltages (230V) is not permissible.

9. Commissioning and performance testing

After all the electrical contacts have been connected and the supply voltage switched on, the plant / machinery must be tested for proper functioning.

Following successful commissioning the safety outputs **4**, **5** and **6**, **7** are activated (relay contacts “closed”). Activating the annunciator results in opening the relay contacts.

The safety system must be tested by qualified staff at appropriate intervals. The testing must be comprehensibly documented at all times. The requirements of the plant / machinery manufacturer must be observed and adhered to.

10. Error diagnosis

If the wiring and connecting up of the supply voltage is correct, only the green LED Power should light up. If the red LED lights up there is a fault in the system, which can be isolated with the aid of the LED.

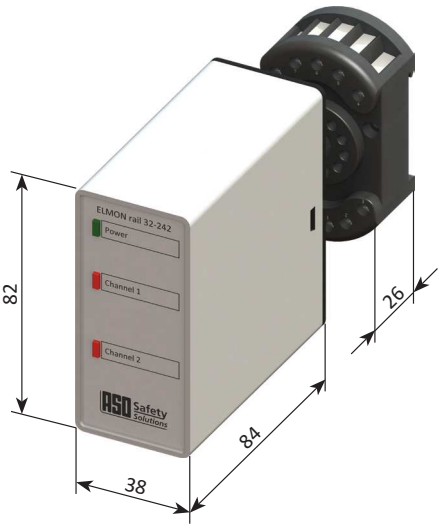
LED	Error	Error correction
green LED **Power** does not light up	Supply voltage absent, too low or wrongly connected.	Test connections and supply voltage: - 24 V AC/DC to terminals **8 9**, tolerance range: ±10%
green LED **Power** flashes cyclically (pulse)	Internal fault is shown by the number of pulses.	See -> Signal displays
red LED **Channel 1** / **Channel 2** lights up	The relevant sensor is recognised as activated.	- Check connections of the relevant sensors (pinched wiring, brittle wiring etc.) - Check sensor *
red LED **Channel 1** / **Channel 2** flashes rapidly	Sensor circuit broken, sensor not connected, connected incorrectly or faulty	- Check connections of the relevant sensors (pinched wiring, brittle wiring etc.) - Check sensor *

* If the fault is not in the wiring, the functioning of the electronics may be checked by fitting an 8.2 kΩ resistance to the annunciator input on the relay. If the electronics then work properly, the annunciator must be tested with an ohmmeter. For this the connection between the annunciator and the relay must be disconnected and connected to an ohmmeter. With an inactivated annunciator the resistance should be 8.2 kΩ ± 500 Ω. If the annunciator is activated, the resistance should not exceed 500 Ω.

11. Decommissioning and disposal

Products manufactured by ASO are intended exclusively for commercial use (B2B). At the end of their service the products should be disposed of in accordance with the local, regional and national regulations. ASO will be pleased to collect the products for disposal in accordance with the regulations.

12. Technical Data



Supply voltage

Low voltage:	U_E	24 V AC/DC ±10 %
	I_E	85 mA
	I_{max}	180mA (100ms)
Input power:	$P_{E\text{-}max}$	3 W 24 V DC
	$P_{E\text{-}max}$	3 VA 24 V AC
Ensuring low voltage (external):		125mA Medium acting fuse 125mA Flink can be used alternatively

Terminal resistance oft the sensor

nominal value	R_{nom}	8,2 kΩ
upper switching point	R_{AO}	> 12,0 kΩ
lower switching point	R_{AU}	< 5,0 kΩ

Safety relay

Nominal current DC	DC-13 / 24 V / 2 A
Nominal current AC	AC-15 / 30 V / 2 A
Mechanical life-time	$>10^6$ actuations

Saftey Relais

Fuse type	M 2 A 5 x 20 glass tube*

Safety relay switching times

Switching off delay (response time)	< 12 ms
Turn-off time	500 ms (ELMON rail 32-242) 100 ms (ELMON rail 32-242 K) (Power on 700ms)

Assembly	Plug-in socket to 35 mm DIN snap-on rail
Housing	11 pol. DIN plug-in socket housing with plug-in socket for 35 mm assembly rail

Dimensions (HxWxD)

Housing	82 x 38 x 84 mm
Housing incl. plug-in socket	82 x 38 x 110 mm

Protection class	IP20
Weight	225 g
Temperature range	-25°C to +55°C

Connection terminals

tightening torque	0,5 Nm

Connection cable cross-section	single- or fine-stranded cable 0,75-1,5 mm^2

Certifications

	EN ISO 13849-1:2015 Categorie 3 PL e MTTFd 180 years, DC 90%
Electronics	MTTFd 3757 years, DC 90 %
Electromechanics	B10d 1000000 / MTTFd 190 years (Nop 52560)

All voltages connected to the switching unit must be safely isolated!

*Not included in the scope of delivery

English

13. EC declaration of conformity

EG - Konformitätserklärung
EC Declaration of conformity
Déclaration de conformité CE

Hiermit erklären wir, dass die nachfolgend bezeichneten Produkte der Baureihe

ELMON board 32-302*
ELMON classic 32-312* **
ELMON rail 32-242**
ELMON rail 32-332*

Sicherheitsschaltgerät zur Kombination mit Schaltleisten, Schaltmatten und Schaltpuffern zur Vermeidung von Gefahren an Quetsch- und Scherstellen,

aufgrund ihrer Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung, den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der nachfolgenden EG-Richtlinien und Normen entspricht:

2006/42/EG
2014/35/EU*
EN ISO 13849-1:2008 / AC:2009
EN ISO 13849-1:2015**
EN 60947-5-1:2004+A1:2009**

EG-Baumusterprüfung**
Notified Body 0044
TÜV Nord Cert GmbH
Langemarckstraße 20
D-45141 Essen
Nr. 44 205 13031822

Alle technischen Daten für diese Produkte werden sicher aufbewahrt und werden erforderlichenfalls der behördlichen Marktaufsicht auf Anfrage zur Verfügung gestellt.

Diese Konformitätserklärung entbindet den Konstrukteur/ Hersteller der Maschine nicht von seiner Pflicht, die Konformität der gesamten Maschine, an der dieses Produkt angebracht wird, entsprechend der EG-Maschinen-richtlinie sicherzustellen.

Hersteller und Dokumentationsbevollmächtigter

ASO GmbH
Hansastr. 52
D-59557 Lippstadt
Lippstadt, 04.07.2018

We hereby declare that the following products of the model range

ELMON board 32-302*
ELMON classic 32-312* **
ELMON rail 32-242**
ELMON rail 32-332*

Safety relay to be used in combination with safety contact edges, safety contact mats and safety contact bumpers for preventing dangers at locations where there is a risk of crushing and cutting,

satisfies the relevant essential health and safety requirements of the EC directives and standards listed below on account of its design and construction, as does the version brought to market by us:

2006/42/EC
2014/35/EU*
EN ISO 13849-1:2008 / AC:2009
EN ISO 13849-1:2015**
EN 60947-5-1:2004+A1:2009**

EC type-examination**
Notified Body 0044
TÜV Nord Cert GmbH
Langemarckstraße 20
D-45141 Essen
Nr. 44 205 13031822

All technical data for these products are securely stored and, if necessary, made available to regulatory market surveillance upon request.

This declaration of conformity does not relieve the designer / manufacturer of the machine from his obligation to ensure that the conformity of the entire machine to which this product is attached satisfies the corresponding EC directive.

Manufacturer and attorney of documents

Par la présente nous déclarons que les produits suivants de la série

ELMON board 32-302*
ELMON classic 32-312* **
ELMON rail 32-242**
ELMON rail 32-332*

Relais de sécurité pour la combinaison de barres palpeuses, tapis de sécurité et bumpers dans le but d'éviter les risques d'écrasement et de cisaillement,

de par sa conception et sa construction, ainsi que dans les modèles mis en circulation par nos soins, répondent aux exigences de base pour la sécurité et la santé des directives et normes CE suivantes:

2006/42/CE
2014/35/EU*
EN ISO 13849-1:2008 / AC:2009
EN ISO 13849-1:2015**
EN 60947-5-1:2004+A1:2009**

Examen CE de type**
Notified Body 0044
TÜV Nord Cert GmbH
Langemarckstraße 20
D-45141 Essen
Nr. 44 205 13031822

Toutes les données techniques relatives à ces produits seront conservées en toute sécurité et, seront mises, sur demande, à la disposition des autorités de réglementation.

Cette déclaration de conformité ne délie pas le constructeur / fabricant de la machine de son obligation d'assurer la conformité de l'ensemble de la machine à laquelle ce produit est apposé selon la directive CE.

Fabricant et agent de documentation

H. Friedrich
- Geschäftsführer - CEO - Gérant -

CE

DIN EN ISO 9001 Stand: 04.07.2018 Rev.:01 Seite 1 von 1

English