

ELMON

Sicherheitsschaltgerät / Safety Relais / Relais de sécurité

ASO Safety
Solutions

ELMON classic 32-312



Betriebsanleitung (Original, Gültigkeit siehe letzte Seite)
ELMON classic 32-312 Sicherheitsschaltgerät

Seite 3-12

Deutsch

Operating Manual (see last page for validity)
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English

Manuel d'utilisation (Validité voir la dernière page)
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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

- The manufacturer and users of the plant / machine on which the protection is being used are responsible for implementing and following all applicable safety regulations and rules.
- When used in conjunction with the higher-order controller, the protection guarantees functional safety, but not the safety of the entire plant / machine. The safety of the entire plant / machine must, therefore, be assessed in accordance with machinery directive 2006/42/EC or appropriate product norm before using the device.
- The operating instructions must always be available at the place of installation of the protection. They must be read thoroughly and observed by all persons involved in the operation, maintenance and servicing of the protection.
- The protection must only be installed and commissioned by professionals familiar with these operating instructions and the applicable operational safety and accident prevention regulations. All of the instructions provided in these operating instructions must be observed and followed.
- All electrical work must only be performed by skilled electricians. All relevant electrical engineering and Employer's Liability Insurance Association safety regulations must be observed.
- During work on the switching unit, it is to be switched to zero potential, checked to ensure that it is at zero potential and protected against being restarted.
- If the potential-free connectors of the relay switching contacts are supplied externally with a dangerous voltage, make certain that these outputs are also switched off during work on the switching unit.
- The switching unit does not contain any components that require servicing by the user. Unauthorised conversions and repairs made to the switching unit will void all guarantees and the manufacturer's liability.
- The protection system is to be professionally inspected at appropriate intervals and be documented in such a way that it is comprehensible at all times.

English



The manufacturer assumes no liability in the event of non-observance or intentional abuse.

3. General information and functional description

The compact and easy-to-install safety relay is designed for outdoor use and can be operated with 230 V mains voltage or 24 V AC/DC.

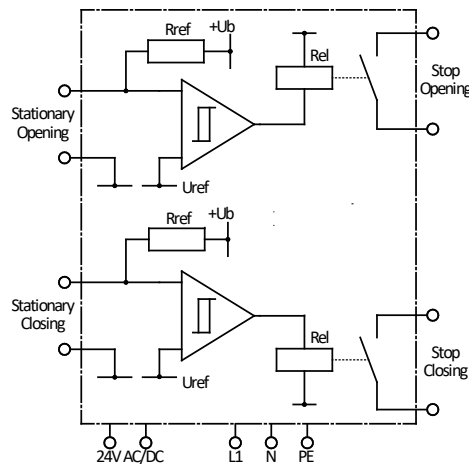
The switching unit, designed with two channels, is used for evaluating safety contact mats and for safeguarding locations where there is a risk of crushing and cutting through the use of safety contact edges and safety bumpers.

The switching unit complies with EN ISO 13849-1:2008, Cat. 3. To meet Cat. 3 requirements, the switching unit has a redundant structure with two, two-way polling, forcibly actuated safety relays per channel.

Two separate sensor circuits can be connected to the switching unit, whereby each acts on one switching output.

The monitoring state of the sensor and the applied operating voltage are indicated by LEDs.

If an error is present, all the safety outputs are not active.



ELMON classic 32-312 block diagram

English

4. Proper use

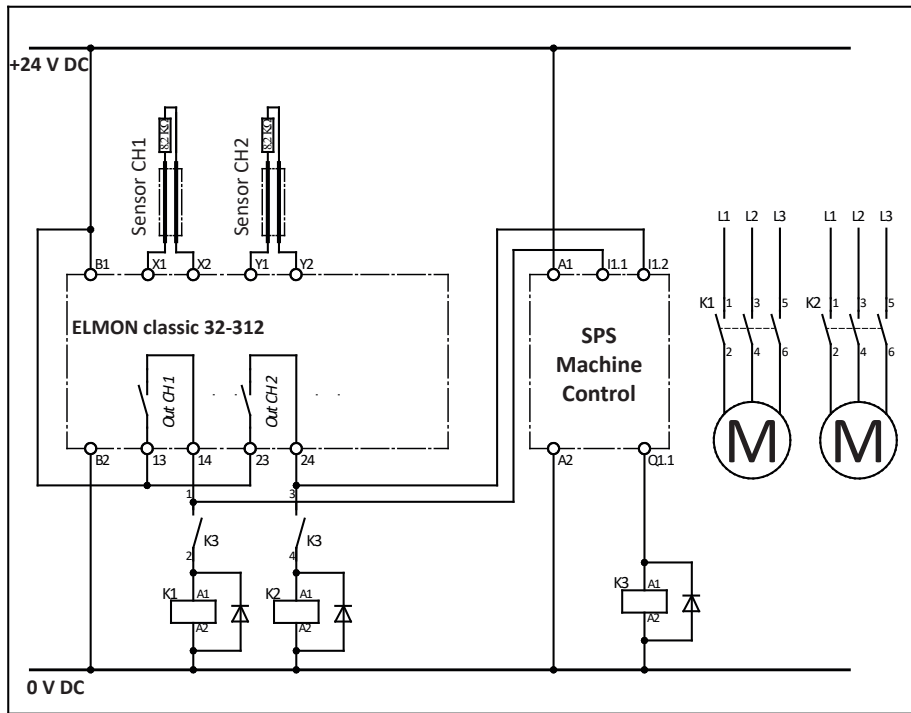
The switching unit can only fulfil its safety-related task if used properly.

The switching unit is intended to be used as protection in combination with safety contact mats, safety bumpers and safety contact edges with 8.2 kΩ resistor for standby-current monitoring.

Any uses above and beyond these uses constitute improper use. The manufacturer assumes no liability for damages arising from improper use.

The device may only be used in special applications with the manufacturer's express consent.

5. Application examples



Circuit diagram in zero-potential state. Sensor not actuated.

English

6. Device overview

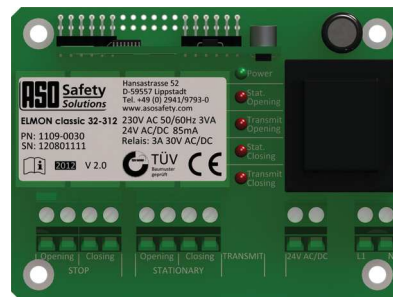
6.1 Versions

ELMON classic 32-312

Polycarbonate housing with screw connections for on-wall mounting in harsh environments.

6.2 Signal indicators

LED Stat. Opening (red)
actuated (on) - interrupted (flashes)
LED Stat. Closing (red)
actuated (on) - interrupted (flashes)
LED POWER (green)
Functional test (on)
Error message (pulse output)



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V1.0: If no error is present, then LED Power shows the function control (briefly off).

V2.1 and later: If no error is present, then LED Power shows the operating state (on).

During the output of an error message, the number of output pulses indicates the error:

Pulse	Error message
1	Voltage supply outside of the valid value range
2	INDUS transmission error
3	Output control Open faulty
4	Output control Close faulty
5	Data transmission between microcontrollers faulty
6	Testing sensor input faulty (stationary contact edges) (Open/Close)

6.3 Connection terminals

STOP Opening	Control circuit (emergency-off) Stop, direction of movement - Opening (channel 1)
STOP Closing	Control circuit (emergency-off) Stop, direction of movement - Closing (channel 2)
STATIONARY Opening	Sensor input Direction of movement - Opening (channel 1)
STATIONARY Closing	Sensor input Direction of movement - Closing (channel 2)
Transmit	No assignment
24 V AC/DC	Supply voltage 24 V AC/DC
L1 N	Supply voltage 230 V 50/60 Hz

7. Mechanical mounting

The switching unit is to be professionally mounted at a suitable location. After removing the cover, the housing can be mounted with four screws.

Do not install the switching unit in the immediate vicinity of strong sources of heat.

The switching unit may be mounted in any orientation. To prevent moisture penetration, it should, however, be installed so that the cable conduits point downward.

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8. Electrical connection

8.1 Prerequisites

The signal cable must not be placed parallel to the motor cable or other power cables.

Cables installed outdoors or outside of the switching cabinet must be protected appropriately.

The protection class specified for this device is only ensured if the supply lines have been properly clamped to the screw connections.

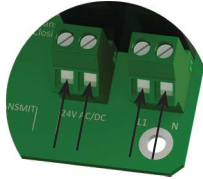
Connecting to the wrong terminals can destroy the switching unit.

The limit values for the supply voltage and the switching capacity of the relay specified in the „technical specifications“ are to be observed.



Sufficient fuse protection must be provided on all output contacts with capacitive and inductive loads.

8.2 Supply voltage



For the voltage supply, either mains voltage (230 V AC 50/60 Hz) or low voltage (24 V AC/DC) may be used.

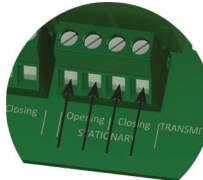
When supplying with 24 V AC/DC, the voltage must comply with the requirements for Safety Low Voltage (SELV). The supply line to the switching unit must be protected with an appropriate fuse.

Never apply both voltages simultaneously!

English

The 230 V supply voltage must be connected to terminals **L1** and **N**. Connect 24 V supply voltage to terminals **24 V AC/DC**.

8.3 Connecting the sensor



Connect the sensor for channel 1 to terminal pair **STATIONARY Opening**. Connect the sensor for channel 2 to terminal pair **STATIONARY Closing**.

If a channel is not used, it must be connected to an 8.2 kΩ resistor.

8.4 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 of the SENTIR edge shall not exceed 100 m.

The length of one SENTIR edge may be up to 25 m.

The total cable length of 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 of the SENTIR bumper shall not exceed 15 m.

The length of one SENTIR bumper may be up to 3 m.

The total cable length of 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 of 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.

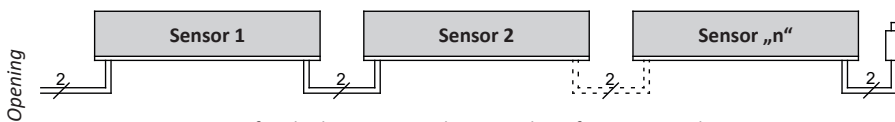


Figure 1: Connection of multiple sensors; in this example: safety contact edge

English

8.5 Connecting the control circuits



The control circuit to be monitored for the opening movement (channel 1, stop-opening movement) is to be connected to the **STOP Opening** terminal pair; for the closing movement (channel 2, stop closing movement), the appropriate control circuit is to be connected to the **STOP Closing** terminal pair.



The connection for the control circuits is permitted only for switching low voltages. The control circuits are dependent on the rated current to protect with an appropriate fuse or the rated current to the control circuits must be limited by other measures to the maximum value.

9. Commissioning and functional test

The plant / machine must be tested for proper function after all of the electrical connections have been established and the supply voltage has been turned on:

- Actuate the sensors in sequence
- Check the switching units for proper reaction

The safety system must be professionally inspected at appropriate intervals. The inspection must be documented in such a way as to be comprehensible at all times.

The requirements of the plant/machine manufacturer are to be taken into account and followed.

10. Error diagnosis

Only the green LED may illuminate if the supply voltage has been correctly connected. If one of the red LEDs illuminate, there is an error in the system which can be pinpointed with the aid of the LED.

LED	Error	Error correction
LED's are not illuminated	The supply voltage is missing, too low or has been connected incorrectly	Check connections and supply voltage.
Green LED flashes cyclically	Internal error is indicated by the number of pulses	According to the error indicator, switch off the output, switch off the device or check the supply voltage.
A single red LED is illuminated	Contact edge(s) not connected, connected incorrectly or faulty	- Check the connections of the corresponding sensors (squeezed or brittle supply lines, etc.) - Check sensors * - Check safety contact edge(s)*
	One of the contact edge connections is not being used	Any contact edge connections that are not being used must be permanently bridged using one of the supplied 8.2 kΩ resistors

English

* If the error is not in the wiring, the function of the electronics can be tested by connecting an 8.2 kΩ resistor to the respective SCE input on the switching unit.

If the electronics work perfectly after performing the test, the sensor must be checked using an ohmmeter. To do this, the connection of the sensor to the switching unit must be disconnected and connected to an ohmmeter. The resistance must be 8.2 kΩ ±500 Ω when the sensor is inactive and must not exceed 500 Ω when the sensor is active.

11. Taking out of service and disposal

The products manufactured by ASO are intended solely for commercial use (B2B). At the end of use, the products are to be disposed of according to all local, regional and national regulations. Products can also be returned to ASO, which will then dispose of them properly.

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12. Technical specifications

Supply voltage

Mains voltage:	U_{Netz}	230 V AC 50/60 Hz $P_{\text{max}} = 3 \text{ VA}$
Low voltage:	U_{E}	24 V AC/DC $\pm 10 \%$ $I_{\text{E}} = 85 \text{ mA}; I_{\text{max}} = 180 \text{ mA (100ms)}$

Terminal resistance of the sensor

nominal value	R_{nom}	= 8,2 k Ω
upper switching point	R_{AO}	> 12 k Ω
lower switching point	R_{AU}	< 5 k Ω

Relay stages

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

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Fuse type	M 2 A 5 x 20 glass tube*
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Safety relay switching times

Switching off delay (response time)	< 10 ms
Turn-off time	500 ms

Housing

Polycarbonate with transparent cover

Dimensions (HxWxD)

Housing	80 x 120 x 55 mm
Housing incl. cable clamps	102 x 120 x 55 mm

Protection class

with M16-cable clamps	IP65
with M16-blanking plug	IP54

Weight

460 g

Temperature range

-20°C to +55°C

Connection terminals

tightening torque	0,5 Nm
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Connection cable cross-section

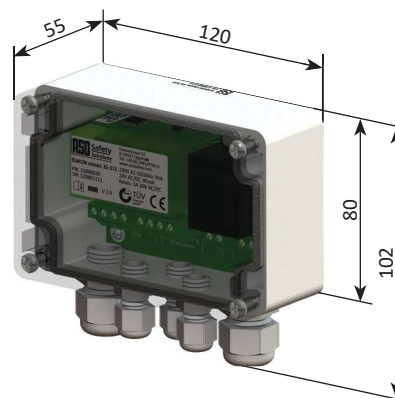
single- or fine-stranded cable 0,75-1,5 mm²

Certifications

	EN ISO 13849-1:2015 Category 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

We hereby declare that the following products of the model range

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*

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

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

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

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,

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

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:

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:

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

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**

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**

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

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

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

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

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

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.

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.

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.

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.

Hersteller und Dokumentationsbevollmächtigter

Manufacturer and attorney of documents

Fabricant et agent de documentation

ASO GmbH
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D-59557 Lippstadt
Lippstadt, 04.07.2018

H. Friedrich
- Geschäftsführer - CEO - Gérant -

