

## ELMON classic 31



**Betriebsanleitung** (Original, Gültigkeit siehe letzte Seite)  
ELMON classic 31 Sicherheitsschaltgerät

Seite 3-12

Deutsch

**Operating Manual** (see last page for validity)  
ELMON classic 31 Safety Relais

Page 13-22

English

**Manuel d'utilisation** (Validité voir la dernière page)  
ELMON classic 31 Relais de sécurité

Page 23-32

Français

## 1. Contents

1.	Contents . . . . .	13
2.	General safety regulations and protective measures . .	14
3.	General. . . . .	15
4.	Proper use . . . . .	15
5.	Device overview . . . . .	15
	5.1 Signal indicators . . . . .	15
	5.2 Connection terminals . . . . .	15
	5.3 Versions and mechanical mounting. . . . .	16
6.	Commissioning . . . . .	16
	6.1 Prerequisites . . . . .	16
	6.2 Electrical connection. . . . .	16
	6.3 Test . . . . .	17
	6.4 Wiring options . . . . .	17
	6.5 Example of use . . . . .	18
	6.6 Connecting multiple sensors per sensor circuit . . . . .	19
7.	Taking out of service and disposal . . . . .	19
8.	Error diagnosis. . . . .	20
9.	Technical specifications . . . . .	21
10.	EC declaration of conformity . . . . .	22

English

**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 manual 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 contact of the relay output is supplied externally with a dangerous voltage, make certain that this voltage is 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

### Safety advice

- The switching unit enables operation at 230 V or at 24 V. Connecting the operating voltage to the wrong terminals can destroy the switching unit.
- Do not install in the immediate vicinity of strong sources of heat.
- For capacitive and inductive loads, ensure adequate protective circuits.
- It is not permissible to operate the safety relay while the housing is open.



**For the design of the safety system to conform to engineer standards acc. to EN ISO 13849-1:2008 category 2, the safety system must be tested prior to each dangerous movement of the plant / machine. Without testing, the operation or wiring of the ELMON classic 31 safety relay does not satisfy these safety requirements.**

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

## ELMON classic 31-31 Safety Relais



### 3. General

The ELMON classic 31 switching unit, designed with one channel, 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 (sensors).

The ELMON classic 31 switching unit is intended for use on plants/machines that make a test signal available through a primary controller prior to each dangerous movement. In combination with the test signal, the switching unit satisfies safety category 2 acc. to EN ISO 13849-1:2008 "Safety-related parts of control systems".

Monitoring of the standby current is made possible by an integrated terminating resistor in the sensor. If the specified standby current is flowing, the output relay is activated and the switching contact is closed. If the sensor is actuated or the sensor circuit is interrupted, the relay switching contact opens. The monitoring state of the sensor and the applied operating voltage are indicated by LEDs.

### 4. Proper use

The ELMON classic 31 switching unit can only fulfil its safety-related task if used properly.

Proper use of the switching unit is the use as protection in combination with safety contact mats, safety bumpers and safety contact edges.

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.

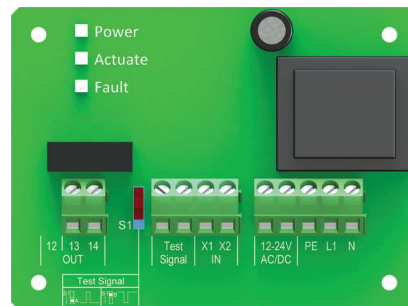
### 5. Device overview

#### 5.1 Signal indicators

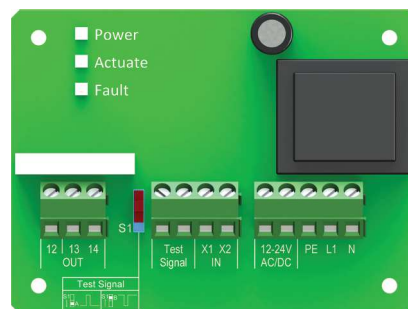
LED	<b>Power</b>	green
Supply voltage		
LED	<b>Actuate</b>	yellow
Sensor actuated		
LED	<b>Fault</b>	red
Safety circuit interrupted		

#### 5.2 Connection terminals

<b>PE, L1, N</b>	Supply voltage 230 V 50/60 Hz
<b>12-24 V AC/DC</b>	Supply voltage 12-24 V AC/DC
<b>X1 X2</b>	Sensor connection
<b>Out 13 14</b>	Safety relay
<b>Out 12 13 14</b>	Safety relay (Version ELMON classic 31-31W)
<b>Test Signal</b>	Test signal input



ELMON classic 31-31



ELMON classic 31-31W

English

## 5.3 Versions and mechanical mounting

### Version *ELMON classic 31-31*

Polycarbonate housing with 1 x M12 and 2 x M16 screw connections for on-wall mounting in harsh environments.

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

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.

### Version *ELMON classic 31-31W*

Same as version *ELMON classic 31-31*, but with changeover contact (outputs **12 13 14**).



For technical reasons, output assignments are not the same as those of version *ELMON classic 31-31* (see page 20).

## 6. Commissioning

### 6.1 Prerequisites

- When supplying with 12-24 V AC/DC, the voltage must comply with the requirements for safety low voltage (SELV).
- 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 and the housing cover is appropriately screwed down.

English

### 6.2 Electrical connection

- Connect supply voltage 12-24 V AC/DC to terminals **12 24 V AC/DC** or 230 V AC to terminals **PE L1 N**.
- During use mains voltage it's advisable to include a delay fuse protection of 1 A.
- Connect the sensor to terminals **X1 X2**.
- Connect the control circuit that is to be monitored to terminals **13 14** or, for version *ELMON classic 31-31W*, to terminals **12 13 14** according to the requirements.
- Connect the test signal supplied by the primary control to the **Test Signal** terminals and select the waveform via DIP slide switch S1.

Upon successful commissioning, safety output **13 14** (*ELMON classic 31-31W 12 13*) is activated (relay contact "closed"). Actuation of the sensor causes relay contact **13 14** (*ELMON classic 31-31W 12 13*) to open.

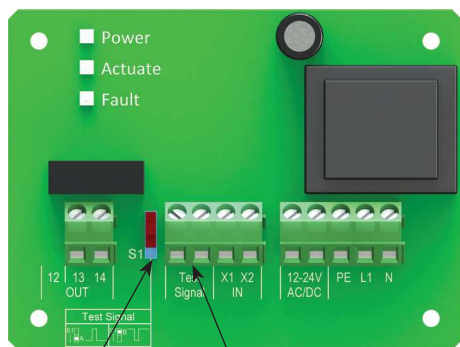


Sufficient fuse protection must be provided on all output contacts with capacitive and inductive loads.

## ELMON classic 31-31 Safety Relais

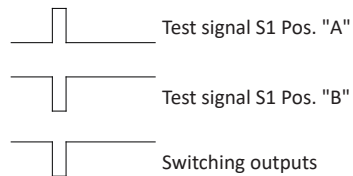
### 6.3 Test

For a standard-compliant design of the protection, the primary machine control must perform a test prior to each dangerous movement or during the non-dangerous phase/movement of the machine. Upon application of the test signal, the output terminal of the switching unit must open. This change in switching state must be evaluated by the primary machine control. If the test result is correct, the machine control then initiates the movement or the next work step. Otherwise, the control must output an error message and the power-driven work equipment (e.g. motor) must receive a switch-off signal from the machine control. The available test signal can be selected with the DIP slide switch.

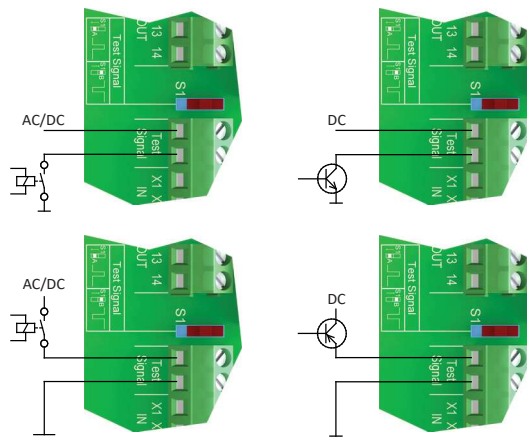


DIP slide switch S1      Test signal connection terminals

#### Characteristics of the signal



### 6.4 Wiring options



$U_{Test}$  12 V ... 28 V AC/DC



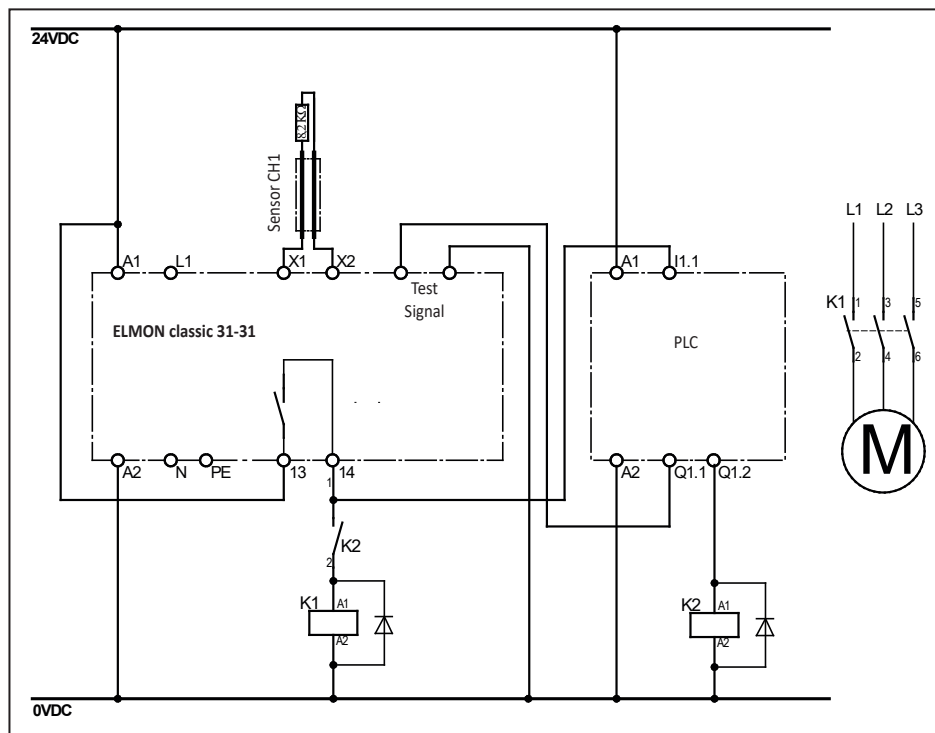
With testing by the control, the ELMON classic 31 system satisfies the Cat. 2 requirements in accordance with EN ISO 13849-1:2008 "Safety-related parts of control systems".

**Without testing, the operation or wiring of the ELMON classic 31 satisfies no specific safety requirement.**

## 6.5 Example of use

Safety-related monitoring of a sensor circuit with primary PLC or machine control.

For a functional test of the protection, the PLC/machine control performs a test prior to each dangerous movement or in the non-dangerous phase/movement of the machine. If the test result is correct, the PLC/machine control then initiates the movement or the next work step.



## 6.6 Connecting multiple sensors per sensor circuit



**ASO sensors must not be connected in parallel.**

The ELMON classic 31 switching unit is only equipped with one input for sensors. Nevertheless, it is possible to connect two or more sensors to the switching unit. For this purpose, the individual sensors are connected in series according to figure 1.

### **Safety contact 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 contact 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 m<sup>2</sup>. 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 k $\Omega$   $\pm$  500  $\Omega$  when the sensor is inactive and must not exceed 500  $\Omega$  when it is active.

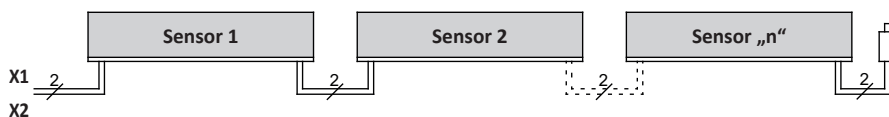


Figure 1: Wiring of multiple sensors; in this example: safety contact edge

## 7. 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.



## 8. Error diagnosis

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

LED	Error	Error correction
LEDs are not illuminated	The supply voltage is missing, too low or has been connected incorrectly	Check connections and supply voltage: 12-24 V AC/DC: 12-24 V AC/DC Tolerance range: +10% L1,N,PE: 230 V AC 50-60 Hz
LED <b>Actuate</b> is illuminated	Sensor supply line or sensor faulty	Check connections, wiring and supply lines of the sensor (squeezed or brittle supply lines, etc.). Check sensor*
	Faulty test	Check setting of DIP slide switch. Adjust or check the test signal of the primary PLC/controller and set the DIP slide switch appropriately.
LED <b>Fault</b> is illuminated	Sensor supply line or sensor faulty	Check connections, wiring and supply lines of the sensor (squeezed or brittle supply lines, etc.). Check sensor*

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 input **X1 X2** on the switching unit. If the electronics work perfectly after performing the test, the sensors must be checked using an ohmmeter. To do this, the connection of the sensor to the safety relay 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.

## ELMON classic 31-31 Safety Relais



### 9. Technical specifications

#### Supply voltage

Mains voltage:  $U_{\text{Mains}}$  230 V AC 50/60 Hz  
 Fuse protection T 1 A  
 Low voltage:  $U_{\text{E}}$  12-24 V AC/DC +10%

#### Power consumption

$P_{\text{max}}$  0,5 VA 230 V AC  
 $P_{\text{max}}$  0,5-1 VA 12-24 V AC/DC

#### Terminating resistor - sensor

nominal value  $R_{\text{Nom}}$  = 8,2 k $\Omega$   
 upper switching point  $R_{\text{AD}}$  > 12,7 k $\Omega$   
 lower switching point  $R_{\text{AU}}$  < 4,6 k $\Omega$

#### Relay stages

nominal current DC DC-13 / 24 V / 1 A  
 nominal current AC AC-15 / 250 V / 1 A  
 Mech. life-time > 10<sup>5</sup> actuations

#### Safety Relais

Fuse type M 1 A 5 x 20 glass tube\*

#### Safety relay switching times

Switching off delay < 5 ms

(response time)

Switching on delay approx. 100 ms

#### Test input voltage

Input voltage  $U_{\text{Test}}$  12 V ... 28 V AC/DC

#### Housing ELMON classic 31-31

Polycarbonate with transparent cover

Dimensions (HxWxD)

Housing 120 x 80 x 57 mm

incl. screw-fittings 120 x 100 x 57 mm

#### Protection class

with screw-fittings IP65

with blanking plug IP54

#### Weight

280 g

#### Temperature range

-20 °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<sup>2</sup>

#### Safety category

EN ISO 13849-1:2015 Category 2 PL d

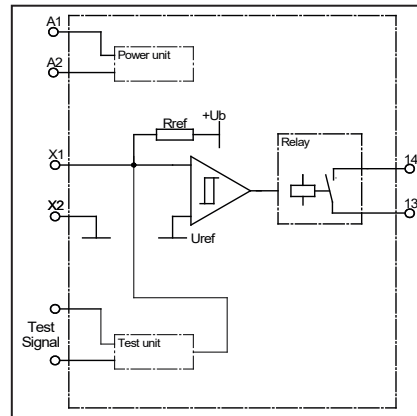
MTTFd 110 years, DC 90%

(Electronic) MTTFd 3477 years

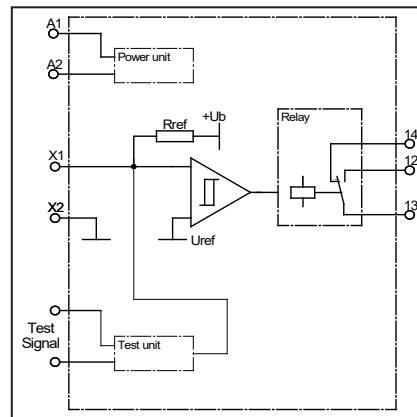
(Electromechanics) B10d 200000

- MTTFd 114 years (Nop 17520)

\*Not included in the scope of delivery



Simplified diagram ELMON classic 31



Simplified diagram ELMON classic 31-31 W

English

## 10. 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 31-20**  
**ELMON board 31-30**  
**ELMON classic 31-21**  
**ELMON classic 31-31\* (W)**  
**ELMON rail 31-33(V)**

**ELMON board 31-20**  
**ELMON board 31-30**  
**ELMON classic 31-21**  
**ELMON classic 31-31\* (W)**  
**ELMON rail 31-33(V)**

**ELMON board 31-20**  
**ELMON board 31-30**  
**ELMON classic 31-21**  
**ELMON classic 31-31\* (W)**  
**ELMON rail 31-33(V)**

Sicherheitsschaltgerät 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  
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 Nr. 44 205 13031822

Examen CE de type\*  
 Notified Body 0044  
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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

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 - Geschäftsführer - CEO - Gérant -

