Installation use and maintenance



(Original instructions)

SR ZERO

Safety Relay Module

English

SAFETY RELAY

SR ZERO

INSTALLATION USE AND MAINTENANCE

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English

OVERVIEW

This symbol indicates an important personal safety warning. Failure to comply with the warning may result in very high risk for exposed personnel.

➔ This symbol indicates an important instruction.

The SR ZERO is a safety relays expansion used to connect the machine safety circuit to 2 OSSD output devices i.e.:

- photoelectric light curtain
- laser scanner
- RFID sensor

See details below about light curtain models, wiring, etc.

- When deciding on the safety category to be adopted, carefully consider the risks analysis of the machine.
- The module has been designed in particular for use with the ReeR light curtains of the Admiral AX (category 4), Vision VX and Vision VXL/MXL (category 2) series, EOS, Magnus RFID sensor and ReeR laser scanner. Consult ReeR before using the interface with other light curtain models or safety devices.
- For safe use of the device, it is essential to read and understand the contents of this handbook.
- Failure to comply with the prescriptions indicated in this notice may result in very high risks for the operating personnel of the protected machine.

English

INSTALLATION AND ELECTRICAL CONNECTIONS



Figure 1

SR ZERO is provided with terminal blocks for the electrical connections.
The unit provides 16 terminals.

➔ Terminal tightening torque: 5...7lb-in (0,6...0,7 Nm).

- Install SR ZERO in an enclosure with a protection class of at least IP54.
- Connect the safety relay module when it is not powered.
- The supply voltage to the units must be 24 ± 20% VDC; PELV (in compliance with the standard EN 60204-1 (Chapter 6.4)).
- Do not use the SR ZERO to supply external devices.
- The same ground connection (0VDC) must be used for all system components.

INSTRUCTIONS CONCERNING CONNECTION CABLES.

- ➔ Wire size range: AWG 12...30, (solid/stranded) (UL).
- ➔ Use 60/75°C copper (Cu) conductor only.
- ➔ We recommend the use of separate power supplies for the safety relay and for other electrical power equipment (electric motors, inverters, frequency converters) or other sources of disturbance.
- ➔ Cables used for connections longer than 50m must have a cross-section of at least 1mm^2 (AWG16).
- ➔ The path of the connection cables between the safety relay and the sensors, the connection referring to the feedback contact must be different from that of other power cables.

English

SR ZERO PINOUT

TERMINAL NUMBER	SIGNAL NAME	TYPE OF SIGNAL	DESCRIPTION
1	**-**	-	Not used
2	**-**	-	Not used
3	**-**	-	Not used
4	**0VDC**	-	Power Supply 0VDC
5	**INPUT1**	Input	Safety input 1
6	**INPUT2**	Input	Safety input 2
7	**K1 K2 FBK IN**	Input	Feedback K1 K2 Input
8	**K1 K2 FBK OUT**	Output	Feedback K1 K2 Output
9	**NC1**	Output	Safety relay A (N.C.)
10	**-**	-	Not used
11	**NO11**	Output	Contact series, safety relay A (N.O.)
12	**NO21**	Output	Contact series, safety relay A (N.O.)
13	**NC2**	Output	Safety relay B (N.C.)
14	**-**	-	Not used
15	**NO12**	Output	Contact series, safety relay B (N.O.)
16	**NO22**	Output	Contact series, safety relay B (N.O.)

Table 1

CHECKLIST AFTER INSTALLATION

To guarantee the system perfect operation perform the following checks at start up and at least every year:

OPERATION / CONTROL	COMPLETE
1. *Verify the correct fixing of SR ZERO to the Omega rail.*	❒
2. *Verify that all the cables are correctly inserted and the terminal blocks well screwed.*	❒
3. *Verify that the led (indicator) light on correctly.*	❒
4. *Verify the positioning of all the sensors connected to SR ZERO.*	❒

English

Example of connection of the SR ZERO module with safety light curtain SAFEGATE S (low range operation)

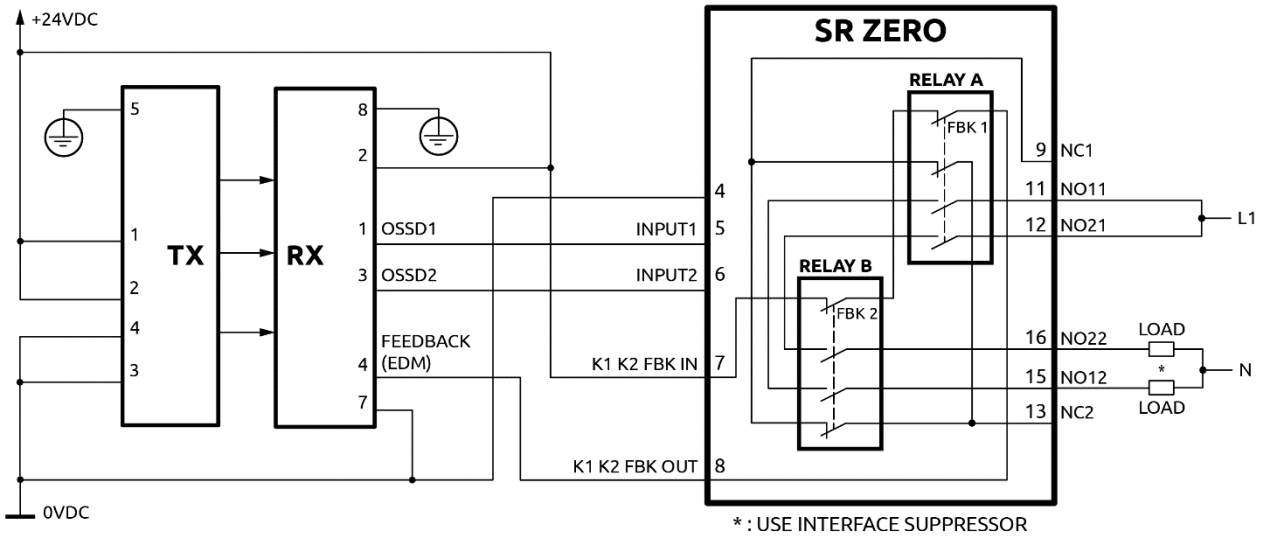


Figure 2

Example of connection of the SR ZERO module with AX / VX / VXL safety light curtain in AUTOMATIC operatione mode

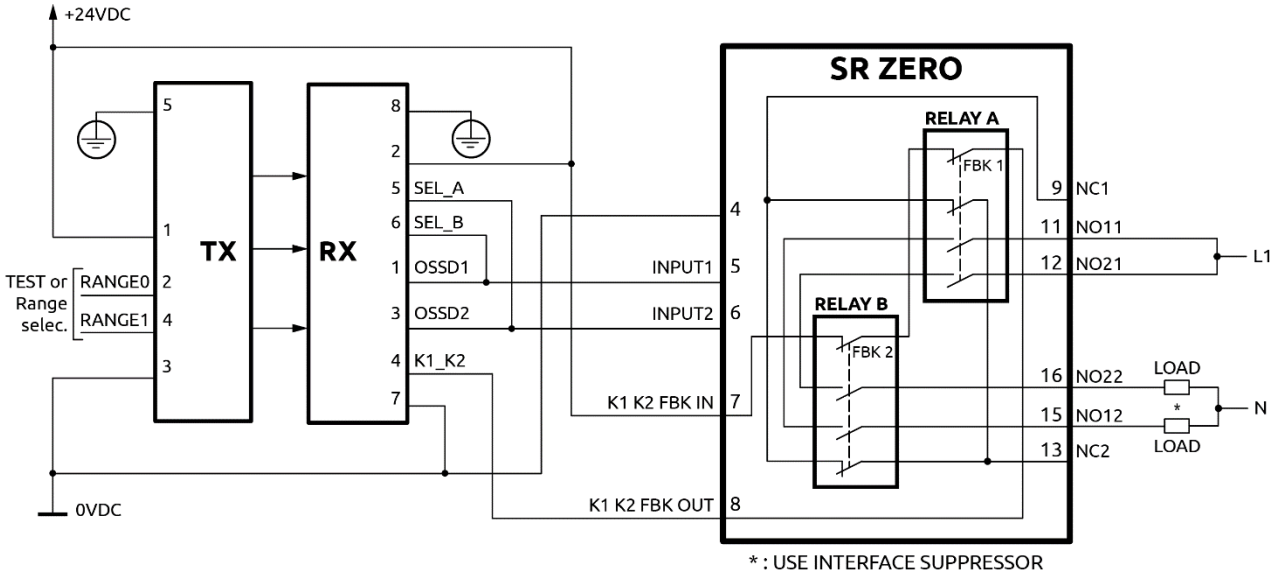


Figure 3

English

Example of connection of the SR ZERO module with AX / VX / VXL safety light curtain in MANUAL operatione mode

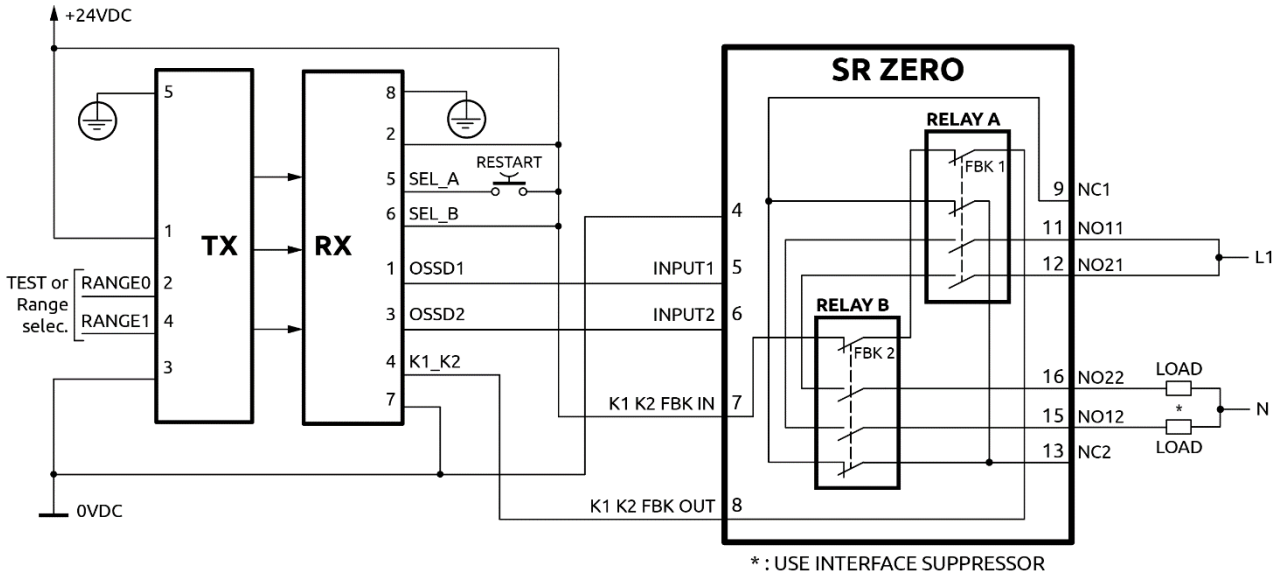


Figure 4

Example of connection of the SR ZERO module with MXL safety light curtain in AUTOMATIC operatione mode

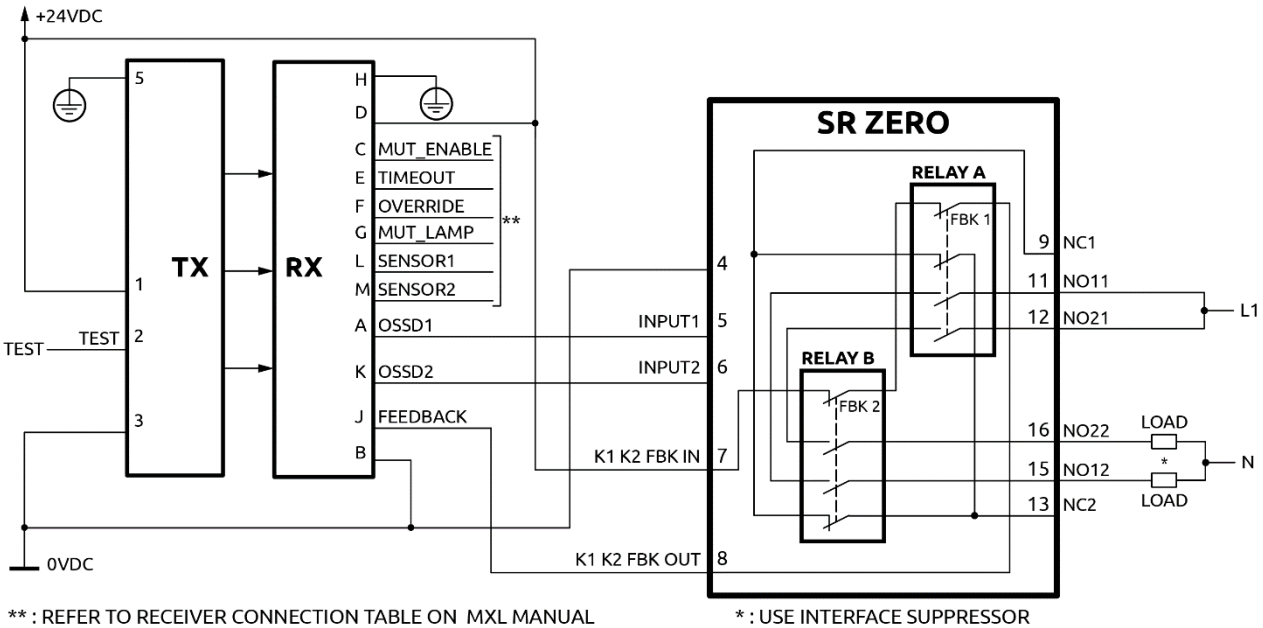


Figure 5

English

Example of connection of the SR ZERO module with MXL safety light curtain in MANUAL operatione mode

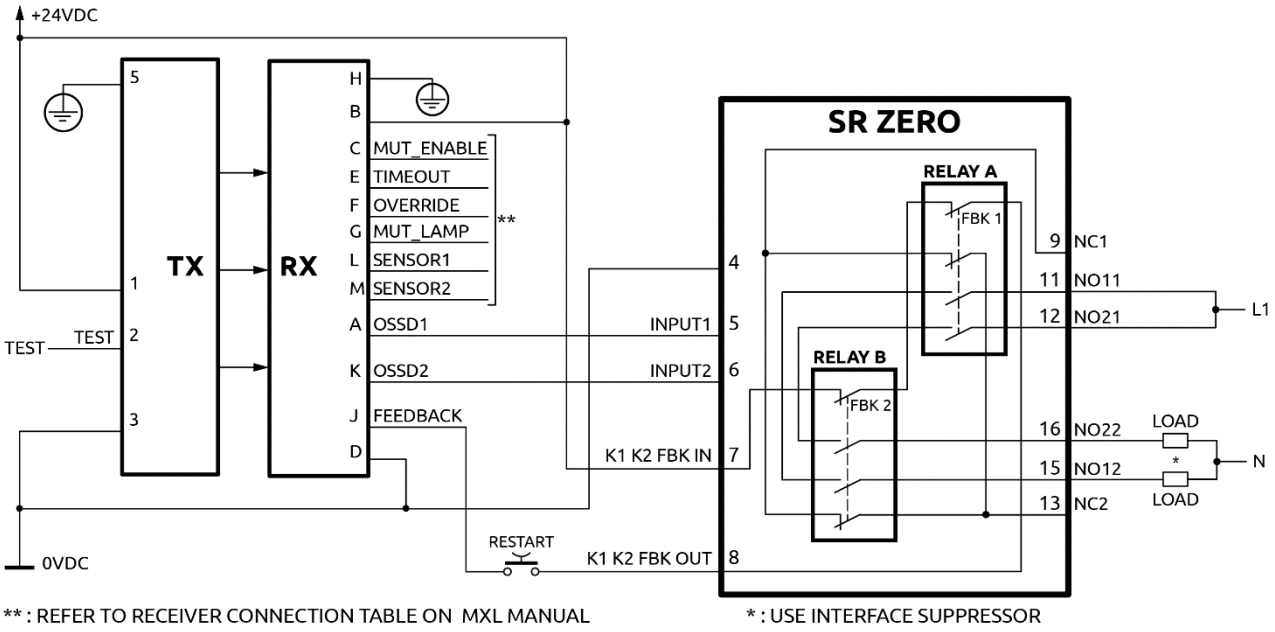


Figure 6

Example of connection of the SR ZERO module with EOS4X safety light curtain in AUTOMATIC operatione mode

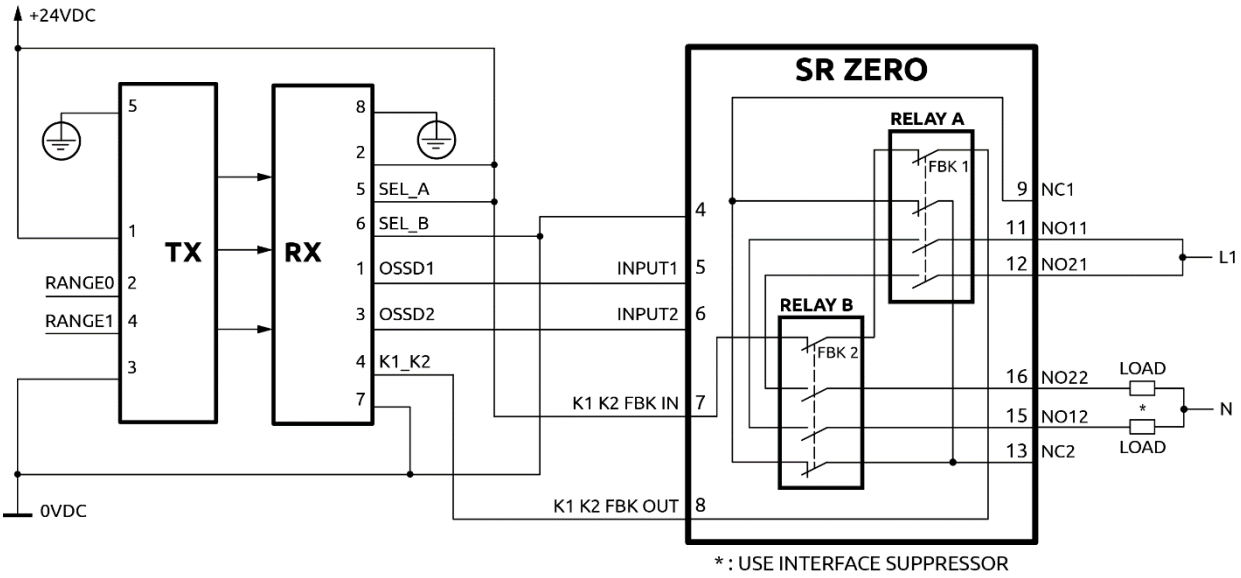


Figure 7

English

➔ Further details regarding connections can be found on each curtain technical manual.

CHARACTERISTICS OF THE OUTPUT CIRCUIT

For the output circuit, the safety relay uses two guided contact safety relays.

These relays are rated by the manufacturer for voltage and current values above those indicated in the technical data; however, to assure correct insulation and to avoid damage or premature aging, protect each output line with an appropriate fuse (depending on the load). Check that load characteristics comply with the indications given in the table below.

Minimum switching voltage	18 VDC
Minimum switching current	20 mA
Maximum switching voltage	250 VAC
Maximum switching current	6 A (AC) / 6 A (DC)

STATUS INDICATORS

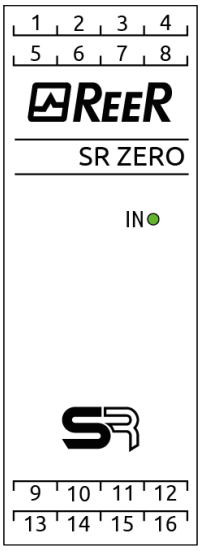


Figure 8

LED	COLOR	STATUS/COLOR	CONDITION
IN	Green	ON	ON with input activated
		OFF	OFF with input not activated

Table 2

English

TECHNICAL DATA

SAFETY DATA	VALUE	STANDARD
Safety level	Type 4	EN 61496-1: 2020
	SIL 3	EN 61508:2010
	SILCL 3	EN 62061:2005 / A2:2015
	Cat.4	EN ISO 13849-1: 2015
Performance level	PL e	EN ISO 13849-1: 2015
PFH_d	2,61E-09	EN 61508:2010
$MTTF_d$ (Refer to next table)		EN ISO 13849-1: 2015
Device lifetime	20 years	
Certifications	cULus, TÜV	

Load	B10d	Number of Commutations	PFHd *	DCavg #	MTTFd # (years)	PL #	CCF #
2A@230Vac	400.000	1 every 30s	1,71E-07	98,94%	27,04	d	80%
		1 every min	8,74E-08	98,88%	54,05	e	80%
		1 every hour	4,99E-09	92,16%	3022,39	e	80%
		1 every day	3,68E-09	45,25%	23745,23	e	80%
0,5A@24VDC	200.000	1 every 30s	3,40E-07	98,97%	13,52	d	80%
		1 every min	1,71E-07	98,94%	27,04	d	80%
		1 every hour	6,39E-09	95,46%	1565,28	e	80%
		1 every day	3,77E-09	62,11%	16296,27	e	80%

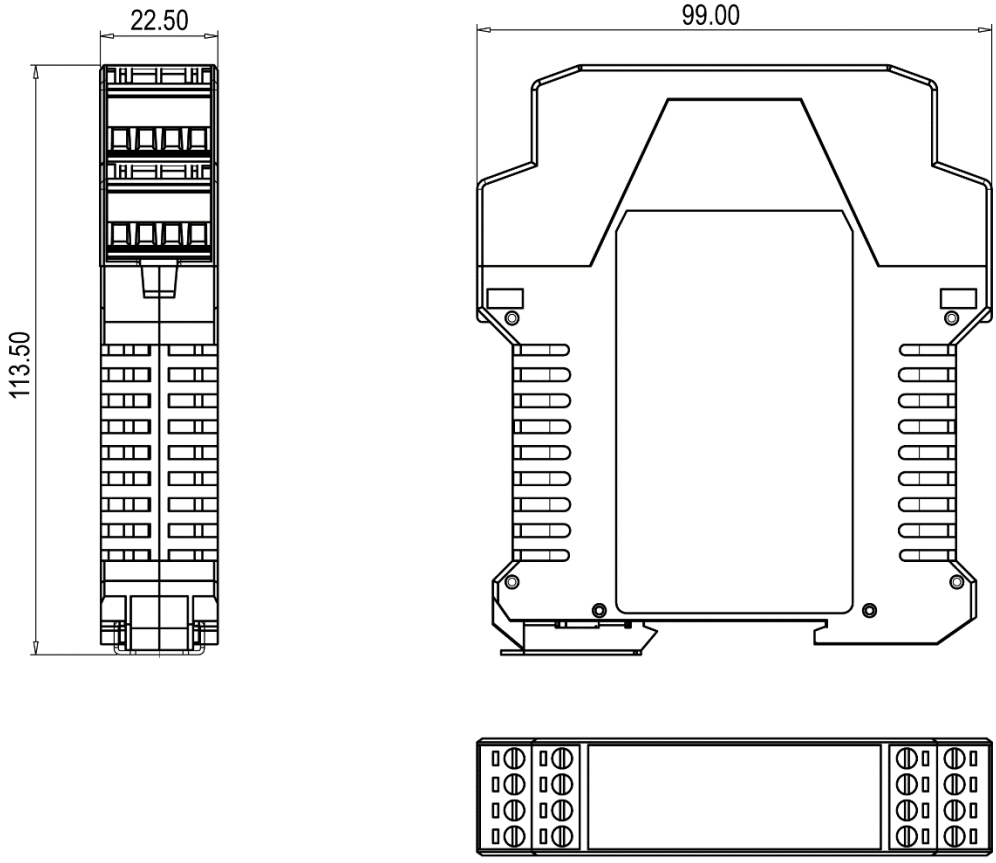
*** EN 61508:2010, EN 62061:2005/A2:2015; # EN ISO 13849-1:2015**

ELECTRICAL PARAMETERS	VALUE
Power supply	24 ± 20% VDC; PELV
Rated impulse between PELV and relay contacts	6 kV
Power requirement	1,5 W max
INPUT DATA	
Input number	2 internal coil relays
Number of EDM input	1 NC contact
OUTPUT DATA	
Number of safety output	2 N.O. and 1 N.C. contacts
Type	Relays with forced guided contacts
Max switching voltage	250VAC, 125 VDC, Overvoltage Category III
Max switching current	6A (AC), 6A (DC)
Max switching power	1500VA, 180W (85W if load voltage >30 VDC)
Max Response time	20ms
Mechanical service life	10 x 10E6
Electrical service life AC1 at 360 switchings/h	> 10E5
CONNECTIONS / OPERATION	
Connections	16 Terminal blocks with protection against reversal of polarity
Status indicator	Input status LED
Max. length of connections	100m
Operating temperature	-30...55°C
Max surrounding air temperature	55°C
Storage temperature	-30...70°C
Relative humidity	10%...95%
Maximum operating altitude	2000m
Vibration resistance (CEI EN 60068-2-6:2009)	+/- 1.5 mm 9...200 Hz
Bump resistance (CEI EN 60068-2-27:2012)	15 g (6 ms half-sine)

English

ENCLOSURE DATA	VALUE
Description	Electronic housing 16 pole, with locking latch mounting
Enclosure protection rating	IP 20
Terminal block protection rating	IP 2X
Fastening	Fast attachment to rail according to CEI EN 60715
Dimensions (h x w x d)	99mm x 22,5mm x 113,5mm
Weight	150g

DIMENSIONS



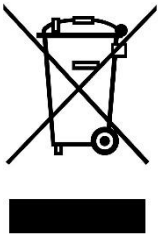
(All dimensions are expressed in mm

Figure 9

English

INDICATIONS AND INFORMATION FOR ENVIRONMENTAL PROTECTION

Dispose of the product in an eco-compatible manner and in accordance with national legislation.



For Countries in the European Union:

Pursuant to the Directive no. 2012/19/EU on waste electrical and electronic equipment (WEEE).

The crossed out wheelie-bin symbol on the equipment or its packaging means that when the product reaches the end of its useful life it must be collected separately from other waste.

Proper separate collection of the discarded equipment for later environment-friendly recycling, processing and disposal, helps to avoid any negative impact on the environment and health and encourages re-use and recycling of the materials the equipment is made of.

In each individual Member State of the European Union this product is required to be disposed of in accordance with Directive 2012/19/EU as implemented in the Member State where the product is disposed of.

For further information please contact ReeR or your local dealer.

WARRANTY

REER warrants that each SR ZERO unit in new ex-factory condition, in conditions of normal use, is free of defects in the materials and of manufacturing defects for a period of 12 (twelve) months.

In this period, REER undertakes to eliminate any faults in the product through repair or replacement of the faulty parts, completely free of charge as regards material and labor.

However, REER reserves the right to replace the entire faulty appliance with another equivalent appliance or with the same characteristics instead of repairing this.

Validity of this warranty is regulated by the following conditions:

- The user must inform REER of the fault within twelve months from the date of delivery of the product.
- The appliance and its components must be in the conditions in which they were delivered by REER.
- The serial numbers must be clearly legible.
- The fault or defect has not been caused directly or indirectly by:
    - Improper use;
    - Non-compliance with instructions for use;
    - Carelessness, inexperience, incorrect maintenance;
    - Repairs, modifications, adaptations not carried out by REER personnel, tampering, etc.;
    - Accidents or impacts (also due to transportation or causes of force majeure);
    - Other causes not to be ascribed to REER.

Repairs will be carried out at the REER laboratories to which the material must be delivered or dispatched: transport risks and the risks of any damage or loss of the material during shipment are the responsibility of the user.

All products and components replaced become the property of REER.

REER does not recognize any other warranties or rights except for those specifically described above; therefore, no claims for damages may be submitted for expenses, interruption of business or other factors or circumstances in any way related to failure of the product or of one of its parts.

Precise, complete compliance with all the rules, instructions and prohibitions indicated in this handbook is an essential requirement for correct functioning of the safety relay.
REER s.p.a. therefore declines any responsibility for all and anything resulting from failure to comply, even partially, with such indications.

Characteristics subject to change without notice. • Total or partial reproduction is forbidden without the prior authorization of REER.

English

EC DECLARATION OF CONFORMITY

REER

CE

Dichiarazione CE di conformità
EC declaration of conformity

Torino, 13/02/2025

REER SpA
via Carcano 32
10153 – Torino
Italy

dichiara che i moduli **SR ZERO** e **SR ZERO A** sono Dispositivi di Sicurezza di :
- **SIL 3** *(secondo la Norma **EN 61508: 2010**)*
- **SILCL 3** *(secondo la Norma **EN 62061 + A2:2015**)*
- **PL e** *(secondo la Norma **EN ISO 13849-1: 2015**)*

declares that the modules **SR ZERO** and **SR ZERO A** are are Safety Devices of :
- **SIL 3** *(according the Standard **EN 61508: 2010**)*
- **SILCL 3** *(according the Standard **EN 62061 + A2:2015**)*
- **PL e** *(according the Standard **EN ISO 13849-1: 2015**)*

realizzati in conformità alle seguenti Direttive Europee:
complying with the following European Directives:

- **2006/42/EC** "Direttiva Macchine"
  "Machine Directive"
- **2011/65/EU** "RoHS – Linea Guida"
  "RoHS – Guideline "
- **2014/30/EU** "Direttiva Compatibilità Elettromagnetica"
  "Electromagnetic Compatibility Directive"

e alle seguenti Norme: */and to the following Standards*:

- **EN 55032: 2015**
- **EN IEC 63000: 2018**

e sono identici all'esemplare esaminato ed approvato con esame di tipo CE da:
and are identical to the specimen examined and approved with a CE - type approval by:

TÜV SÜD Product Service GmbH – Zertifizierstelle – Ridlerstraße 65 – 80339 – München – Germany
N.B. number: 0123 - Certificate number: Z10 024820 0085 Rev. 01

Responsabile per la documentazione tecnica: Carlo Pautasso
Responsible person for technical documentation:

Carlo Pautasso
Direttore Tecnico
Technical Director

Simone Scaravelli
Amministratore Delegato
Managing Director

English

UKCA DECLARATION OF CONFORMITY

ReeR declares that SR ZERO Safety Relay module complies with following UK legislation:

- S.I. 2008 No. 1597 - The Supply of Machinery (Safety) Regulations
- S.I. 2016 No. 1101 - Electrical Equipment (Safety) Regulations
- S.I. 2016 No. 1091 - Electromagnetic Compatibility Regulations
- S.I. 2012 No. 3032 - The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

➔ Please refer to the link https://www.reersafety.com/certifications to download the complete UKCA Declaration of Conformity.

English

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English

All REER product manuals are available at URL https://www.reersafety.com/it/en/download/manuals