Safety units SSZ-CVS/N/2 and SSZ-CVS/N/3 – Operating Manual

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1. About

Units type SSZ-CVS/N are logic systems to assure safety functions (App. IV pos.21 MS Directive 2006/42/EC). Units of SSZ-CVS/N type are used for stoppage of dangerous machines and other equipment, which functioning can be dangerous for people present in their hazardous zone. They can be also used for signaling and warning about danger for people who will be present in such zone directly or indirectly and their life or health would be at risk.

Units are designed for cooperation with 2- channel sensing resistors- **Pressure Sensitive SSZ Safety Devices:** SSZ-safety mat, SSZ-safety rail (**SSZ-**SSL 05 NBR, 06 NBR, 06 EPDM, 08 NBR, 08 EPDM, 10 NBR and 10 EPDM) and SSZ-safety bumper.

Control units supplied by AC/DC (9÷36)V can be used, for example in vehicles and in every place where supply voltage is in given range. Units labeled 230/24 can be supplied by mains power 230V or (after switching position of an internal switch) by AC/DC 24V. In both cases, polarity of plugged cables is not important.

2. Labeling

a. SSZ-CVS/N/2/230/24 - unit cat.2, supplied by 230 V AC or 24V AC/DC
b. SSZ-CVS/N/2/12 – unit cat.2 supplied by (9÷36)V AC/DC
c. SSZ-CVS/N/3/230/24
   unit cat.3 supplied by 230 V AC or 24VAC AC/DC
d. SSZ-CVS/N/3/12 – category 3 unit supplied by (9÷36)V AC/DC

3. Technical parameters

SSZ-CVS/N/2/230/24	
Supply voltage	230V AC or 24V AC/DC
Load carrying capacity of safety circuits	2A
Operating temperature [℃]	0÷50
Can be used internally	Yes
Maximum resistance of single sensor's channel	250kΩ
Maximal difference between resistances of channels	20%
Maximum time of actuation	<20 ms
MTTF	34 years
$MTTF_d$	17.17 (medium)
DC (Diagnostic Coverage)	90%
CCF (Common Cause Failure)	80
PFH_d (according to IEC/EN 62061)	4.477×10^{-6}
Category compatible with IEC/EN 62061	SIL1
Class of safety category according to PN 954-1	Second
Performance Level according to PN-EN ISO 13849-1	PL c
Storage temperature [℃]	-10÷70
Protection level	IP30
Dimension (H/W/D) [mm]	112x23x99

SSZ-CVS/N/2/12	
Supply voltage	(9÷36)V AC/DC
Load carrying capacity of safety circuits	2A
Operating temperature [℃]	0÷50
Can be used internally	Yes
Maximal resistance of single sensor's channel	250kΩ
Maximal difference between resistances of channels	20%
Maximum time of actuation	<20 ms
MTTF	34 years
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SSZ-CVS/N/3/230/24	
Supply voltage	230V AC or 24V AC/DC
Load carrying capacity of safety circuits	2A
Operating temperature [℃]	0÷50
Can be used internally	Yes
Maximal resistance of single sensor's channel	250kΩ
Maximal difference between resistances of channels	20%
Maximum time of actuation	<20 ms
MTTF	406 years
$MTTF_d$	203.5 (high)
DC (Diagnostic Coverage)	90%
CCF (Common Cause Failure)	80
PFH_d (according to IEC/EN 62061)	0.375×10^{-6}
Category compatible with IEC/EN 62061	SIL2
Class of safety category according to PN 954-1	Third
Performance Level according to PN-EN ISO 13849-1	PL d
Storage temperature [℃]	-10÷70
Protection level	IP30
Dimension (H/W/D) [mm]	112x23x99

SSZ-CVS/N/3/12	
Supply voltage	(9÷36)V AC/DC
Load carrying capacity of safety circuits	2A
Operating temperature [℃]	0÷50
Can be used internally	Yes
Maximal resistance of single sensor's channel	250kΩ
Maximal difference between resistances of channels	20%
Maximum time of actuation	<20 ms
MTTF	406 years
$MTTF_d$	203.5 (high)
DC (Diagnostic Coverage)	90%
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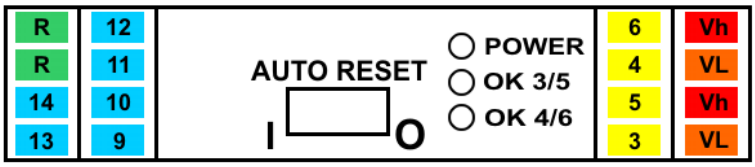
Storage temperature [℃]	-10÷70
Protection level	IP30
Dimension (H/W/D) [mm]	112x23x99

4. Testing of functioning

- Disconnect sensors on terminals 3, 4, 5 and 6
- Short terminals by leads. Short terminals 3 and 5 by one lead, and 4 and 6 by the second one. After switching on, two control lights will turn on (OK 3/5 and OK 4/6) and out-relays will be activated.
- In case of safety units with automatic blocking, only one light will turn on. Press RESET in order to reset a safety unit.
- If terminals 3 and 4 or 5 and 6 are short, then both channels (K1 and K2 releases) will be deactivated.
- If we break connection on 3/5 terminals, K1 relay will be deactivated.
- If we break connection on 4/6 terminals, K2 relay will be deactivated.

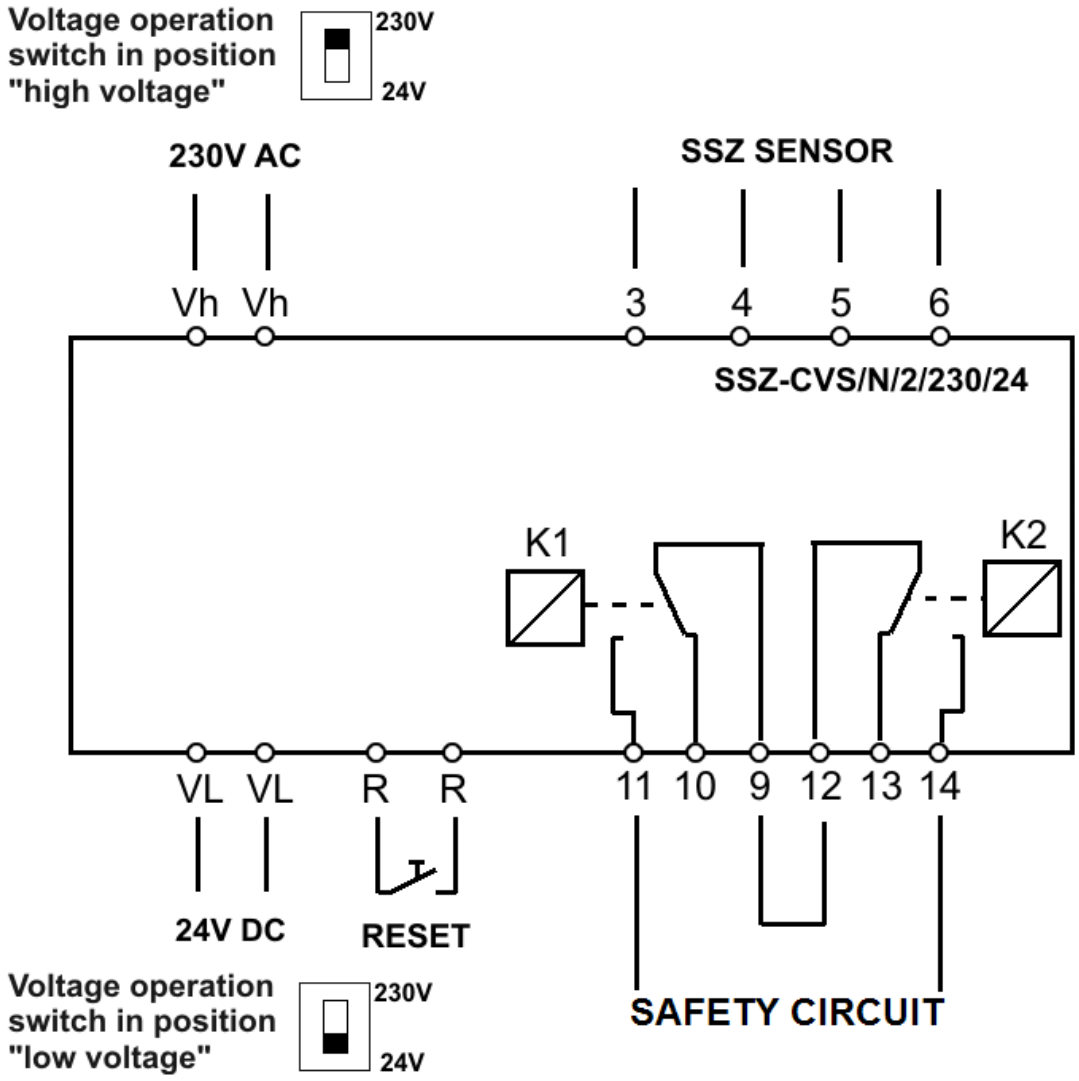
5.Terminals



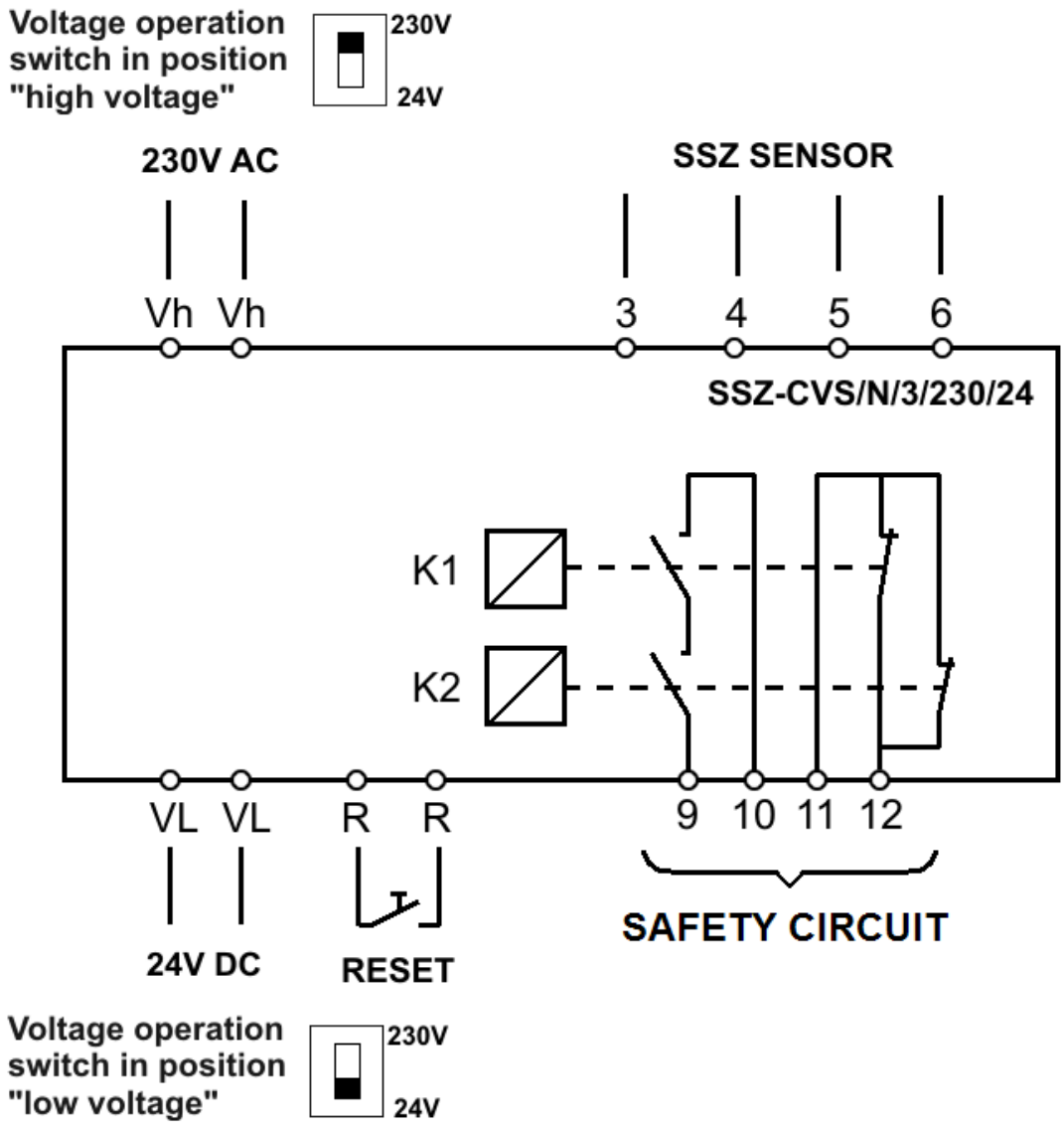
Terminal of safety unit	Type of safety unit			
	SSZ-CVS/N/2/230/24	SSZ-CVS/N/3/230/24	SSZ-CVS/N/2/12	SSZ-CVS/N/2/12
3	SSZ sensor, terminal 3			
4	SSZ sensor, terminal 4			
5	SSZ sensor, terminal 5			
6	SSZ sensor, terminal 6			
9	Relays output	Relays output	Relays output	Relays output
10	Relays output	Relays output	Relays output	Relays output
11	Relays output	Relays output	Relays output	Relays output
12	Relays output	Relays output	Relays output	Relays output
13	Relays output	-	Relays output	-
14	Relays output	-	Relays output	-
R	RESET button			
R	RESET button			
Vh	L (230V AC)		-	
Vh	N (230V AC)		-	
VL	+24V AC/DC		(9÷36)V AC/DC	
VL	0V		0V	

6.Connections

a. Exemplary connection of category 2 unit

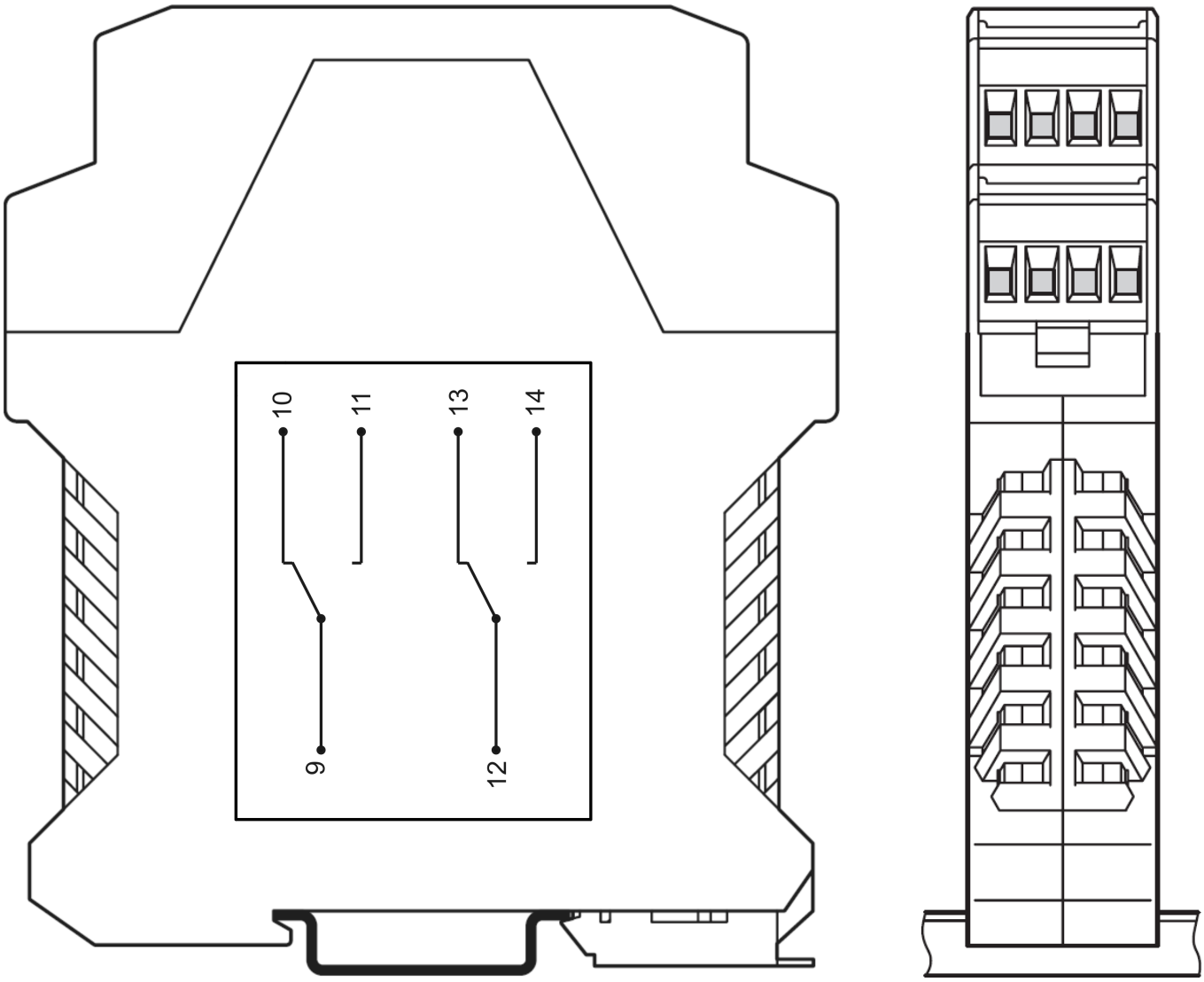


b. Exemplary connection of category 3 unit



7. Fixation

The control units SSZ-CVS/N are fixed at the DIN 35 mm rail as at the drawing:



8.Means used for preventing from systematic defects (PN-EN ISO 13849-1 : 2002 G)

- Construction of units provide prevention in case of power supply break. End relays are up (safe state) when safe state is present on the input. In case of power supply break, relays are disconnected (unsafe state)
- In supply limbs of measuring circuits, self-contained constant voltage regulator were used, which protect (together with capacitive filters) against fluctuations of input voltage
- Comparators used in input circuits have wide range of supply voltage
- Input resistance measuring circuit is designed to level errors resulting form unstable supply voltage
- Output relays used are designed to work in safety equipment
- Construction of measuring circuits is used in other tools produced by us for many years
- Equipment is tested at an angle of electromagnetic compatibility.
- Equipment passed tests of environmental factors influence
- Units are subject to internal quality control.
- Production process is executed by the staff which constantly improve their abilities

- Elements included in units are produced by renowned, reliable, properly certified companies.
- The company has 20-years of tradition and experience, is represented all over Europe and other countries.
- SSZ equipment is in the top of rank

9. Storage and transport

To protect the safety SSZ-CVS/N/2 and SSZ-CVS/N/3 control units from the damages they should be transported and stored in the primary packaging material.

Storage : in closed, dry and draughty, free of direct atmospheric influences places. The temperature of the store should be not lower as –10°C and not higher as 70°C. The relative ai r humidity not higher as 80%. Protection class: IP 30

10.Notes

NOTE: SAFETY UNITS ARE ONLY A PART OF SAFETY SYSTEMS – ONE MUST DESIGN AND CONSTRUCT SAFETY SYSTEM ACCORDING TO RULES INCLUDED IN STANDARDS AND DIRECTIVES FOR MACHINES

NOTE: SWITCHING CURRENTS OF SAFETY TERMINALS CAN NOT EXCEEDED NOMINAL VALUES IN CASE OF SUCH SITUATION, A SYSTEM MUST BE RE-DESIGNED

NOTE: ALL EXTERNAL LEADS SHOULD BE SHUT BY SLEEVES WITH SIDE INSULATION.

NOTE: ALL ELECTRIC CONNECTIONS SHOULD BE PROPERLY TIGHTEN AND CHECKED. PERIODICAL CONTROL OF ELECTRICAL TERMINALS IS RECOMMENDED

NOTE: UNITS DESIGNE ONLY FOR WORK IN PLACES NOT ENDANGERED FOR EXTERNAL FACTORS (E.G. RAIN).

NOTE: RESET AND SUPPLY SWITHCES SHOULD BE SIZED BY ATTACHED LABELS IN ORDER TO PREVENT SETTINGS FROM INTERFERENCE OF UNATORIZED PEOPLE

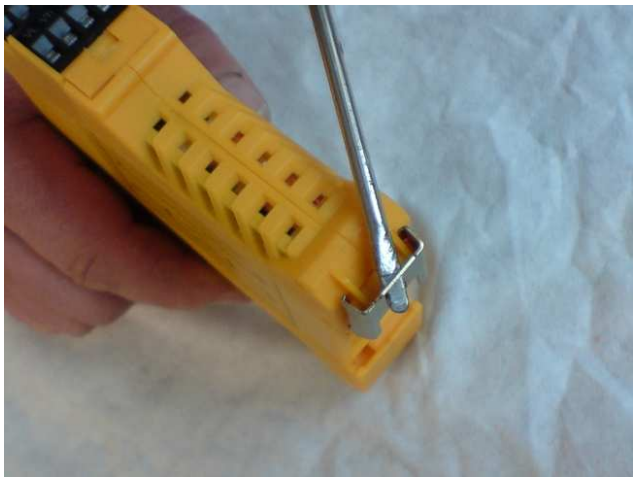
NOTE: IT IS FORBIDDEN TO REPAIR SAFETY UNITS OR TO BRIDGE ELECTRIC CONNECTIONS .IN CASE OF THEIR FAILURE IT IS NECESSARY TO SEND A UNIT TO AUTHORIZED SERVICE OR TO THE PRODUCER OR SELLER

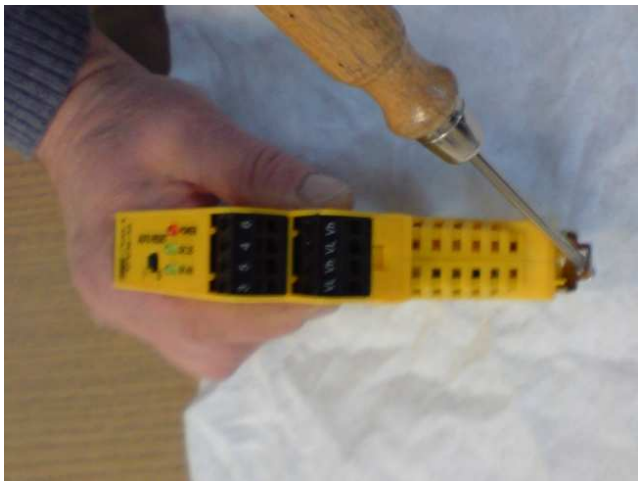
Notes IN CASE OF ANY FAILURE OF SAFETY SYSTEM, IT IS FORBIDDEN TO START ANY DANGEROUS MACHINES

NOTE: IT IS RECOMMENDED TO CHECK CORRECTNESS OF SAFETY SYSTEM FUNCTIONING BEFORE EVERY START OF A DANGEROUS MACHINE.

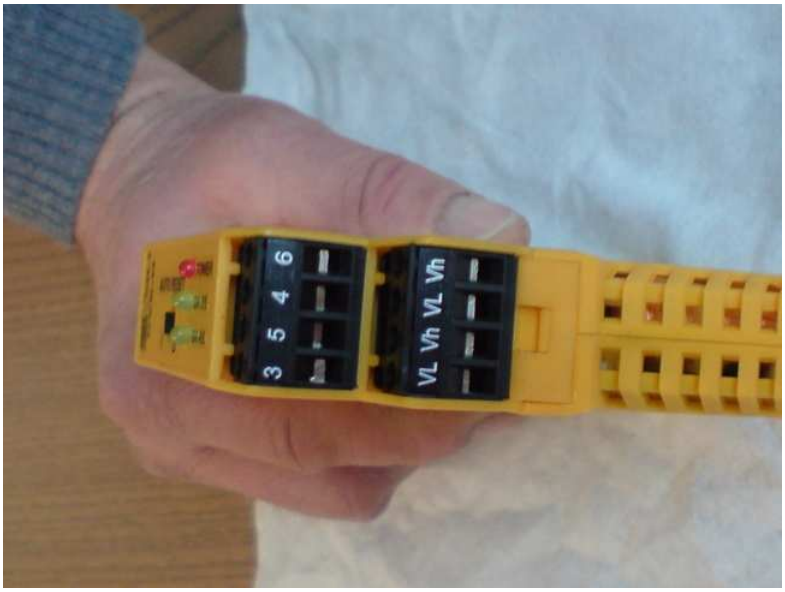
NOTE: REGARDLESS CIRCUMSTANCES, IT IS ALWAYS OBLIGATORY TO OBBEY SAFETY RULES AND TO HAVE LIMITED TRUST IN SAFETY SYSTEMS

NOT OBBEYING OF THE RULES INCLUDED IN THIS MANUAL CAN RESULT IN ACCIDENT, HEALTH PROBLEMS OR DEATH.

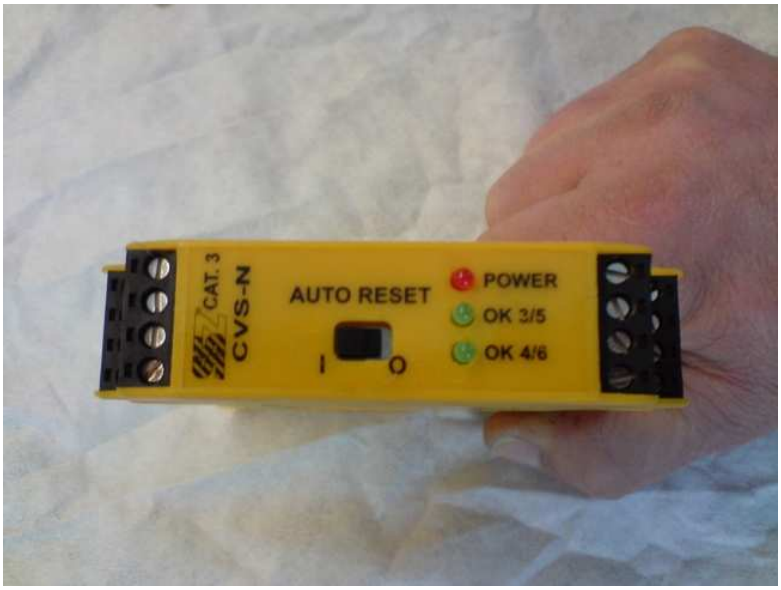




Picture 3a, 3b. For the installation on the rail pull the snapper



Picture 4. ATTENTION! The terminals are not in chronological order !
3-5, 4-6(not 3-4 5-6)
Vh= Voltage HIGH = 230 V
Vl =Voltage LOW = 24 V



Picture 5. Reset selector:
I – Automatic Reset
O – Manual Reset use terminals R-R