

Реле принудительно управляемой связи ZSCoupling

Технические характеристики

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Electrical Connection

Forcibly Guided Coupling Relay ZSCoupling

Operating Instructions

Checks and maintenance

The following checks are regularly required to ensure proper and continuous functioning

- Check the switching function
- Check for signs of manipulation and safety function bypassing
- Check if the device is mounted and connected securely

- Check for soiling

Check if the safety device is working properly, in particular:

- Every time after initial commissioning
- Every time after replacing a component
- After every fault in the safety circuit

Regardless of this, the safe functioning of the safety device should be checked at suitable intervals, e.g. as part of the maintenance schedule of the plant. Not maintenance is required for the device itself.

What to do in Case of a Fault?

Device does not switch on:

- Check the wiring by comparing it to the wiring diagrams
- Check the control line at A1
- Check Feedback loop
- Check reference potential

If the fault still exists, perform the steps listed under "Commissioning Procedure".

If these steps do not remedy the fault either, return the device to the manufacturer for examination.

Opening the device is impermissible and will void the warranty.

Proof-Test



In order to check the proper function of the device, the following steps have to be carried out

- Deactivate the ZSCoupling. Check that the contacts (13-14 to 33-34) are opened by disabling and the monitoring contact 41-42 is closed
- Now reactivate the device. Check that the contacts (13-14 to 33-34) are closed again and the monitoring contact 41-42 is open.

If one of the above switching states is not present, the proof test is failed.

ATTENTION: If the proof test is not passed, it is mandatory to replace the device. Otherwise, there is a risk of loss of functional safety.

Techn. Data

Basic component, suitable for safety applications according to the following standards	EN ISO 13849-1; EN 62061; IEC 61508 Parts 1-2 und 4-7; IEC 61511-1
Power consumption	A1/A2 = DC 24 V: approx. 0.8W
Control voltage	DC 24 V - 15 % / + 10%
Max. leakage current at „0“	5 mA
Filtering of test pulses at nominal voltage DC 24V	
Switch-off pulses (Pulse width / Pulse rate)	≤ 2 ms / ≥ 50 ms
Number NO contacts	3
Number NC contacts	1
Max. switching voltage	AC 250 V
NO breaking capacity (13-14, 23-24, 33-34) (6 switching cycles / min)	AC: 250 V, 2000 VA, 8 A for DC-1 250 V, 3 A for AC-15 DC: 30 V, 240 W, 8 A for DC-1 24 V, 3 A for DC-13
Max. thermal total current I _{th}	See total current limit curve
NC breaking capacity (41-42)	AC: 250 V, 500 VA, 2 A für DC-1 DC: 30 V, 60 W, 2 A für DC-1
Min. contact load	5 V, 10 mA
External fuses NO / NC	10 A gG / 4 A gG
Wire width	0.14 - 2.5 mm ²
Tightening moment (Min. / Max.)	0.5 Nm / 0.6 Nm
Typ. switch-on delay / switch-off delay of NO Contacts (13-14, 23-24, 33-34)	< 25 ms / < 40 ms (A1/A2 = DC 24 V)
Max. line resistance at nominal voltage	100 Ω
Contact material	AgSnO ₂
Service life	mech. 1 x 10 ⁷ cycles
Dielectric strength (EN 60664-1)	800V: Basic strength for SELV/PELV circuit (A1, A2, 41, 42) 6kV: Safe strength, reinforced insulation between relay contacts (13-14, 23-24, 33-34) and SEL/PELV circuit (A1, A2, 41, 42)
Rated insulation voltage	50V: SELV/PELV circuit (A1, A2, 41, 42) 250V: Between relay contacts (13-14, 23-24, 33-34) and SELV/PELV circuit(A1, A2, 41, 42)
Protection	IP20
Ambient temperature range	-15 °C to +55 °C (See total current limit curve)
Max. altitude	≤ 2000 m (above sea level)
Degree of pollution / Overvoltage category	2 / 3 (DIN VDE 0110-1)
Weight	approx. 70 g
Mounting	DIN rail according to EN 60715 TH35

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Operating Instructions

Disclaimer and warranty

If the above mentioned conditions for appropriate use are not complied with or if the safety instructions are not followed or if any maintenance operations are not carried out as required, this shall lead to an exclusion of liability and loss of warranty.

ATTENTION!

We would like to point out that it is the full responsibility of the operator to ensure a plant availability. Using the ZSCoupling in safety applications the safety state „Energy Switched Off“ is established if requested by the controlling device.

This means that the connected load is switched off as soon as a request from connected sensor elements or diagnostic measures detects a dangerous state, e.g. caused by a component fault.

Since process-related applications in particular have high demands on availability, limited availability can also have significant consequences. It is therefore recommended to stock a second unit to avoid long downtimes in such a case. These are recommendations of the manufacturer, the evaluation of the importance of the plant availability is the sole responsibility of the operator.

Total Current Limit Curve

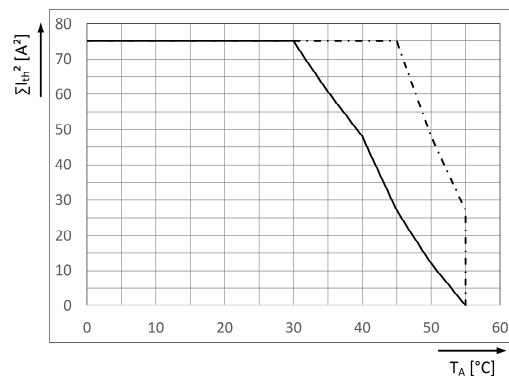


Fig 6: Total current limit curve ZSCoupling

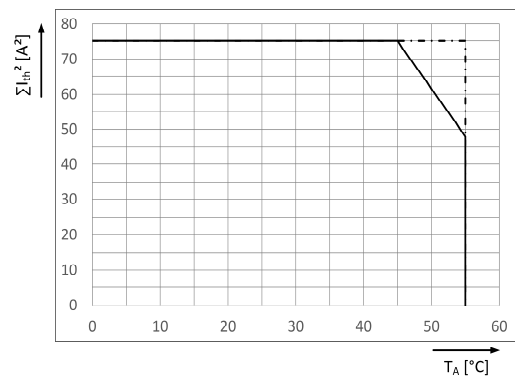


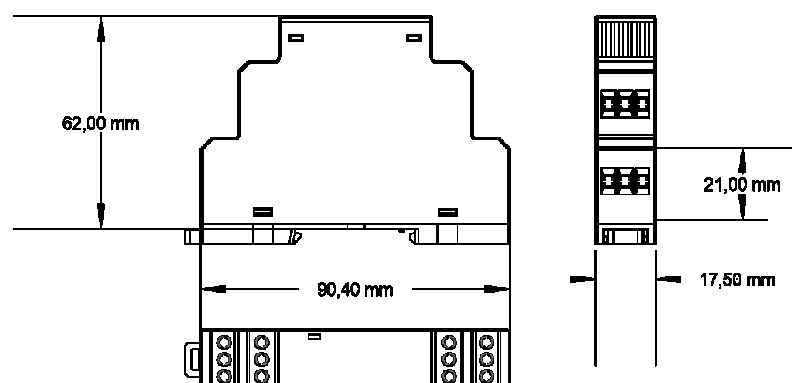
Fig. 7: Total current limit curve ZSCoupling HP

Fig. 6 and Fig. 7 shows the total current limit curves for ZSCoupling (Fig. 6) and ZSCoupling HP (Fig. 7).

- 0 mm distance to adjacent devices with the same power dissipation
- - - 5 mm distance to adjacent devices with the same power dissipation

Total current: $\sum I_n^2 = I_1^2 + I_2^2 + I_3^2$ (I_1, I_2, I_3 : Current over contacts 13-14, 23-24, 33-34)

Dimension Drawing



Variants

Order-No. 456020	ZSCoupling, DC 24 V	fixed screw terminals
Order-No. 456030	ZSCoupling HP, DC 24V	fixed screw terminals

Accessories

Order-No. 472596	Spacer Electric Cabinetrail spacer 5mm, PU = 12 pcs
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Operating Instructions

Safety Characteristics

B10_d - values

B10_d values [cycles] - AC-15	I ≤ 1A	I ≤ 2 A 400.000	I ≤ 3 A 400.000
B10_d values [cycles] - DC-13	I ≤ 1A	I ≤ 2 A 450.000	I ≤ 3 A 450.000

Safety parameters according to EN ISO 13849-1

Load - AC-15 / DC-13	≤ 1 A / ≤ 1 A	≤ 2 A / ≤ 2 A	≤ 3 A / ≤ 3 A
Max. duration of use [Years]	20	20	20
Proof-Test-Intervall [Years]	1	1	1
PFH [1/h]	c	c	c
SIL	1.14E-06	1.14E-06	1.14E-06
nop [Cycles / year] - AC-15 / DC-13	≤ 20,000 / ≤ 100,000	≤ 20,000 / ≤ 22,500	≤ 20,000 / ≤ 22,500

Safety parameters according to IEC 61508 - High Demand

Type	A
HFT	0
SIL	1
SFF [%]	50
λ _{SD} [FIT]	0
λ _{SU} [FIT]	571
λ _{DD} [FIT]	0
λ _{DU} [FIT]	571
PFH [1/h]	5.71E-07

Load - AC-15 / DC-13	≤ 1 A / ≤ 1 A	≤ 2 A / ≤ 2 A	≤ 3 A / ≤ 3 A
nop [Cycles / year] - AC-15 / DC-13	≤ 20,000 / ≤ 100,000	≤ 20,000 / ≤ 22,500	≤ 20,000 / ≤ 22,500

Safety parameters according to IEC 61508 - Low Demand

Type	A
HFT	0
SIL	1
SFF [%]	50
λ _{SD} [FIT]	0
λ _{SU} [FIT]	250
λ _{DD} [FIT]	0
λ _{DU} [FIT]	250
PFD _{avg} (e.g. for T = 1 year)	1,1E-03
PTI (Proof-Test Intervall) [year]	13

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