



Basic device for Emergency-Stop and Safety Gate Applications

SNO 4003K

PI 0131-0603 E



EN 60204-1	Stop category	0
EN 954-1	Safety category	4



- Basic device to EN 60204-1 and EN 954-1 single E-stop monitoring.
- Manual or automatic start
- Application up to safety category 2 and stop category 0
- 3 Enabling paths, 1 signalling path
- Feedback loop to monitoring external contactors

Device styles

SNZ 4003K with screw terminals

SNZ 4003K-A with plug-in terminals

Description of Device and Function

The Device is a single-channel safety switching device for emergency stop equipment conforming to EN 60204-1, with self-monitoring on each ON-OFF cycle and positively driven relays.

The device has two reset inputs, Y2 (without reset monitoring) and Y3 (with reset monitoring). The two relays, K1 and K2, are activated automatically (bridge Y1-Y2) or by operating the reset button (on Y1-Y3). They switch to self-maintaining via their own contacts, if there is an electrical connection (emergency stop button, position switch) between terminal A1 and the supply voltage. After this switch-on phase the enabling current paths are closed and the signalling current path is open. If the electrical connections between terminal A1 and the supply voltage are interrupted, the enabling current paths open and the signalling current path closes.

The excitation condition (self-maintaining) of the two channels is indicated by a green LED K1, K2. A second green LED indicates the presence of supply voltage.

Emergency stop equipment can be constructed to stop category 0 (EN 60204-1).

The device corresponds to category 4 for safety-related parts of controllers (EN 954-1).

Proper Use

The device is for monitoring sensors (e.g. emergency stop buttons, position switches) that are used as part of the safety equipment of machines for the purpose of protecting people, material and machinery.

Notes

- The safety category acc. to EN 954-1 depends on the external circuitry, the choice of control devices and their location on the machine.
- Expansion devices or external contactors with positively driven contacts can be used to duplicate the enabling current paths.
- The device and the contacts must be protected at max. 8 A.
- The emergency stop chain must be closed before the reset button is activated.
- If magnetic switches with reed contacts or sensors with semiconductor outputs are connected the input peak current must be noticed (see Technical Data).

Please observe instructions from safety authorities.

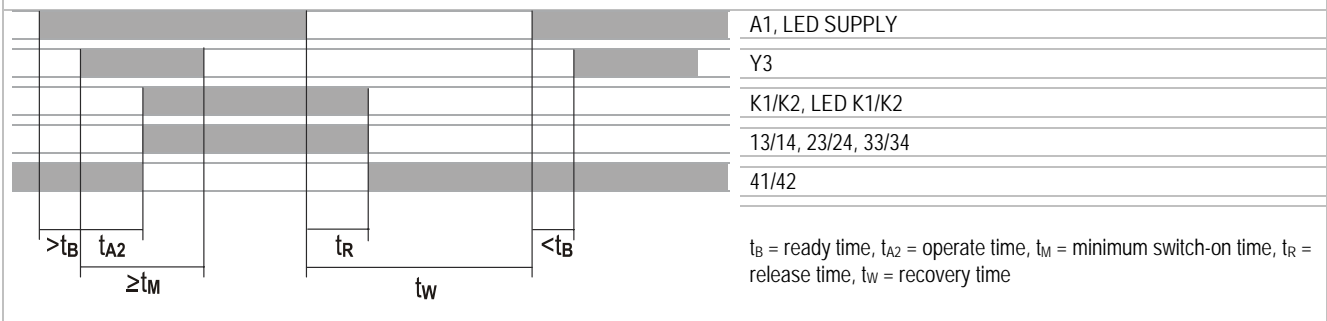


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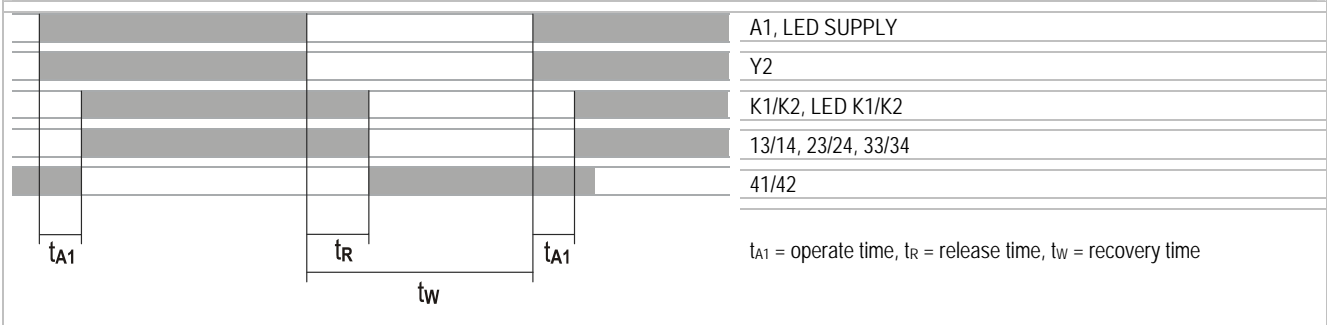
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Function diagram for manual start (restarting lockout) with reset monitoring (Installation 2)



Function diagram for automatic start (Installation 1)



Installation

1. Emergency stop, single-channel, automatic reset (1.1)

2. Emergency stop, single-channel, manual reset (2.1)

3. 3 enabling current paths (NO), 1 signalling current path (NC)

4. Power supply (PE for AC devices only)

Please consult the connection diagram during installation.

1	Emergency stop, single-channel, automatic reset (1.1)
2	Emergency stop, single-channel, manual reset (2.1)
3	3 enabling current paths (NO) 1 signalling current path (NC)
4	Power supply PE for AC devices only



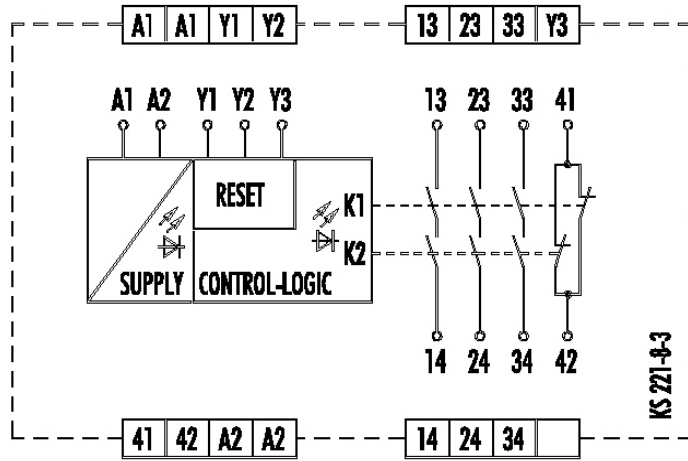
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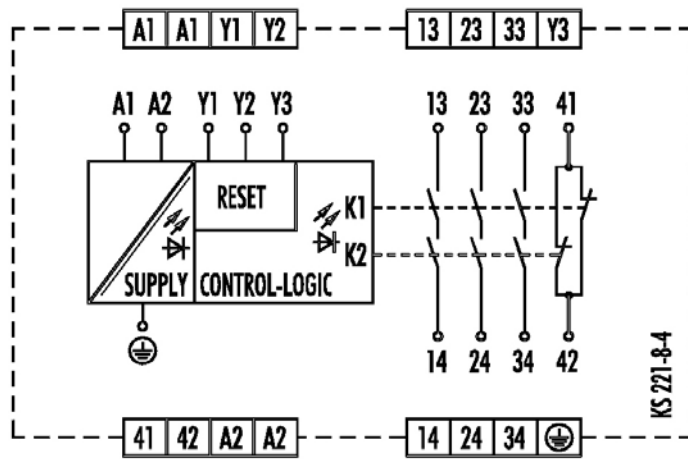
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Connection Diagrams

AC/DC 24 V



AC 115-120 V / AC 230 V



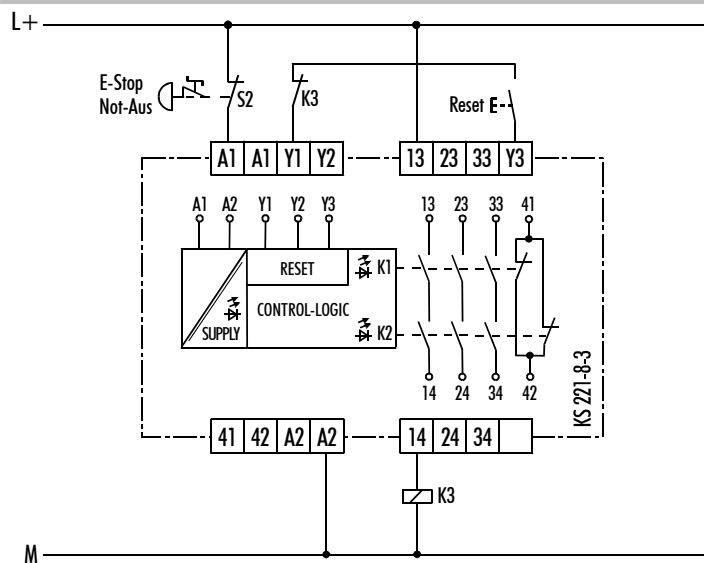


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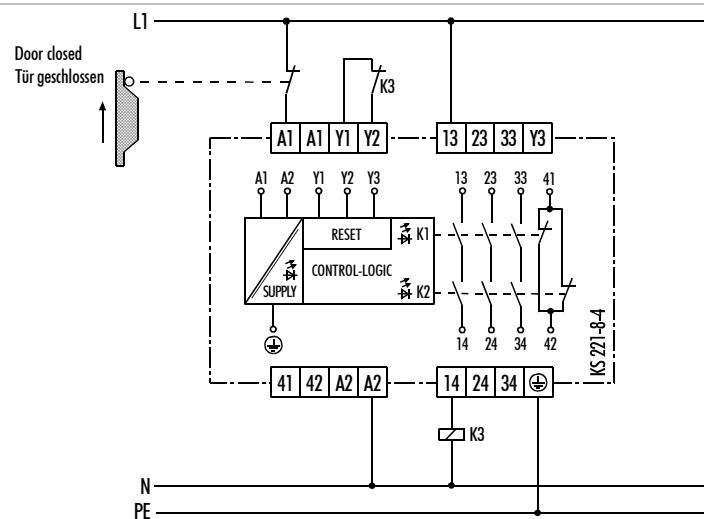
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Application Examples



Emergency-Stop Application, single channel, manual start with Reset button monitoring

The single channel application complies with the requirement of the stop category 0 acc. to EN 60204-1 and the safety category 2 acc. EN 954-1. However the circuit of the emergency-stop button is not redundant. Ground faults in the emergency-stop circuit are immediately detected. Power supply DC 24 V



Safety Gate Application, single channel, automatic start

The single channel application complies with the requirement of the stop category 0 acc. to EN 60204-1 and the safety category 2 acc. EN 954-1. However the circuit of the safety gate is not redundant. Ground faults in the safety gate circuit are immediately detected. Power supply AC 230 V



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Technical Data			
Power circuit			
Rated voltage U_N	AC/DC 24 V	AC 115 - 120 V	AC 230 V
Rated power	DC 1.3 W AC 1.8 W / 3.2 VA	2.0 W / 2.3 VA	2.0 W / 2.3 VA
Residual ripple	2.4 V _{SS}	--	--
Rated frequency AC		50 to 60 Hz	
Operating voltage range		0.85 to 1.1 x U_N	
Isolation supply circuit / control circuit	No	Yes	Yes
Input peak current (A1)	AC 1,6 A / DC 1,2 A	--	--
Rated short-circuit current	1400 mA	--	--
Protection for control circuit supply	PTC thermistor	Short-circuit-proof transformer	Short-circuit-proof transformer
Operate time / recovery time	2 s / 3 s	--	--
Control circuit			
Rated output voltage to supply input Y2		DC 24 V	
Conductor resistance in Y1-Y2 / Y1-Y3 (at U_N , regardless of supply voltage)		$\leq 70 \Omega$	
Rated current inputs Y2, Y3		15 mA	
Release time t_R with emergency stop K1, K2		60 ms	
Operate time (Y3) t_{A2} K1, K2		50 ms	
Operate time (Y2) t_{A1} K1, K2		180 ms	
Recovery time t_W		≤ 200 ms	
Ready time t_B		≤ 300 ms	
Minimum ON time t_M on Y3		50 ms	
Output circuit			
Contact equipment	3 enabling current paths with positively driven contacts (NO), 1 signalling current path (NC)		
Rated switching voltage U_n	AC/DC 230 V		
Max. continuous current I_n per current path NO/NC	8 A / 5 A		
Max. total current for all current paths	12 A	8 A	8 A
Utilization category according to IEC 947-5-1	AC-15: U_e 230 V, I_e 4 A (360 h ⁻¹) DC-13: U_e 24 V, I_e 4 A (360 h ⁻¹) AC-15: U_e 230 V, I_e 3 A (3600 h ⁻¹) DC-13: U_e 24 V, I_e 2.5 A (3600 h ⁻¹)		
Mechanical service life	10 x 10 ⁶ switching operations		
short-circuit protection, fuse	max. 8 A		
General data			
Clearance/creepage distance between circuits	to DIN VDE 0110 Part -1: 04.97 depending on device version, see Isolation supply circuit		
Overvoltage category	III		
Rated impulse withstand level	4 kV		
Rated voltage	AC 300 V		
Power-frequency test voltage	2 kV		
Contamination level of device: inside / outside	2 / 3		
Climatic application class	H V G to DIN 40040: 04.87		
Protection class to DIN VDE 0470 Part 1. Housing / terminals	IP 40/IP 20		
Ambient / storage temperature	-25 ... +55 / -25 ... +75 °C		
Weight	0.20 kg	0.25 kg	0.25 kg
Terminals and connection			
Single-core or finely stranded	1 x 0.14 mm ² to 2.5 mm ² 2 x 0.14 mm ² to 0.75 mm ²		
Stripping length	max. 8 mm		
Finely-stranded with wire-end ferrule to DIN 46228	1 x 0.25 mm ² to 2.5 mm ² 2 x 0.25 mm ² to 0.5 mm ²		
Max. tightening torque	0.5 to 0.6 Nm		

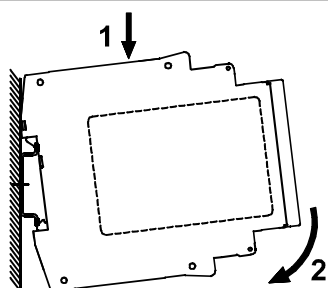


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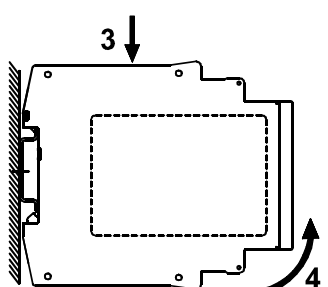
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Assembly



- 1 Attach device to DIN rail.
- 2 Press carefully onto the DIN rail (in direction of arrow) until it locks into place.

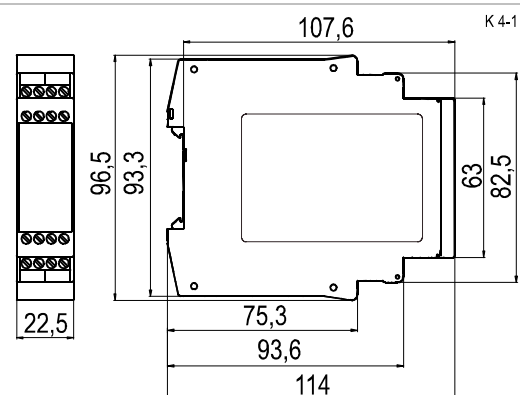
Disassembly



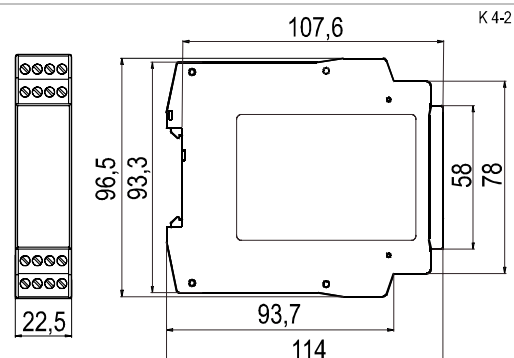
- 3 Push down (in direction of arrow)
- 4 Release and remove it from the DIN rail (see arrow)

Dimension Diagram

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SNO 4003K-A



Subject to changes

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