

#### **Basic Unit**

SNO 2004-17

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SNO 2004-17

t<sub>A</sub>

Function Diagram

t<sub>R</sub> t

One-channel †<sub>M</sub> E-Stop

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According to EN 60204 - 1 and EN 954 - 1 Single or Dual Channel E-Stop Possible Rated Voltage in the E-Stop Control Circuit: 24 V DC

SNO 2004	EN 60204-1	For Stop Category	0
	EN 954-1	Safety Category	3

### For Example

- Protection of persons and machines
- Control of power contactors
- Use with programmable logic control systems
- Protection in assembly lines

### Function

After supply voltage (L1/L+) is applied through the non-activated E-Stop switch to terminal A1 and through the neutral/middle-point conductor (N/M) to terminal A2, the switch-on monitoring logic is activated with the RESET switch. The switch-on monitoring logic triggers relays K1 and K2 which, after response time  $t_A$ , become self-locking through their own contacts. Simultaneously, the relay contacts of K1 and K2 deactivate the switch-on monitoring logic. After this switch-on phase, the two enable current paths (13/14 and 23/24) which are intended for the output are closed. Two LEDs provide a display and these LEDs are assigned to the safety channels. If the E-Stop switch is activated, the current supply lines for relays K1 and K2 are interrupted. The enable current paths at the output are opened.

# Notes

Approvals

ET 95258

(U1

6P

FD 0221-6 W1

A1 Supply voltage, LED SUPPLY

 $t_A = Response time t_R = Release time for the E-Stop$ 

 $t_{\rm M}$  = Minimum switch-on time

A2 Supply voltage Y2 Reset

K1, K2, LED K1/K2 13/14, 23/24  To multiply the enabling current paths, expansion units or external power contactors with positively guided contacts can be used.



**Connection Diagram** KS 0344-1 W1 SNO 2004-17 A1 23 13 24 A2 Y2 13 23 A1 K1 K2 + K1 K2 ÷. **\***本 K1 К2 ŶÌ 口 口 14 24 lЛ Y2 Y1 14 A2

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Two-channe E-Stop

Order Example



24 V AC/24 V DC
Rated Voltage

SCHLEICHER Relays and Automation Systems

# SNO 2004-17

A 1088

# **Application Example Single-Channel E-Stop Circuit**

A 1086

**External Contact Expansion** 

**Application Example** 



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The single channel E-Stop circuit complies with the requirements of the Stop category 0 acc. to the EN 60204-1 norm and the Safety category 2 acc. to EN 954-1. However the circuit of the E-Stop momentary contact is not redundant. Ground faults in the E-Stop circuit are immediately detected.

### **Application Example**

#### A 1087

#### **Dual-Channel E-Stop Circuit (with cross monitoring)**



Μ

The dual-channel E-Stop circuit disconnects reliably even if one of the two contacts of the E-Stop switch does not open. If a fault occurs (for example, if the E-Stop contact connected at A1 does not open), the safety circuit is activated by the second (redundant) contact at A2. Enabling current paths 13/14 and 23/24 open. In the event of a short circuit or short circuit to ground of the conductors leading to the E-Stop switch, the voltage available at Y1 collapses. In case of a short circuit to ground of the cable leading to the RESET switch, the voltage applied at Y1/Y2 is short-circuited. Relays K1 and K2 return immediately to the de-energized position and the electronic fuse is triggered. This example meets Stop category 0 according to EN 60204-1 and Safety category 3 according to EN 954-1.



If the number of enable current paths is not sufficient, two external contactors can be used for expansion. They are driven through one of the enable current paths of the SNO 2004-17. The function of the external contactors is monitored through their own NC contacts. The NC contacts are connected in series to the RESET switch. Contactors K4 and K5 must have positively driven contacts.

### Notes

Μ

Applies to application examples A 1087 and A 1088: To avoid loss of control voltage L1/L+ in the event of a bridge fault in the E-Stop control circuit, a fuse can be connected in series (previous) to the E-Stop switch.



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TECHNICAL DATA	SNO 2004-17
FUNCTION According to EN 60204-1 Function Display Function Diagram	Emergency-Stop Relay 2 LEDs, green FD 0221-6 W1
POWER SUPPLY DATA         Rated Voltage $U_N$ V AC,         Rated Consumption at 50 Hz and $U_N$ (AC)         Rated Consumption at 50 Hz and $U_N$ (AC)         Rated Consumption at $U_N$ (DC)         Residual Ripple         Rated Frequency         Operating Voltage Range	/DC <b>24</b> VA 2,5 W 1,5 W 1,2 V 2,4 Hz 50 to 60 0,8 to 1,1 x U <sub>N</sub>
CONTROL CIRCUIT only for supplying the control inputs         Control Output Y1 with respect to A2:         Line Resistance (Control Inputs)         Rated Output Voltage       V         Rated Current       V         Rated Short-Circuit Current I <sub>K</sub> max.       Fuse         Response Time       (PTC)         Recovery Time       (PTC)	$\Omega \leq 70$ / DC 24 mA 12 mA s - s - s -
Control Inputs Y2: Rated Current Input Y2 Response Time t <sub>A</sub> K1, K2 Release Time tr for the E-Stop K1, K2 Minimum Switch-ON Time t <sub>M</sub> for Y2	mA 12 ms 20 ms 50 ms 30
OUTPUT CIRCUIT         Contact Equipment         Contact Type         Contact Material         Switching Voltage Un         V AC,         Maximum Rated Current In per Contact         Maximum Total Current for all Contacts         Application Category According to EN 60947-5-1:1991         Short-Circuit Protection, Max. Fuse Element Class gG         Permissible Switching Frequency       Switching Cycl         Mechanical Lifetime       Switching Cycl	2 N.O. Safety Contact Forced Contact Ag-Alloy; Gold-Plated /DC 230/300 A 4 A 8 AC-15: U <sub>e</sub> 230 V AC, I <sub>e</sub> 2 A DC-13: U <sub>e</sub> 24 V DC, I <sub>e</sub> 2 A A 4 cle/h 3600 Cycle 3 x 10 <sup>6</sup>
GENERAL DATA         Creepage and Clearance Distances Between Circuits         According to DIN VDE 0110-1:04.97: Rated Withstand Voltage         Over-Voltage Category         Contamination Level         Design Voltage       V         Test Voltage U <sub>eff</sub> 50 Hz acc. to DIN VDE 0110-1, Table A.1         Protection Class Housing/Terminals acc. to DIN VDE 0470 Sec. 1:11.92         Radiated Noise         Noise Immunity	kV 4 III 3 Outside, 2 Inside 7 AC 300 kV 2,21 2 IP 40/IP 20 EN 50081-1:03.93, -2:03.94 EN 50082-2:1995
Ambient Temperature, Working Range Dimension Diagram Connection Diagram Weight Accessories Approvals	°C
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