# Safety switching device
# Two-hand control SNZ 4052K



## Evaluation device for two-hand actuators and safety gate monitoring

- Base device according to DIN EN 574 Type III C, IEC 204-1 and EN 954-1
- Stop category 0 according to EN 60204-1
- Applications up to safety category 4 according to EN 954-1
- Safety category of the device: 4 according to EN 954-1
- Two-channel actuation; 1 NO contact and 1 NC contact for each channel
- Cross monitoring
- Monitoring of synchronous activation
- 2 enabling current paths, 1 signaling current path

### Applications

- Protection of operating personnel from danger caused by movable parts
- For immediate interruption of the power supply – stop category 0
- Monitoring of two-hand applications
- Monitoring of safety gates
- Protection of people and machinery

### Function

**Device and function description**

The device complies with EN 574 Type III C safety requirements. The safety behavior of the device is designed for applications according to category 4 (EN 954-1). The device is single-fault safe and self-monitoring. Synchronous activation of both actuators (two-hand momentary contact or safety gate contacts) is monitored. Each of the two actuators is connected to the device with a NO contact and a NC contact. The technical design of the input circuit provides cross connection and ground fault monitoring. The output function is designed with 2 NO contacts as an enabling current path and 1 NC contact as signaling current path (all positively driven).

With supply voltage applied to terminals A1/A2 and the feedback loop (terminals Y1/Y2) closed, the enabling current paths are closed by simultaneously activating the actuators (S1+S2). Both actuators must be activated within 0.5 s for the output contacts to be enabled. If only one of the two actuators is released, the device is immediately de-energized. The enabling current paths open. The device can be restarted only after both actuators have returned to their initial position (for example when the two-hand momentary contact switches have been released) and the feedback circuit is closed again. The feedback circuit should only be opened again after both actuators are activated. Otherwise the device will remain in the OFF position. The current status of the device is indicated by 3 LEDs: application of the supply voltage with LED SUPPLY, activation of both actuators with LED K1 and additionally with LED K2 in case of synchronous activation.

### Notes

**Proper use**

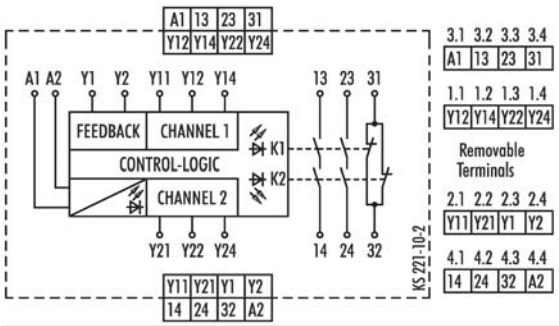
Machines whose operation requires repeated motion of the hands into the hazardous zone may be operated with this device.

- The safety category according to EN 954-1 depends on the external circuitry, the choice of control devices and their placement on the machine.
- SNE expansion devices or external contactors with positively driven contacts can be used to multiply the enabling current paths.
- The device and the contacts must be protected with max. 6 A utilization category gG or through circuit breakers with trigger characteristic B or C.
- The devices must be installed in a control cabinet with a protection degree of at least IP 54.

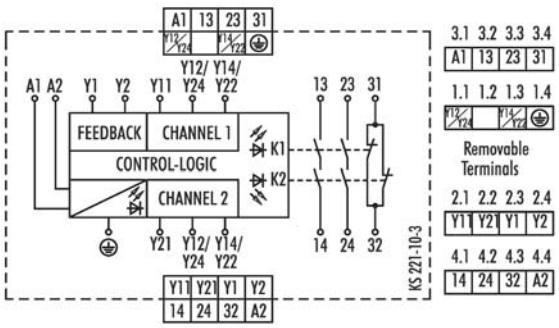
**Please also note the information provided by your trade association.**

### Circuit diagram

**SNZ 4052K / K-A** **AC / DC 24 V**




**SNZ 4052K / K-A** **AC 115 – 120 V / AC 230 V**



# Safety switching device
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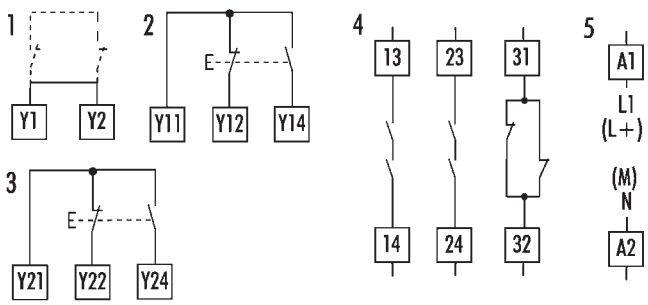
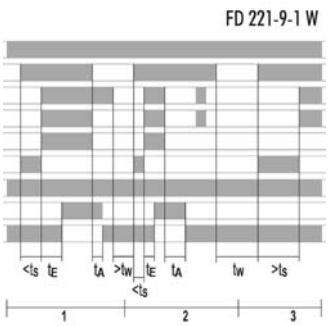
## Installation




| | Please consult the circuit diagram during installation. |
|---|---|
| 1 | **Feedback loop**<br>for monitoring external contactors |
| 2 | **Actuator S1** |
| 3 | **Actuator S2**<br>two-channel, manual start, with cross monitoring |
| 4 | **2 enabling current paths**<br>**1 signaling NC contact** |
| 5 | **Power supply** |

## Function diagram

**SNZ 4052K**

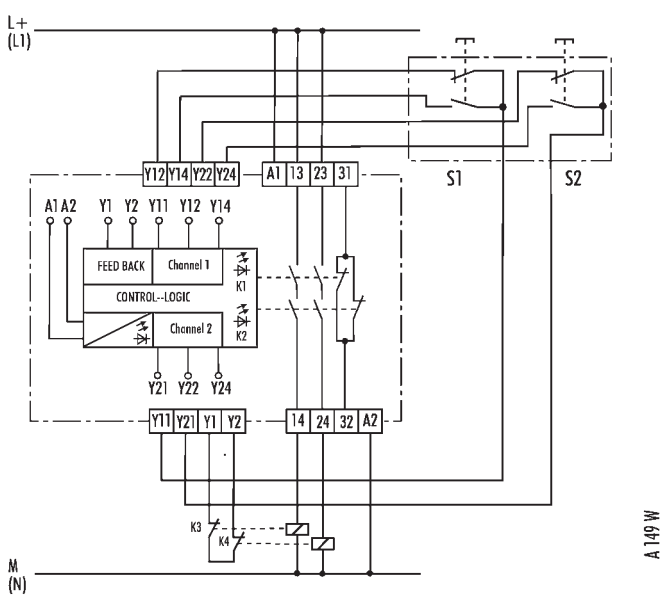



A1/A2 supply voltage, LED SUPPLY
Actuator S1
Actuator S2
K1, LED K1
K2, LED K2
Synchronous monitoring
Y1/Y2 FEED BACK
13/14, 23/24
31/32

$t_E$ = response time
$t_A$ = release time
$t_W$ = recovery time
$t_S$ = synchronous monitoring time

(1) Enabled in case of synchronous activation.
(2) Enabled in case of synchronous activation. If one of the actuators is released, the unit will be immediately disabled. It can be enabled again only after both actuators have been released.
(3) Not enabled in case of asynchronous activation.

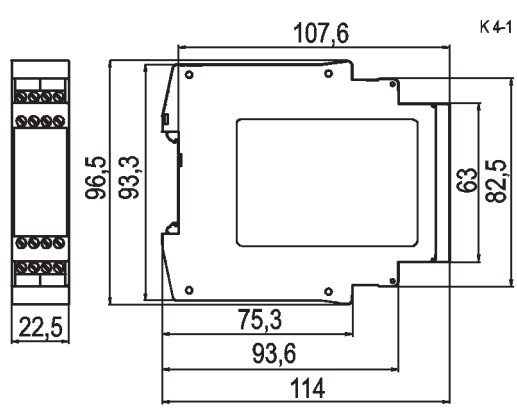
## Application example



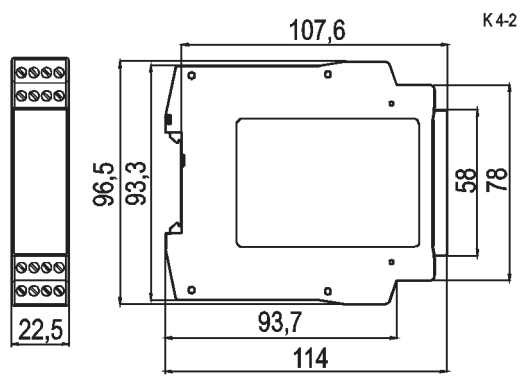

**Two-hand control**
according to type III C safety category 4 with contact expansion

## Dimension diagram

**SNZ 4052K**




**SNZ 4052K-A**



# Safety switching device
# Two-hand control SNZ 4052K

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| Technical data | | SNZ 4052K | | |
|---|---|---|---|---|
| **Function** according to EN 574-1 | | Two-hand control relay | | |
| Function display | | 3 LEDs green | | |
| Function diagram | | FD 221-9-1 W | | |
| **Power supply circuit** | | | | |
| Rated voltage $U_N$ | AC/DC | 24 V | | |
| Rated voltage $U_N$ | AC | | 115 – 120 V | 230 V |
| Rated consumption at 50 Hz and $U_N$ (AC) | | 3.1 VA | 2.4 VA | 2.4 VA |
| Rated consumption at 50 Hz and $U_N$ (AC) | | 1.9 W | 2.2 W | 2.2 W |
| Rated consumption at $U_N$ (DC) | | 2.4 W | – | – |
| Residual ripple | | 2.4 $V_{ss}$ | – | – |
| Electrical isolation supply circuit – control circuit | | no | yes | yes |
| Fuse for control circuit supply | | PTC thermistor | Short-circuit proof transformer | Short-circuit proof transformer |
| Residual ripple $U_{SS}$ | | 2.4 V | | |
| Rated frequency | | 50 – 60 Hz | | |
| Operating voltage range | | 0.85 – 1.1 x $U_N$ | | |
| **Control circuit** | | | | |
| Rated output voltage (Y12/Y14 or Y22/Y24 and Y1), only for supply of inputs Y11, Y21 and Y2 | | DC 24 V | | |
| Response time $t_E$ for K1, K2 | | 40 ms | | |
| Release time $t_A$ | | < 50 ms | | |
| Synchronous monitoring time $t_S$ | | ≤ 500 ms | | |
| Recovery time $t_W$ | | ≤ 250 ms | | |
| **Output circuit** | | | | |
| Contact assignment | | 2 enabling current paths, positively driven contacts (NO contact), 1 signaling current path (NC contact) | | |
| Rated operating voltage $U_n$ | | AC/DC 230 V | | |
| Max. continuous current $I_n$ per contact | | 6 A | | |
| Max. total current of all current paths | AC/DC 24 V | 12 A | | |
| | AC 115 – 120 V, AC 230 V | 8 A | | |
| Application category according to EN 60947-5-1 | | AC-15: $U_e$ 230 V, $I_e$ 4 A (360 switching cycles/h)<br>DC-13: $U_e$ 24 V, $I_e$ 4 A (360 switching cycles/h) | | |
| Short-circuit protection, max. fuse insert | | 6 A class gG or circuit breaker with trigger characteristic B or C | | |
| Mechanical life | | 10 x $10^6$ switching cycles | | |
| **General data** | | | | |
| Creepage distances and clearances between the circuits | | according to EN 60664-1 | | |
| Overvoltage category | | III | | |
| Rated impulse voltage | | 4 kV | | |
| Rated voltage | | AC 300 V | | |
| Degree of pollution | | 3 outside, 2 inside | | |
| Protection degree according to DIN EN 60529 (housing / terminals) | | IP 40/IP 20 | | |
| Ambient temperature / storage temperature | | -25 – +55 °C/-25 – +75 °C | | |
| Dimension diagram | | K 4-1 (screw terminals / K 4-2 (pluggable terminals) | | |
| Rated cross sections fine-stranded/solid | | 2 x 0.14 – 0.75 $mm^2$/1 x 0.14 – 2.5 $mm^2$ | | |
| or fine-stranded with ferrules | | 1 x 0.25 – 2.5 $mm^2$/2 x 0.25 – 0.5 $mm^2$ | | |
| Permissible tightening torque | | 0.5 – 0.6 Nm | | |
| for UL and CSA applications | Wire ranges | AWG 18-16 only use Cu wires | | |
| | Max. tightening torques | 0.79 in-lbs | | |
| Weight | | 0.20 kg (DC device) / 0.25 kg (AC device) | | |
| Accessories | | – | | |
| Approvals | | | | |

**Overview of the devices/Part numbers**

| Type | Rated voltage | | Terminals | Part No. | Std. Pack |
|---|---|---|---|---|---|
| SNZ 4052K | AC/DC 24 V | 50 – 60 Hz | Terminal block, rising cage termination | R1.188.0450.1 | 1 |
| | AC 115 – 120 V | 50 – 60 Hz | Terminal block, rising cage termination | R1.188.0920.1 | 1 |
| | AC 230 V | 50 – 60 Hz | Terminal block, rising cage termination | R1.188.0930.1 | 1 |
| SNZ 4052K-A | AC/DC 24 V | 50 – 60 Hz | Pluggable connector, rising cage termination | R1.188.0530.1 | 1 |
| | AC 115 – 120 V | 50 – 60 Hz | Pluggable connector, rising cage termination | R1.188.0940.1 | 1 |
| | AC 230 V | 50 – 60 Hz | Pluggable connector, rising cage termination | R1.188.0950.1 | 1 |