



Emergency-Stop Relay

Universal Basic/Expansion Unit
According to EN 60204 - 1 and EN 954 - 1
Single or Dual Channel E-Stop are Possible
With/Without Off-Delay Time
With/Without RESET Key Monitoring and Back-Up Time
Rated Voltage in the E-Stop Control Circuit: 24 V DC

| | | | |
|------------|------------|-------------------|-----|
| SNV 2021 - | EN 60204-1 | For Stop-Category | 0/1 |
| SNV 2024 | EN 954-1 | Safety-Category | 3 |

SNV 2021-17

SNV 2022-17

SNV 2023-17

SNV 2024-17



For Example

- ▶ Modular devices system which, depending on its use, enables the grouping of the optimal application of E-Stop circuits.
- ▶ Protection of persons and machinery
- ▶ Monitoring of sliding safety gates
- ▶ Terminating braking processes by means of the off-delay time

Function

The Universal devices SNV 2021-17, SNV 2022-17, SNV 2023-17, and SNV 2024-17 can be used as basic units or as expansion units.

After the supply voltage has been applied to terminals A1/A2, and if the E-Stop switch is not pressed, the control logic circuit is activated with the RESET key. This circuit triggers the relays K1 and K2. After their response time t_A , they become self-locked. After this switch - on phase, the two enabling current paths 17/18, 27/28, which are intended for the output, are closed and the feedback loop (NC) opens (terminals X1/X2). This is displayed by three LEDs, which are associated with the safety channels, the supply voltage, and the E-Stop switch input.

If the E-Stop switch is pressed, the current leads to the relays K1 and K2 are interrupted. The enabling current paths 17/18, 27/28 at the output are opened after the selected off-delay time t_{R1} has elapsed, and the feedback loop X1/X2 is closed.

The off-delay time of the SNV 2021 and the SNV 2022 can be delivered with two adjustment ranges and that of the SNV 2023 and the SNV 2024 can be delivered with one adjustment range. These can be adjusted in 12 steps from 0 to 3 s and 0 to 30 s respectively by means of a rotary switch.

Construction of an E-stop circuit of stop category 0 is possible, if the rotary switch is set to 0 s. Off-delay times > 0 s correspond to Stop Category 1.

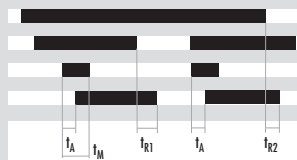
The differences between SNV 2021, SNV 2022, SNV 2023, and SNV 2024 are shown in the following table:

| | Off-delay time | | RESET key monitoring | Time back-up |
|-------------|---------------------------|----------------------------|----------------------|--------------|
| | Adjustment range 0 to 3 s | Adjustment range 0 to 30 s | | |
| SNV 2021-17 | X | X | | |
| SNV 2022-17 | X | X | X | |
| SNV 2023-17 | X | | | X |
| SNV 2024-17 | X | | X | X |

Function Diagram

FD 0372-1 W1

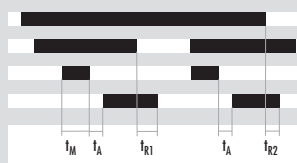
SNV 2021-17



A1/A2 Supply voltage, LED SUPPLY
 Y1 E-Stop, LED Y1
 Y13 RESET
 17/18, 27/28, LED K1, K2
 t_A = Response time
 t_{R1} = Adjustable off-delay time (0 to 30s)
 t_{R2} = Release time
 t_M = Minimum switch-on time

FD 0372-2 W1

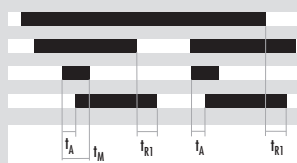
SNV 2022-17



A1/A2 Supply voltage, LED SUPPLY
 Y1 E-Stop, LED Y1
 Y13 RESET
 17/18, 27/28, LED K1, K2
 t_A = Response time
 t_{R1} = Adjustable off-delay time (0 to 30s)
 t_{R2} = Release time
 t_M = Minimum switch-on time

FD 0372-3 W1

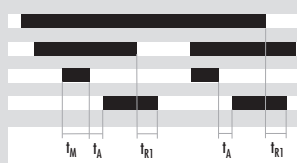
SNV 2023-17



A1/A2 Supply voltage, LED SUPPLY
 Y1 E-Stop, LED Y1
 Y13 RESET
 17/18, 27/28, LED K1, K2
 t_A = Response time
 t_{R1} = Adjustable off-delay time (0 to 3 s)
 t_{R2} = Release time
 t_M = Minimum switch-on time

FD 0372-4 W1

SNV 2024-17



A1/A2 Supply voltage, LED SUPPLY
 Y1 E-Stop, LED Y1
 Y13 RESET
 17/18, 27/28, LED K1, K2
 t_A = Response time
 t_{R1} = Adjustable off-delay time (0 to 3 s)
 t_{R2} = Release time
 t_M = Minimum switch-on time

RESET key monitoring

With RESET key monitoring, the device is enabled only with the falling edge of the RESET key. This means that only static operation of the device is possible with this function. The RESET key must always be activated for start-ups. An automatic start by shunting the RESET key is not possible. Devices without RESET key monitoring are suited for dynamic operation (automatic start). The RESET key can be shunted. This function becomes important in the field of protective gate applications with cyclic external access.

Time back-up

Devices with time back-up have the following effect: If the supply voltage (A1/A2) fails, the supply voltage of relays K1 and K2 is maintained until the selected off-delay time t_{R1} has elapsed. The relays K1 and K2 switch into their de-energized position only after it has elapsed. Devices with time back-up can be delivered only with the adjustment range 0 to 3 s. With devices without time back-up, failure of the supply voltage (A1/A2) causes the relays K1 and K2 to switch off with the off-delay time t_{R2} . The relays K1 and K2 switch into their de-energized position.

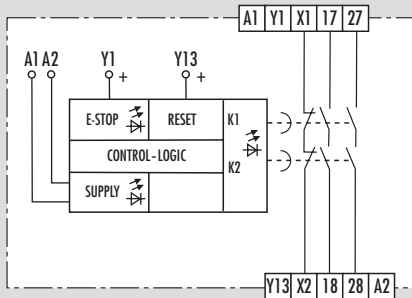


SNV 2021-17 SNV 2022-17 SNV 2023-17 SNV 2024-17

Connection Diagram

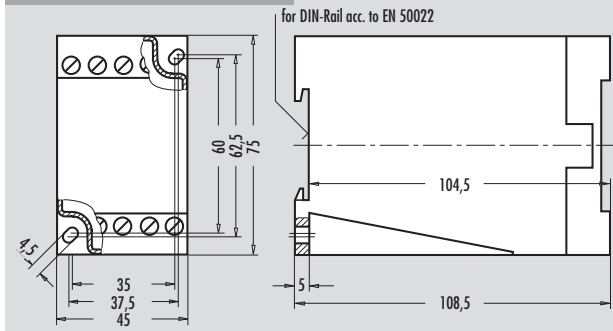
KS 0346-1 W1

SNV 2021-17, SNV 2022-17, SNV 2023-17, SNV 2024-17



Dimension Diagram

S 3-2

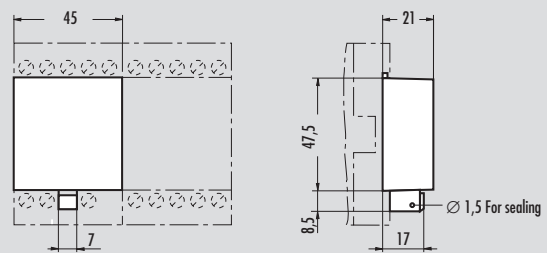


Notes

- ▶ In the devices SNV 2021-17 and SNV 2022-17 only single-channel E-Stop is possible due to the supply voltage that is needed for the off-delay time!
- ▶ It is possible to delete the preselected off-delay time prematurely by interrupting A1 (only with SNV 2021-17 and SNV 2022-17).
- ▶ It has to be considered that in the devices SNV 2023 - 17 and SNV 2024 - 17 when installing the E-Stop circuit within the supply voltage circuit, the immediate de-activation of the enabling current paths 17/18 and 27/28 is guaranteed only if the off-delay time (with time back-up) is set to zero.

Accessory

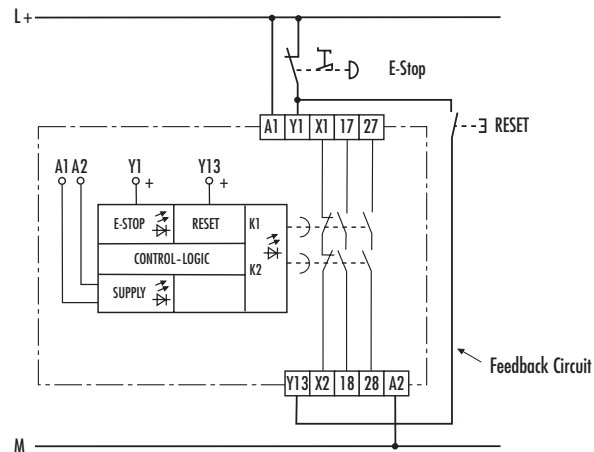
Cover Z 29



Application Example

A 1109

Basic Unit, Single Channel E-Stop Circuit

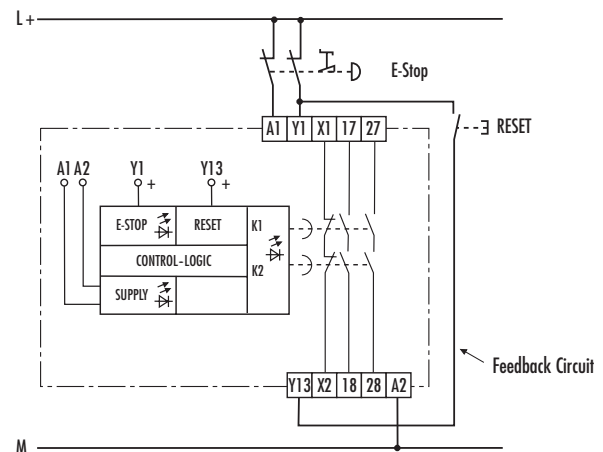


The single channel E-Stop circuit complies with the requirements acc. to EN 60204-1. The E-stop circuit offers however no redundancy. When the RESET switch is connected to the terminal Y13 (option: without RESET monitoring), the unit will be enabled by actuating the RESET switch.

Application Example

A 1110

Basic Unit, Dual Channel E-Stop Circuit



The dual channel E-Stop circuit switches off even if one of the two contacts of the E-Stop button does not open. If a fault occurs (e.g. the E-Stop contact connected to A1 does not open), the safety circuit is activated by the second (redundant) contact Y1. The enabling current paths 17/18, 27/28 switch back into their off-position after the delay time has elapsed.

Note: By opening the E-Stop contacts connected to A1, the off-delay time is set to zero for the devices SNV 2021-17 and SNV 2022-17! The RESET switch is monitored (only at SNV 2022-17 and SNV 2024-17); i.e. the device is enabled only by releasing the switch (with the falling edge of the RESET switch). If the RESET switch is closed before the supply is applied to terminals Y1 and Y13, or there is a short circuit in the cable, the enabling current paths remain open. If however, a short circuit in the RESET cable occurs when the emergency-stop relay is already active, the cyclic self checking feature of the item will detect it when switching the supply OFF/ON. As a consequence, the enabling current paths will not close and the safety function is guaranteed.

Approvals



Order Example

SNV 2021-17 30 s 24 V DC

Type End-Range Rated Voltage



SNV 2021-17

SNV 2022-17

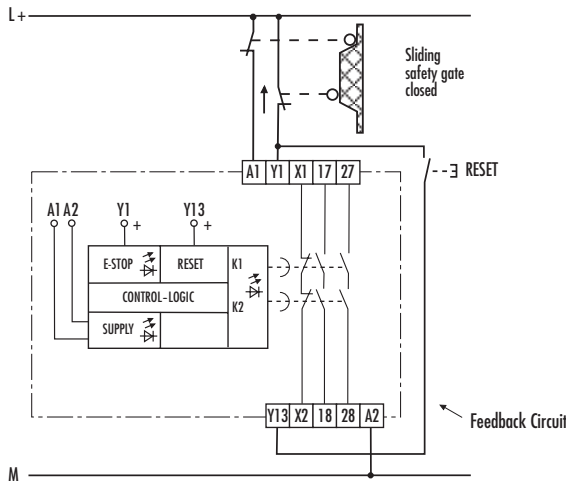
SNV 2023-17

SNV 2024-17

Application Example

A 1111

Basic Unit, Dual-Channel Protective Gate Monitoring



The position of the sliding gate is monitored through channel 1 (A1) and channel 2 (Y1). SNV 202x-17 is activated through the RESET key. If the safety sliding gate opens, the emergency-stop relay turns back into its off position. The enabling current paths 17/18, 27/28 open. When the safety gate is closed again, the emergency-stop relay can be reactivated with the RESET key.

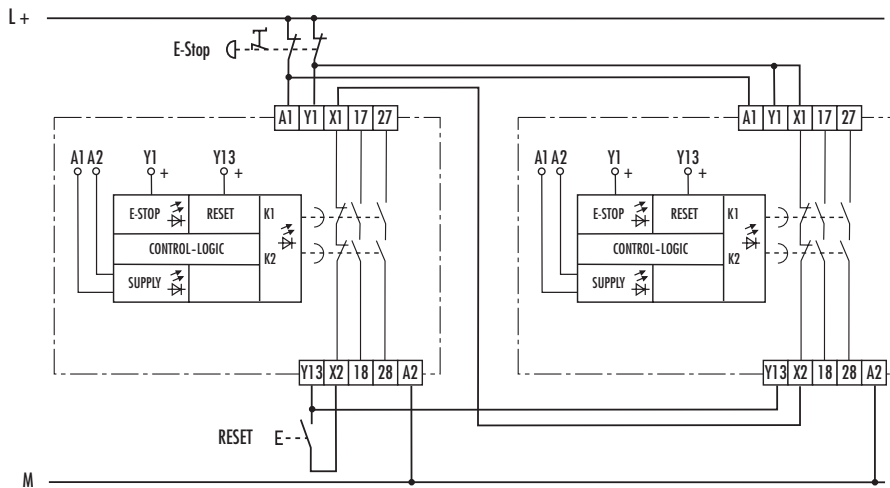
Note: By opening the E-Stop contacts connected to A1, the off-delay time is set to zero for the devices SNV 2021-17 and SNV 2022-17 !



Application Example

A 1112

Application as Basic and Expansion Unit



Two SNV 2023-17 with dual-channel control circuit used as basic unit and as expansion unit. This modular structure can be cascaded up to n units.

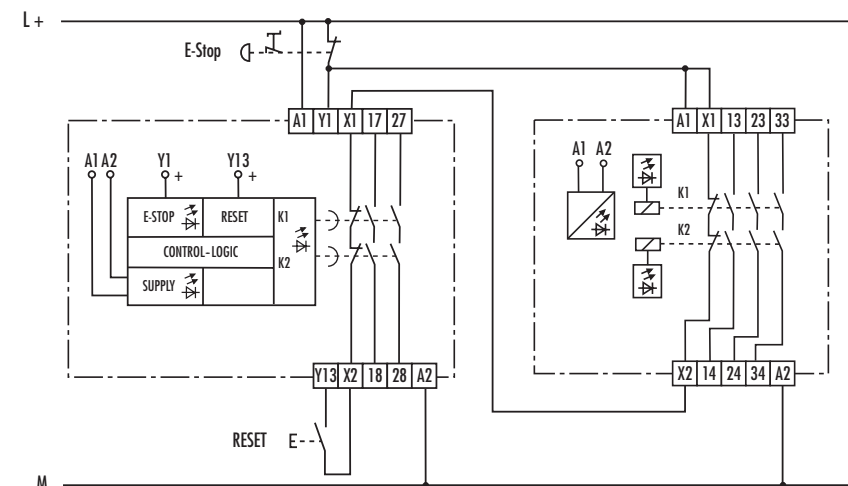
In an emergency stop situation, different off-delay times can be adjusted to both devices. All the units are reset through a single common key. A renewed start-up after an emergency stop can only occur, if all the relays already reached their de-energized position.

Note: By opening the E-Stop contacts connected to A1, the off-delay time is set to zero for the devices SNV 2021-17 and SNV 2022-17 !

Application Example

A 1113

Basic Unit with Expansion Unit SNO 3004-xx



One SNV 202x-17 as a single-channel controlled basic unit (e.g. Stop-Category 1) with an expansion unit SNO 3004-xx (Stop-Category 0). This modular structure can be cascaded up to n units.

All the units are reset through one single key. A renewed start-up after an emergency stop can only occur, if all the relays already reached their de-energized position.



TECHNICAL DATA

FUNCTION According to EN 60204-1
Function Display
Function Diagram

POWER SUPPLY DATA

| | |
|--|-----------------|
| Rated Voltage U_N | V DC |
| Rated Consumption at U_N | W |
| In-Rush Current (SNV 2023, SNV 2024) | mA/ms |
| Residual Ripple | V _{ss} |
| Operating Voltage Range | |
| Fuse | |
| Rated Short-Circuit Current I_K max. | mA |
| Response Time (PTC) | s |
| Recovery Time | s |

CONTROL CIRCUIT

| | |
|---|----|
| Control Inputs Y1, Y13: | |
| Line Resistance | Ω |
| Rated Current | mA |
| Response Time t_A | ms |
| Release Time t_{R1} for the E-Stop Selectable | s |
| Back-up Time t_{R1} for the E-Stop on SNV 2023-17 and SNV 2024-17 | s |
| Release Time t_r for the E-Stop and End Range $t_{R1} = 0$ s | ms |
| Minimum Switch-ON Time t_M | ms |
| Minimum Switch-OFF Time t_M | ms |

OUTPUT CIRCUIT

| | |
|--|-------------------|
| Contact Equipment | |
| Contact Type | |
| Contact Material | |
| Switching Voltage U_n | V AC/DC |
| Maximum Rated Current I_n per Contact | A |
| Maximum Total Current for all Contacts | A |
| Total of All Contact Currents | A |
| Application Category According to EN 60947-5-1:1991 | |
| Short-Circuit Protection, Max. Fuse Element Class gG | A |
| Permissible Switching Frequency | Switching Cycle/h |
| Mechanical Lifetime | Switching Cycle |

GENERAL DATA

| | |
|--|------|
| Creepage and Clearance Distances Between Circuits According to DIN VDE 0110-1:04.97: Rated Withstand Voltage | kV |
| Over-Voltage Category | |
| Contamination Level | |
| Design Voltage | V AC |
| Test Voltage U_{eff} 50 Hz acc. to DIN VDE 0110-1, Table A.1 | kV |
| Protection Class Housing/Terminals acc. to DIN VDE 0470 Sec. 1:11.92 | |
| Radiated Noise | |
| Noise Immunity | |

| | |
|------------------------------------|------------|
| Ambient Temperature, Working Range | °C |
| SNV 2021, SNV 2022 | -25 to +55 |
| SNV 2023, SNV 2024 | -10 to +55 |
| Dimension Diagram | |
| Connection Diagram | |
| Weight | kg |
| Accessories | |
| Approvals | |

GENERAL TECHNICAL SPECIFICATIONS

SNV 2021-17

SNV 2022-17

SNV 2023-17

SNV 2024-17

Emergency-Stop Relay
3 LEDs, green
FD 0372-1 W1 to FD 0372-4 W1

| |
|--------------------|
| 24 |
| 1,3 |
| 450/200 |
| 2,4 |
| 0,8 to 1,1 x U_N |
| PTC-Resistance |
| 4000 |
| 3 |
| 2 |

| |
|--|
| ≤ 200 |
| 5 |
| 100 |
| 2 Setting Ranges |
| 1. Setting Range 3 s adjustable in 12 steps: 0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1, 1.5, 2, 2.5, 3 ± 10 % |
| 2. Setting Range 30 s adjustable in 12 steps: 0, 1, 2, 3, 4, 6, 8, 10, 15, 20, 25, 30 ± 10 % |
| Setting Range 0 to 3 s adjustable in 12 steps 0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1, 1.5, 2, 2.5, 3 ± 10 % |
| 20 |
| 150 |
| 2 |

| |
|----------------------------------|
| 2 N.O. Safety Contact |
| 1 N.C. Feedback Contact |
| Forced Contact |
| Ag-Alloy; Gold-Plated |
| 230/230 |
| 6 |
| 2 |
| 12 |
| AC-15: U_e 230 V AC, I_e 4 A |
| DC-13: U_e 24 V DC, I_e 3 A |
| 6 |
| 3600 |
| 30 x 10 ⁶ |

| |
|----------------------------|
| 4 |
| III |
| 3 Outside, 2 Inside |
| 300 |
| 2,21 |
| IP 40/IP 20 |
| EN 50081-1:03.93, -2:03.94 |
| EN 50082-2:1995 |

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