

S4000



S4000 – universal safety relays

The **S4000** safety relays offer customized solutions for the safety of man and machine. These devices combine excellent technical performance with efficient use in everyday industrial applications. Compact design, flexible use and flexible connection methods are the decisive advantages of these devices. Depending on the application and the selected device, the safety relays can be used up to PL e/Category 4 (EN ISO 13849-1) or SIL 3 (EN 62061)

Versatile application options

- Emergency stop monitoring
- Monitoring of protective doors and interlocks
- Light curtain monitoring
- Two-hand relay
- Monitoring of valves and limit value switches
- Safe contact expansions

Safety relays

S4000

**The simple and safe
connection for every situation.**



Basic devices

SNA, SNO, SNS, SNT, SNZ**Basic devices**

The basic devices of the **SNA, SNO, SNS, SNT** and **SNZ** device families feature a safe internal logic component for the monitoring of the respective safety functions.

Basic devices with time function

SNV**Basic devices with time function**

The basic devices of the **SNV** device families feature a safe internal logic component for the monitoring of the respective safety functions. In addition, these devices offer time-delayed, safe outputs and a corresponding time setting on the device.

Contact expansion relays

SNE**Contact expansion relays**

The contact expansion relays of the **SNE** device family feature a redundant internal structure and are used for contact multiplication on, for example, basic devices.



Overview Safety relays S4000

Applications

		SNO 4083KM	SNO 4062K/KM	SNO 4063K/KM	SNA 4043K/KM	SNA 4044 K/KM	SNA 4063K/KM	SNA 4064K/KM	SNO 4003K	SNO 1012K
PL	Applications in accordance with EN ISO 13849-1 up to PL	e	e	e	e	e	e	e	d	d
Cat.	Applications in accordance with EN ISO 13849-1 up to category	4	4	4	4	4	4	4	2	2
SIL	Applications in accordance with EN 62062 up to SIL _{CL}	3	3	3	3	3	3	3	2	2
	Emergency stop monitoring	●	●	●	●	●	●	●	●	●
	Protective gate monitoring	●	●	●	●	●	●	●	●	●
	Safety light grid in accordance with EN 61496-1 BWS type 4	● ¹⁾	●	●	●	●	●			
	Two-hand control according to EN 574									
	Controlled stop according to EN 60204-1 stop Catégorie 1									
	Standstill monitoring									
	Safety shut-off mat monitoring (4-wire principle, short-circuiting)	●	● ¹⁾	● ¹⁾						
	Elevator systems according to EN 81-1	●			●	●	●	●		
	Combustion plants according to EN 50156-1	●			●	●	●	●		
	Contact expansion									

Features

	Single-channel input circuit 1 NC contact or semiconductor	●	●	● ¹⁾	●	●	●	●	●	●
	Two-channel input circuit 2 NC contacts or semiconductors	●	●	●	●	●	●	●		
	Two-channel input circuit 2 NO/NC contacts or semiconductors	●								
	Synchronous time monitoring (s)	0,5/1,5								
	Automatic Reset	●	●	●	●	●			●	●
	Manual Reset		●	●	●	●			●	●
	Reset button monitoring	●	●	●			●	●	●	
	Contacts (NO/NC) *safe semiconductor outputs	3 / 1	2 / 1	3	3 / 1	4	3 / 1	4	3 / 1	2
	OFF-delayed contacts (NO / NC)									
	ON-delayed contacts (NO / NC)									
	KM device types for fast, tactile applications	●	●	●	●	●	●	●		
	Reset of time lapse for OFF-delayed contacts									
	Rated voltage DC (V)	24	24	12 24	24	24	24	24	24	24
	Rated voltage AC (V)	24 115-230	24 115-120 230	24 115-120 230	24 42-48 115-120 230	24 42-48 115-120 230	24 42-48 115-120 230	24 42-48 115-120 230	24 115-120 230	24
	Page	38	40	42	44	44	46	46	48	50

Basic Devices

¹⁾ 24 V devices only

²⁾ applies to undelayed contacts; the following applies to delayed contacts: PL d / category 3 / SILCL 2

³⁾ depends on the category of the basic device or the safety analysis.

	SNS 4074K SNS 4084K	SNT 4M63K	SNZ 4052K	SNZ 1022K	SNV 4063KL	SNV 4063KP	SNV 4074SL	SNV 4076SL	SNV 4274SL	SNV 4074ST	SNE 4003K	SNE 4004K	SNE 4004KV	SNE 4028S
	e	e	e	c	e ²⁾	e ²⁾	e	e	e	e	d ³⁾	d ³⁾	d ³⁾	e ³⁾
	4	4	4	1	4 ²⁾	4 ²⁾	4	4	4	4	3 ³⁾	3 ³⁾	3 ³⁾	4 ³⁾
	3	3	3	1	3 ²⁾	3 ²⁾	3	3	3	3	2 ³⁾	2 ³⁾	2 ³⁾	3 ³⁾
		●			●	●	●	●	●	●				
		●	●	●	●	●	●	●	●	●				
					●	●	●	●	●	●				
			IIIC	IIIA										
	●				●	●	●	●	●	●			●	
	●													
							●	●	●	●				
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●	●			●	●	●	●	●	●	●	●	●	●	●
●	●			●	●	●	●	●	●	●	●			●
	●	●	●											
		0.5	0.5				1.0	1.0	1.0	1.0				
●	●	●	●	●	●	●	●	●	●	●				
●	●			●	●	●	●	●	●	●				
●	●			●	●	●	●	●	●	●				
4*	3	2 / 1	1/1	2	2	2 / 2	3 / 1	2 / 2	2 / 2	3 / 1	4 / 1			8 / 1
				1		2 / 2	3	2 / 2					4 / 1	
					1				2 / 2					
						●	●	●	●					
				●				●					●	
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
	24 115-120 230	24 115-120 230	24 115-230			115-230	115-230	115-230	115-230		24		24 115-230	
52	54	56	58	60	62	64	64	66	66	68	70	70	72	
Basic Devices with time function										Contact- Expansion Relais				

Basic device – SNO 4083KM



Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Monitoring of light barriers
- Up to PL e/Categorie 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop Category 0 according to EN 60204-1
- Single-channel or two-channel control
- Two-channel control with NC/NC or NC/NO
- Manual or automatic start
- Cross monitoring
- Synchronous time monitoring for two-channel control
- 3 enabling current path / 1 signalling current path

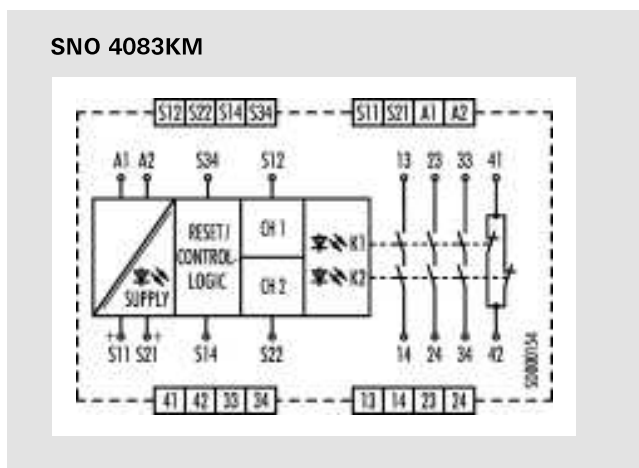
Function

After the supply voltage is applied to terminals A1/A2 and the safety inputs are closed, the enabling current paths (NO contacts) are closed and the signal current path (NC contact) is opened automatically or by pressing the reset button (manual monitored start). When the safety inputs are opened/de-energized the enabling current paths (NO contacts) are opened immediately and the signal current path (NC contact) is closed.

- **Reduced installation work** – The SNO 4083KM requires fewer connection cables, irrespective of whether operation with or without cross monitoring is desired. This saves time and money when it comes to wiring.
- **Universal application** – The two-channel control of the device is carried out by either an NC/NC or an NC/NO combination of the safety sensor. In the case of two-channel control of the device, a synchronous time is automatically monitored between the two channels.

- **SafeStart function** – When the device is used with a manual start, the reset input is automatically monitored for a rising and falling signal edge. A manual reset signal is only accepted if the control inputs of the device are activated by the safe transducer (e.g. emergency stop button) during the entire activation procedure.
- **Monoflop function** – This function is integrated into the device and prevents device interlocking under all circumstances. This is a decisive advantage in applications where very short interruptions of the safety-related signals can occur, or in the case of transducers with bouncing contacts or safe optical sensors (BWS), for example.
- **Simple diagnosis** – The device features an intelligent display system that shows the user the different operating modes of the device in its different applications. This means, for example, that when the control inputs are closed and manual start has been selected, a reset signal is displayed, which has not yet been given. Fault states in the control (e.g. synchronous time exceeded or a short-circuit in two-channel control) are also signaled to the user via a blinking code.

Circuit diagram



Basic device – SNO 4083KM

Overview of devices | part numbers

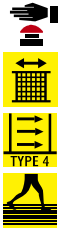
Type	Rated voltage	Synchr. Time	Terminals	Part no.	Std. pack
SNO 4083KM-A	24 V DC	1.5 s	Screw terminals, pluggable	R1.188.3580.0	1
SNO 4083KM-A	115-230 V AC	1.5 s	Screw terminals, pluggable	R1.188.3590.0	1
SNO 4083KM-C	24 V DC	1.5 s	Cage clamp, pluggable	R1.188.3600.0	1
SNO 4083KM-C	115-230 V AC	1.5 s	Cage clamp, pluggable	R1.188.3610.0	1
SNO 4083KM-A	24 V DC	0.5 s	Screw terminals, pluggable	R1.188.3830.0	1
SNO 4083KM-A	115-230 V AC	0.5 s	Screw terminals, pluggable	R1.188.3840.0	1
SNO 4083KM-C	24 V DC	0.5 s	Cage clamp, pluggable	R1.188.3850.0	1
SNO 4083KM-C	115-230 V AC	0.5 s	Cage clamp, pluggable	R1.188.3860.0	1

Technical data

Function		Emergency stop relay
Function display		3 LEDs, green
Power supply circuit		
Rated voltage U_N	A1, A2	24 V DC/ 115-230 V AC
Rated consumption	24 V DC	1.6 W
	115-230 V AC	1.8 W / 4.0 VA
Rated frequency		50 - 60 Hz
Operating voltage range U_B		0.85 - 1.1 x U_N
Electrical isolation supply circuit - control circuit		yes (at $U_N = 115-230$ V AC)
Control circuit		
Rated output voltage	S11/S21	22.5 V DC
Input current / peak current	S12, S22	25 mA / 100 mA
	S14, S34	3 mA / 5 mA
Response time t_{A1} / t_{A2}		250 ms
Minimum ON time t_M		60 ms
Recovery time t_w		120 ms
Release time t_R		20 ms
Synchronous time t_s		0.5 s / 1.5 s
Permissible test pulse time t_{TP}		< 0,8 ms
Max. resistivity, per channel ¹⁾	24 V DC	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$
	115-230 V AC	$\leq 12 \Omega$
Output circuit		
Enabling paths	13/14, 23/24, 33/34	normally open contact
Signaling paths	41/42	normally closed contact
Contact assignment		forcebly guided
Contact type		Ag-alloy, gold-plated
Rated switching voltage	enabling / signaling path	230 V AC
Max. thermal current I_{th}	enabling / signaling path	6 A / 2 A
Max. total current I^2 of all current path	($T_u = 55$ °C) / ($T_u = 65$ °C)	25 A ² / 9 A ²
Application category (NO)	AC-15	U_e 230V, I_e 5 A
	DC-13	U_e 24V, I_e 5A
Short-circuit protection (NO), lead fuse / circuit breaker		6 A class gG / melting integral < 100 A ² s
Mechanical life		10 ⁷ switching cycles
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +65 °C / -25 °C - + 75 °C
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque		0.5 - 0.6 Nm
Wire ranges cage clamp terminals		1 x 0,25 mm ² – 1.5 mm ²
Weight	24 V AC/DC device / AC device	0.2 kg
Standards		EN ISO 13849-1, EN 62061, EN 81-1, EN 50156-1
Approvals		TÜV :CE (pending)

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device – SNO 4062K/KM



Function

SNO 4062K

The device is a two-channel switching device for emergency stop applications with self-monitoring on each ON-OFF cycle. It complies with EN 60204-1 and is equipped with forcibly guided relays.

Basic function:

With supply voltage applied to terminals A1/A2 and the safety inputs closed, pressing the reset button closes the enabling current paths (manual start). When the safety inputs are opened/de-energized the enabling current paths will open.

Operating modes / system functions

- **Single or two-channel control** With single-channel control both CH1 and CH2 safety channels are connected in parallel; with two-channel control they are switched separately.
- **Without cross monitoring** Both safety channels are switched to the positive potential (S12 and S31 to S11).
- **With cross monitoring** Safety channel CH1 is switched to positive potential (S11 to S12), and safety channel CH2 to negative potential (S21 to S22).
- **Manual start** When the safety inputs are closed, a button is used to open reset input S34 (triggering with falling edge) or to close reset input S35 (triggering with rising edge).
- **Automatic start** Reset input S35 is connected to S33. The device starts with the rising edge of the signal on safety input S12.
- **Start inhibit** After supply voltage has been applied and the safety inputs closed, the enabling paths will not close. Starting is only possible after the reset button has been operated. For start inhibit the reset inputs have to be controlled with the button, as with manual start mode.
- **Restart inhibit** No restart after the safety inputs have been opened and closed. Restarting is only possible after the reset button has been operated. For restart inhibit the reset inputs have to be activated with the button, as in manual start mode.
- **Semiconductor compatible** OSSD (output signal switching devices) signals from a light curtain or other safety sensors with semiconductor outputs can be processed. Test pulses $< t_{tr}$ do not influence the device functions. Test pulses $> t_{tr}$ can lock the device.

Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Monitoring of light barriers
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop Category 0 according to EN 60204-1
- Reset button monitoring
- Manual or automatic start
- Single-channel or two-channel control
- Cross monitoring
- 2 enabling current paths, 1 signal current path

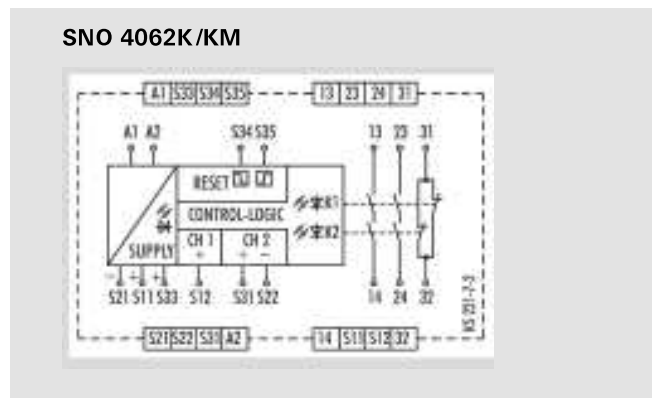
SNO 4062KM

The function of this device corresponds to that of the SNO 4062K without synchrocheck. The device is suitable for connecting to light curtains for Type 4 (EN 61496-1) and connecting to short-circuit forming 4-wire safety mats, switching strips or switching edges (without monitoring resistance).

- **Safety mats** The device must be operated with two channels and cross monitoring. If there is resistance $< 50 \Omega$ / channel and a short circuit between the channels (S11/S12 and S21/S22) the enabling paths open and the SUPPLY LEDs flashes.
- **Light curtain for Type 4 (EN 61496-1)** The device will be operated with two channels and without cross monitoring, if the light curtain connected to the OSSD detects a shunt fault on its own.

For applications with tactile operating modes (rapid ON-OFF cycles, for example with manual supply) we recommend using SNO 4062KM.

Circuit diagram




Basic device – SNO 4062K/KM

Overview of devices | part numbers

Type	Rated voltage	Terminals	Part no.	Std. pack
SNO 4062K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.0700.2	1
SNO 4062KM-A	24 V AC/DC	Screw terminals, pluggable	R1.188.0720.2	1
SNO 4062K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.2000.0	1

Technical data

Function	Emergency stop relay	
Function display	3 LEDs, green	
Power supply circuit		
Rated voltage U_N	A1, A2	24 V AC/DC
Rated consumption	24 V DC (K / KM)	2,0 W / 2,1 W
Rated frequency		50 - 60 Hz
Operating voltage range U_B		0,85 - 1,1 x U_N
Electrical isolation supply circuit - control circuit		no
Control circuit		
Rated output voltage	S11, S33/S21	22 V DC
Input current / peak current	S12, S31/S22	40 mA / 100 mA
	S34, S35	5 mA / 50 mA
Response time t_{A1} / t_{A2}		40 ms / 500 ms (KM: 40 ms / 80 ms)
Minimum ON time t_M		50 ms
Recovery time t_w		150 ms
Release time t_R		15 ms
Synchronous time t_s		200 ms (CH1 → CH2)
Permissible test pulse time t_{TP}		< 1ms
Max. resistivity, per channel ¹⁾		$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$
Output circuit		
Enabling paths	13/14, 23/24	normally open contact
Signaling paths	31/32	normally closed contact
Contact assignment		forcebly guided
Contact type		Ag-alloy, gold-plated
Rated switching voltage	enabling / signaling path	230 V AC
Max. thermal current I_{th}	enabling / signaling path	6 A / 3 A
Max. total current I^2 of all current path	($T_u = 55^\circ\text{C}$)	9 A ²
Application category (NO)	AC-15	U_o 230 V, I_o 3 A
	DC-13	U_o 24 V, I_o 2,5A
Short-circuit protection (NO), lead fuse / circuit breaker		6 A class gG / melting integral < 100 A ² s
Mechanical life		10 ⁷ switching cycles
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +55 °C / -25 °C - + 75 °C
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque		0.5 - 0.6 Nm
Wire ranges cage clamp terminals		1 x 0.25 mm ² – 1.5 mm ²
Weight	24 V AC/DC device / AC device	0.21 kg
Standards		EN ISO 13849-1, EN 62061
Approvals		

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device – SNO 4063K/KM



Function

SNO 4063K

The device is a two-channel switching device for emergency stop applications with self-monitoring on each ON-OFF cycle. It complies with EN 60204-1 and is equipped with forcibly guided relays.

Basic function

After supply voltage has been applied to the A1/A2 terminals and the safety inputs have been closed, pressing the reset button closes the enabling current paths (manual start). When the safety inputs are opened/de-energized the enabling current paths will open.

Operating modes / system functions

- **Single or two-channel control** With single-channel control both safety channels, CH1 and CH2, are connected in parallel; with two-channel control they are switched separately. For AC devices, only two-channel operation with cross-connection monitoring is possible.
- **Without cross monitoring** Both safety channels are switched to the positive potential (S12 and S31 to S11).
- **With cross monitoring** Safety channel CH1 is switched to positive potential (S11 to S12), and safety channel CH2 to negative potential (S21 to S22).
- **Manual start** When the safety inputs are closed, a button is used to open reset input S34 (triggering with falling edge) or to close reset input S35 (triggering with rising edge).
- **Automatic start** Reset input S35 is connected to S33. The device starts with the rising edge of the signal on safety input S12.
- **Start inhibit** After supply voltage has been applied and the safety inputs closed, the enabling paths will not close. Starting is only possible after the

Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Monitoring of light barriers
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop Category 0 according to EN 60204-1
- Manual or automatic start
- Cross monitoring
- Single-channel or two-channel control
- 3 enabling current paths

reset button has been pressed. For start inhibit the reset inputs have to be controlled with the button, as with manual start mode.

- **Restart inhibit** No restart after the safety inputs have been opened and closed. Restarting is only possible after the reset button has been pressed. For restart inhibit the reset inputs have to be activated with the button, as in manual start mode.
- **Semiconductor compatible** OSSD (output signal switching devices) signals from a light curtain or other safety sensors with semiconductor outputs can be processed. Test pulses $< t_{TP}$ do not influence the device functions. Test pulses $> t_{TP}$ can lock the device.

SNO 4063KM

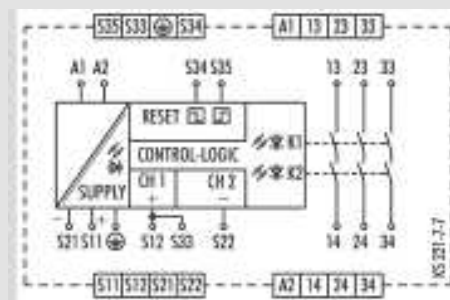
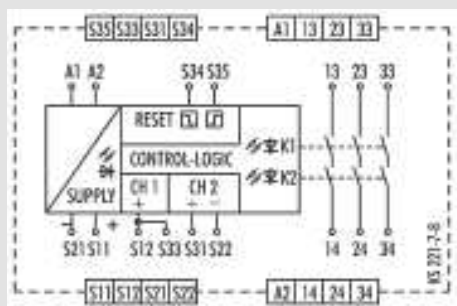
The function of this device corresponds to that of the SNO 4063K. The device is suitable for connecting to light curtains for Type 4 (EN 61496-1) and to short-circuit forming 4-wire safety mats, switching strips or switching edges (without monitoring resistance).

- **Safety mats** The device must be operated with two channels and cross monitoring. If there is resistance $< 50 \Omega$ / channel and a short circuit between the channels (S11/S12 and S21/S22) the enabling paths open and the SUPPLY LEDs flash.
- **Light curtain for Type 4 (EN 61496-1)** The device will be operated with two channels and without cross monitoring, if the light curtain connected to the OSSD detects a shunt fault on its own.

For applications with tactile operating modes (rapid ON-OFF cycles, for example at manual supply) we recommend the use of SNO 4063KM.

Circuit diagram

SNO 4063K/KM




Basic device – SNO 4063K/KM

Overview of devices | part numbers

Type	Rated voltage	Terminals	Part no.	Std. pack
SNO 4063K-A	12 V DC	Screw terminals, pluggable	R1.188.1120.0	1
	24 V AC/DC	Screw terminals, pluggable	R1.188.0990.0	1
	115 – 120 V AC	Screw terminals, pluggable	R1.188.1000.0	1
	230 V AC	Screw terminals, pluggable	R1.188.1010.0	1
SNO 4063K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.2450.0	1
SNO 4063KM-A	24 V AC/DC	Screw terminals, pluggable	R1.188.1280.0	1

Technical data

Function		Emergency stop relay
Function display		3 LEDs, green
Power supply circuit		
Rated voltage U_N	A1, A2	24 V AC/DC, 115-120 V AC, 230 V AC
Rated consumption	24 V DC (K / KM)	2.0 W / 2.1 W
	115-120 V AC, 230 V AC	2.4 W / 4.4 VA
Rated frequency		50 - 60 Hz
Operating voltage range U_B		0.85 - 1.1 x U_N
Electrical isolation supply circuit - control circuit		yes (at $U_N = 115-230$ V AC, 230 V AC)
Control circuit		
Rated output voltage	S11/S21	22 V DC
Input current / peak current	S12/S33, S31/S22	40 mA / 100 mA
	S34, S35	5 mA / 50 mA
Response time t_{A1} / t_{A2}		40 ms / 600 ms
Minimum ON time t_M		50 ms
Recovery time t_w		100 ms
Release time t_R		15 ms
Synchronous time t_s		200 ms (CH1 → CH2)
Permissible test pulse time t_{TP}		< 1 ms
Max. resistivity, per channel ¹⁾	24 V AC/DC	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$
	115-120 V AC, 230 V AC	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$
Output circuit		
Enabling paths	13/14, 23/24, 33/34	normally open contact
Contact assignment		forcebly guided
Contact type		Ag-alloy, gold-plated
Rated switching voltage	enabling path	230 V AC
Max. thermal current I_{th}	enabling path	6 A
Max. total current I^2 of all current path	($T_u = 55$ °C)	9 A ²
Application category (NO)	AC-15	U_o 230 V, I_o 3 A
	DC-13	U_o 24 V, I_o 2.5 A
Short-circuit protection (NO), lead fuse / circuit breaker		6 A class gG / melting integral < 100 A ² s
Mechanical life		10 ⁷ switching cycles
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +55 °C / -25 °C - + 75 °C
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque		0.5 - 0.6 Nm
Wire ranges cage clamp terminals		1 x 0.25 mm ² – 1.5 mm ²
Weight	24 V AC/DC device / AC device	0-21 kg / 0-25 kg
Standards		EN ISO 13849-1, EN 62061
Approvals		

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device – SNA 4043K/KM, SNA 4043KE, SNA 4044K/KM



Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Monitoring of light barriers
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop Category 0 according to EN 60204-1
- Single-channel or two-channel control
- Automatic start
- Manual reset without monitoring
- Cross monitoring
- 3 to 4 enabling current paths

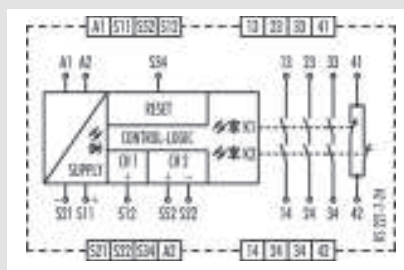
Function

Emergency stop and safety gate monitor The safety switching devices of our SNA product line are used to monitor safety sensors (emergency stop buttons, safety gate switches, etc.), feature a large number of safety switching contacts (3 NO contacts/1 NC contact or 4 NO contacts) with a total width of only 22.5 mm at a constant current of up to 8 A. They can be implemented in the extended temperature range up to 65° C.

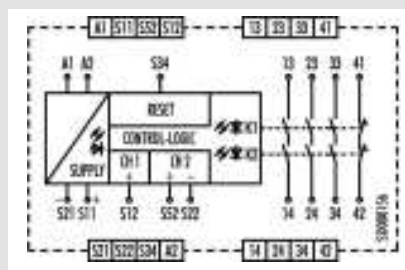
- **Automatic start** – Reset input S34 is connected to safety input S11. To monitor external contact blocks (EDM), their NC contacts must be connected in series between S34 and S11.
- **Manual start without monitoring** – Reset input S34 is connected to safety input S11 via a RESET button. To monitor external contact blocks (EDM), their NC contacts must be connected to the RESET button in series.
- **Monitoring of light curtains** – The KM device types are especially suitable for the monitoring of very fast tactile switching operations, for example in safety light curtain applications. Very short switch-off procedures of a few milliseconds are detected reliably and lead to the switching off of the internal relays.

Circuit diagram

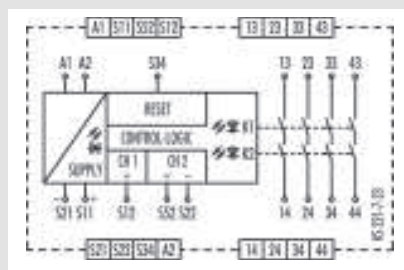
SNA 4043K/KM



SNA 4043KE



SNA 4044K/KM






Basic device – SNA 4043K/KM, SNA 4043KE, SNA 4044K/KM

Overview of devices | part numbers

Type	Rated voltage	Terminals	Part no.	Std. pack
SNA 4043K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.1810.0	1
SNA 4043K-A	42-48 V AC	Screw terminals, pluggable	R1.188.1820.0	1
SNA 4043K-A	115-120 V AC	Screw terminals, pluggable	R1.188.1830.0	1
SNA 4043K-A	230 V AC	Screw terminals, pluggable	R1.188.1840.0	1
SNA 4043K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.1940.0	1
SNA 4043KM-A	24 V AC/DC	Screw terminals, pluggable	R1.188.3250.0	1
SNA 4043KM-C	24 V AC/DC	Cage clamp, pluggable	R1.188.3400.0	1
SNA 4043KE-A	AC/DC 24 V	Screw terminals, pluggable	R1.188.3810.0	1
SNA 4043KE-C	AC/DC 24 V	Cage clamp, pluggable	R1.188.3820.0	1
SNA 4044K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.1860.0	1
SNA 4044K-A	42-48 V AC	Screw terminals, pluggable	R1.188.1870.0	1
SNA 4044K-A	115-120 V AC	Screw terminals, pluggable	R1.188.1880.0	1
SNA 4044K-A	230 V AC	Screw terminals, pluggable	R1.188.1890.0	1
SNA 4044K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.1960.0	1
SNA 4044KM-A	24 V AC/DC	Screw terminals, pluggable	R1.188.1480.0	1
SNA 4044KM-C	24 V AC/DC	Cage clamp, pluggable	R1.188.3410.0	1

S4000

Technical data

Function			Emergency stop relay
Function display			3 LEDs, green
Power supply circuit			
Rated voltage U_N	A1, A2	24 V AC/DC / 42-48 V AC / 115-120 V AC / 230 V AC	
Rated consumption	24 V DC / 24 V AC	1.6 W / 2.9 VA	
	42-48 V AC / 115-120 V AC / 230 V AC	2.3 W / 2.6 VA	
Rated frequency			50 - 60 Hz
Operating voltage range U_B			0.85 - 1.1 x U_N
Electrical isolation supply circuit - control circuit			yes (at $U_N = 42-48$ V AC, 115-230 V AC, 230 V AC)
Control circuit			
Rated output voltage	S11/S21	24 V DC	
Input current / peak current	S12, S52/S22 S34	25 mA / 100 mA 5 mA / 50 mA	
Response time t_{A1} / t_{A2}			350 ms / 350 ms
Minimum ON time t_M			100 ms
Recovery time t_w			750 ms
Release time t_R			10 ms
Synchronous time t_s			no
Permissible test pulse time t_{TP}			< 1 ms
Max. resistivity, per channel ¹⁾	24V AC/DC	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$	
	42-48V AC / 115-120 V AC, 230 V AC	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$	
Output circuit	SNA 4043K/KM	SNA 4044K/KM	
Enabling paths	13/14, 23/24, 33/34	13/14, 23/24, 33/34, 43/44	normally open contact
Signaling paths	41/42	---	normally closed contact
Contact assignment			forcefully guided
Contact type			Ag-alloy, gold-plated
Rated switching voltage	enabling / signaling path		230 V AC
Max. thermal current I_{th}	enabling / signaling path		8 A / 5 A
Max. total current I^2 of all current path	(Tu = 55 °C) / (Tu = 65 °C)		25 A ² / 9 A ²
Application category (NO)	AC-15 DC-13		U_e 230 V, I_n 3 A U_e 24 V, I_n 3 A
Short-circuit protection (NO), lead fuse / circuit breaker			6 A class gG / melting integral < 100 A ² s
Mechanical life			10 ⁷ switching cycles
General data			
Creepage distances and clearances between the circuits			EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)			IP40 / IP20
Ambient temperature / storage temperature			-25 °C - +65 °C / -25 °C - +75 °C
Wire ranges screw terminals,	fine-stranded / solid		1 x 0.14 mm ² - 2.5 mm ² / 2 x 0.14 mm ² - 0.75 mm ²
	fine-stranded with ferrules		1 x 0.25 mm ² - 2.5 mm ² / 2 x 0.25 mm ² - 0.5 mm ²
Permissible torque			0.5 - 0.6 Nm
Wire ranges cage clamp terminals			1 x 0.25 mm ² - 1.5 mm ²
Weight	24 V AC/DC device / AC device		0.21 kg / 0.25 kg
Standards			EN ISO 13849-1, EN 62061, EN 81-1, EN 50156-1
Approvals			TÜV   

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device – SNA 4063K/KM, SNA 4064K/KM



Applications

- Monitoring of emergency stop applications
- Monitoring of safety gates
- Monitoring of light barriers
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop Category 0 according to EN 60204-1
- Single-channel or two-channel control
- Manual reset with monitoring
- Cross monitoring
- 3 to 4 enabling current paths

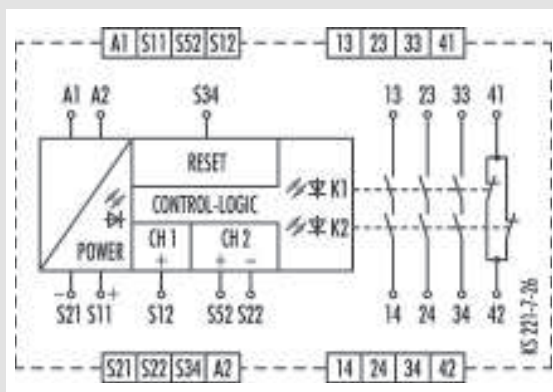
Function

After the supply voltage is applied to terminals A1/A2 and the safety inputs are closed, the enabling current paths (NO contacts) are closed and the signal current path (NC contact) is opened by pressing the reset button (manual start with monitoring). When the safety inputs are opened/de-energized, the enabling current paths (NO contacts) are opened immediately.

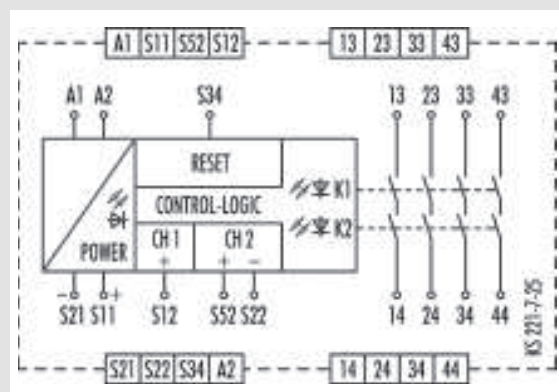
- **Manual start with monitoring** – Reset input S34 is connected to safety input S11 via a RESET button. To monitor external contact blocks (EDM), their NC contacts must be connected in series to the RESET button.
- **Monitoring of light curtains** – The KM device types are especially suitable for the monitoring of very fast tactile switching operations, for example in safety light curtain applications. Very short switch-off procedures of a few milliseconds are detected reliably and lead to the switching off of the internal relays.

Circuit diagram

SNA 4063K/KM



SNA 4064K/KM






Basic device – SNA 4063K/KM, SNA 4064K/KM

Overview of devices | part numbers

Type	Rated voltage	Terminals	Part no.	Std. pack
SNA 4063K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.1440.0	1
SNA 4063K-A	42-48 V AC	Screw terminals, pluggable	R1.188.1850.0	1
SNA 4063K-A	115-120 V AC	Screw terminals, pluggable	R1.188.1450.0	1
SNA 4063K-A	230 V AC	Screw terminals, pluggable	R1.188.1460.0	1
SNA 4063K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.1950.0	1
SNA 4063KM-A	24 V AC/DC	Screw terminals, pluggable	R1.188.3290.0	1
SNA 4063KM-C	24 V AC/DC	Cage clamp, pluggable	R1.188.3420.0	1
SNA 4064K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.1900.0	1
SNA 4064K-A	42-48 V AC	Screw terminals, pluggable	R1.188.1910.0	1
SNA 4064K-A	115-120 V AC	Screw terminals, pluggable	R1.188.1920.0	1
SNA 4064K-A	230 V AC	Screw terminals, pluggable	R1.188.1930.0	1
SNA 4064K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.1970.0	1
SNA 4064KM-A	24 V AC/DC	Screw terminals, pluggable	R1.188.3360.0	1
SNA 4064KM-C	24 V AC/DC	Cage clamp, pluggable	R1.188.3430.0	1

S4000

Technical data

Function			Emergency stop relay
Function display			3 LEDs, green
Power supply circuit			
Rated voltage U_N	A1, A2	24 V AC/DC / 42-48 V AC / 115-120 V AC / 230 V AC	
Rated consumption	24V DC / 24 V AC	1.6 W / 2.9 VA	
	42-48V AC / 115-120V AC / 230 V AC	2.3 W / 2.6 VA	
Rated frequency			50 - 60 Hz
Operating voltage range U_B			0.85 - 1.1 x U_N
Electrical isolation supply circuit - control circuit			yes (at $U_N = 42-48$ V AC, 115-230 V AC, 230 V) AC
Control circuit			
Rated output voltage	S11/S21	24 V DC	
Input current / peak current	S12, S52/S22 S34	25 mA / 100 mA 5 mA / 50 mA	
Response time t_{A1} / t_{A2}			100 ms / ---
Minimum ON time t_M			100 ms
Recovery time t_w			750 ms
Release time t_R			10 ms
Synchronous time t_s			no
Permissible test pulse time t_{TP}			< 1 ms
Max. resistivity, per channel ¹⁾	24V AC/DC	$\leq (5 + (1,176 \times U_B / U_N - 1) \times 100) \Omega$	
	42-48V AC / 115-120 V AC, 230 V AC	$\leq (5 + (1,176 \times U_B / U_N - 1) \times 100) \Omega$	
Output circuit	SNA 4063K/KM	SNA 4064K/KM	
Enabling paths	13/14, 23/24, 33/34	13/14, 23/24, 33/34, 43/44	normally open contact
Signaling paths	41/42	---	normally closed contact
Contact assignment			forcefully guided
Contact type			Ag-alloy, gold-plated
Rated switching voltage	enabling / signaling path		230 V AC
Max. thermal current I_{th}	enabling / signaling path		8 A / 5 A
Max. total current I^2 of all current path	(Tu = 55 °C) / (Tu = 65 °C)		25 A ² / 9 A ²
Application category (NO)	AC-15 DC-13		U_c , 230 V, I_c , 3 A U_c , 24 V, I_c , 3 A
Short-circuit protection (NO), lead fuse / circuit breaker			6 A class gG / melting integral < 100 A ² s
Mechanical life			10 ⁷ switching cycles
General data			
Creepage distances and clearances between the circuits			EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)			IP40 / IP20
Ambient temperature / storage temperature			-25 °C - +65 °C / -25 °C - + 75 °C
Wire ranges screw terminals,	fine-stranded / solid		1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules		1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque			0.5 - 0.6 Nm
Wire ranges cage clamp terminals			1 x 0-25 mm ² bis 1-5 mm ²
Weight	24 V AC/DC device / AC device		0-21 kg / 0-25 kg
Standards			EN ISO 13849-1, EN 62061, EN 81-1, EN 50156-1
Approvals			TÜV   

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device – SNO 4003K



Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Up to PL d/Category 2 (EN ISO 13849-1)*
- Up to SIL_{CL} 2 (EN 62061)*

Features

- Stop Category 0 according to EN 60204-1
- Single-channel control
- Manual or automatic start
- 3 enabling current paths, 1 signal current path
- Feedback loop for monitoring external contactors

* Specific applications may also require higher categories/levels

Function

The device is a single-channel switching device for emergency stop applications with self-monitoring on each ON-OFF cycle. It complies with EN 60204-1 and is equipped with forcibly guided relays.

The device has either two Y2 reset inputs (without reset monitoring) or two Y3 reset inputs (with reset monitoring). The K1 and K2 relays are actuated either automatically (bridge Y1 Y2) or after the reset button (on Y1 Y3) has been pressed.

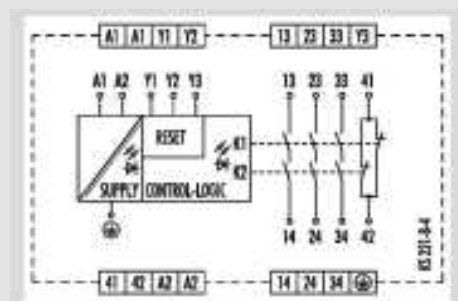
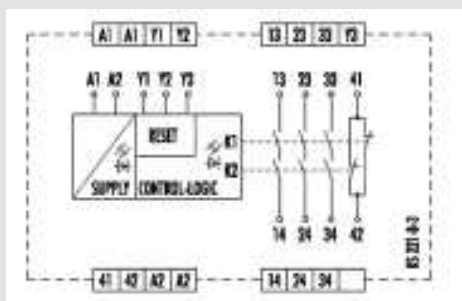
They become self-locking through their own contacts, if there is an electrical connection between terminal A1 and the supply voltage (emergency stop button, position switches).

After this switch-on phase the enabling current paths are closed and the signaling current path is open.

If the electrical connections between terminal A1 and the supply voltage are interrupted, the enabling current paths open and the signaling current path closes. The energized state (self-locking) of the two channels is indicated by a green LED K1, K2. The second green LED indicates that supply voltage has been applied. The set-up of an emergency stop facility after stop Category 0 (EN 60204-1) is possible.

Circuit diagram

SNO 4003K

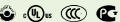


Basic device – SNO 4003K

Overview of devices | part numbers

Type	Rated voltage	Terminals	Part no.	Std. pack
SNO 4003K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.0500.1	1
	115 – 120 V AC	Screw terminals, pluggable	R1.188.0900.1	1
	230 V AC	Screw terminals, pluggable	R1.188.0910.1	1
SNO 4003K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.1990.0	1

Technical data

Function		Emergency stop relay
Function display		2 LEDs, green
Power supply circuit		
Rated voltage U_N	A1, A2	24 V AC/DC / 115-120 V AC / 230 V AC
Rated consumption	24 V DC	1.3 W
	115-120 V AC, 230 V AC	2.2 W / 3.9 VA
Rated frequency		50 - 60 Hz
Operating voltage range U_B		0.85 - 1.1 x U_N
Electrical isolation supply circuit - control circuit		yes (at $U_N = 115-120$ V AC, 230 V AC)
Control circuit		
Rated output voltage	Y1	24 V DC
Input current / peak current	Y2, Y3	90 mA / 1500 mA
Response time t_{A1} / t_{A2}		60 ms
Minimum ON time t_M (Manueller Start)		60 ms
Recovery time t_w		200 ms
Release time t_R		60 ms
Max. resistivity	24V AC/DC	$\leq (2.5 + (1.176 \times U_B / U_N - 1) \times 50) \Omega$
	115-120 V AC, 230 V AC	$\leq (7.5 + (1.176 \times U_B / U_N - 1) \times 150) \Omega$
Output circuit		
Enabling paths	13/14, 23/24, 33/34	
Signaling paths	41/42	normally closed contact
Contact assignment		forcebly guided
Contact type		Ag-alloy, gold-plated
Rated switching voltage	enabling / signaling path	230 V AC
Max. thermal current I_{th}	enabling / signaling path	8 A / 5 A
Max. total current I^2 of all current path	($T_u = 55$ °C)	9 A ²
Application category (NO)	AC-15	U_e 230 V, I_e 5 A
	DC-13	U_e 24 V, I_e 5A
Short-circuit protection (NO), lead fuse / circuit breaker		6 A class gG / melting integral < 100 A ² s
Mechanical life		10 ⁷ switching cycles
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +55 °C / -25 °C - + 75 °C
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque		0.5 - 0.6 Nm
Wire ranges cage clamp terminals		1 x 0.25 mm ² – 1.5 mm ²
Weight	24 V AC/DC device / AC device	0,20 kg / 0,25 kg
Standards		EN ISO 13849-1, EN 62061
Approvals		

Basic device – SNO 1012K



Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Up to PL d/Category 2 (EN ISO 13849-1)*
- Up to SIL_{CL} 2 (EN 62061)

Features

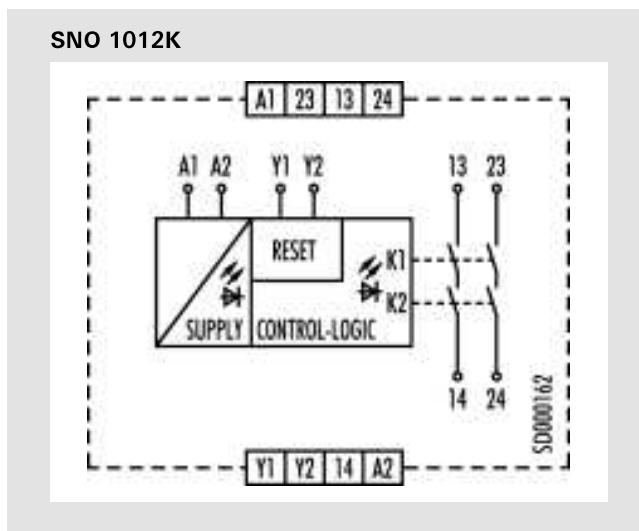
- Stop Category 0 according to EN 60204-1
- Single-channel control
- Manual or automatic start
- 2 enabling current paths
- Check of external contactors (EDM)
- Compact design

* Specific applications may also require higher categories/levels

Function

After the operating voltage (L+/L1) is applied via an unactuated emergency stop button or safety gate contact on A1 and A2, the device can be switched on via a Y1/Y2-connected reset button. When the device is on, the internal relays K1 and K2 are energized and the enabling current paths 13/14 and 23/24 are closed. When the emergency stop button or the safety gate contact is actuated, the current supply of the internal relays is interrupted and the enabling current paths are opened.

Circuit diagram




Basic device – SNO 1012K

Overview of devices | part numbers

Type	Rated voltage	Terminals	Part no.	Std. pack
SNO 1012K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.3740.0	1
SNO 1012K-C	24 V AC/DC	Cage clamps, pluggable	R1.188.3750.0	1

Technical data

Function		Emergency stop relay
Function display		2 LEDs, green
Power supply circuit		
Rated voltage U_N	A1, A2	24 V AC/DC
Rated consumption	24 V DC	1 W / 2 VA
Rated frequency		50 - 60 Hz
Operating voltage range U_B		0,85 - 1,1 x U_N
Electrical isolation supply circuit - control circuit		no
Control circuit		
Rated output voltage	Y1	24 V DC
Input current / peak current	Y2	50 mA / 70 mA
Response time t_{A1} / t_{A2}		< 20 ms / < 70 ms
Minimum ON time t_M		30 ms
Recovery time t_w		> 200 ms
Release time t_r		< 70 ms
Max. resistivity		$\leq (2,5 + (1,176 \times U_B / U_N - 1) \times 50) \Omega$
Output circuit		
Enabling paths	13/14, 23/24	normally open contact
Contact assignment		forcebly guided
Contact type		Ag-alloy, gold-plated
Rated switching voltage		240 V AC / 50V DC
Max. thermal current I_{th}	enabling path	6 A
Max. total current I^2 of all current path (Tu = 55 °C)		72 A ² / 9 A ²
Application category (NO)		AC-15 U_o 230 V, I_o 3 A
		DC-13 U_o 24 V, I_o 3 A
Short-circuit protection (NO), lead fuse / circuit breaker		6 A class gG / melting integral < 100 A ² s
Mechanical life		10 x 10 ⁶ switching cycles
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +55 °C / -25 °C - + 75 °C
Wire ranges screw terminals,		fine-stranded / solid
		1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
		fine-stranded with ferrules
		1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque		0.5 - 0.6 Nm
Wire ranges cage clamp terminals		2 x 0.25 mm ² – 1.5 mm ²
Weight		0.12 kg
Standards		EN ISO 13849-1, EN 62061
Approvals		

Basic device – SNS 4074K / SNS 4084K



Applications

- Standstill monitoring
- Monitoring of electrical lockout devices
- Control of spring-actuated tumblers
- Monitoring of low rotational speeds in setup operation
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Reliable monitoring of dynamic input signals
- Adjustable monitoring frequency 0.1 – 99 Hz
- 4 selectable operating mode groups
- Single-channel or two-channel control
- Manual or automatic start
- Cross monitoring
- 4 safe semi-conductor outputs

Standstill monitoring function

The SNS 4084K standstill monitor provides for the safe monitoring of the frequency of a signal at inputs I1 to I4 of the device. If the frequency of the impulses is higher than the frequency set at the rotary switches (0.1 – 99 Hz), outputs Q1/Q2 will switch off. This monitoring function can be used to detect the standstill or a lower, safer rotational speed of a machine. In applications of this sort, a spring-actuated or magnet-actuated tumbler of an electric interlocking device, for example, can be controlled from the output of the device.

The sensors for the detection of movement can, for example, be two inductive proximity switches or a rotary encoder connected to inputs I1 - I4. The frequency of the impulses to be monitored is set at the two rotary switches and splitter input T1, and is stored in the device on which the ENTER button is pressed while the voltage is applied to the device.

SNS 4074K

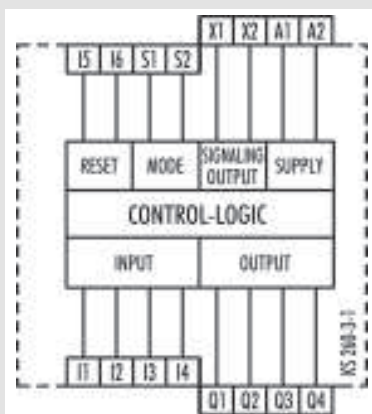
The device features a bypass input, which allows safety-oriented bypassing of the monitoring function, e.g. when a safe position has been reached. In this case, the signal must fulfill at least the safety category of the selected monitoring function.

SNS 4084K

The device features an input for the implementation of a start override, which allows the safe outputs to be switched off even during machine standstill. This means, for example, that a spring-activated protective locking facility can be activated during machine start-up.

Circuit diagram

SNS 4074K/SNS 4084K



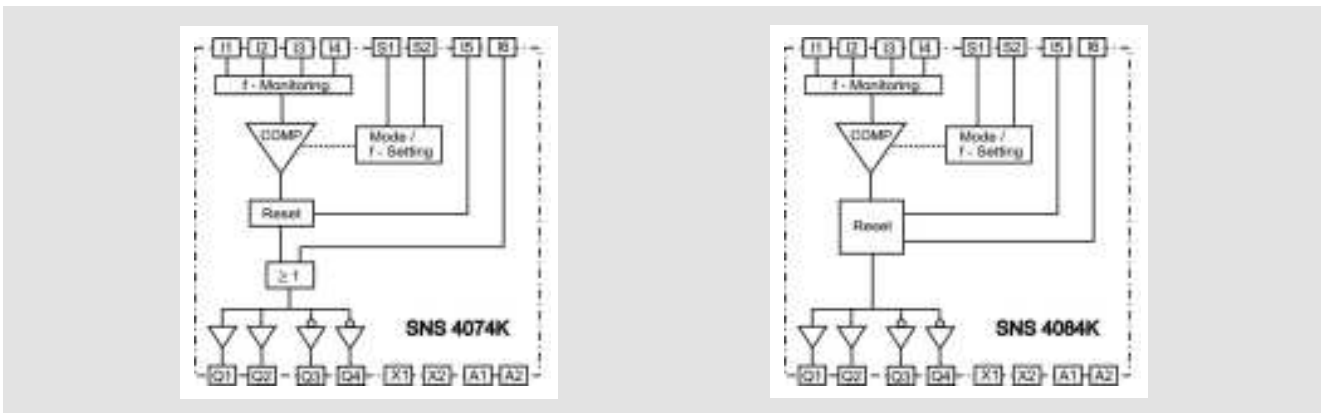
Terminals	Description
A1	+ 24 V
A2	GND
X1 / X2	Signal output, semi-conductor (plus switching)
S1	Configuration input for operating mode group
S2	Configuration input for operating mode group
I1	Sensor input
I2	Sensor / configuration input (depending on the operating mode group)
I3	Sensor / configuration input (depending on the operating mode group)
I4	Sensor / configuration input (depending on the operating mode group)
I5	Reset input
I6	Bypass input (SNS 4074K) / start override input (SNS 4084K)
Q1 / Q2	Safe Output, semi-conductor (plus switching)
Q3 / Q4	Safe Output, semi-conductor (plus switching), inverted

Basic device – SNS 4074K / SNS 4084K

Overview of devices | part numbers

Type	Frequency range	Terminals	Part no.	Std. pack
SNS 4074K-A	0,5 - 99 Hz	Screw terminals, pluggable	R1.188.3640.0	1
SNS 4074K-C	0,5 - 99 Hz	Cage clamp, pluggable	R1.188.3650.0	1
SNS 4074K-A	0,1 - 9,9 Hz	Screw terminals, pluggable	R1.188.3620.0	1
SNS 4074K-C	0,1 - 9,9 Hz	Cage clamp, pluggable	R1.188.3630.0	1
SNS 4084K-A	0,5 - 99 Hz	Screw terminals, pluggable	R1.188.3480.0	1
SNS 4084K-C	0,5 - 99 Hz	Cage clamp, pluggable	R1.188.3490.0	1
SNS 4084K-A	0,1 - 9,9 Hz	Screw terminals, pluggable	R1.188.3660.0	1
SNS 4084K-C	0,1 - 9,9 Hz	Cage clamp, pluggable	R1.188.3670.0	1

Function diagram

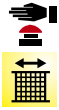


S4000

Technical data

Function		Standstill monitoring
Function display		12 LEDs, green/red
Function mode / adjustment		Frequency monitoring / 2 x-position switch
Adjustment range	f_{ST}	0,1 - 99 Hz / 0,5 - 99 Hz
Power supply circuit		
Rated voltage U_N	A1, A2	24 V DC
Rated consumption	24 V DC	1.8 W
Operating voltage range U_B		0.85 - 1.1 x U_N
Electrical isolation supply circuit - control circuit		no
Control circuit		
Rated output voltage		24 V DC
Input current / peak current	I1 - I6, S1, S2	3 mA / 3,8 mA
Minimum ON time t_M		100 ms (< 5 s)
Release time t_R		12 ms + 1.6 / f_{ST}
Max. cable length per input		100 m
Output circuit		
Enabling paths	Q1, Q2, Q3, Q4	Semi-conductor (plus switching), safety-related
Signaling paths	X1, X2	Semi-conductor (plus switching), not safety-related
Rated switching voltage	enabling path	30 V DC
Max. thermal current I_{th}	enabling path	2 A
Max. total current I^2 of all current path	($T_u = 55^\circ\text{C}$)	4 A
Mechanical life		Must be short-circuit proof
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +55 °C / -25 °C - + 75 °C
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque		0,5 - 0.6 Nm
Wire ranges cage clamp terminals		1 x 0.25 mm ² – 1.5 mm ²
Weight		0.16 kg
Standards		EN ISO 13849-1, EN 62061
Approvals		TÜV

Basic device – SNT 4M63K



Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop Category 0 according to EN 60204-1
- Manual or automatic start
- Cross monitoring
- 3 enabling current paths (NO contact, forcibly guided)
- Feedback loop for monitoring external contactors

Function

The device is a two-channel switching device with self-monitoring on each ON-OFF cycle. It complies with EN 60204-1 and is equipped with forcibly guided relays. It is intended for monitoring connected switching elements on separating safety devices and generating a safety-oriented signal (enable). Depending on the design, separating safety devices may include sliding safety gates, safety gates, housings, covers, sheetings, screens, etc.

Basic function

With supply voltage applied to terminals A1/A2 and the safety inputs closed, pressing the reset button closes the enabling current paths (manual start). When the safety inputs are opened the enabling paths will open.

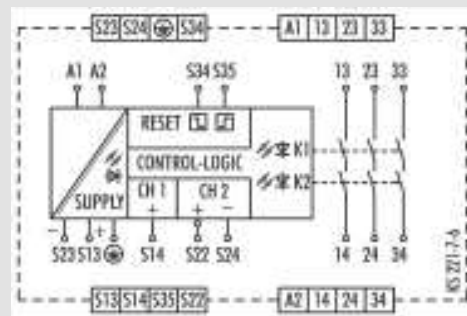
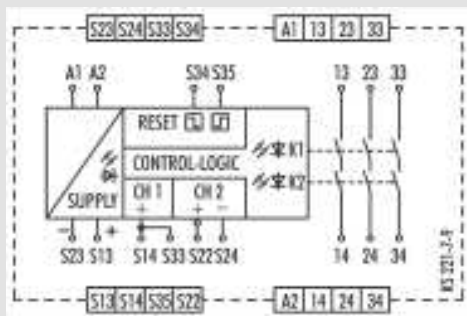
Operating modes / system functions

- **Two-channel control** – The device uses two-channel control. With equivalent control safety channel CH1 is connected via positive potential, safety channel CH2 via negative potential. With non-equivalent control both safety channels are connected to the positive potential.
- **Cross monitoring** – With equivalent control, cross monitoring is achieved by means of the short-circuit principle; with non-equivalent control it is achieved through function diversity.

- **Manual start** – When the safety inputs are closed, a button is used to close reset input S34 and open it again (triggering with falling edge) or to close reset input S35 (triggering with rising edge).
- **Automatic Start** – Reset input S35 is connected to S33/S14. The device starts with the rising edge of the signal on safety input S14.
- **Start inhibit** – After supply voltage has been applied and the safety inputs closed, the enabling paths will not close. Starting is only possible after the reset button has been operated. For start inhibit the reset inputs have to be activated with the button, as during manual start mode.
- **Restart inhibit** – No restart after the safety inputs have been opened and closed. Restarting is only possible after the reset button has been operated. For restart inhibit, the reset inputs have to be activated with the button, as in manual start mode.

Circuit diagram

SNT 4M63K




Basic device – SNT 4M63K

Overview of devices | part numbers

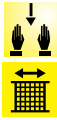
Type	Rated voltage	Terminals	Part no.	Std. pack
SNT 4M63K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.1050.0	1
	115 – 120 V AC	Screw terminals, pluggable	R1.188.1060.0	1
	230 V AC	Screw terminals, pluggable	R1.188.1070.0	1
SNT 4M63K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.2390.0	1

Technical data

Function	Emergency stop relay, valve position and safety gate monitoring	
Function display	3 LEDs, green	
Power supply circuit		
Rated voltage U_N	A1, A2	24 V AC/DC, 115-120 V AC, 230 V AC
Rated consumption	24 V DC	2.0 W
	115-120 V AC, 230 V AC	2,6 W / 3.2 VA
Rated frequency		50 - 60 Hz
Operating voltage range U_B		0.85 - 1.1 x U_N
Electrical isolation supply circuit - control circuit		yes (at $U_N = 115-230$ V AC, 230 V AC)
Control circuit		
Rated output voltage	S13/S23	22 V DC
Input current / peak current	S14/S33, S22/S24	40 mA / 100 mA
	S34, S35	5 mA / 50 mA
Response time t_{A1} / t_{A2}		40 ms / 600 ms
Minimum ON time t_M		80 ms
Recovery time t_w		100 ms
Release time t_R		15 ms
Synchronous time t_s		200 ms (CH1 → CH2)
Max. resistivity, per channel ¹⁾	24 V AC/DC	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$
	115-120 V AC, 230 V AC	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$
Ausgangskreise		
Enabling paths	13/14, 23/24, 33/34	normally open contact
Contact assignment		forcebly guided
Contact type		Ag-alloy, gold-plated
Rated switching voltage	enabling path	230 V AC
Max. thermal current I_{th}	enabling path	6 A
Max. total current I^2 of all current path	($T_u = 55$ °C)	9 A ²
Application category (NO)	AC-15	U_o 230 V, I_o 3 A
	DC-13	U_o 24 V, I_o 2.5 A
Short-circuit protection (NO), lead fuse / circuit breaker		6 A class gG / melting integral < 100 A ² s
Mechanical life		10 ⁷ switching cycles
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +55 °C / -25 °C - + 75 °C
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque		0.5 - 0.6 Nm
Wire ranges cage clamp terminals		1 x 0.25 mm ² – 1-5 mm ²
Weight		0-21 kg / 0-25 kg
Standards		EN ISO 13849-1, EN 62061
Approvals		

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device – SNZ 4052K



Applications

- Protection of people and machinery
- Monitoring of two-hand applications
- Monitoring of safety gates
- According to EN 574 Type IIIC
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop Category 0 according to EN 60204-1
- 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

Function

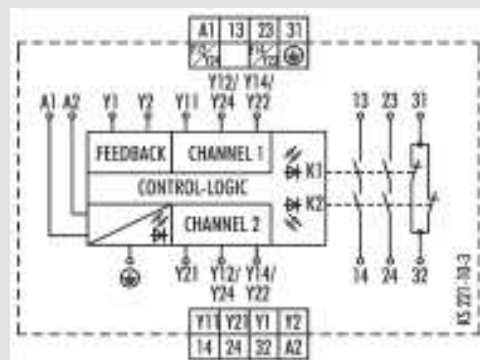
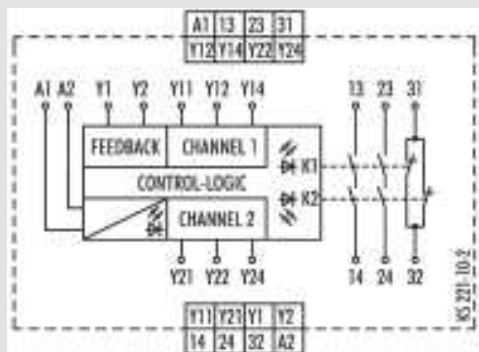
The device complies with EN 574 Type III C safety requirements. The safety behavior of the device is designed for applications according to Category 4 (EN 954-1). The device is single-fault safe and self-monitoring. Synchronous activation of both actuators (two-hand momentary contact or safety gate contacts) is monitored. Each of the two actuators is connected to the device with an NO contact and an 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 forcibly guided).

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.

Circuit diagram

SNZ 4052K




Basic device – SNZ 4052K

Overview of devices | part numbers

Type	Rated voltage	Terminals	Part no.	Std. pack
SNZ 4052K-A	24 V AC/DC	Screw terminals, pluggable	R1.188.0530.1	1
	115 – 120 V AC	Screw terminals, pluggable	R1.188.0940.1	1
	230 V AC	Screw terminals, pluggable	R1.188.0950.1	1
SNZ 4052K-C	24 V AC/DC	Cage clamp, pluggable	R1.188.2020.0	1

Technical data

Function		Two-hand control relay
Function display		3 LEDs, green
Power supply circuit		
Rated voltage U_N	A1, A2	24 V AC/DC, 115-120 V AC, 230 V AC
Rated consumption	24 V DC	2,4 W
	115-120 V AC, 230 V AC	2,2 W / 3,1 VA
Rated frequency		50 - 60 Hz
Operating voltage range U_B		0,85 - 1,1 x U_N
Electrical isolation supply circuit - control circuit		yes (at $U_N = 115-230$ V AC, 230 V AC)
Control circuit		
Rated output voltage	Y12/Y14, Y22/Y24, Y1	24 V DC
Input current / peak current	Y11, Y21	60 mA / 1000 mA
	Y2	< 100 mA
Response time t_{A1} / t_{A2}		40 ms
Recovery time t_w		250 ms
Release time t_R		50 ms
Synchronous time t_s		≤ 500 ms
Max. resistivity, per channel	24 V AC/DC	≤ (2,5 + (1,176 x U_B / U_N - 1) x 50) Ω
	115-120 V AC, 230 V AC	≤ (2,5 + (1,176 x U_B / U_N - 1) x 50) Ω
Output circuit		
Enabling paths	13/14, 23/24	normally open contact
Signaling paths	31/32	normally closed contact
Contact assignment		forcebly guided
Contact type		Ag-alloy, gold-plated
Rated switching voltage	enabling / signaling path	230 V AC
Max. thermal current I_{th}	enabling / signaling path	6 A / 2 A
Max. total current I^2 of all current path	($T_u = 55$ °C)	9 A ²
Application category (NO)	AC-15	U_o 230 V, I_o 3 A
	DC-13	U_o 24 V, I_o 2,5 A
Short-circuit protection (NO), lead fuse / circuit breaker		6 A class gG / melting integral / < 100 A ² s
Mechanical life		10 ⁷ switching cycles
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +55 °C / -25 °C - + 75 °C
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque		0,5 - 0,6 Nm
Wire ranges cage clamp terminals		1 x 0.25 mm ² – 1,5 mm ²
Weight		0,20 kg / 0,25 kg
Standards		EN ISO 13849-1, EN 62061, EN 574
Approvals		

Basic device – SNZ 1022K



Applications

- Protection of people and machinery
- Monitoring of two-hand applications
- Monitoring of safety gates
- According to EN 574 Type IIIA
- Up to PL c/Category 1 (EN ISO 13849-1)
- Up to SIL_{CL} 1 (EN 62061)

Features

- Stop Category 0 according to EN 60204-1
- Two-channel actuation; 1 NO contact and 1 NC contact for each channel
- Cross monitoring
- Monitoring of synchronous activation
- 1 changeover contact

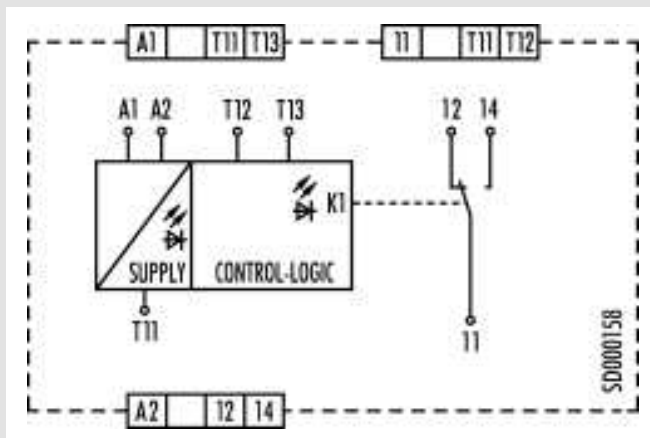
Function

After the power supply is established at terminals A1/A2 and the feedback loop is closed (terminals Y1/Y2), the release current paths are closed when the actuators (S1+S2) are operated at the same time. The two actuators must be operated within 0.5 s to trigger a release. If just one of the two actuators is released, the device is immediately de-energized and the enabling current path is opening.

The device can only be restarted once the two actuators are returned to their initial positions (e.g. the two-hand buttons have been released). The current status of the device is shown by 2 LEDs. The presence of the power supply is indicated with the SUPPLY LED, the operation of the two actuators with the K1 LED, if there is synchronous operation.

Circuit diagram

SNZ 1022K




Basic device – SNZ 1022K

Overview of devices | part numbers

Type	Rated Voltage	Synchronous time	Terminals	Part no.	Std. pack
SNZ 1022K-A	24 V AC/DC	0.5 s	Screw terminals, pluggable	R1.188.3700.0	1
SNZ 1022K-A	115-230 V AC	0.5 s	Screw terminals, pluggable	R1.188.3710.0	1
SNZ 1022K-C	24 V AC/DC	0.5 s	Cage clamps, pluggable	R1.188.3720.0	1
SNZ 1022K-C	115-230 V AC	0.5 s	Cage clamps, pluggable	R1.188.3730.0	1

Technical data

Function		Two-hand control relay
Function display		2 LEDs, green
Power supply circuit		
Rated voltage U_N	A1, A2	24 V AC/DC / 115-230 V AC
Rated consumption	AC/DC 24 V	0.7 W / 2.0 VA
	AC 115-230 V	3 VA
Rated frequency		50 - 60 Hz
Operating voltage range U_B		$0.85 - 1.1 \times U_N$
Electrical isolation supply circuit - control circuit		yes (at $U_N = 115-230$ V AC)
Control circuit		
Rated output voltage	T11	24 V DC
Input current / peak current	T12	2.5 mA / 3 mA
	T13	25 mA / 60 mA
Response time t_{A1} / t_{A2}		< 20 ms
Recovery time t_w		> 250 ms
Release time t_R		< 20 ms
Synchronous time t_s		≤ 500 ms
Max. resistivity, per channel		$(5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$
Output circuit		
Enabling paths	10/12/14	changeover contact
Contact type		Ag-alloy, gold-plated
Rated switching voltage		230 V AC
Max. thermal current I_{th}	enabling path 10/12	6 A
Application category (NO)	AC-15	U_c 230 V, I_c 3 A
	DC-13	U_c 24 V, I_c 2 A
Short-circuit protection (NO), lead fuse / circuit breaker		6 A class gG / melting integral < 100 A ² s
Mechanical life		10×10^6 switching cycles
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection degree according to DIN EN 60529 (housing / terminals)		IP40 / IP20
Ambient temperature / storage temperature		-25 °C - +55 °C / -25 °C - +75 °C
Wire ranges screw terminals,	fine-stranded / solid	$1 \times 0.14 \text{ mm}^2 - 2.5 \text{ mm}^2 / 2 \times 0.14 \text{ mm}^2 - 0.75 \text{ mm}^2$
	fine-stranded with ferrules	$1 \times 0.25 \text{ mm}^2 - 2.5 \text{ mm}^2 / 2 \times 0.25 \text{ mm}^2 - 0.5 \text{ mm}^2$
Permissible torque		0.5 - 0.6 Nm
Wire ranges cage clamp terminals		$2 \times 0.25 \text{ mm}^2 - 1.5 \text{ mm}^2$
Weight	24 V AC/DC device / AC device	0.1 kg
Standards		EN ISO 13849-1, EN 62061, EN 574
Approvals		TÜV 

Basic device with time function – SNV 4063KL



Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Termination of braking operations through OFF-delay time
- Control of solenoid-actuated interlocks
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop category 0/1 according to EN 60204-1
- Single-channel or two-channel control
- Manual or automatic start
- OFF-delay time adjustable in the range 0.15 to 3 s or 1.5 to 30 s
- Reset button monitoring, cross monitoring, monitoring of synchronous time
- 3 enabling current paths (2 undelayed, 1 OFF-delayed)

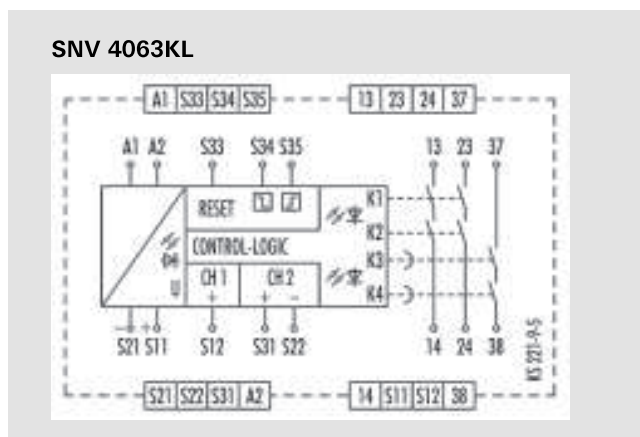
Function

With the supply voltage applied to terminals A1/A2 and the emergency set right and left margins in-line button. This controls relays K1 to K4, which become self-locking (when starting via reset button monitoring after the response time). After this switch-on phase the 3 enabling current paths are closed (terminals 13/14, 23/24 and 37/38).

Three LEDs display the state of relays K1/K2, K3/K4 and the supply voltage. If the emergency stop button is activated, the current supplies for relays K1 to K4 are interrupted. The undelayed enabling current paths (terminals 13/14, 23/24) are opened with release time t_{R1} while the off-delayed enabling current path (terminals 37/38) is opened after the pre-set OFF-delay time t_{R2} . The OFF-delay time can be adjusted infinitely in the range 0.15 to 3 s or 1.5 to 30 s. With a two-channel control and cross-monitoring wiring of the sensor circuit, additional errors such as short-circuit or ground fault can be detected. An electronic fuse protects the device against damage. After the cause of the malfunction has been removed, the device is operational again after approx. 3 s.

- **Reset button monitoring** – The device can be started either with the falling edge or with the rising edge (terminals S34 or S35). For emergency stop applications with manual start the button must be connected to terminals S33/S34. The device is enabled only with the falling edge of the reset signal. For starting, the reset button must be pressed and released. For safety gate applications in which an automatic start is performed it is necessary to bridge terminals S33/S35. The device will react at the rising edge of input S12 which is internally connected to S33.
- **Monitoring of synchronous time** – The use of safety limit switches for single-channel or two-channel circuits in safety gate applications depends on the required safety level. The device provides a monitoring of the synchronous time of two connected safety switches. A synchronous time $t_s \approx 0.5$ s requires limit switches positioned in such a way that channel 1, terminals S11/S12, closes before channel 2, terminals S21/S22. If channel 2 closes before channel 1, the synchronous time is $t_s = \infty$.

Circuit diagram

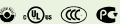


Basic device with time function – SNV 4063KL

Overview of devices | part numbers

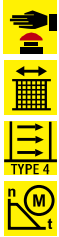
Type	Time range	Rated voltage	Terminals	Part no.	Std. pack
SNV 4063KL-A	3 s	24 V DC	Screw terminals, pluggable	R1.188.0620.0	1
	30 s	24 V DC	Screw terminals, pluggable	R1.188.0640.0	1
SNV 4063KL-C	3 s	24 V DC	Cage clamp, pluggable	R1.188.2010.0	1
	30 s	24 V DC	Cage clamp, pluggable	R1.188.3900.0	1

Technical data

Function	Emergency stop relay for controlled stop	
Function display	3 LEDs, green	
Function mode / adjustment	Time / stepless	
Adjustment range	0.15 - 3 s / 1.5 - 30 s	
Power supply circuit		
Rated voltage U_N	A1, A2	24 V DC
Rated consumption	24 V DC	2.6 W
Operating voltage range U_B	0.85 - 1.1 x U_N	
Electrical isolation supply circuit - control circuit	no	
Control circuit		
Rated output voltage	S11, S33/S21	22 V DC
Input current / peak current	S12, S31/S22	25 mA / 2500 mA
	S34, S35	40 mA / 2500 mA
Response time t_{A1} / t_{A2}	30 ms / 700 ms	
Minimum ON time t_M	200 ms	
Recovery time t_w	500 ms	
Release time t_R	25 ms	
Release time t_{Ri} , delayed contacts (tolerance)	0.15 - 3 s / 1.5 - 30 s ($\pm 16\%$)	
Synchronous time t_s	500 ms	
Permissible test pulse time t_{TP}	< 1 ms	
Max. resistivity, per channel ¹⁾	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$	
Output circuit		
Enabling paths	13/14, 23/24	normally open contact
	37/38	normally open contact, OFF-delayed
Contact assignment	forceably guided	
Contact type	Ag-alloy, gold-plated	
Rated switching voltage	enabling path	230 V AC
Max. thermal current I_{th}	enabling path	6 A
Max. total current I^2 of all current path	($T_u = 55^\circ\text{C}$)	5 A ²
Application category (NO)	AC-15	U_c 230 V, I_c 3 A
	DC-13	U_c 24 V, I_c 2 A
Short-circuit protection (NO), lead fuse / circuit breaker	6 A Class gG / melting integral < 100 A ² s	
Mechanical life	10 ⁷ switching cycles	
General data		
Creepage distances and clearances between the circuits	EN 60664-1	
Protection degree according to DIN EN 60529 (housing / terminals)	IP40 / IP20	
Ambient temperature / storage temperature	-25 °C - +55 °C / -25 °C - + 75 °C	
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque	0.5 - 0.6 Nm	
Wire ranges cage clamp terminals	1 x 0.25 mm ² – 1.5 mm ²	
Weight	0.20 kg	
Standards	EN ISO 13849-1, EN 62061	
Approvals		

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device with time function – SNV 4063KP



Applications

- Protection of people and machinery
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Monitoring of interlocking installation with position switches and integrated locking
- Control of spring-actuated interlocks
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

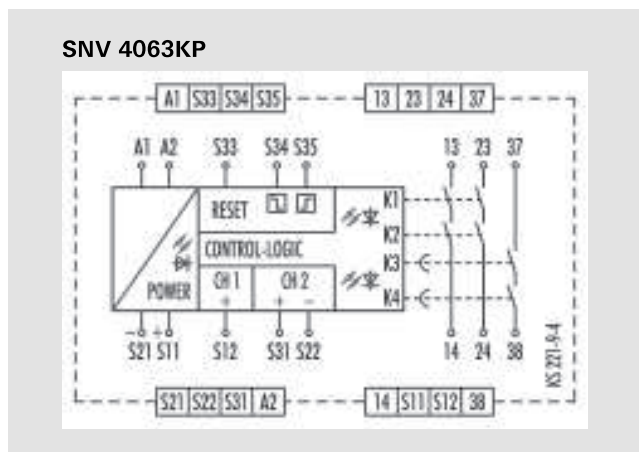
- Stop Category 0 according to EN 60204-1
- Single-channel or two-channel control
- Manual or automatic start
- ON-delay time adjustable in the range 0.15 to 3 s or 1.5 to 30 s
- Reset button monitoring, cross monitoring
- 3 enabling current paths (2 undelayed, 1 ON-delayed)

Function

With supply voltage applied to terminals A1/A2, relays K3 and K4 (terminals 37/38) start with the pre-selected ON-delay time. The ON-delay time t_{A1} can be adjusted infinitely in the range 0.15 to 3 s or 1.5 to 30 s according to the device type. The device is enabled by pressing the reset button. The following operating modes can be selected:

- **Operating mode with reset button monitoring (evaluation of the falling edge; manual start)** – The reset button must be connected to S34 through terminal S33. For starting the relay, the reset button must be pressed. Relays K3 and K4 (terminals 37/38) will switch into the OFF position. With the falling edge of the reset signal, the reset is completed and activates relays K1 and K2, which become self-locking after the response time t_{A3} . After this switch-on phase, the 2 enabling current paths defined for the output are closed (terminals 13/14, 23/24). With the emergency stop command, the power supply to relays K1 and K2 is interrupted. The enabling current paths (terminals 13/14, 23/24) are immediately opened with release time t_{R} , and relays K3 and K4 will start after the pre-set ON-delay time t_{A1} , terminals 37/38. Three LEDs display the state of relays K1/K2, K3/K4 and the supply voltage.

Circuit diagram



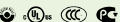
- **Operating mode without reset button monitoring (evaluation of the rising edge; automatic start)** – For monitoring of interlocking installations with locking mechanism or safety gate applications in which on automatic start shall be performed it is necessary to jumper terminals S33/S35. The device will react at the rising edge of input S12 that is internally connected to S33. Relays K3 and K4 (terminals 37/38) will switch into the OFF position. With the rising edge of input S12 the relay K1 is activated and response time t_{A2} started. When the time has elapsed, the 2 enabling current paths are closed (terminals 13/14, 23/24). With a stop command the power supply to relays K1 and K2 is interrupted. The enabling current paths (terminals 13/14, 23/24) are immediately opened with release time t_{R} , and relays K3 and K4 will start after the pre-set ON-delay time t_{A1} , terminals 37/38. With a two-channel control and cross-monitoring wiring of the sensor circuit, additional errors such as shunt fault or ground fault can be detected. An electronic fuse protects the device from damage. After the cause of the malfunction has been removed, the device is operational again after approx. 3 s.

Basic device with time function – SNV 4063KP

Overview of devices | part numbers

Type	Time range	Rated voltage	Terminals	Part no.	Std. pack
SNV 4063KP-A	3 s	24 V DC	Screw terminals, pluggable	R1.188.0660.0	1
	30 s	24 V DC	Screw terminals, pluggable	R1.188.0680.0	1

Technical data

Function	Emergency stop relay for access delay combined with locking mechanism	
Function display	3 LEDs, green	
Function mode / adjustment	Time / stepless	
Adjustment range	0.15 - 3 s / 1.5 - 30 s	
Power supply circuit		
Rated voltage U_N	A1, A2	24 V DC
Rated consumption	24 V DC	2.6 W
Operating voltage range U_B	0.85 - 1.1 x U_N	
Electrical isolation supply circuit - control circuit	no	
Control circuit		
Rated output voltage	S11, S33/S21	22 V DC
Input current / peak current	S12, S31/S22	25 mA / 2500 mA
	S34, S35	40 mA / 2500 mA
Response time t_{A1} / t_{A2}	30 ms / 700 ms	
Minimum ON time t_M	200 ms	
Recovery time t_w	500 ms	
Release time t_R	25 ms	
Release time t_{Ri} , delayed contacts (tolerance)	0.15 - 3 s / 1.5 - 30 s ($\pm 16\%$)	
Synchronous time t_s	500 ms	
Permissible test pulse time t_{TP}	< 1 ms	
Max. resistivity, per channel ¹⁾	$\leq (5 + (1.176 \times U_B / U_N - 1) \times 100) \Omega$	
Output circuit		
Enabling paths	13/14, 23/24	normally open contact
	37/38	normally open contact, ON-delayed
Contact assignment	forcefully guided	
Contact type	Ag-alloy, gold-plated	
Rated switching voltage	enabling path	230 V AC
Max. thermal current I_{th}	enabling path	6 A
Max. total current I^2 of all current path	($T_u = 55^\circ\text{C}$)	5 A ²
Application category (NO)	AC-15	U_c 230 V, I_c 3 A
	DC-13	U_c 24 V, I_c 2 A
Short-circuit protection (NO), lead fuse / circuit breaker	6 A Class gG / melting integral < 100 A ² s	
Mechanical life	10 ⁷ switching cycles	
General data		
Creepage distances and clearances between the circuits	EN 60664-1	
Protection degree according to DIN EN 60529 (housing / terminals)	IP40 / IP20	
Ambient temperature / storage temperature	-25 °C - +55 °C / -25 °C - + 75 °C	
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque	0,5 - 0,6 Nm	
Wire ranges cage clamp terminals	1 x 0.25 mm ² – 1.5 mm ²	
Weight	0.20 kg	
Standards	EN ISO 13849-1, EN 62061	
Approvals		

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device with time function – SNV 4074SL / SNV 4076SL



Applications

- Controlled stop according to Category 1 (EN 60204-1)
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Monitoring of interlocks
- Monitoring of light barriers
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Stop Category 0/1 according to EN 60204-1
- Time setting in 10 steps
- Time ranges 3s, 30s or 300s
- Single-channel or two-channel control
- Manual or automatic control
- Cross monitoring

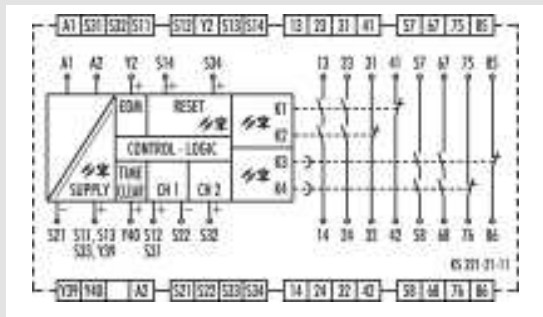
OFF-delay function

After the supply voltage is applied to terminals A1/A2 and the safety inputs are closed, the enabling current paths (NO contacts) are closed automatically or by pressing the reset button (manual start). When the safety inputs are opened/de-energized the enabling current paths (NO contacts) are opened immediately or with a delay.

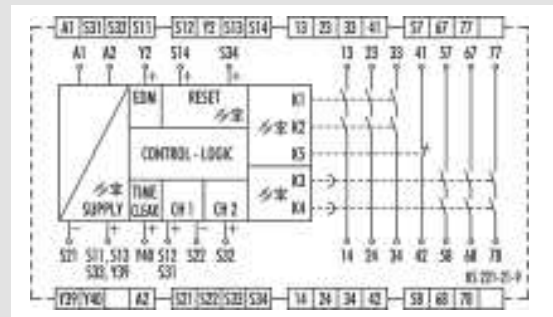
- **Automatic start** – Reset input S14 is connected to safety input S12. To monitor external contact blocks (EDM), their NC contacts must be connected in series between S34 and S12.
- **Manual start without monitoring** – Reset input S14 is connected to safety input S12 via a reset button. To monitor external contact blocks (EDM), their NC contacts must be connected in series to the reset button.
- **Manual start with monitoring** – Reset input S34 is connected to safety input S11 via a reset button. To monitor external contact blocks (EDM), their NC contacts must be connected in series to the reset button.

Circuit diagrams

SNV 4074SL



SNV 4076SL






Basic device with time function – SNV 4074SL / SNV 4076SL

Overview of devices | part numbers

Type	Time range	Rated voltage		Terminals	Part no.		Std. pack
					24V DC	115 – 230V AC	
SNV 4074SL-A	3s	24 V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2130.0	R1.188.2310.0	1
SNV 4074SL-A	30s	24 V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2160.0	R1.188.2340.0	1
SNV 4074SL-A	300s	24 V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2190.0	R1.188.2370.0	1
SNV 4074SL-C	3s	24 V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2140.0	R1.188.2320.0	1
SNV 4074SL-C	30s	24 V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2170.0	R1.188.2350.0	1
SNV 4074SL-C	300s	24 V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2200.0	R1.188.2380.0	1
SNV 4076SL-A	3s	24 V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2040.0	R1.188.2220.0	1
SNV 4076SL-A	30s	24 V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2070.0	R1.188.2250.0	1
SNV 4076SL-A	300s	24 V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2100.0	R1.188.2280.0	1
SNV 4076SL-C	3s	24 V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2050.0	R1.188.2230.0	1
SNV 4076SL-C	30s	24 V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2080.0	R1.188.2260.0	1
SNV 4076SL-C	300s	24 V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2110.0	R1.188.2290.0	1

Technical data

Function	Emergency stop relay	
Function display	5 LEDs, green/red	
Function mode / adjustment	Time setting in 10 steps	
Adjustment range	0,1 - 3 s / 0 - 30 s / 0 - 300 s	
Power supply circuit		
Rated voltage U_N	A1, A2	24 V DC / 115-230 V AC
Rated consumption	24 V DC 115-230 V AC	2,8 W 3,2 W / 6,3 VA
Rated frequency	50 - 60 Hz	
Operating voltage range U_B	0,85 - 1,1 x U_N	
Electrical isolation supply circuit - control circuit	yes (at $U_N = AC$ 115-230 V)	
Control circuit		
Rated output voltage	S11, S13, S33, Y39 / S21	22 V DC
Input current / peak current	S12, S31/S22, S32	3 mA / 4,5 mA
	S14, S34, Y2, Y40	4 mA / 4,5 mA
Response time t_{A1} / t_{A2}	200 ms	
Minimum ON time t_M	100 ms	
Recovery time t_w	50 ms	
Release time t_R	20 ms	
Release time t_{R1} , delayed contacts (tolerance)	0,1 / 0,2 / 0,3 / 0,4 / 0,5 / 0,8 / 1 / 1,5 / 2 / 3 s (0,1 % ± 15 ms)	
	0 / 2 / 4 / 6 / 0,5 / 8 / 10 / 15 / 20 / 30 s (0,1 % ± 15 ms)	
	0 / 20 / 40 / 60 / 80 / 100 / 150 / 200 / 250 / 300 s (0,1 % ± 15 ms)	
Permissible test pulse time t_{TP}	< 1 ms	
Max. resistivity, per channel ¹⁾	24 V DC 115-230 V AC	< 50 Ω < 50 Ω
Output circuit		
Enabling paths	13/14, 23/24, 33/34	normally open contact
	57/58, 57/68, 77/78	normally open contact, OFF-delayed
Signaling paths	31/32, 41/42 75/76, 85/86	normally closed contact normally closed contact, OFF-delayed
Contact assignment	forcibly guided	
Contact type	Ag-alloy, gold-plated	
Rated switching voltage	enabling- / signaling path	230 V AC
Max. thermal current I_{th}	enabling- / signaling path	6 A / 2 A
Max. total current I^2 of all current path ($T_u = 55^\circ C$)	40 A ²	
Application category (NO)	AC-15 DC-13	U_o 230 V, I_o 3 A U_o 24 V, I_o 3 A
Short-circuit protection (NO), lead fuse / circuit breaker	6 A class gG / melting integral < 100 A ² s	
Mechanical life	10 ⁷ switching cycles	
General data		
Creepage distances and clearances between the circuits	EN 60664-1	
Protection degree according to DIN EN 60529 (housing / terminals)	IP40 / IP20	
Ambient temperature / storage temperature	-25 °C - +55 °C / -25 °C - +75 °C	
Wire ranges screw terminals,	fine-stranded / solid	1 x 0,14 mm ² - 2,5 mm ² / 2 x 0,14 mm ² - 0,75 mm ²
	fine-stranded with ferrules	1 x 0,25 mm ² - 2,5 mm ² / 2 x 0,25 mm ² - 0,5 mm ²
Permissible torque	0,5 - 0,6 Nm	
Wire ranges cage clamp terminals	1 x 0,25 mm ² - 1,5 mm ²	
Weight	0,33 kg / 0,35 kg	
Standards	EN ISO 13849-1, EN 62061, EN 50156-1	
Approvals	TÜV   	

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Basic device with time function – SNV 4274SL / SNV 4074ST



Applications

- Monitoring of limit values in the process industry
- Monitoring of emergency stop applications
- Monitoring of safety gates
- Monitoring of interlocks
- Monitoring of light barriers
- Up to PL e/Category 4 (EN ISO 13849-1)
- Up to SIL_{CL} 3 (EN 62061)

Features

- Continuously adjustable, analog time setting
- Time ranges 3s, 30s or 300s
- Retriggering of the time delay possible
- Single-channel or two-channel control
- Manual or automatic start
- Cross monitoring

OFF-delay with retriggering function (SNV 4274SL)

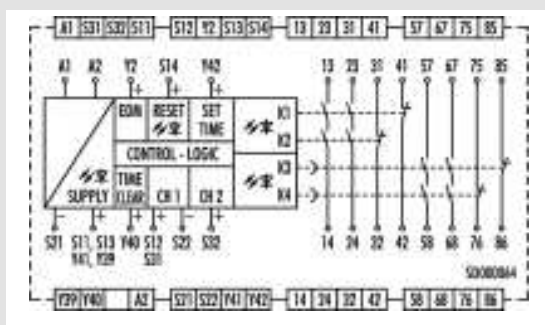
After the supply voltage is applied to terminals A1/A2 and the safety inputs are closed, the contacts are switched on immediately, either automatically or by pressing the reset button (manual start). When the safety inputs are opened/de-energized, the contacts are switched off immediately or with a release delay. The set release delay only expires if the safety inputs are opened longer than the release delay set on the device. If the safety inputs are closed again before the release delay has expired (retriggering), the delayed contacts will remain closed, too.

ON-delay function (SNV 4074ST)

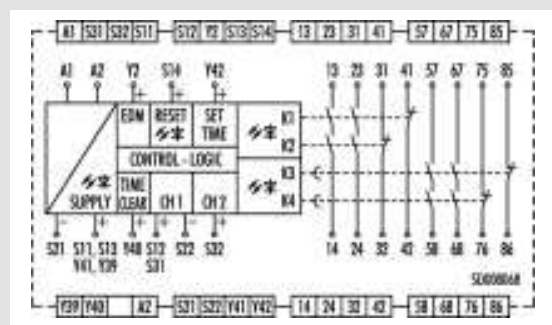
After the supply voltage is applied to terminals A1/A2 and the safety inputs are closed, the contacts are switched on immediately or with a response delay, either automatically or by pressing the reset button (manual start). When the safety inputs are opened/de-energized the contacts are switched off immediately.

Circuit diagrams

SNV 4274SL



SNV 4074ST






Basic device with time function – SNV 4274SL / SNV 4074ST

Overview of devices | Part numbers

Type	Time range	Rated voltage		Terminals	Part no.		Std. Pack
					24V DC	115 – 230V AC	
SNV 4274SL-A	3s	24V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2470.0	R1.188.2650.0	1
SNV 4274SL-A	30s	24V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2500.0	R1.188.2680.0	1
SNV 4274SL-A	300s	24V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2530.0	R1.188.2710.0	1
SNV 4274SL-C	3s	24V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2480.0	R1.188.2660.0	1
SNV 4274SL-C	30s	24V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2510.0	R1.188.2690.0	1
SNV 4274SL-C	300s	24V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2540.0	R1.188.2720.0	1
SNV 4074ST-A	3s	24V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2560.0	R1.188.2740.0	1
SNV 4074ST-A	30s	24V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2590.0	R1.188.2770.0	1
SNV 4074ST-A	300s	24V DC	115 – 230V AC	Screw terminals, pluggable	R1.188.2620.0	R1.188.2800.0	1
SNV 4074ST-C	3s	24V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2570.0	R1.188.2750.0	1
SNV 4074ST-C	30s	24V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2600.0	R1.188.2780.0	1
SNV 4074ST-C	300s	24V DC	115 – 230V AC	Cage clamp, pluggable	R1.188.2630.0	R1.188.2810.0	1

Technical data

Function	Emergency stop relay	
Function display	5 LEDs, green/red	
Function mode / adjustment	Time / stepless	
Adjustment range	0,15 - 3 s / 1,5 - 30 s / 15 - 300 s	
Power supply circuit		
Rated voltage U_N	A1, A2	24 V DC / 115-230 V AC
Rated consumption	24 V DC 115-230 V AC	2,8 W 3,2 W / 6,3 VA
Rated frequency	50 - 60 Hz	
Operating voltage range U_B	0,85 - 1,1 × U_N	
Electrical isolation supply circuit - control circuit	yes (at $U_N = 115-230 V AC$)	
Control circuit		
Rated output voltage	S11, S13, S33, Y39 / S21	22 V DC
Input current / peak current	S12, S31/S22, S32	3 mA / 4,5 mA
	S14, S34, Y2, Y40	4 mA / 4,5 mA
Response time t_{A1} / t_{A2}	200 ms	
Minimum ON time t_M	100 ms	
Recovery time t_w	50 ms	
Release time t_R	20 ms	
Release time t_{Rd} , delayed contacts (tolerance)	0,15 - 3 s ($\pm 16\%$ of the setting value)	
	1,5 - 30 s ($\pm 16\%$ of the setting value)	
	15 - 300 s ($\pm 16\%$ of the setting value)	
Permissible test pulse time t_{TP}	< 1 ms	
Max. resistivity, per channel ¹⁾	24 V DC 115-230 V AC	< 50 Ω < 50 Ω
Output circuit		
Enabling paths	13/14, 23/24	normally open contact
	57/58, 57/68	normally open contact, time delayed
Signaling paths	31/32, 41/42 75/76, 85/86	normally closed contact normally closed contact, time delayed
Contact assignment	forcefully guided	
Contact type	Ag-alloy, gold-plated	
Rated switching voltage	enabling- / signaling path	230 V AC
Max. thermal current I_{th}	enabling- / signaling path	6 A / 2 A
Max. total current I^2 of all current path	($T_U = 55^\circ C$)	40 A ²
Application category (NO)	AC-15 DC-13	U_e 230 V, I_e 3 A U_e 24 V, I_e 3 A
Short-circuit protection (NO), lead fuse / circuit breaker	6 A class gG / melting integral < 100 A ² s	
Mechanical life	10 ⁷ switching cycles	
General data		
Creepage distances and clearances between the circuits	EN 60664-1	
Protection degree according to DIN EN 60529 (housing / terminals)	IP40 / IP20	
Ambient temperature / storage temperature	-25 °C - +55 °C / -25 °C - + 75 °C	
Wire ranges screw terminals,	fine-stranded / solid	1 × 0,14 mm ² – 2,5 mm ² / 2 × 0,14 mm ² – 0,75 mm ²
	fine-stranded with ferrules	1 × 0,25 mm ² – 2,5 mm ² / 2 × 0,25 mm ² – 0,5 mm ²
Permissible torque	0,5 - 0,6 Nm	
Wire ranges cage clamp terminals	1 × 0,25 mm ² – 1,5 mm ²	
Weight	0,33 kg / 0,35 kg	
Standards	EN ISO 13849-1, EN 62061, EN 50156-1	
Approvals	TÜV   	

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Contact expansion relay – SNE 4003K



Applications

- Duplication of the enabling current paths of a basic device
- Contact expansion in safety-oriented systems
- Contact expansion for light curtains
- Up to PL e/Category 4 (EN ISO 13849-1)*
- Up to SIL_{CL} 3 (EN 62061)*

Features

- Safe isolation according to EN 50178
- Single-channel or two-channel operation
- 3 enabling current paths (NO contact)
- 2 signaling current paths (NC contact)
- Wide input voltage range from 15 V DC
- Suitable for semiconductor outputs

* Depends on the category of the basic device or the safety control.

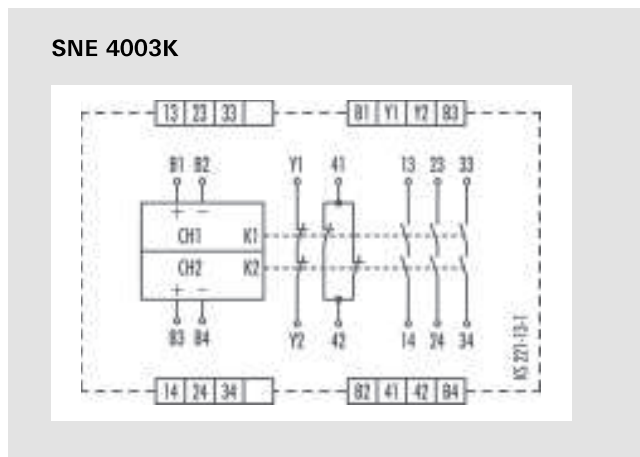
Function

The SNE 4003K is an expansion device for basic devices (such as safety switching devices, light curtains, laser scanners) that are part of the machine's safety equipment and are used for protecting people, materials and machines.

The device is designed with two channels and redundancy. The enabling current paths are separated from the control circuits and signaling circuits with creepage distances and clearances > 5.5 mm (safe isolation). There is basic insulation to separate the enabling current paths from one another and the control circuits from the signaling current paths. The broad input voltage range of 15 V DC to 30 V DC makes the SNE 4003K ideal for single-channel or two-channel control by semiconductors.

Input voltage to the SNE 4003K is connected via one or two enabling current paths of a basic device. When the input voltage is applied relays K1 and K2 switch into the ON position. After this switch-on phase, enabling current paths 13/14, 23/24, 33/34 are closed and feedback current path Y1/Y2 and signaling current path 41/42 are opened. This is displayed through two LEDs, K1 and K2, which are assigned to relays K1 and K2. If the enabling current paths of the basic device are opened when the emergency stop button is pressed, relays K1 and K2 on the SNE 4003K switch back into the OFF-position. The enabling current paths open and the feedback current path closes. Feedback current path Y1/Y2 prevents the basic device from switching on again before K1 or K2 releases.

Circuit diagram

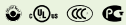


Contact expansion relay – SNE 4003K

Overview of devices | Part numbers

Type	Rated voltage	Terminals	Part no.	Std. Pack
SNE 4003K-A	24 V DC	Screw terminals, pluggable	R1.188.1340.0	1

Technical data

Function	Emergency stop expansion relay	
Function display	2 LEDs, green	
Power supply circuit		
Rated voltage U_N	B1/B2, B3/B4	24 V DC
Rated consumption	24 V DC	1.2 W
Operating voltage range U_B	0.63 - 1.25 x U_N	
Electrical isolation supply circuit - control circuit	no	
Control circuit		
Input current / peak current	B1/B2, B3/B4	50 mA / 500 mA
Response time t_{A1} / t_{A2}	< 40 ms	
Recovery time t_w	≤ 40 ms	
Release time t_R	< 20 ms	
Permissible test pulse time t_{TP}	< 1 ms	
Max. resistivity, per channel ¹⁾	≤ (5 + (1.6 x U_B / U_N - 1) x 100) Ω	
Output circuit		
Enabling paths	13/14, 23/24, 33/34	normally open contact
Signaling paths	41/42	normally closed contact
Contact assignment	forcebly guided	
Contact type	Ag-alloy, gold-plated	
Rated switching voltage	enabling- / signaling path	230 V AC
	Y1/Y2	230 V AC
Max. thermal current I_{th}	enabling- / signaling path	6 A / 2 A
	Y1/Y2	2 A
Max. total current I^2 of all current path (Tu = 55 °C)	9 A ²	
Application category (NO)	AC-15	U_e 230 V, I_e 3 A
	DC-13	U_e 24 V, I_e 2,5 A
Short-circuit protection (NO), lead fuse / circuit breaker	6 A class gG / melting integral < 100 A ² s	
Mechanical life	10 ⁷ switching cycles	
General data		
Creepage distances and clearances between the circuits	EN 60664-1	
Protection degree according to DIN EN 60529 (housing / terminals)	IP40 / IP20	
Ambient temperature / storage temperature	-25 °C - +55 °C / -25 °C - + 75 °C	
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque	0.5 - 0.6 Nm	
Wire ranges cage clamp terminals	1 x 0.25 mm ² – 1.5 mm ²	
Weight	0,21 kg	
Standards	EN ISO 13849-1, EN 62061	
Approvals		

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Contact expansion relay – SNE 4004K / SNE 4004KV



Applications

- Expansion of a basic device’s enabling current paths
- Contact expansion in safety equipment
- Up to PL d/Category 3 (EN ISO 13849-1)*
- Up to SIL_{CL} 2 (EN 62061)*

Features

- Stop Category 0 and 1 according to EN 60204-1 (see “Function”)
- Single-channel or two-channel control
- SNE 4004K: 4 enabling current paths, undelayed (NO contact)
3 signaling current paths, undelayed (NC contact)
- SNE 4004KV: 4 enabling current paths, OFF-delayed (NO contact)
3 signaling current paths, OFF-delayed (NC contact),
Time buffering

* Depends on the category of the basic device or the safety control.

Function

SNE 4004K

Supply voltage to the SNE devices is routed via an enabling current path of a basic device. When the supply voltage is applied relays K1 and K2 switch into the ON position. After this switch-on phase the four enabling current paths 13/14, 23/24, 33/34, 43/44 (of the SNE 4004K) or 17/18, 27/28, 37/38, 47/48 (of the SNE 4004KV) are closed and the feedback current path Y1/Y2 is open. This is displayed through two LEDs that are assigned to relays K1 and K2.

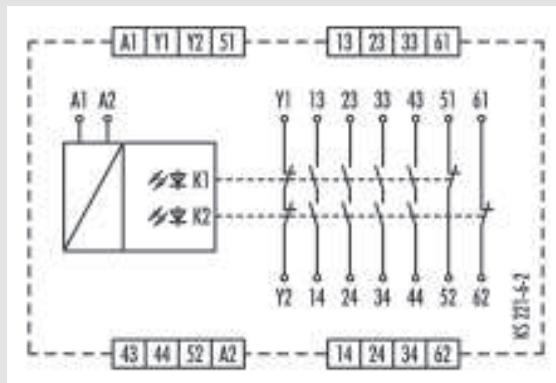
When the enabling current paths of the basic device are opened through the operation of the emergency stop button, relays K1 and K2 on the SNE 4004K switch back into the OFF-position. The enabling current paths open and the feedback current path closes. Feedback current path Y1/Y2 prevents the basic device from switching on again before K1 or K2 releases.

SNE 4004KV

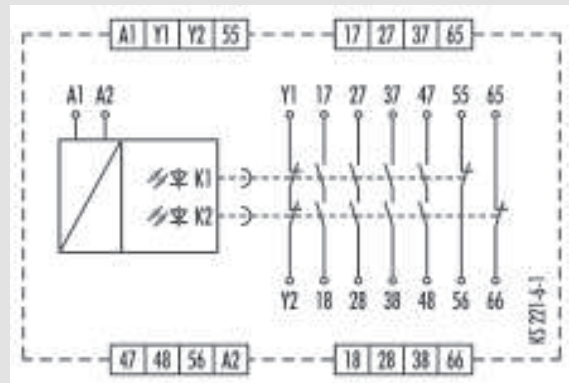
The functions of this device correspond to those of the SNE 4004K. The SNE 4004KV is available with the following four OFF-delay times t_{R1} : 0.5 s; 1 s; 2 s and 3 s. The device has an OFF-delay time that is enabled through capacitors. This causes the OFF-delay time t_{R1} to elapse completely even in case of failure of the power supply (A1/A2). It cannot be reset before it has elapsed. Once the delay time has elapsed, relays K1 and K2 switch into the OFF- position, OFF-delay times of > 0 s correspond to stop category 1.

Circuit diagrams

SNE 4004K



SNE 4004KV

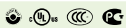


Contact expansion relay – SNE 4004K / SNE 4004KV

Overview of devices | part numbers

Type	Time range	Rated voltage	Terminals	Part no.	Std. Pack
SNE 4004K-A	–	24 V AC/DC	Screw terminals, pluggable	R1.188.0590.0	1
SNE 4004K-C	–	24 V AC/DC	Cage clamp, pluggable	R1.188.1980.0	1
SNE 4004KV-A	0,5 s	24 V DC	Screw terminals, pluggable	R1.188.0460.0	1
	1 s	24 V DC	Screw terminals, pluggable	R1.188.0470.0	1
	2 s	24 V DC	Screw terminals, pluggable	R1.188.0480.0	1
	3 s	24 V DC	Screw terminals, pluggable	R1.188.0490.0	1
SNE 4004KV-C	0,5 s	24 V DC	Cage clamp, pluggable	R1.188.2410.0	1
	1 s	24 V DC	Cage clamp, pluggable	R1.188.2420.0	1
	2 s	24 V DC	Cage clamp, pluggable	R1.188.2430.0	1
	3 s	24 V DC	Cage clamp, pluggable	R1.188.2440.0	1

Technical data

Function	Emergency stop expansion relay	
Function display	2 LEDs, green	
Function mode / adjustment	Time, fixed	
Adjustment range	0,5 s / 1 s / 2 s / 3 s	
Power supply circuit		
Rated voltage U_N	A1, A2	24 V DC / 24 V AC/DC
Rated consumption	24 V DC 24 V AC/DC	1.2 W 1.7 W / 3.1 VA
Rated frequency	50 - 60 Hz	
Operating voltage range U_B	0,85 - 1.1 x U_N	
Electrical isolation supply circuit - control circuit	non	
Control circuit		
Input current / peak current	A1, A2	65 mA / 1800 mA
Response time t_{A1} / t_{A2}	20 ms	
Minimum ON time t_M	0,15 x t_R	
Recovery time t_w	≤ 200 ms	
Release time t_R	40 ms	
Release time $t_{R, \text{delayed contacts}}$ (tolerance)	0,5 s / 1 s / 2 s / 3 s (± 35 %)	
Max. resistivity, per channel ¹⁾	≤ (2,5 + (1,176 x U_B / U_N - 1) x 50) Ω	
Output circuit		
Enabling paths	13/14, 23/24, 33/34, 43/44	normally open contact
	17/17, 27/28, 37/38, 47/48	normally open contact, time delayed
Signaling paths	51/52, 61/62	normally closed contact
	55/56, 65/66	normally closed contact, time delayed
Contact assignment	forcefully guided	
Contact type	Ag-alloy, gold-plated	
Rated switching voltage	enabling / signaling path	230 V AC
	Y1/Y2	230 V AC
Max. thermal current I_{th}	enabling / signaling path	6 A / 2 A
	Y1/Y2	2 A
Max. total current I^2 of all current path ($T_u = 55^\circ\text{C}$)	9 A ²	
Application category (NO)	AC-15 DC-13	U_e 230 V, I_e 5 A U_e 24 V, I_e 5 A
Short-circuit protection (NO), lead fuse / circuit breaker	6 A class gG / melting integral < 100 A ² s	
Mechanical life	10 ⁷ switching cycles	
General data		
Creepage distances and clearances between the circuits	EN 60664-1	
Protection degree according to DIN EN 60529 (housing / terminals)	IP40 / IP20	
Ambient temperature / storage temperature	-25 °C - +55 °C / -25 °C - + 75 °C	
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque	0,5 - 0,6 Nm	
Wire ranges cage clamp terminals	1 x 0.25 mm ² – 1.5 mm ²	
Weight	0.20 kg	
Standards	EN ISO 13849-1, EN 62061	
Approvals		

¹⁾ If two-channel devices are installed as single channel, the value is halved.

Contact expansion relay – SNE 4028S



Applications

- Duplication of the enabling current paths of a basic device
- Contact expansion in safety-oriented systems
- Amplification of the output performance of light curtains
- Up to PL e/Category 4 (EN ISO 13849-1)*
- Up to SIL_{CL} 3 (EN 62061)*

Features

- Single-channel or two-channel control
- Cross monitoring
- Safe isolation
- 8 enabling current paths, 1 signal current path

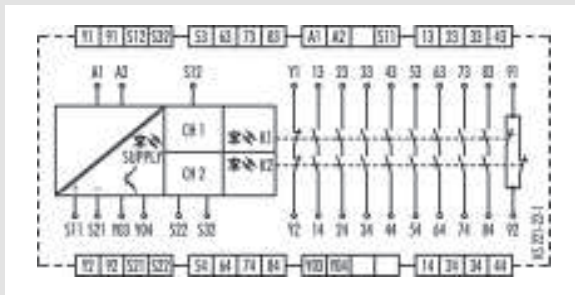
* Depends on the category of the basic device or the safety control.

Function

After the supply voltage is applied to terminals A1/ A2 and the safety inputs are closed, the enabling current paths (NO contacts) are closed and the signaling current paths (NC contacts) are opened automatically. When the safety inputs are opened/de-energized the enabling current paths (NO contacts) are opened immediately and the signaling current paths (NC contacts) are closed.

Circuit diagram

SNE 4028S




Contact expansion relay – SNE 4028S

Overview of devices | part numbers

Type	Rated voltage	Terminals	Part no.	Std. pack
SNE 4028S-A	24 V DC	Screw terminals, pluggable	R1.188.3120.0	1
SNE 4028S-A	115-230 V AC	Screw terminals, pluggable	R1.188.3510.0	1
SNE 4028S-C	24 V DC	Cage clamp, pluggable	R1.188.3540.0	1
SNE 4028S-C	115-230 V AC	Cage clamp, pluggable	R1.188.3550.0	1

Technical data

Function	Contact expansion relay	
Function display	3 LEDs, green	
Power supply circuit		
Rated voltage U_N	A1, A2	24 V AC/DC / 115-230 V AC
Rated consumption	24 V AC/DC	3.4 W / 6.1 VA
	115-230 V AC	2.7 W / 6 VA
Rated frequency	50 - 60 Hz	
Operating voltage range U_B	0.85 - 1.1 x U_N	
Electrical isolation supply circuit - control circuit	yes (at $U_N = 115-230$ V AC)	
Control circuit		
Rated output voltage	S11/S21	24 V DC
Input current / peak current	S12, S32/S22	50 mA / 200 mA
Response time t_{A1} / t_{A2}	25 ms	
Recovery time t_w	≤ 40 ms	
Release time t_R	10 ms	
Permissible test pulse time t_{TP}	< 1 ms	
Max. resistivity, per channel ¹⁾	24 V AC/DC	≤ (5 + (1.176 x $U_B / U_N - 1$) x 100) Ω
	115-230 V AC	≤ 12 Ω
Output circuit		
Enabling paths	13/14, 23/24, 33/34, 43/44	normally open contact
	53/54, 63/64, 73/74, 83/84	normally open contact
Signaling paths	91/92, Y1/Y2	normally closed contact
	Y03/Y04	semiconductor output (PNP), not safety-oriented
Contact assignment	forcebly guided	
Contact type	Ag-alloy, gold-plated	
Rated switching voltage	enabling- / signaling path	230 V AC / 24 V DC
	Y03/Y04	24 V DC
Max. thermal current I_{th}	enabling- / signaling path	6 A / 2 A
	Y03/Y04	20 mA
Max. total current I_2 of all current path	($T_u = 55$ °C)	2 x 25 A ²
Application category (NO)	AC-15	U_e 230 V, I_e 5 A
	DC-13	U_e 24 V, I_e 5 A
Short-circuit protection (NO), lead fuse / circuit breaker	6 A class gG / melting integral < 90 A ² s	
Mechanical life	10 ⁷ switching cycles	
General data		
Creepage distances and clearances between the circuits	EN 60664-1	
Protection degree according to DIN EN 60529 (housing / terminals)	IP40 / IP20	
Ambient temperature / storage temperature	-25 °C - +55 °C / -25 °C - + 75 °C	
Wire ranges screw terminals,	fine-stranded / solid	1 x 0.14 mm ² – 2.5 mm ² / 2 x 0.14 mm ² – 0.75 mm ²
	fine-stranded with ferrules	1 x 0.25 mm ² – 2.5 mm ² / 2 x 0.25 mm ² – 0.5 mm ²
Permissible torque	0.5 - 0,6 Nm	
Wire ranges cage clamp terminals	1 x 0.25 mm ² – 1.5 mm ²	
Weight	0.38 kg	
Standards	EN ISO 13849-1, EN 62061	
Approvals	TÜV 	

¹⁾ If two-channel devices are installed as single channel, the value is halved.