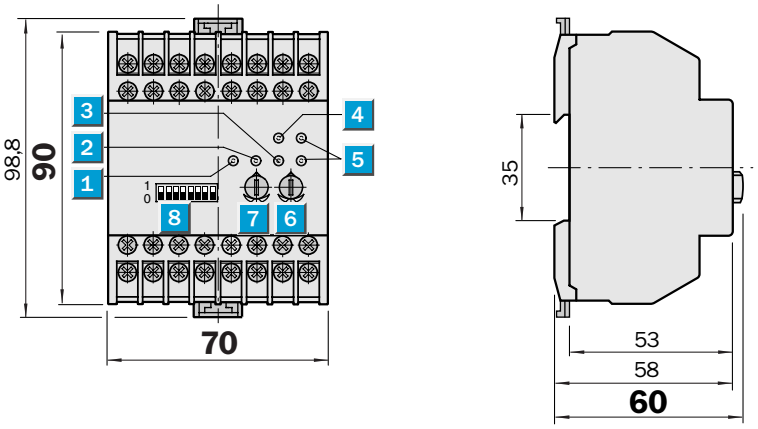
Features

- Universal supply voltage
- 3 inputs that can be connected via DIP-switches
- Adjustable time stages
- Housing with snap fastening for support rail DIN 46277

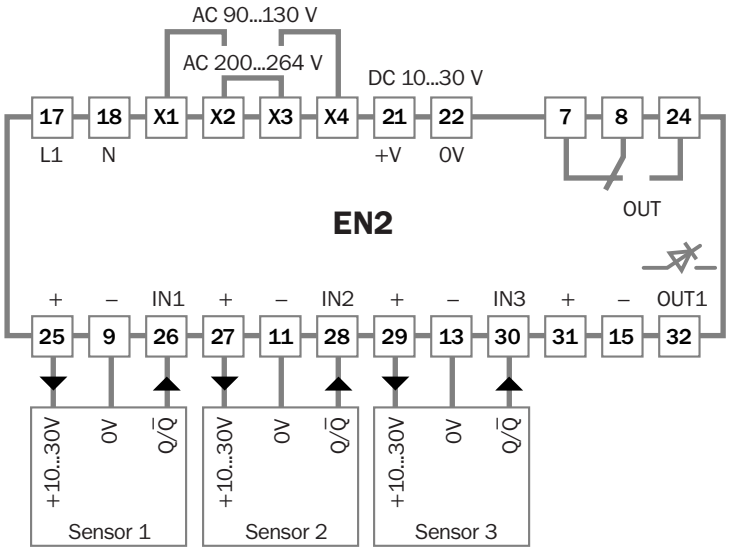
Dimensional drawing



1 Display IN 1
2 Display IN 2
3 Display IN 3
4 Operating display
5 Display OUT (transistor/relay)
6 Time delay off t_2
7 Time delay on t_1
8 DIP switches F1 – F8

Connection diagram

EN 2
EN 2T

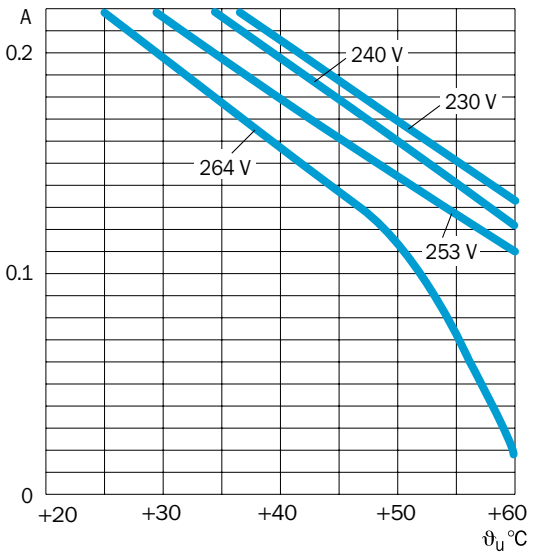


Technical data		EN 2	EN 2T
Supply voltage V_S	90…130 V AC or 200…264 V AC	■	■
	(can be reset using bridges)		
	10…30 V DC[1]	■	■
Mains frequency	48…62 Hz	■	■
Power consumption	Approx. 40 VA	■	■
Outputs			
Supply voltage for sensor	24 V DC ± 25 %	■	■
Output current (total)	220 mA (1.4 A) in total, see load curve	■	■
Transistor output	32 (OUT 1)	■	■
Switching current, max.	100 mA, short-circuit-resistant,	■	■
	display OUT, flashes on overload,		
	goes out if there is a short-circuit		
Switching frequency	10 kHz	■	■
Relay output	7/8/24 (OUT)	■	■
Switching voltage, max.	250 V AC	■	■
Switching current, max.	2 A	■	■
Switching frequency	10/s	■	■
Inputs	26 (IN 1) and 28 (IN 2) and 30 (IN 3)	■	■
	suitable for PNP, NPN[2] and B sensor		
	outputs		
Input voltage	10…30 V DC	■	■
HIGH	> 10 V DC	■	■
LOW	> 6 V DC	■	■
Minimum switching time	5 µs	■	■
Logic	Linking the 3 inputs and delay and	■	■
	storage modes via DIP-switches F1 – F8		
	(see truth table and function diagrams)		
Time stages			
Time delay off t_1	0.005…1 s, adjustable	■	■
Time delay on t_2	0.005…1 s, adjustable	■	
	1…120 s, adjustable		■
VDE protection class	⧈	■	■
Enclosure rating	IP 20	■	■
Ambient temperature	Operation – 25 °C…+ 55 °C	■	■
	Storage – 40 °C…+ 70 °C	■	■
Shock load	Complying with IEC 68	■	■
Weight	Approx. 400 g	■	■
Housing material	Plastic	■	■

[1] Delivery 200… 264 V AC

[2] External pull-up resistor ≤ 10 kΩ required for NPN variant

Load curve – output current



Order information

Type	Order no.
EN 2	6 009 654
EN 2T	6 010 342

Truth table

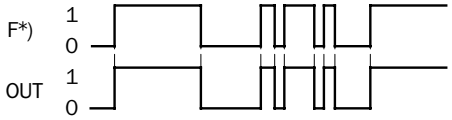
Logic module:
The logic input levels of the 3 inputs are linked together depending on the position of the 8 DIP switches F 1 – F 8 on the front of the equipment and immediately, or with a delay, produce a reaction at the output (which is formed in parallel as a relay and semiconductor output).

F 3	0	IN 1 normal		
	1	IN 1 inverted		
F 7	0	IN 2 normal		
	1	IN 2 inverted		
F 5	0	f (IN 1, IN 2) = IN 1 or IN 2		
	1	f (IN 1, IN 2) = IN 1 and IN 2		
F 8	0	**F 8 = 0**		
	1		**F 8 = 1**	
F 6	0	f (IN 1, IN 2, IN 3) = IN 3 or f (IN 1, IN 2)	IN 3 normal	
	1	f (IN 1, IN 2, IN 3) = IN 3 and f (IN 1, IN 2)	IN 3 inverted	
F 4	0	OUT 1 normal	**F 4 = 0**	
	1	OUT 1 inverted		**F 4 = 1**
F 1 **F 2**	0 0	**Mode 1** (no delay)	**Mode 5**	**Mode 9**
	0 1	**Mode 2** (switching on and switching off delay)	**Mode 6**	**Mode 10**
	1 0	**Mode 3** (dynamic delay)	**Mode 7**	**Mode 11**
	1 1	**Mode 4** (frequency discriminator)	**Mode 8**	**Mode 12**

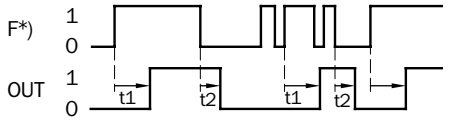
Function diagrams and description of the modes

F 8 = 0

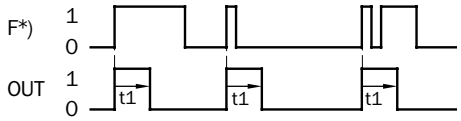
Mode 1 — F 1 = 0 — F 2 = 0



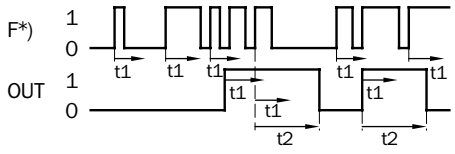
Mode 2 — F 1 = 0 — F 2 = 1



Mode 3 — F 1 = 1 — F 2 = 0



Mode 4 — F 1 = 1 — F 2 = 1



Delay modes

No delay

Output OUT follows the logic linking of the inputs IN 1, IN 2 and IN 3 F*) without delay.

Delay switching on and switching off

Output OUT follows with a delay in response and drop-out time F*).
F*) must be high for a minimum of t_1 for OUT to react. If F*) is LOW, t_1 is reset. When t_1 elapses, OUT responds, the oscillator is stopped for t_1.
If then F*) is low again, t_2 begins to run, after the end of which OUT becomes inactive. If F*) goes high again during t_2, t_2 is reset and begins to run again at F*) = LOW. Both times t_1 and t_2 can therefore be retriggered.

Dynamic delay

Output OUT is set with a rising signal edge of F*) for the duration of t_1. This time cannot be retriggered here.

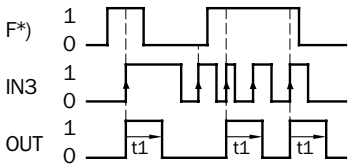
Frequency discriminator

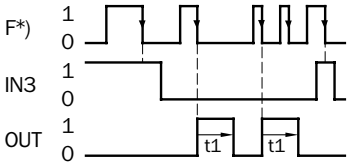
The time stage t_1 is set by the first rising signal edge of F*). If a further rising signal edge of F*) occurs within the course of t_1, OUT is set for the duration of t_2 and t_1 is retriggered simultaneously. All further rising signal edges of F*), if they arrive within the course of t_1, retrigger both t_1 and t_2. In practice, t_2 should always be set greater than t_1. If t_1 has elapsed but t_2 has not yet done so, t_2 is not retriggered by the next rising signal edge of F*).

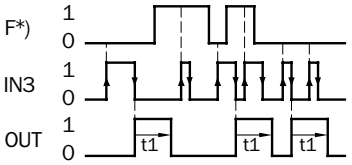
This function produces a frequency discriminator for the setting $t_2 > t_1$: If the duration of the period T of the input frequency of F*) is less than t_1, OUT always goes to HIGH; if T is or becomes greater than t_1 OUT remains or becomes LOW.

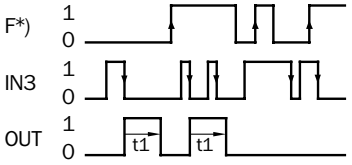
F*) logic link of the inputs: F = f (IN 1, IN 2, IN 3)

	F 8 = 1	F 4 = 0	Memory modes
Mode 5	F 1 = 0	F 2 = 0	If during the rising signal edge of IN 3, the link F*) is HIGH, the output OUT is set with this signal edge for the time t_1.
Mode 6	F 1 = 0	F 2 = 1	If during the falling signal edge of F*), IN 3 is not HIGH, the output is set for the duration of t_1.
Mode 7	F 1 = 1	F 2 = 0	If F*) was not HIGH during the rising signal edge of IN 3, the output is set for the time t_1 with the falling signal edge of IN 3.
Mode 8	F 1 = 1	F 2 = 1	If no rising signal edge of F*) occurs during the HIGH time of IN 3, the output is set for the duration of t_1 by the falling signal edge of IN 3.

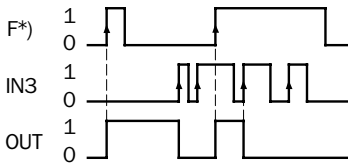


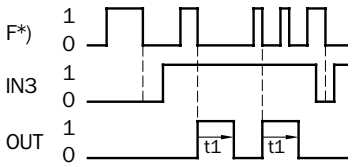


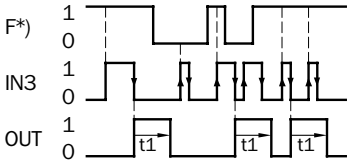


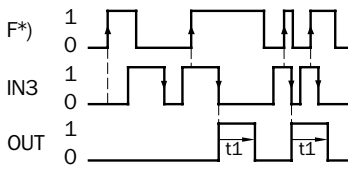


	F 8 = 1	F 4 = 1	Memory modes
Mode 9	F 1 = 0	F 2 = 0	A rising signal edge of F*) sets the output; a rising signal edge of IN 3 resets it (signal edge-controlled RS-flipflop).
Mode 10	F 1 = 0	F 2 = 1	If IN 3 is HIGH during the falling signal edge of F*), the output is set for the duration of t_1 (i.e. as mode 2, but used inverted in IN 3).
Mode 11	F 1 = 1	F 2 = 0	If F*) was not HIGH when the signal edge of IN 3 was rising, as the signal edge of IN 3 falls, the output is set for the time t_1 (as mode 3, F* used inverted).
Mode 12	F 1 = 1	F 2 = 1	If no rising signal edge of F*) occurs during the HIGH time of IN 3, the output will be set for the duration of t_1 during the falling signal edge of IN 3.







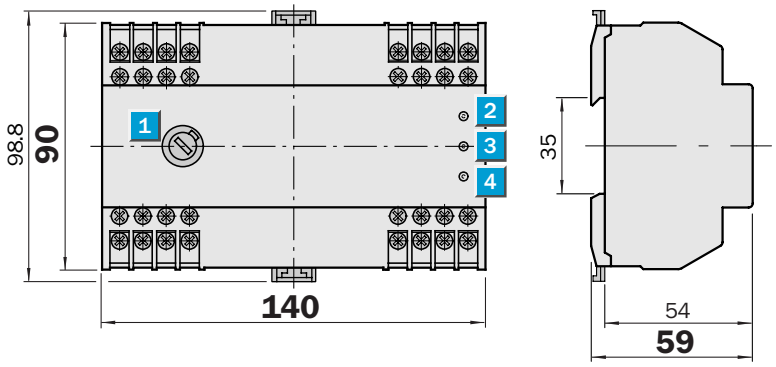


F*) logic link of the inputs: F = f (IN 1, IN 2, IN 3)

Features

- Universal supply voltage
- 2 inputs, each with a relay output
- Housing with snap fastening for support rail DIN 46277

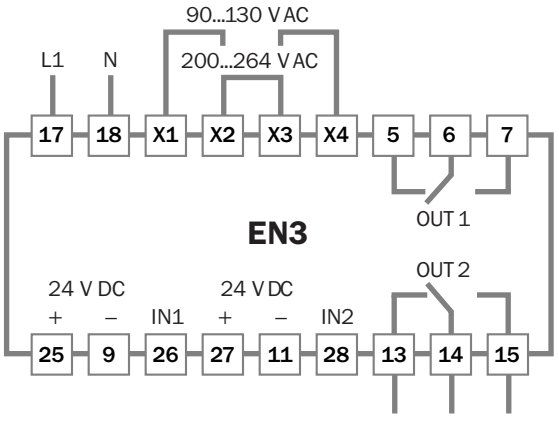
Dimensional drawing



1 Fuse (250 V/0.25 A)
2 Display IN 1
3 Operating display
4 Display IN 2

Connection diagram

EN 3

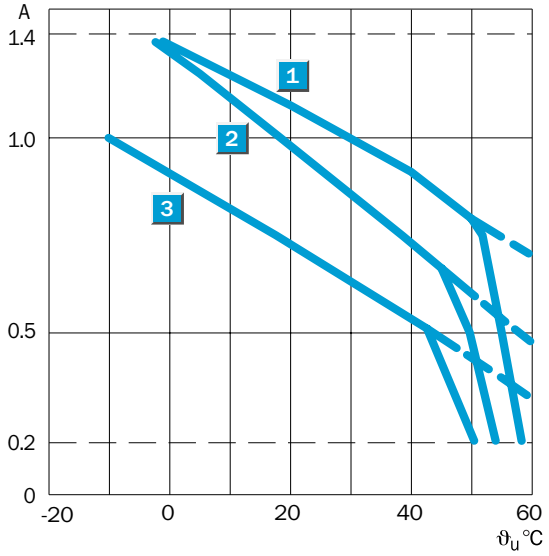


Technical data	EN 3
Supply voltage V_S	90 ... 130 V AC or 200 ... 264 V AC[1]
	(can be reset using bridges)
Mains frequency	48 ... 62 Hz
Power consumption	env. 40 VA
Outputs	
Supply voltage for sensor	24 V DC ± 25 %
Output current (total)	1.4 A in total, see load graph,
	output current
Min. load	200 mA
Relay output	5/6/7 (OUT 1) and 13/14/15 (OUT 2)
Switching voltage, max.	250 V AC
Switching current, max.	2 A
Switching frequency	20/s
Inputs for PNP, NPN[2] and B	
sensor inputs	26 (IN 1), 28 (IN 2)
Input voltage	10 ... 30 V DC
HIGH	> 10 V DC
LOW	< 6 V DC
VDE protection class[1]	⧈
Enclosure rating	IP 20
Ambient temperature	Operation – 25 °C ... + 55 °C
	Storage – 40 °C ... + 70 °C
Shock load	Complying with IEC 68
Weight	Approx. 970 g
Housing material	Plastic

[1] Delivery 200 ... 264 V AC

[2] External pull-up resistor ≤ 10 kΩ required for NPN variant

Load curve, output current



Order information

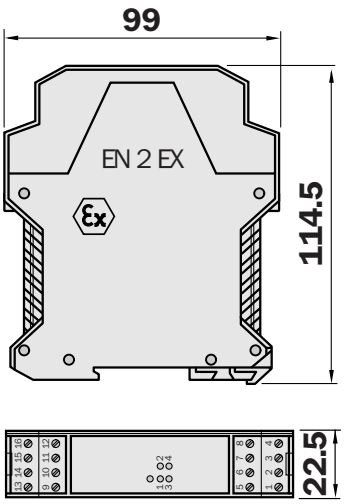
Type	Order no.
EN 3	6 009 692

Features

- Ⓔx II (1) G/D [EEx ia] IIC according to Directive 94/9/EC (ATEX) with intrinsically safe inputs
- Reliable electrical isolation between input, output and supply voltage to VDE 0100 Part 410
- 2-channel each with one relay output 1 x u
- Invertible outputs
- Mounting on 35 mm (1.378 in.) DIN rails according to DIN EN 60715

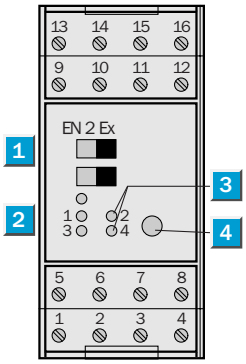
CE Ⓔx

Dimensional drawing



Adjustments possible

All Types



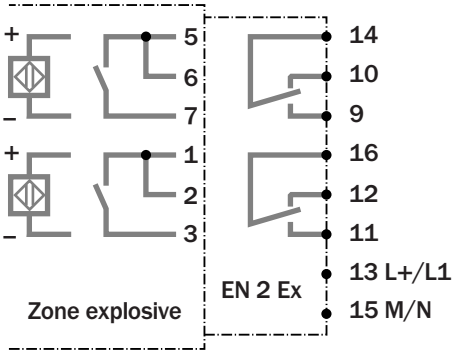
1 Switches to reverse action. Switch in position I and contact in the input circuit closed, output active (ON). Switch in position II, output action inverted.

2 LED (red), cable monitoring indicator:
The activation of the cable-break and cable short-circuit monitoring is only functional if a sensor/proximity switch to EN 60947-5-6 (NAMUR) or a mechanical contact with suitable resistance circuit as per the operating instructions is connected. This circuit monitors the input current and deactivates the output with input currents < 0.3 mA cable-break and > 6.5 mA short-circuit irrespective of setting for the direction of action.

3 LED (yellow), switch status indication:
This LED is activated in parallel to the output.

4 LED (green), supply voltage indication.

Connection diagram



Technical data	EN 2 Ex-	1	2	3							
Supply voltage V_S	120 V AC										
	230 V AC										
	24 V DC										
Power frequency	48 ... 62/s										
Power consumption per channel	Approx. 2.2 VA										
Power consumption, total	Approx. 0.7 W										
Inputs	For 1 or 2 sensors										
No-load voltage	8.5 V DC										
EC-type examination certificate	TÜV 03 ATEX 2346										
Output voltage U_o, max.	≤ 10.5 V										
Output current I_o, max.	≤ 26 mA										
Output power P_o, max.	67 mW										
External capacity C_a, max.	2.41 µF										
External inductivity L_a, max.	45 mH										
Ambient temperature T_A	Operation: –20 °C ≤ T_a ≤ +60 °C										
Switching points	0 < 1.55 mA										
	1 > 1.75 mA										
Short circuit current	I ≥ 8.5 mA										
Switching outputs [1]	1 relay per input: SPDT										
Switching voltage $U_{max.}$	250 V AC										
Switching current $I_{max.}$	5 A										
Switching power $P_{max.}$	100 VA										
VDE protection class	I										
Enclosure rating	IP 20										
Ambient temperature T_A	Storage: –25 °C ... +85 °C										
Weight	Approx. 175 g										
Housing material	Plastic										

[1] Provide suitable spark suppression for inductive or capacitive loads.

Transmission characteristics	
Active direction (light-/dark-switching):	Can be changed over (see table)
Cable monitoring:	Can be switched off
Max. switching frequency:	20/s

Order information	
Type	**Order no.**
EN 2 EX-1	6 010 459
EN 2EX-2	6 010 460
EN 2EX-3	6 009 944

Table of switching functions

Input		Active direction light/dark change-over switch on		Cable monitoring		Output status	
		I	II		Red LED	Relay	Yellow LED
No fault in input circuit	Contact open	Normal		as desired	off	dropped off	off
			Inverted	as desired	off	responded	on
	Contact closed	Normal		as desired	off	responded	on
			Inverted	as desired	off	dropped off	off
With fault in input circuit	Cable break	Normal		on	on	dropped off	off
			Inverted	on	on	dropped off	off
	Short-circuit	Normal		on	on	dropped off	off
			Inverted	on	on	dropped off	off
	Cable break	Normal		off	off	dropped off	off
			Inverted	off	off	responded	on
	Short-circuit	Normal		off	off	responded	on
			Inverted	off	off	dropped off	off