

SINEAX SV 814

Isolating switching amplifier

Output with relay contacts or transistors,
in housing S17 or S23
for rail or wall mounting

CE 0102 Ex II (1) G

Application

The isolating switching amplifier **SINEAX SV 814** (Figs. 1 and 2) is available in single and two-channel versions and is used for transferring binary signals usually from fail-safe circuits to non-fail-safe circuits.

The amplifier input may be either a sensor conforming to DIN EN 50 227 or a contact. Input and output signals are electrically insulated. The output is either an auxiliary relay with a potentially-free change-over contact or a transistor.

Yellow LED's on the front of the unit signal energised output relays or conducting output transistors. The relationship between the signals on the front and the status of the outputs can be configured with the aid of switches which are also located on the front of the unit.

Provision is made for monitoring the input with respect to open and short-circuits. Should one of these faults occur, the output relay of the channel concerned resets and the fault is signalled by the alarm relay AF and the red LED on the front of the unit. The monitoring circuit is enabled by a switch (e.g. for use with mechanical transmitter contacts).

Another switch on the frontplate facilitates testing of the relays and LED's. Switching it on causes all the LED's to light and all the relays to pick-up, respectively output transistors to conduct, irrespective of the status of the input signal at the time.

The switching amplifier is supplied in two different casings depending on the number of input channels and output contacts: SINEAX SV 814-1/2/3 (Fig. 1) in casing Type S17 and SINEAX SV 814-4/5 (Fig. 2) in casing Type S23. Both types of casing are suitable for either rail or wall mounting.

The instrument fulfils all the important requirements and regulations concerning electromagnetic compatibility **EMC** and **Safety** (IEC 1010 resp. EN 61 010). It was developed and is manufactured and tested in strict accordance with the **quality assurance standard** ISO 9001.



Fig. 1. SINEAX SV 814-1/2/3 in housing **S17** clipped onto a top-hat rail.



Fig. 2. SINEAX SV 814-4/5 in housing **S23** screw hole mounting brackets pulled out.

Features / Benefits

- One or two channels according to DIN EN 50 227 (substitute for DIN 19 234: 1990-06)
- Output relays or output transistors with open collectors or with a current level according to DIN EN 50 227
- Electrical isolation between input, output and power supply according to IEC 1010 resp. EN 61 010
- AC/DC power supply / Universal
- In type of protection "Intrinsic safety" [EEx ia] IIC (see "Table 5: Data on explosion protection")
- Indication of the switching status by LED's
- Configurable input circuit monitor for detecting open and short-circuits
- Switch for setting the relationship between output status and signal LED's
- Green LED signals a power supply failure

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Technical data

Signal inputs (for channels I and II)

Type: Binary signals, preferably from contactless sensors acc. to DIN EN 50 227, in type of protection "Intrinsically safe" EEx ia IIC

Number: 1 or 2 (S1 or S1 and S2) (signal inputs S1 and S2 have a common ground)

Operating data

Open-circuit voltage: Approx. 9 V DC

Internal resistance: 1.1 k Ω

Short-circuit current: ≤ 8 mA

Switching level: Off I ≤ 1.2 mA, On I ≥ 2.1 mA


Hysteresis: 0.2 mA

Line resistance: Max. $2 \times 50 \Omega$

Output contacts

Output A1 or A1 and A2: Output contacts for channels I and II galvanically isolated

Table 1: Version of the contact outputs **A1** and **A2** as **relay contacts**



Symbol	Material	Contact rating
	Gold flashed silver alloy	AC: ≤ 2 A / 250 V (500 VA) DC: ≤ 1 A / 0.1...250 V (30 W)

Relay approved by UL, CSA, TÜV, SEV

Mechanical life: $> 5 \cdot 10^7$ operations

Switching delay: Approx. 0.5 s standard, adjustable in the works between 0.1 and 10 s

Table 2: Version of the contact outputs **A1** and **A2** as **transistor outputs**

Version		Technical data
Designation	Symbol	
Transistor output with open collector		Contact rating ≤ 1.5 W Voltage ≤ 30 V DC Switching current per output ≤ 50 mA DC With protection against reversal of polarity and induced voltages
Transistor output with current level acc. to DIN EN 50 227		Contact rating ≤ 0.48 W Voltage ≤ 16 V DC Switching current per output ≤ 30 mA DC Contact open 0.35...1.2 mA Contact closed 2.1...10 mA but 360 Ω With protection against reversal of polarity

Switching delay: Approx. 0.5 s standard, adjustable in the works between 0.001 and 10 s

Time delay: Common for all channels
– Standard (energised and de-energised)
– Energised only
– De-energised only

Direction of action of the contact outputs **A1** and **A2**: Adjustable by switch (Table 7)

Direction of action of status displays **LED 1** and **LED 2**: Adjustable by switch (Table 7)

Maximum switching frequency

Input-relay output: ≤ 5 Hz

Input-transistor output: ≤ 1 kHz

Signal input monitoring

Behaviour: Circuit break and shorting are signalled by the contact output AF and red LED (see Section "Specification and ordering information", feature 1, lines 1, 4 and 5).

The output of the corresponding channel is disabled if the input current $I \leq 0.15$ mA (operation of the open-circuit monitor) or $R_{\text{sensor}} \leq 350 \Omega$ (operation of the short-circuit monitor).

Version of the contact output **AF**: **Relay or transistors** (see Table 1 and 2)

Switching delay: ≤ 0.5 s fixed setting (other values not possible)

Effectiveness of input monitoring: Enabled or disabled by switch $\frac{4}{5}$ (Table 8).
If the transmitter is a contact instead of an active sensor and the input circuit has to be monitored, two resistors must be fitted close to the contact as show in Fig. 3.

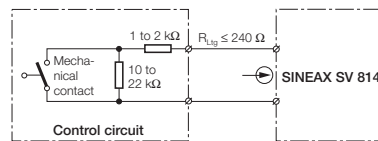


Fig. 3. Input contact circuit.

Power supply H $\rightarrow \bigcirc$

AC/DC module (DC and 45...400 Hz)

Table 3: Nominal voltages and tolerance

Nominal voltage U_N	Tolerance
24 ... 60 V DC / AC	DC - 15...+ 33% AC $\pm 15\%$
85 ... 230 V AC	$\pm 10\%$
85 ... 110 V DC	- 15 ... + 10%

Power input: ≤ 1.4 W resp. ≤ 2.7 VA

Electrical isolation: Signal inputs to contact outputs and power supply

Regulations

Electromagnetic compatibility: The standards DIN EN 50 081-2 and DIN EN 50 082-2 are observed

Intrinsically safe: Acc. to DIN EN 50 020: 1996-04

Electrical standards: Acc. to IEC 1010 resp. EN 61 010

Protection (acc. to IEC 529 resp. EN 60 529):
Housing IP 40
Terminals IP 20

Operating voltages: Signal inputs < 50 V
Relay outputs and power supply < 250 V
Transistor outputs < 30 V

Rated insulation voltage: Signal inputs to power supply and contact outputs < 375 V

Contamination level: 2

Overvoltage category: Contact outputs and signal inputs II, power supply III

Sure isolation: Acc. to EN 61 010 and DIN/VDE 106, Part 101

Test voltage: Signal inputs to contact outputs 2.3 kV, 50 Hz, 1 min.

Signal inputs to power supply 3.7 kV, 50 Hz, 1 min.

Contact outputs to power supply 3.7 kV, 50 Hz, 1 min.

Contact output to contact output 1.9 kV, 50 Hz, 1 min.

Environmental conditions

Climatic rating: Climate class 3Z acc. to VDI/VDE 3540

Commissioning temperature: - 10 to + 55 °C

Operating temperature: - 20 to + 55 °C

Storage temperature: - 40 to + 70 °C

Relative humidity of annual mean: $\leq 75\%$ standard climatic rating

Installation data

Housing: Housing S17, S23
Dimensions see Section "Dimensional drawings"

Material of housing: Lexan 940 (polycarbonate), Flammability Class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen

Mounting: For snapping onto top-hat rail (35 x 15 mm or 35 x 7.5 mm) acc. to EN 50 022

or
directly onto a wall or panel using the pull-out screw hole brackets

Position of use: Any

Electrical terminals: DIN/VDE 0609
Screw terminals with wire guards, for light PVC wiring and max. 2 x 0.75 mm² or 1 x 2.5 mm²

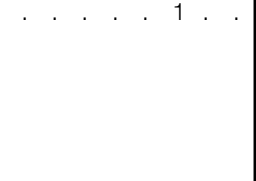
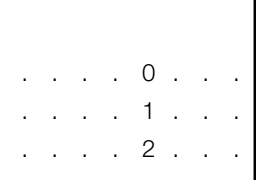
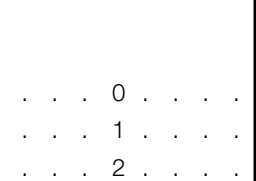
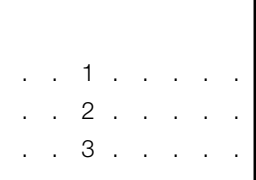
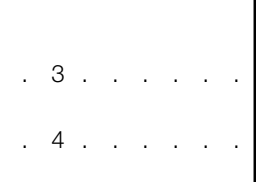
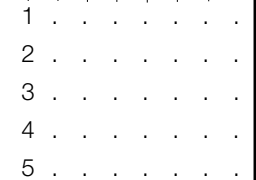
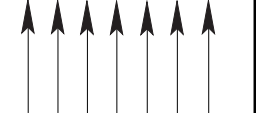
Weight: Housing S17 approx. 190 g
Housing S23 approx. 210 g

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Table 4: Specification and ordering information

Order Code 814 –			
Features, Selection	*SCODE	no-go	
1. Mechanical design, contacts			
1) Housing S17, 1 channel / 1 signal contact / 1 fault contact	E		1
2) Housing S17, 1 channel / 2 signal contacts	EF		2
3) Housing S17, 2 channels / 1 signal contact per channel	F		3
4) Housing S23, 1 channel / 2 signal contacts / 1 fault contact	E		4
5) Housing S23, 2 channels / 2 × 1 signal contact / 1 fault contact			5
2. Version / Power supply (U_N)			
3) [Ex ia] IIC / 24 ... 60 V DC/AC Input intrinsically safe			. 3
4) [Ex ia] IIC / 85 ... 110 V DC Input intrinsically safe 85 ... 230 V AC			. 4
3. Version of the contact (output)			
1) Relay change-over contact (≤ 5 Hz)	H		. . 1
2) Transistor switch, open collector (≤ 1 kHz)			. . 2
3) Transistor switch, DIN EN 50 227 (≤ 1 kHz)			. . 3
4. Version of switching delay			
Switching delay			
0) Standard (energised and de-energised)			. . . 0
1) Energised only			. . . 1
2) De-energised only			. . . 2
5. Switching delay			
0) Switching delay standard, approx. 0.5 s		 0
1) Switching delay standard fast, approx. 1 ms		H 1
2) Switching delay [s]		 2
Line 1: With contact version transistor only			
Line 2: Permissible values with relay output [s] 0.1...10 with transistor output [s] 0.001...10			
6. Special features			
0) Without	Y	 0 . . .
1) With		 1 . . .
Without special features (line 0): Order No. complete. With special feature (line 1): The features to be omitted must be marked hereafter with / (slant line) in the order code until reaching the required feature. The following functions can be configured by the user.			
7. Input monitoring			
Common to all channels			
A) Open and short-circuit monitor disabled		FY A . . .
Standard settings where nothing stated in order: Monitor enabled. Only applicable for versions with fault signalling contact (selection criterion 1, lines 1, 4 and 5) and transmitter contacts or corresponding transmitter contact circuits (Fig. 3)!			



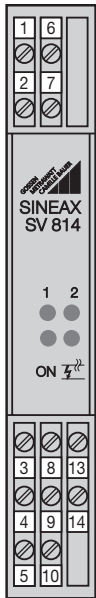
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Electrical connections

Front

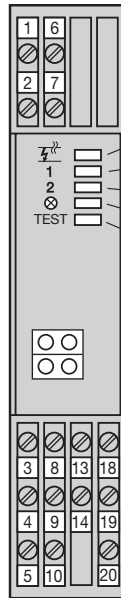
S1, S2
→



- 1 Yellow LED 1
Status display of signal input S1
- 2 Yellow LED 2
Status display of signal input S2
- $\frac{I}{I_{sc}}$ Red LED 3
Open and short-circuit monitor (both inputs)
- ON Green LED 4
device standing by

View **with**
transparent cover
housing **S17**

S1, S2
→

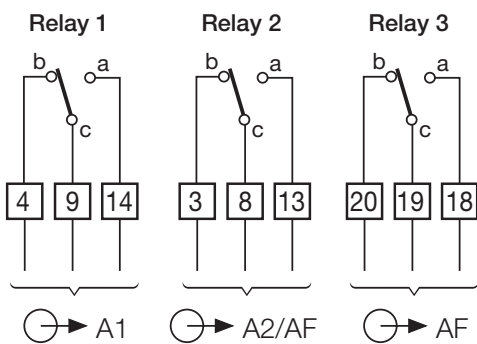


Configuration switch for:

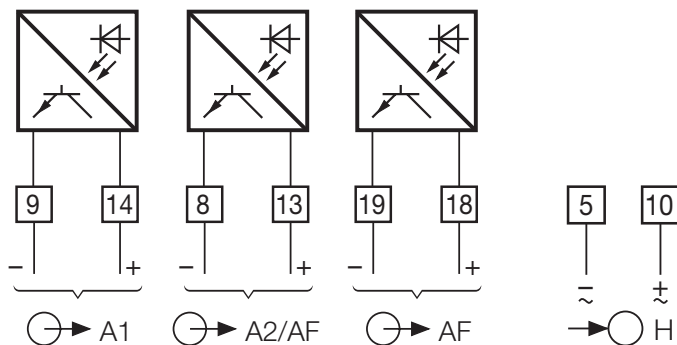
- Input monitor
- Direction of action A1
- Direction of action A2
- Direction of action of the LEDs
- Relay, transistor and LED test

OFF/ON
INV/NORMAL
INV/NORMAL
INV/NORMAL
ON/OFF

View **without**
transparent cover
housing **S23**

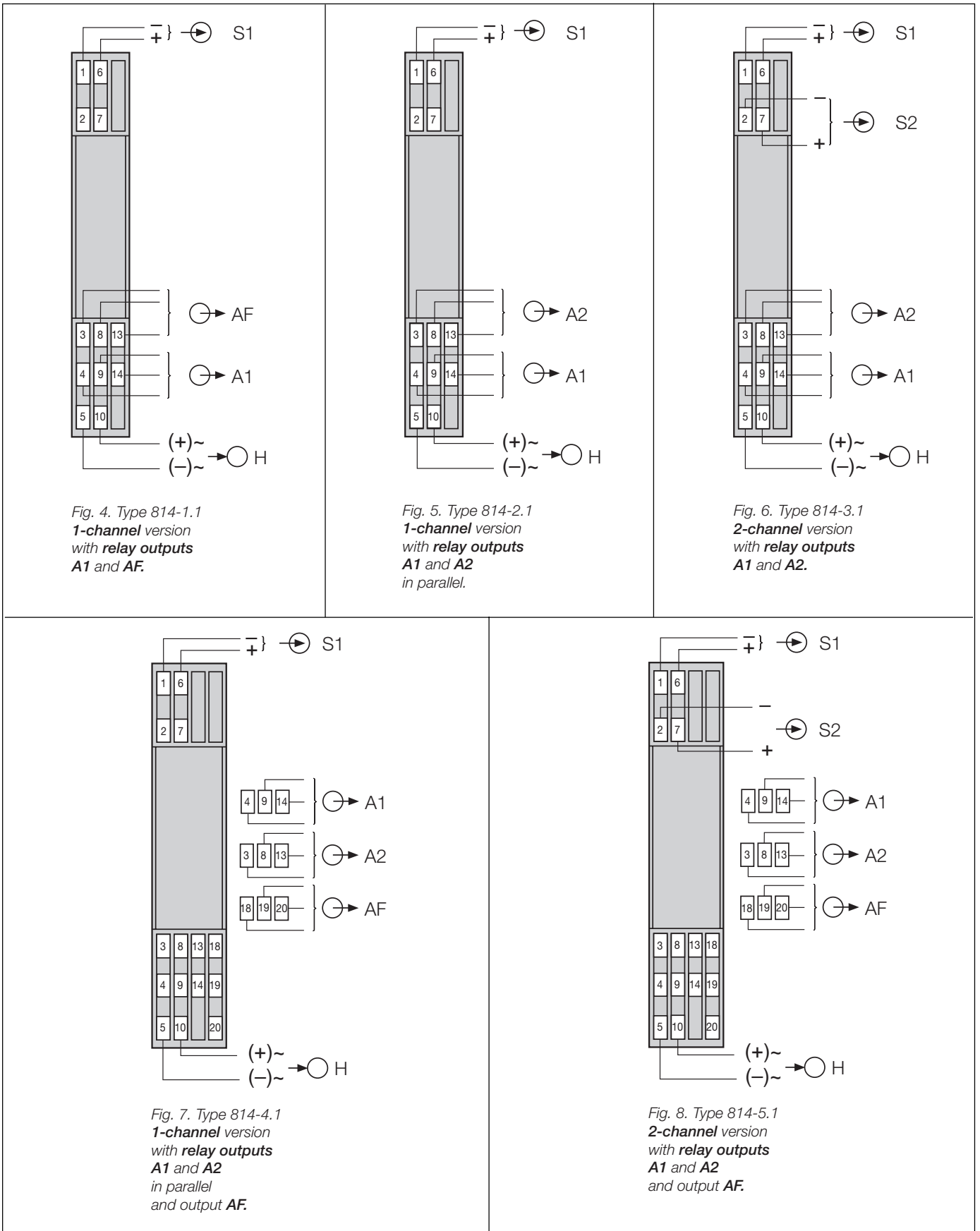


N/O contact: a - c
N/C contact: b - c



- S1, S2 = Signal inputs for channels I and II
- A1, A2 = Contact outputs for channels I and II
- AF = Contact output for monitoring signal inputs (fault signalling output)
- H = Power supply

Table 6: Terminal allocation



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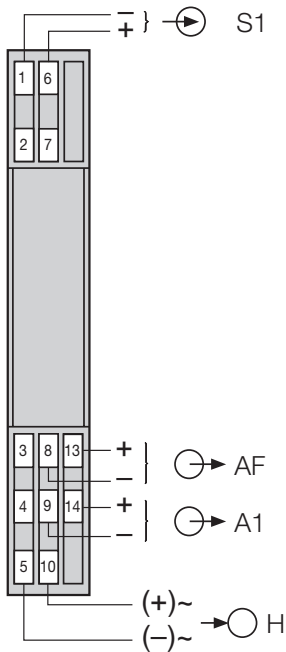


Fig. 9. Type 814-1.2 / -1.3
1-channel version
with transistor outputs
A1 and **AF**.

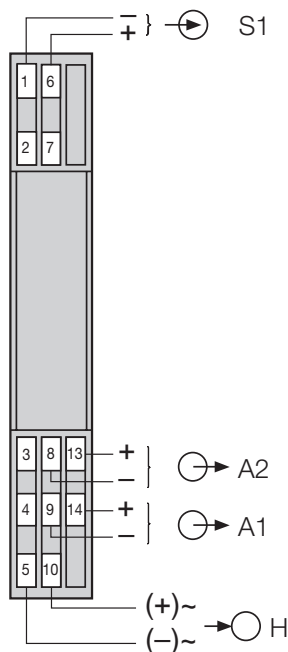


Fig. 10. Type 814-2.2 / -2.3
1-channel version
with transistor outputs
A1 and **A2**
in parallel.

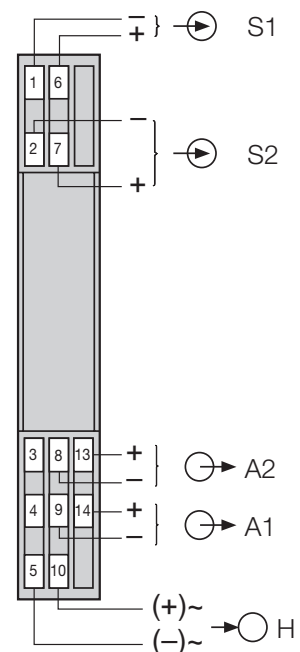


Fig. 11. Type 814-3.2 / -3.3
2-channel version
with transistor outputs
A1 and **A2**.

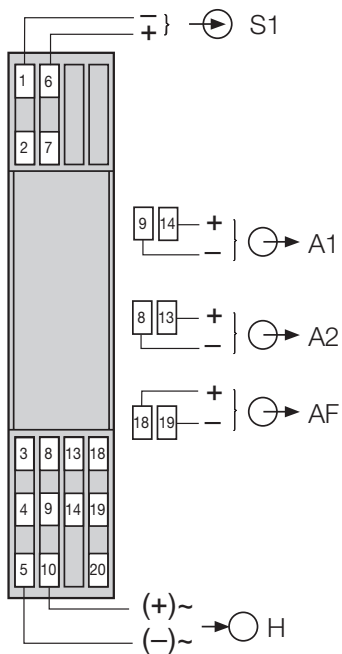


Fig. 12. Type 814-4.2 / -4.3
1-channel version
with transistor outputs
A1 and **A2**
in parallel
and output **AF**.

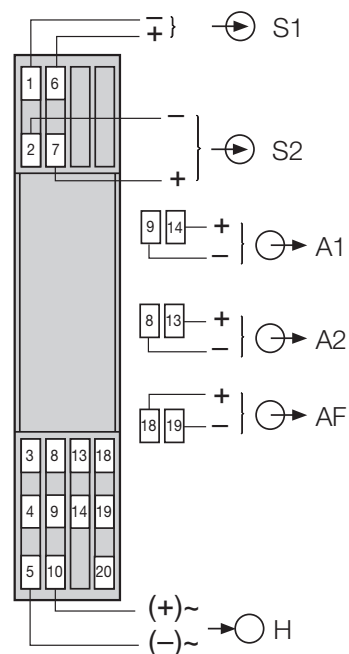


Fig. 13. Type 814-5.2 / -5.3
2-channel version
with transistor outputs
A1 and **A2**
and output **AF**.

Operating sense

The statuses of outputs A1 and A2 and the LED's 1 and 2 for the different operating senses and input signals are given in Table 7.

Signal inputs

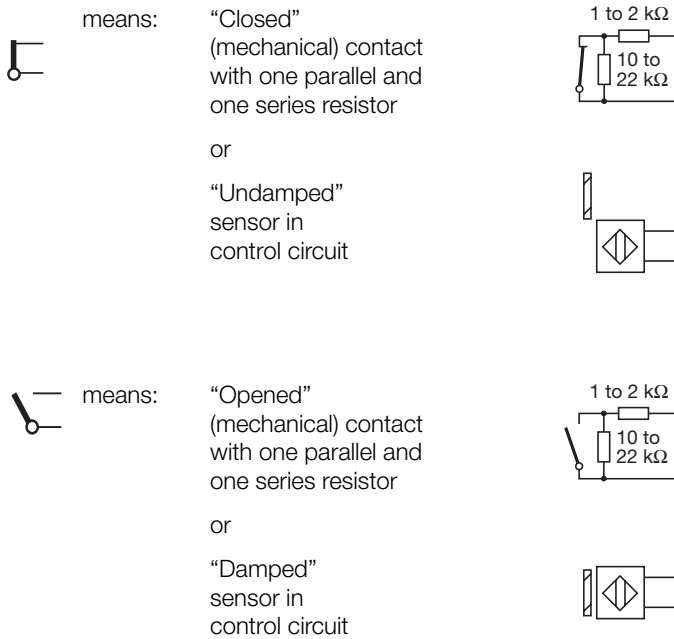


Table 7:

The arrangement of the configuration switches and LED's is shown in Section "Electrical connections".

Signal inputs		Output contacts				LED displays (yellow)		Configuration switches			
Designation	Status	Designation	Status			Designation	Status	Designation	Position	Designation	Position
			4	9	14						
			3	8	13						
S1	A1						●	«1»			
							⊗				
							⊗				
							●				
							●				⊗
							⊗				
S2	as above	A2	as above	as above	as above	as above	as above	«2»	as above	as above	as above
Explanation: <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 10px;"> <div style="text-align: center;"> <p>Relay de-energised or transistor non-conducting, ≙ status with power failure too</p> </div> <div style="text-align: center;"> <p>Relay energised or transistor conducting</p> </div> <div style="margin-left: 20px;"> <p>⊗ Off</p> <p>● On</p> </div> </div>											

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Table 8: Statuses of the output contact AF, LED 3, output contacts A1 and A2 and LED's 1 and 2
The positions of the configuration switches and LED's are also given in the Section "Electrical connections".

	Signal inputs S1 and S2 Status	Output contacts AF Status b c a S17 3 8 13 S23 20 19 18	LED display (red) LED 3 Status	Output contacts A1 and A2 Status b c a A1 4 9 14 A2 3 8 13	LED displays (yellow) LED 1 and LED 2 Status	Configuration switches														
						Designation	Position	Designation	Position	Designation	Position	Designation	Position							
 normal operation						«»	(1)*	«1» and «2»	«»	(1)	«Test»									
 open-circuit/ short-circuit	(1)					«»		«1» and «2»		(1)	«»	(1)	«Test»							
Relay and LED test	(1)					«»		«1» and «2»		(1)	«»	(1)	«Test»							

(1) No influence

* Where mechanical contacts are used **without a parallel and serie resistor**, the configuration switch "" for monitoring the input must be switched to "OFF" (to the left). The settings for the logic are the same as for "Normal operation".

Dual-channel versions with fault signalling output:

A short-circuit or open-circuit in one channel does not influence the operation of the other even though the red LED is lit (only applies to Types 814-3 ... and 814-5 ...).

If only one channel of a dual-channel version is being used, a resistor (1 ... 15 kΩ) must be connected across the input which is not in use. This excludes any spurious operation in the red alarm LED.

Dimensional drawings

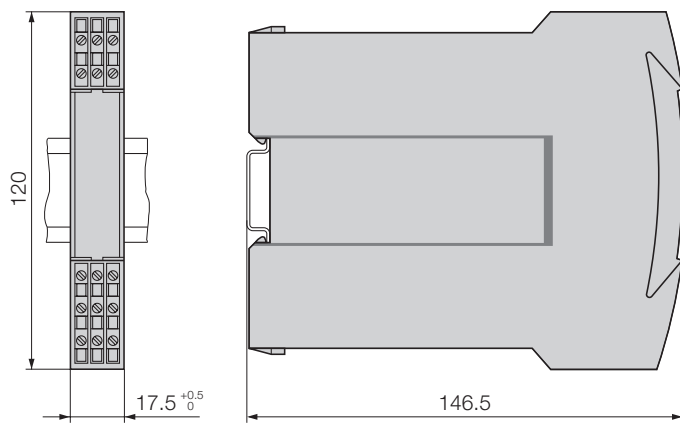


Fig. 14. SINEAX SV 814 in housing **S17** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022).

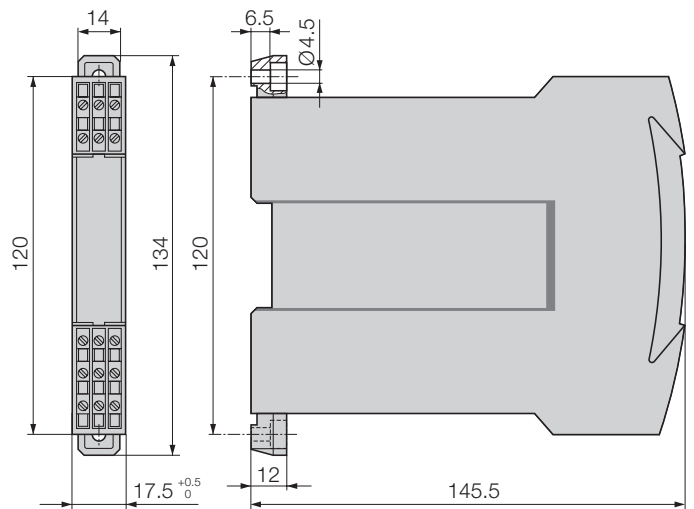


Fig. 15. SINEAX SV 814 in housing **S17** screw hole mounting brackets pulled out.

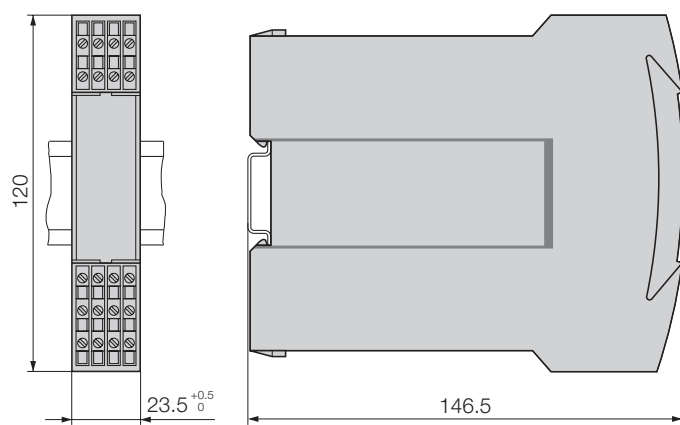


Fig. 16. SINEAX SV 814 in housing **S23** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022).

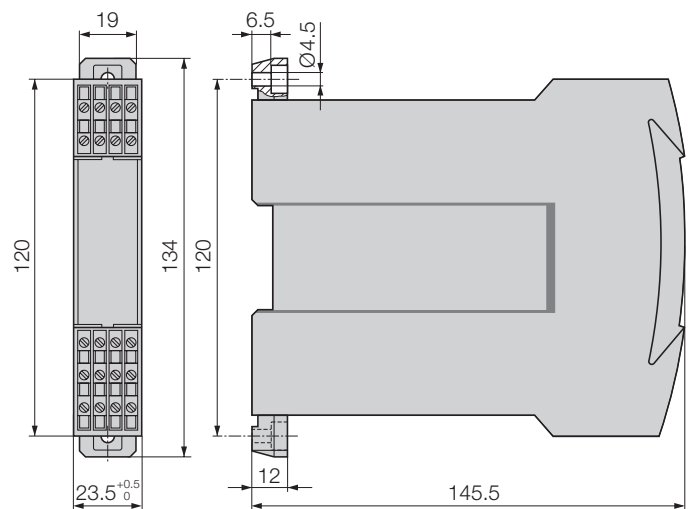


Fig. 17. SINEAX SV 814 in housing **S23** screw hole mounting brackets pulled out.

Standard accessories

- 1 Operating Instructions in three languages: German, French, English
- 2 Withdrawing handle (for opening the housing)
- 2 Labels (under transparent cover)
- 1 Ex approval

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Camille Bauer Ltd

Aargauerstrasse 7
CH-5610 Wohlen/Switzerland
Phone +41 56 618 21 11
Fax +41 56 618 24 58
Telex 827 901 cbm ch

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METRAWATT
CAMILLE BAUER

