SINEAX TV 808, 1 channel
Isolating amplifier unipolar/bipolar

CAMILLE BAUER

For electrically insulating, amplifying and converting DC signals

CE 0102 Ex II (1) G

Application

The purpose of the isolating amplifier **SINEAX TV 808** (Fig. 1 and 2) is to electrically insulate input and output signals, respectively to amplify and/or change the signal level or type (current or voltage) of the input signals.

Variants

- Ex and non-Ex isolating amplifiers
- 36 standard input and output combinations selected by plug-in jumpers
- User-specific input and/or output ranges
- Power supply 24…60 V DC/AC or 85…230 V DC/AC

Please request our data sheet TV 808-12 Le for two-channel versions.

*Fig. 1. Isolating amplifier SINEAX TV 808 in housing **S17** clipped onto a top-hat rail.*

*Fig. 2. Isolating amplifier SINEAX TV 808 in housing **S17**, screw hole mounting brackets pulled out.*

Features / Benefits

- Electric insulation between input, output (2.3 kV) and power supply (3.7 kV) / Prevents measurement errors due to potential leakage
- Flexibility provided by 36 different input and output combinations selected by simply positioning plug-in jumpers / No influence on accuracy / Reduced stocking
- Non-standard user-specific ranges available
- AC/DC power supply / Universal
- Available in type of protection "Intrinsic safety" [EEx ia] IIC (see "Table 4: Data on explosion protection")
- Provision for either snapping the isolating amplifier onto top-hat rails or securing it with screws to a wall or panel
- Housing only 17,5 mm (size S17 housing) / Low space requirement

Standard versions

Input and output set to 0 … 20 mA. Any of the standard ranges simply selected by positioning plug-in jumpers without influencing measurement accuracy.

Table 1: Standard (non-Ex) version

Standard ranges Input	Standard ranges Output	Power supply	Order Code	Article Number
0 … 20 mA 4 … 20 mA, ± 20 mA 2 … 10 V, ± 10 V 0 … 10 V,	**0 … 20 mA** 4 … 20 mA, ± 20 mA 2 … 10 V, ± 10 V 0 … 10 V	24 … 60 V DC/AC	808 - 1111	124 404
		85 … 230 V DC/AC	808 - 1121	124 412

Please complete the Order Code 808-11.1 .. according to Table 3 "Ordering informations" for versions with user-specific input and/or output ranges.

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Technical data

Measuring input

DC current:
Standard ranges
0…20 mA, 4…20 mA, ± 20 mA
Limit values
0…0.1 to 0…50 mA
also live-zero,
start value > 0 to ≤ 50% final value
– 0.1…0…+ 0.1 to
– 50…0…+ 50 mA
also bipolar asymmetrical
R_i = 15 Ω

DC voltage:
Standard ranges
0…10 V, 2…10 V, ± 10 V
Limit values
0…0.06 to 0…40, **Ex max. 30 V**
also live-zero,
start value > 0 to ≤ 50% final value
– 0.06…0…+ 0.06 to
– 40…0…+ 40 V,
Ex max. – 30…0…+ 30 V
R_i = 100 kΩ

Overload:
DC current
continuously 2-fold
DC voltage
continuously 2-fold

Measuring output

DC current:
Standard ranges
0…20 mA, 4…20 mA, ± 20 mA
Limit values
0…1 to 0…20 mA
0.2…1 to 4…20 mA
– 1…0…+ 1 to – 20…0…+ 20 mA

Burden voltage: 12 V

External resistance:
$$R_{ext}\ \text{max.}\ [k\Omega] = \frac{12\ V}{I_{AN}\ [mA]}$$
I_{AN} = Output circuit full-scale value

DC voltage:
Standard ranges
0…10 V, 2…10 V, ± 10 V
Limit values
0…1 to 0…10 V
0.2…1 to 2…10 V
– 1…0…+ 1 to – 10…0…+ 10 V

Burden:
$$R_{ext}\ \text{min.}\ [k\Omega] \geq \frac{U_{AN}\ [V]}{5\ mA}$$

Current limiter at R_{ext} max.: Approx. 1.1 × I_{AN} for current output

Voltage limiter at $R_{ext} = \infty$: Approx. 13 V

Residual ripple in output current: < 0.5% p.p.

Response time: < 50 ms

Power supply H

AC/DC power pack (DC and 45...400 Hz)

Table 2: Nominal voltages and tolerances

Nominal voltage U_N	Tolerance	Instrument version
24... 60 V DC / AC	DC –15...+ 33% AC ± 15%	Standard (non-Ex)
85...230 V [1] DC / AC		
24... 60 V DC / AC	DC – 15...+ 33% AC ± 15%	Type of protection “intrinsically safe” [EEx ia] IIC
85...230 V AC	± 10%	
85...110 V DC	–15...+ 10%	

Power input: ≤ 1.2 W resp. ≤ 3 VA

Accuracy data (acc. to DIN/IEC 770)

Basic accuracy: Limit error ≤ ± 0.2%
Including linearity and reproducibility errors

Reference conditions:

Ambient temperature: 23 °C, ± 2 K

Power supply: 24 V DC ± 10% and 230 V AC ± 10%

Output burden: Current: 0.5 · R_{ext} max.
Voltage: 2 · R_{ext} min.

Influencing factors:

Temperature: < ± 0.1% per 10 K

Burden influence: < ± 0.1% for current output
< ± 0.2% for voltage output
if R_{ext} < 2 · R_{ext} min.

Longtime drift: < ± 0.3% / 12 months

Switch-on drift: < ± 0.2%

Common and transverse mode influence: < ± 0.2%

Output + or – connected to ground: < ± 0.2%

Installation data

Housing: Housing S17
See section “Dimensional drawings” for dimensions

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

[1] *For power supplies > 125 V, the auxiliary circuit should include an external fuse with a rating ≤ 20 A DC.*

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Mounting:	For snapping onto top-hat rail (35 × 15 mm or 35 × 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
Terminals:	DIN/VDE 0609 Screw terminals with wire guards, for light PVC wiring and max. 2 × 0.75 mm² or 1 × 2.5 mm²
Permissible vibrations:	2 g acc. to EN 60 068-2-6
Shock:	3 x 50 g 3 shocks each in 6 directions acc. to EN 60 068-2-27
Weight:	Approx. 0.18 kg
Electrical insulation:	All circuits (measuring input / measuring output / power supply) are electrically insulated

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
Protection (acc. to IEC 529 resp. EN 60 529):	Housing IP 40 Terminals IP 20
Electrical standards:	Acc. to IEC 1010 resp. EN 61 010
Operating voltages:	< 300 V between all insulated circuits
Contamination level:	2
Overvoltage category acc. to IEC 664:	III for power supply II for measuring input and measuring output
Double insulation:	– Power supply versus all other circuits – Measuring input versus measuring output
Test voltage:	Measuring input versus: – measuring output 2.3 kV, 50 Hz, 1 min. – power supply 3.7 kV, 50 Hz, 1 min. Measuring output versus: – power supply 3.7 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:	– 25 to + 55 °C, **Ex – 20** to + 55 °C
Storage temperature:	– 40 to + 70 °C
Annual mean relative humidity:	≤ 75%

Table 3: Ordering informations (see also Table 1: "Standard versions")

DESCRIPTION		MARKING
1. Mechanical design		
Housing S17 for rail and wall mounting		808 - 1
2. Number of channels		
1) 1 channel		1
3. Version / Power supply		
1) Standard,	24 … 60 V DC/AC	1
2) Standard,	85 … 230 V DC/AC	2
3) [EEx ia] IIC, (Input intrinsically safe)	24 … 60 V DC/AC	3
4) [EEx ia] IIC, (Input intrinsically safe)	85 … 110 V DC / 230 V AC	4
4. Function		
1) 1 input, 1 electrically insulated output		1

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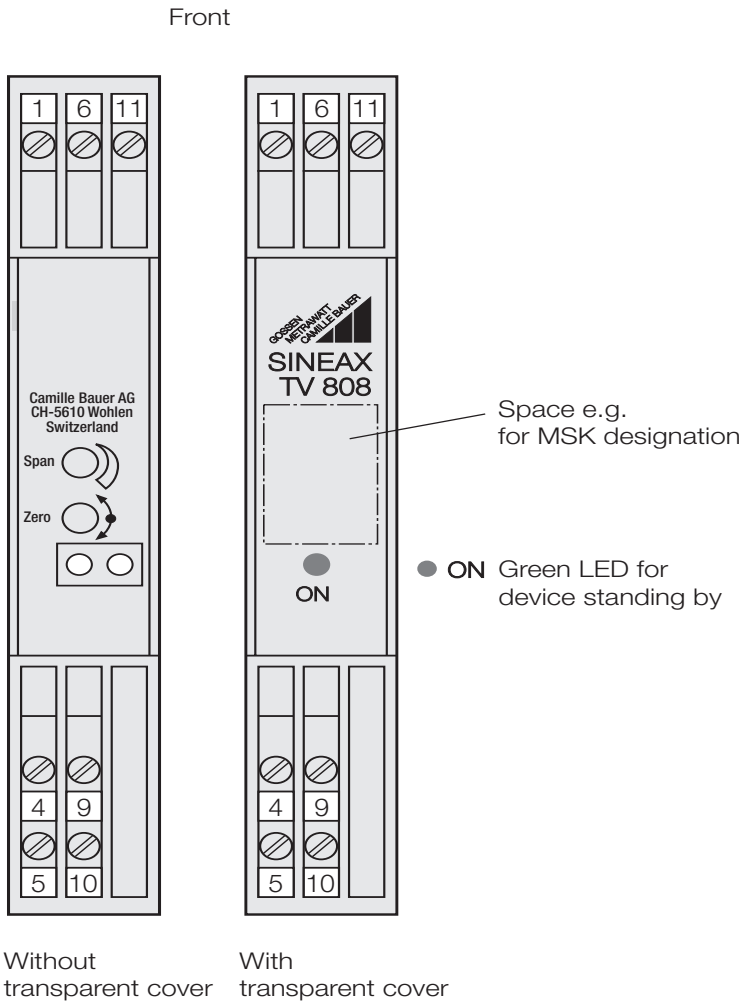
DESCRIPTION	MARKING
5. Input signal 9) Input [V] Z) Input [mA] Line 9: [V] 0 … 0.06 to 0 … 40, **Ex max. 30** also live-zero, start value > 0 to ≤ 50% final value [V] – 0.06 … 0 … + 0.06 to – 40 … 0 … + 40, **Ex max. – 30 … 0 … + 30** also bipolar asymmetrical Line Z: [mA] 0 … 0.1 to 0 … 50 also live-zero, start value > 0 to ≤ 50% final value [mA] – 0.1 … 0 … + 0.1 to – 50 … 0 … + 50 also bipolar asymmetrical	9 Z
6. Output signal 9) Output [V] Z) Output [mA] Line 9: [V] 0 … 1 to 0 … 10 0.2 … 1 to 2 … 10 – 1 … 0 … + 1 to – 10 … 0 … + 10 Line Z: [mA] 0 … 1 to 0 … 20 0.2 … 1 to 4 … 20 – 1 … 0 … + 1 to – 20 … 0 … + 20	9 Z

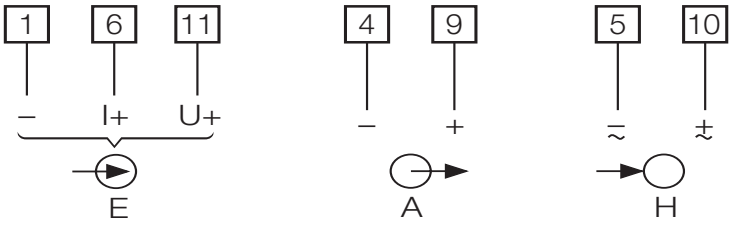
Possible special versions, e.g. increased climatic rating on inquiry.

Table 4: Data on explosion protection ⟨Ex⟩ II (1) G

Order code	Type of protection	Input	Output	Type Examination Certificate	Mounting location
808-113. .. 808-114. ..	[EEx ia] IIC	**U_o = 6 V** **I_o = 63 µA** **L_i = 20 µH** **C_i = 20 nF** only for connection to certified intrinsically safe circuits with following maximum value: **U_o = 30 V**	U_m = 253 V AC resp. 125 V DC	PTB 97 ATEX 2191	**Outside** the hazardous area

Electrical connections





E = Input
A = Output
H = Power supply

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Configuration

The SINEAX TV 808 unit has to be opened before it can be configured.

Type of output signal (voltage or current)

The output can be configured for a voltage or current signal by inserting the plug-in jumpers **ST 4** and **ST 3** in position **"U"** or **"I"** (Fig. 3).

Output ⊖►	Jumpers ST 4	Jumpers ST 3
Voltage [V]	U I	U I
Current [mA]	U I	U I

Standard input and output ranges

Two of the six plug-in jumpers **B1** to **B6** are used for selecting the standard ranges of the isolating amplifiers. Providing the potentiometers "Span" and "Zero" are not moved, changing the range has no influence on amplifier accuracy.

⊖► / ⊖►	4…20 mA	**0…20 mA**	–20…20 mA	2…10 V	0…10 V	–10…10 V
4…20 mA	B1, B4	B2, B4	B3, B4	B1, B4	B2, B4	B3, B4
0…20 mA	B1, B5	**B2, B5**	B3, B5	B1, B5	B2, B5	B3, B5
–20…20 mA	B1, B6	B2, B6	B3, B6	B1, B6	B2, B6	B3, B6
2…10 V	B1, B4	B2, B4	B3, B4	B1, B4	B2, B4	B3, B4
0…10 V	B1, B5	B2, B5	B3, B5	B1, B5	B2, B5	B3, B5
–10…10 V	B1, B6	B2, B6	B3, B6	B1, B6	B2, B6	B3, B6

The default setting of the preferred versions ex stock is 0 … 20 mA for input and output, i.e. jumpers are inserted in positions B2 and B5 and jumpers ST 4 and ST 3 are in position "I".

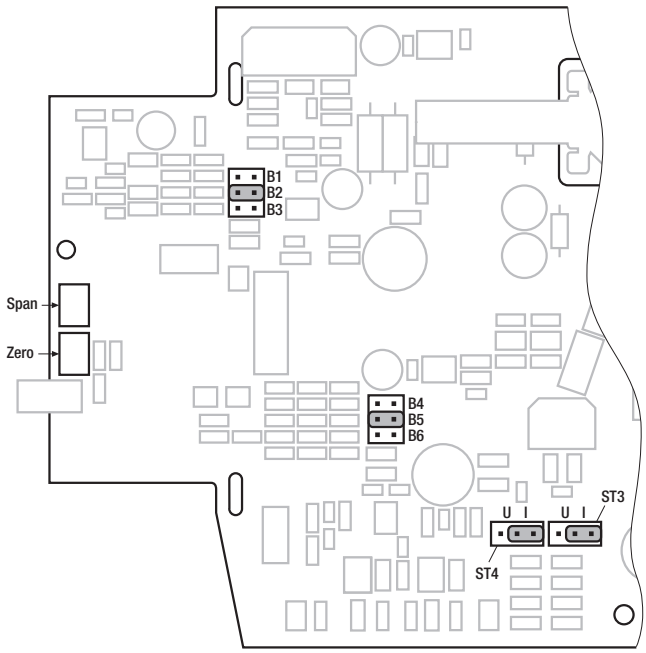

Fig. 3. Position of the jumpers ST 4 and ST 3, B1 to B6 and the potentiometers "Span" and "Zero".

Dimensional drawings

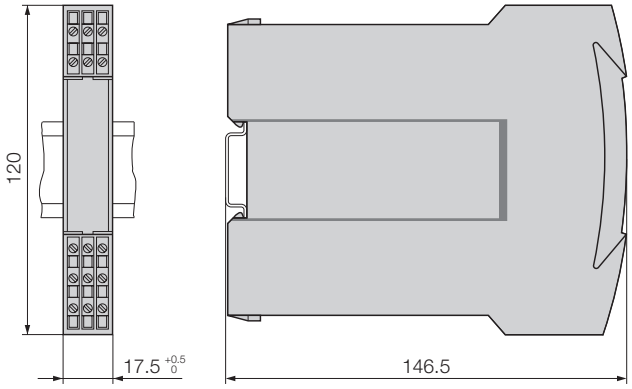

Fig. 4. SINEAX TV 808 in housing **S17** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022).

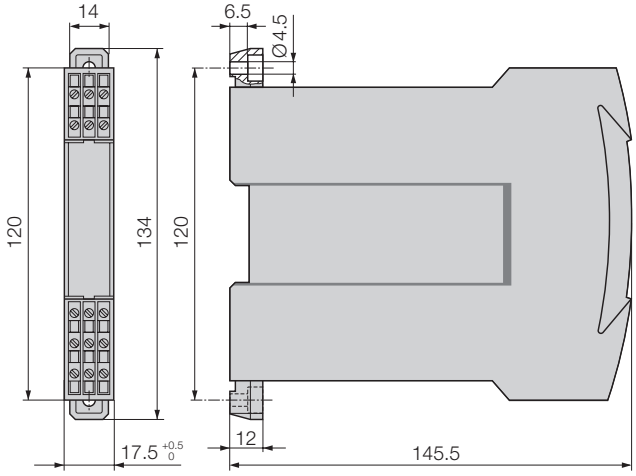

Fig. 5. SINEAX TV 808 in housing **S17,** screw hole mounting brackets pulled out.

Standard accessories

1 Operating Instructions in three languages: German, French, English
2 Withdrawing handle (for opening the housing)
2 Labels (under transparent cover)
1 Type Examination Certificate (for instruments in type of protection “Intrinsically safe” only)

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Subject to change without notice • Edition 01.04 • Data sheet No. TV 808-11 Le

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