The following symbols in the Operating Instructions indicate safety precautions which must be strictly observed:



Operating Instructions
Isolating amplifier SINEAX TV 819



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TV 819 Be 147 969 03.01

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1. Read first and then …



The proper and safe operation of the device assumes that the Operating Instructions are **read** and the safety warnings given in the various Sections

7. Mounting
8. Electrical connections
9. Configuration
10. Commissioning

are **observed**.

The device should only be handled by appropriately trained personnel who are familiar with it and authorised to work in electrical installations.

2. Scope of supply (Fig. 1 and 2)

Isolating amplifier, one of the two versions (1)
Order Code: Significance of the 1st to 7th digits

819 – x x x x x x

3	Housing with screw terminals, not pluggable
9	Housing with screw terminals, pluggable
1	Standard / Power supply 24 … 60 V DC, AC
2	Standard / Power supply 85 … 230 V DC, AC
1	Function: 1 input max. 600 V
2	Function: 1 input > 600 to 1000 V
9	Input [V]
Z	Input [mA]
9	Output [V]
Z	Output [mA]

819 – x x x x x x

0	Output characteristic standard (directly proportional, 0…Y / 0.2Y…Y / –Y…0…+Y)
1	Output characteristic (inversely proportional, Y…0 / Y…0.2Y / +Y…0…–Y)
0	Without test certificate
D	With test certificate in German
E	With test certificate in English

Y = Output circuit full-scale value



Fig. 1



Fig. 2

1 Operating Instructions (2) in German, French and English

3. Brief description

The purpose of the isolating amplifier **SINEAX TV 819** 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.

Any of the input and output standard ranges given in the Section "9. Configuration" and the type of input and output variable (current or voltage) are simply selected by positioning soldered jumpers. The fine adjustment is accomplished using the potentiometers "Zero" and "Span".

The isolating amplifiers that are supplied as preferred devices have the following basic configuration:

– Measuring input: 4 … 20 mA
– Measuring output: 4 … 20 mA

4. Overview of the parts

Figure 3 shows those parts of the device of consequence for electrical connections and other operations described in the Operating Instructions.

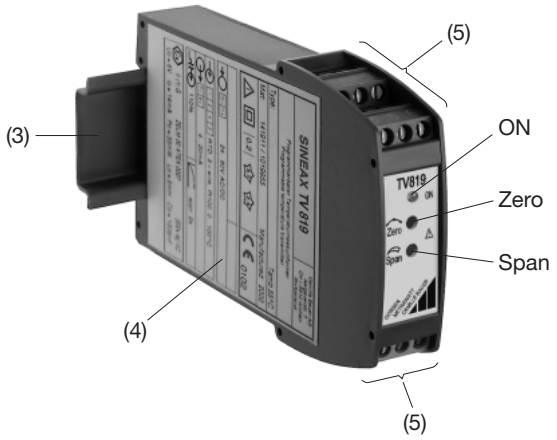


Fig. 3

(3) Top-hat rail 35 × 15 mm or 35 × 7.5 mm (EN 50 022)
(4) Type label
(5) Screw terminals
ON Green LED for indicating device standing by

5. Technical data

Measuring input

DC current:	Limit values 0…0.1 to 0…40 mA, also live-zero, start value > 0 to ≤ 50% final value or span 0.1 to 40 mA between – 40 and 40 mA (also bipolar asymmetrical)
DC voltage:	Limit values 0…0.06 to 0… 800 V (1000 V*), also live-zero, start value > 0 to ≤ 50% final value or span 0.06 to 600 V (1000 V*) between – 600 and 600 V (–1000 and 1000 V*) (also bipolar asymmetrical)
Overload capacity:	DC current continuously 2-fold DC voltage continuously 2-fold

Measuring output

DC current:	Limit values 0…1 to 0…20 mA 0.2…1 to 4…20 mA – 1…0…+ 1 to – 20…0…+ 20 mA
External resistance:	R_{ext} max. ≤ 600 Ω at output 20 mA
DC voltage:	Limit values 0…1 to 0…10 V 0.2…1 to 2…10 V – 1…0…+ 1 to – 10…0…+ 10 V
Load capacity:	R_{ext} min. ≥ 2 kΩ at output 10 V

Power supply

DC, AC power pack (DC or 45…400 Hz)
Nominal voltages and tolerances

Nominal voltages U_N	Tolerances
24… 60 V DC, AC	DC – 15…+ 33% AC ± 15%
85…230 V DC, AC**	

Power input: ≤ 1.5 W resp. ≤ 3 VA

LED

Green LED: Lights after switching on the power supply

6. Opening and closing the device

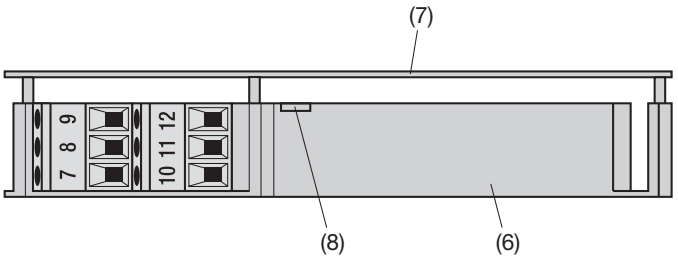


Fig. 4. Opening the device.

The device consists of a casing (6) and a cover (7). Both parts of the casing may be fitted together manually by tightly fitting pins. At the top edge of the casing there are four small indentations (8). To open the casing, place a screwdriver (min. size 2) at these positions and carefully lift the pins a few mm out of the casing. To lift the cover completely, place a suitable tool between the casing and the cover and release all the pins.

The close the casing, introduce the pins into the holes in the casing and lightly press both parts together until the casing and cover are completely closed.

7. Mounting

The SINEAX TV 819 can be mounted on a top-hat rail.

When deciding where to install the transmitter (measuring location), take care that the **limits** of the operating temperature **are kept**:
– 25 and + 55 °C

Simply clip the device onto the top-hat rail (EN 50 022) (see Fig. 5).

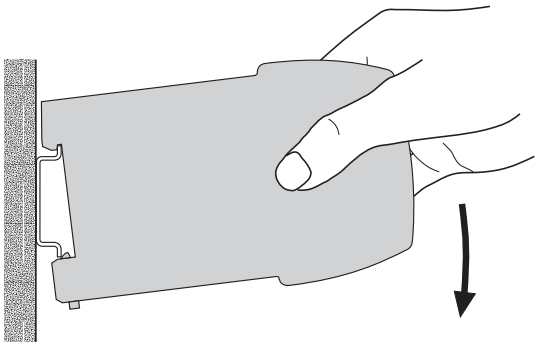


Fig. 5. Mounting on top-hat rail 35 × 15 or 35 × 7.5 mm.

8. Electrical connections

Depending on the version of the device, there are fixed or plug-in screw terminals for connecting the wires. These are easily accesssible at the front of the isolating amplifier and are suitable for wires of up to 2.5 mm².

Make sure that all cables are not live when making the connections!
Impending danger by high input voltage or high power supply voltage!

* For input voltages of > 600 V, the double insulation is no longer assured. The safety is reduced.
** An external supply fuse must be provided for DC supply voltages > 125 V.

Also note that, …

… the data required to carry out the prescribed measurement must correspond to those marked on the nameplate of SINEAX TV 819 (⊖► measuring input, ⊖► measuring output and →○ power supply!

… the resistance in the output circuit may not **overrange** the current output value

$$R_{ext}\ \text{max.}\ [k\Omega] = \frac{12\ V}{I_{AN}\ [mA]}$$

(I_{AN} = current output value)

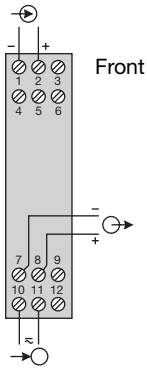
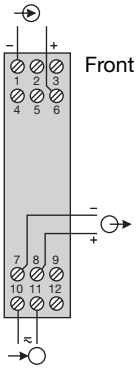
and not **underrange** the voltage output value

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

(U_{AN} = voltage output value)**!**

… the measurement input and output cables should be twisted pairs and run as far as possible away from heavy current cables!

In all other respects, observe all local regulations when selecting the type of electrical cable and installing them!

Measuring function / Application	DC voltage (direct input)	DC current	DC voltage (input via potential devider)	
Measuring span	0.06 … 40 V	0.1 … 40 mA	> 40 … 600 V	> 40 … 1000 V
Measuring range limits taking the max. measuring range into consideration	– 40 … 0 …40 V	– 40 … 0 … 40 mA	– 600 … 0 … 600 V	– 1000 … 0 … 1000 V
Electrical connections = Measuring input = Measuring output = Power supply				

9. Configuration

The SINEAX TV 819 unit has to be opened before it can be configured (see Section “6. Opening and closing the device”).

9.1 Standard input ranges

Soldered jumpers are provided for the coarse setting of the input ranges and the fine adjustment is accomplished using the potentiometers “Zero” and “Span”.

Current [mA]	Soldered jumpers			R_i
0 … 0.1	1, 3	7, 10, 11		1.335 kΩ
0 … 0.2	1, 3	8, 11		1.335 kΩ
0 … 0.5	1, 4	9, 10, 11		135 Ω
0 … 1	1, 4	7, 10, 11		135 Ω
0 … 2	1, 4	8, 11		135 Ω
0 … 5	1, 5	6, 7, 8, 10, 11		15 Ω
0 … 10	1, 5	10, 11		15 Ω
0 … 20	1, 5	6, 11		15 Ω
0.2 … 1	1, 4	8, 10, 11	12, 15	135 Ω
1 … 5	1, 4	6, 9	12, 15	135 Ω
2 … 10	1, 5	6, 7, 10, 11	12, 15	15 Ω
4 … 20	1, 5	6, 7, 8, 11	12, 15	15 Ω
– 0.1 … 0 … + 0.1	1, 3	8, 11	13, 14, 16	1.335 kΩ
– 0.2 … 0 … + 0.2	1, 3	7, 9	13, 14, 16	1.335 kΩ
– 0.5 … 0 … + 0.5	1, 4	7, 10, 11	13, 14, 16	135 Ω
– 1 … 0 … + 1	1, 4	8, 11	13, 14, 16	135 Ω
– 2 … 0 … + 2	1, 4	6, 9	13, 14, 16	135 Ω
– 5 … 0 … + 5	1, 5	10, 11	13, 14, 16	15 Ω
– 10 … 0 … + 10	1, 5	6, 11	13, 14, 16	15 Ω
– 20 … 0 … + 20	1, 5	6, 7	13, 14, 16	15 Ω

Example: Input range 0…20 mA. For this range, the soldered jumpers 1, 5, 6 and 11 must be linked.

Voltage [V]	Soldered jumpers			R_i
0 … 0.06		6, 9, 10, 11		1.121 MΩ
0 … 0.1		7, 8, 10, 11		1.121 MΩ
0 … 0.2		6, 8, 9, 11		1.121 MΩ
0 … 0.5		6, 7, 8, 9, 10		1.121 MΩ
0 … 1	2	6, 7, 8,10, 11		131.2 kΩ
0 … 2	2	7, 8, 9, 11		131.2 kΩ
0 … 5	2	8, 10		131.2 kΩ
0 … 10	1	10, 11		121.8 kΩ
0 … 20	1	6, 11		121.8 kΩ
0 … 40	1	8		121.8 kΩ
0.2 … 1	2	9, 10, 11	12, 15	131.2 kΩ
1 … 5	2	6, 8, 9, 10	12, 15	131.2 kΩ
2 … 10	1	6, 7, 10, 11	12, 15	121.8 kΩ
4 … 20	1	6, 7, 8, 11	12, 15	121.8 kΩ
– 0.1 … 0 … + 0.1		6, 8, 9, 11	13, 14, 16	1.121 MΩ
– 0.2 … 0 … + 0.2		6, 7, 9, 10	13, 14, 16	1.121 MΩ
– 0.5 … 0 … + 0.5	2	7, 8, 10, 11	13, 14, 16	131.2 kΩ
– 1 … 0 … + 1	2	7, 8, 9, 11	13, 14, 16	131.2 kΩ
– 2 … 0 … + 2	2	6, 8, 9, 10	13, 14, 16	131.2 kΩ
– 5 … 0 … + 5	1	10, 11	13, 14, 16	121.8 kΩ
– 10 … 0 … + 10	1	6, 11	13, 14, 16	121.8 kΩ
– 20 … 0 … + 20	1	8	13, 14, 16	121.8 kΩ

Voltage range > 40 V … 600 V,
Type 819 - ..1.. (see type label)

Voltage [V]	Soldered jumpers			R_i
0 … 100	1	6, 8, 10, 11		1.831 MΩ
0 … 150	1	10, 11		1.831 MΩ
0 … 200	1	6, 7, 9, 11		1.831 MΩ
0 … 250	1	7, 8, 11		1.831 MΩ
0 … 600	1	8		1.831 MΩ
– 50 … 50	1	6, 8, 10, 11	13, 14, 16	1.831 MΩ
– 100 … 100	1	6, 7, 9, 11	13, 14, 16	1.831 MΩ
– 150 … 150	1	6, 11	13, 14, 16	1.831 MΩ
– 200 … 200	1	9, 10	13, 14, 16	1.831 MΩ
– 300 … 300	1	8	13, 14, 16	1.831 MΩ

Voltage range > 40 V … 1000 V
Type 819 - ..2.. (see type label)

Voltage [V]	Soldered jumpers			R_i
0 … 100	2	6, 8, 9, 10		3.051 MΩ
0 … 150	2	6, 7, 9		3.051 MΩ
0 … 200	1	6, 7, 10, 11		3.042 MΩ
0 … 250	1	10, 11		3.042 MΩ
0 … 600	1	6, 7, 9, 10		3.042 MΩ
0 … 1000	1	8		3.042 MΩ
– 50 … 50	2	6, 8, 9, 10	13, 14, 16	3.051 MΩ
– 100 … 100	1	6, 7, 10, 11	13, 14, 16	3.042 MΩ
– 150 … 150	1	6, 8, 9, 11	13, 14, 16	3.042 MΩ
– 200 … 200	1	6, 7, 8, 11	13, 14, 16	3.042 MΩ
– 400 … 400	1	10	13, 14, 16	3.042 MΩ
– 500 … 500	1	8	13, 14, 16	3.042 MΩ

9.2 Standard output ranges

Soldered jumpers are provided for the coarse setting of the output ranges and the fine adjustment is accomplished using the potentiometers “Zero” and “Span”.

Current [mA]	Soldered jumpers	Voltage [V]	Soldered jumpers
0 … 20	B 20	0 … 10	B 20 B 22 B 23
4 … 20	B 21	2 … 10	B 21 B 22 B 23
± 20	—	± 10	B 22 B 23

9.3 Specific user output ranges

Units that have been configured for a specific user output range cannot be subsequently reconfigured.

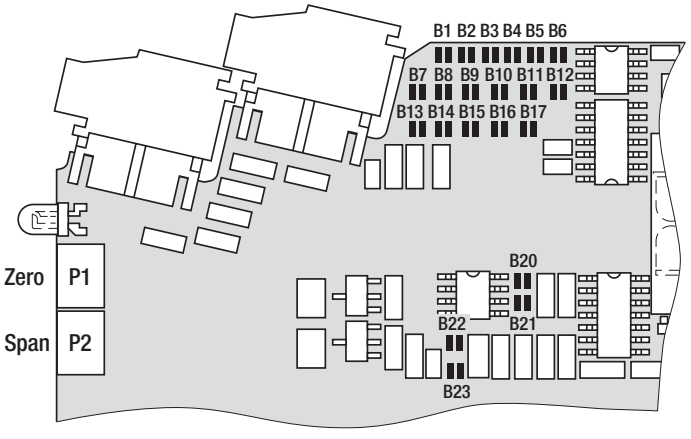


Fig. 6. Position of the soldered jumpers B .., potentiometer “Zero” and “Span”.

10. Commissioning

Switch on the measuring input and the power supply.

The power supply unit must be capable of supplying a brief current surge when switching on. The instruments presents a low impedance at the instant of switching which requires a current I_{start} of…

… $I_{start} \geq 160$ mA for the version with a power supply range of 24 – 60 V DC, AC

or

… $I_{start} \geq 35$ mA for the version with a power supply range of 85 – 230 V DC, AC

11. Maintenance

No maintenance is required.

12. Releasing the isolating amplifier

Release the isolating amplifier from a top-hat rail as shown in Fig. 7.

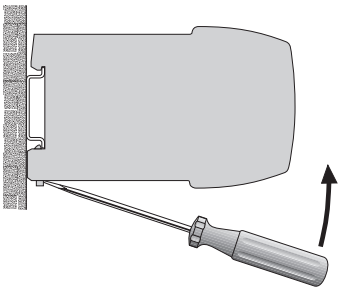


Fig. 7

13. Dimensional drawings

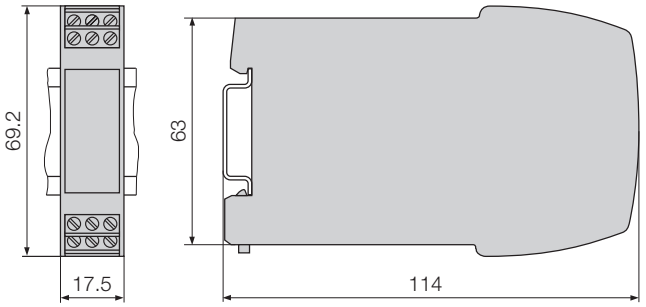


Fig. 8. SINEAX TV 819 in carrying rail housing **P12/17** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022), **screw terminals not pluggable.**

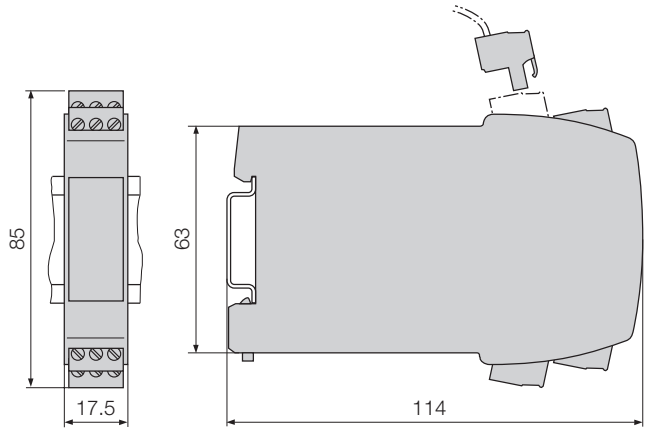


Fig. 9. SINEAX TV 819 in carrying rail housing **P12/17 St** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022), **screw terminals pluggable.**