

SINEAX TV 819 1 channel Isolating amplifier unipolar/bipolar

For electrically insulating, amplifying and converting DC signals



Application

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

The compact SINEAX TV 819 provides a large selection of input and output ranges that can be configured by the user with soldered jumpers and potentiometers.

The amplifier 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**.

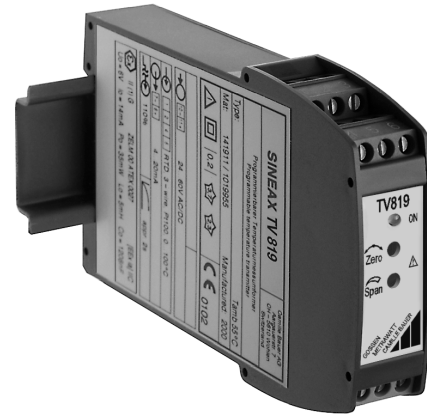


Fig. 1. Isolating amplifier SINEAX TV 819 in housing **P12/17**, terminals not pluggable.

Features / Benefits

- Electric insulation between input, output 2.3 kV and power supply 2.3 kV / Prevents measurement errors due to potential leakage
- Flexibility provided by more than 250 different input and output combinations selected by simply positioning soldered jumpers / Reduced stocking
- Wide DC, AC power pack tolerance / Universal
- Mounting of the isolating amplifier on a top-hat rail
- Housing only 17.5 mm / Low space requirement



Fig. 2. Isolating amplifier SINEAX TV 819 in housing **P12/17 St**, terminals pluggable.

Standard versions

Input and output set to 4...20 mA. Any of the standard ranges given in the Section “Technical data, measuring inputs” are simply selected by positioning soldered jumpers. The fine adjustment is accomplished using the potentiometers “Zero” and “Span”. It is only necessary to quote the **Order No.:**

Tabelle 1: Standard-Ausführung

| Standard range Input | Standard range Output | Power supply | Screw terminals | Order Code | Order No. |
|-------------------------|--------------------------|--------------------|--------------------|------------|-----------|
| 4 ... 20 mA | 4 ... 20 mA | 24... 60 V DC/AC | not pluggable | 819 - 311 | 146 838 |
| | | 85 ... 230 V DC/AC | | 819 - 321 | 146 846 |
| | | 24 ... 60 V DC/AC | pluggable | 819 - 911 | 146 854 |
| | | 85 ... 230 V DC/AC | | 819 - 921 | 146 862 |

Please complete the Order Code 819 – according to “Table 3: Ordering information” for versions with user-specific input and/or output ranges.

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Isolating amplifier unipolar/bipolar

Technical data

Measuring input \rightarrow

DC current: Limit values
0...0.1 to 0...40 mA
also live-zero,
start value > 0 to \leq 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...600 V (1000 V*)
also live zero,
start value > 0 to \leq 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 \rightarrow

DC current: Standard ranges
0...20 mA, 4...20 mA, \pm 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: $R_{\text{ext max.}} [\text{k}\Omega] = \frac{12 \text{ V}}{I_{\text{AN}} [\text{mA}]}$
 I_{AN} = Output circuit full-scale value

DC voltage: Standard ranges
0...10 V, 2...10 V, \pm 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: $R_{\text{ext min.}} [\text{k}\Omega] \geq \frac{U_{\text{AN}} [\text{V}]}{5 \text{ mA}}$
 U_{AN} = Output circuit full-scale value

Current limiter at $R_{\text{ext max.}}$: Approx. $1.1 \times I_{\text{AN}}$ for current output

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

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

Response time: < 100 ms

Power supply \rightarrow

DC, AC power pack (DC or 45...400 Hz)

Table 2: Nominal voltages and tolerances

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

Power input: \leq 1.5 W resp. \leq 3 VA

Accuracy data (acc. to EN/IEC 60 770-1)

Basic accuracy: Limit error $\leq \pm$ 0.2%
including linearity and reproducibility errors

Reference conditions:

Ambient temperature: 23 °C, \pm 2 K

Power supply: 24 V DC \pm 10% and 230 V AC \pm 10%

Output burden: Current: $0.5 \cdot R_{\text{ext max.}}$
Voltage: $2 \cdot R_{\text{ext min.}}$

Influencing factors:

Temperature: $< \pm$ 0.1% per 10 K

Burden influence: $< \pm$ 0.1% for current output
 $< \pm$ 0.2% for voltage output
if $R_{\text{ext}} < 2 \cdot R_{\text{ext min.}}$

Longtime drift: $< \pm$ 0.3% / 12 months

Switch-on drift: $< \pm$ 0.2%

Common and transverse mode influence: $< \pm$ 0.2%

Output + or - connected to ground: $< \pm$ 0.2%

Installation data

Mechanical design: Housing **P12/17** and **P12/17 St**
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

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

Position of use: Any

Electrical terminals (fixed or pluggable): PHOENIX screw terminals with wire guards, for 0.14 mm² to 2.5 mm²

* For input voltages of > 600 V, the double insulation is no longer assured. The safety is reduced.

Weight: Approx. 0.1 kg

Electrical insulation: All circuits (measuring inputs / measuring outputs / power supply) are electrically insulated

Regulations

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

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

Permissible operating voltages acc. to EN 61 010-1.1

Input voltage up to ≤ 600 V

Increased isolation, contamination level 1, overvoltage category I

| | | |
|--------------|-------|--------|
| | Input | Output |
| Power supply | 600 V | 600 V |
| Input | | 600 V |

Corresponding Test Voltages

Increased isolation, contamination level 1, overvoltage category I

| | | |
|--------------|--------|--------|
| | Input | Output |
| Power supply | 2300 V | 2300 V |
| Input | | 2300 V |

Permissible operating voltages acc. to EN 61 010-1.1

Input voltage > 600 V to 1000 V

Standard isolation, contamination level 1, overvoltage category I

| | | |
|--------------|--------|--------|
| | Input | Output |
| Power supply | 1000 V | 1000 V |
| Input | | 1000 V |

Corresponding Test Voltage

Standard isolation, contamination level 1, overvoltage category I

| | | |
|--------------|--------|--------|
| | Input | Output |
| Power supply | 2200 V | 2200 V |
| Input | | 2200 V |

Ambient tests

EN 60 068-2-6: Vibration

Acceleration: ± 2 g

Frequency range: 10 ... 150 ... 10 Hz, rate of frequency sweep: 1 octave/minute

Number of cycles: 10, in each of the three axes

EN 60 068-2-27: Shock

Acceleration: 3 × 50 g, 3 shocks each in 6 directions

EN 60 068-2-1/-2/-3: Cold, dry heat, damp heat

Environmental conditions

Commissioning temperature: - 10 to + 55 °C


Operating temperature: - 25 to + 55 °C

Storage temperature: - 40 to + 70 °C

Annual mean relative humidity: ≤ 75%

Table 3: Ordering information

(see also Table 1: "Standard versions")

| | |
|---|---|
| Order Code 819 - |  |
| Features, Selection | |
| 1. Mechanical design | |
| 3) Housing P12/17 for rail mounting, screw terminals not pluggable | 3 |
| 9) Housing P12/17 St for rail mounting, screw terminals pluggable | 9 |
| 2. Version / Power supply | |
| 1) Standard, 24 ... 60 V DC/AC | . 1 |
| 2) Standard, 85 ... 230 V DC/AC | . 2 |
| 3. Function | |
| 1) 1 input max. 600 V, 1 electrically insulated output | . . 1 |
| 2) 1 input > 600 to 1000 V, 1 electrically insulated output | . . 2 |
| 4. Input signal | |
| 9) Input [V] | . . . 9 |
| Z) Input [mA] | . . . Z |
| Line 9: [V] 0 ... 0.06 to 0 ... 600 resp. 0...> 40 to 0...1000*, also live-zero, start value > 0 to 50% final value or span 0.06 (>40*) to 600 V (1000*) V between - 600 (- 1000*) and 600 (1000*) also bipolar asymmetrical. * for line 2 in feature 3 only! | |
| Line Z: [mA] 0 ... 0.1 to 0 ... 40; 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. Not for line 2 in feature 3! | |

SINEAX TV 819 1 channel

Isolating amplifier unipolar/bipolar

| | |
|--|-----------------|
| Order Code 819 - | |
| Features, Selection | |
| 5. Output signal | |
| 9) Output [V] | 9 |
| Z) Output [mA] | Z |
| 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 | |
| 6. Output characteristic | |
| 0) Standard (directly proportional, 0...Y / 0,2Y...Y / -Y...0...+Y) | . 0 |
| 1) Inversely proportional, Y...0 / Y...0,2Y / +Y...0...-Y) | . 1 |
| 7. Test certificate | |
| 0) Without test certificate | . . 0 |
| D) Test certificate in German | . . D |
| E) Test certificate in English | . . E |

Dimensional drawings

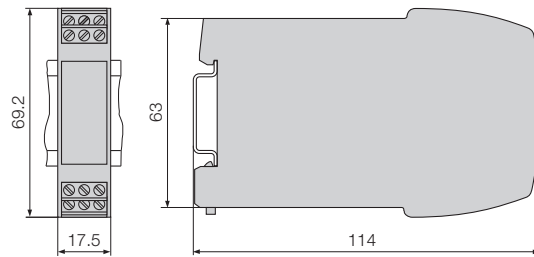


Fig. 3. SINEAX TV 819 in carrying rail housing **P12/17** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022), screw terminals not pluggable.

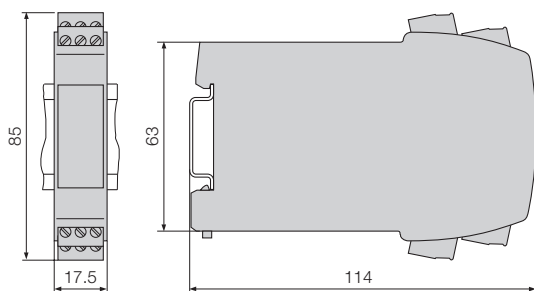


Fig. 4. SINEAX TV 819 in carrying rail housing **P12/17 St** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022), screw terminals pluggable.

Y = Output circuit full-scale value

Standard accessories

1 Operating Instructions in German, French and English

Electrical connections

| Measuring function / application | DC voltage (direct input) | DC current | DC voltage (input via potential divider) | |
|--|---------------------------|----------------------|--|-------------------------|
| | Measuring span | 0.06 ... 40 V | 0.1 ... 40 mA | > 40 ... 600 V |
| Measuring range limits taking account of the max. measuring span | - 40 ... 0 ... 40 V | - 40 ... 0 ... 40 mA | - 600 ... 0 ... 600 V | - 1000 ... 0 ... 1000 V |
| Electrical connections | | | | |