

SINEAX I552

Transducer for AC current

With power supply
 RMS value measurement, with 2 measuring ranges
 Carrying rail housing P13/70

Application

The transducer **SINEAX I552** (Fig. 1) converts a sinusoidal or a distorted AC current into a **load independent** DC current or a **load independent** DC voltage proportional to the measured value.

The transducer 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.

Features / Benefits

- Measuring input: AC current, sine or distorted wave forms, RMS value measurement

| Measured variable | Measuring range limits |
|-------------------|----------------------------------|
| AC current | 0...0.1 / 0.5 to 0...≤ 1.2 / 6 A |

- Measuring output: Unipolar or live zero output variables
- Measuring principle: Logarithmic method
- AC/DC power supply / Universal
- Standard version as per Germanischer Lloyd

Mode of operation

Input signal I~ is galvanically separated from the mains network using a transformer.

The following mathematical expression is then formed using a root-mean-square value computer

$$I_{\text{eff}} = \sqrt{\frac{1}{T} \int_0^T i^2 dt}$$



Fig. 1. Transducer SINEAX I552 in housing P13/70 clipped onto a top-hat rail.

Following filtration by means of an active filter, the transformation properties of the measuring transducer are determined in the succeeding characteristics circuit.

The output amplifier transforms the measuring signal into an impressed DC current output signal A.

The electronic components are supplied with voltage H from the mains supply unit.

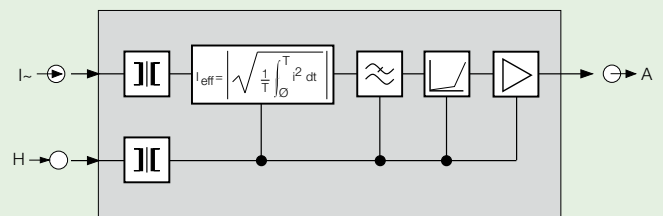


Fig. 2. Block diagram.

Technical data

General

| | |
|----------------------|---|
| Measured quantity: | AC current Sine or distorted wave forms RMS value measurement |
| Measuring principle: | Logarithmic method |

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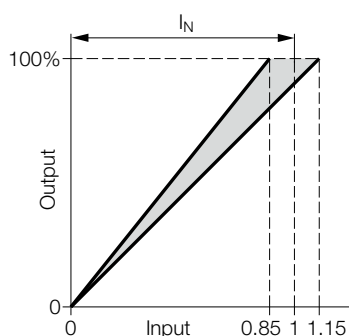
Transducer for AC current

Measuring input E $\rightarrow \oplus$

Nominal frequency f_N : 50/60 or 400 Hz

Nominal input current I_N
(measuring range end value): Measuring range limit values
0...0.1 / 0.5 to 0...< 1.2 / 6 A
Measuring range end value ratio
1 : 5

Setting: Admissible alteration of full scale output, variable sensitivity, adjustable with potentiometer
Setting range
0.85...1.15 · I_N ($\pm 15\%$)



Own consumption: ≤ 1 VA with input end value

Overload capacity:

| Measured quantity I_N | Number of applications | Duration of one application | Interval between two successive applications |
|----------------------------|------------------------|-----------------------------|--|
| $1.2 \cdot I_N$ | — | continuously | — |
| $20 \cdot I_N$ | 10 | 1 s | 100 s |

Measuring output A $\rightarrow \oplus$

Load-independent DC current: 0...1 to 0...20 mA
resp. live-zero
0.2...1 to 4...20 mA

Burden voltage: 15 V

External resistance: $R_{\text{ext max.}} [\text{k}\Omega] = \frac{15 \text{ V}}{I_{\text{AN}} [\text{mA}]}$
 I_{AN} = Output current end value

Load-independent DC voltage: 0...1 to 0...10 V
resp. live-zero
0.2...1 to 2...10 V

External resistance: $R_{\text{ext}} [\text{k}\Omega] \geq \frac{U_A [\text{V}]}{2 \text{ mA}}$

Current limit under overload: $\leq 1.5 \cdot I_{\text{AN}}$ at current output
Approx. 10 mA at voltage output

Voltage limit under $R_{\text{ext}} = \infty$: ≤ 25 V

Residual ripple in output current: $\leq 0.5\%$ p.p. at setting time 300 ms
 $\leq 2\%$ p.p. at setting time 50 ms

Setting time: 50 ms or 300 ms

Power supply H $\rightarrow \ominus$

AC/DC power pack (DC or 50/60 Hz)

Table 1: Rated voltages and permissible variations

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

Option: Connected to the low tension terminal side 12 and 13
24 V AC or 24...60 V DC

Power consumption: 3 VA

Accuracy (acc. to EN 60 688)

Reference value: Output end value

Basic accuracy: Class 0.5

Reference conditions:

Ambient temperature: 15 ... 30 °C

Input variable: Rated operating range

Frequency: $f_N \pm 2$ Hz

Curve shape: Sine-wave

Crest factor: $\sqrt{2}$

Power supply: In rated range

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

Warm-up time: ≤ 5 min.

Influence effects (maxima): included in basic error

Frequency: 40 ... 400 Hz, $\pm 0.3\%$
30 ... 1000 Hz, $\pm 0.5\%$

Crest factor: 1 ... 2.5, $\pm 0.2\%$
> 2.5 ... 6, $\pm 0.5\%$

Safety

Protection class: II (protection isolated, EN 61 010)

Housing protection: IP 40, housing (test wire, EN 60 529)
IP 20, terminals (test finger, EN 60 529)

Contamination level: 2

Overvoltage category: III

Rated insulation voltage (versus earth): 300 V, input
230 V, power supply
40 V, output

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| | | | |
|---------------|--|-----------------------|---------------|
| Test voltage: | 50 Hz, 1 min. acc. to EN 61 010-1 3700 V, input versus all other circuits as well as outer surface 3700 V, power supply versus output as well as outer surface 490 V, output versus outer surface | Relative humidity: | ≤ 75%, no dew |
| | | Altitude: | 2000 m max. |
| | | Indoor use statement! | |

Installation data

| | |
|----------------------|---|
| Mechanical design: | Housing P13/70 |
| Material of housing: | Lexan 940 (polycarbonate), flammability Class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen |
| Mounting: | For rail mounting |
| Mounting position: | Any |
| Weight: | Approx. 0.3 kg |

Connecting terminals

| | |
|---|---|
| Connection elements: | Screw-type terminals with indirect wire pressure |
| Permissible cross section of the connection leads: | ≤ 4.0 mm ² single wire or 2 x 2.5 mm ² fine wire |

Environmental conditions

| | |
|------------------------|-----------------|
| Operating temperature: | - 10 to + 55 °C |
| Storage temperature: | - 40 to + 70 °C |

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 x 50 g 3 shocks each in 6 directions |
| EN 60 068-2-1/-2/-3: | Cold, dry heat, damp heat |
| IEC 1000-4-2/-3/-4/-5/-6 EN 55 011: | Electromagnetic compatibility |

Germanischer Lloyd

| | |
|----------------------------|------------------|
| Type approval certificate: | No. 12 258-98 HH |
| Ambient category: | C |
| Vibration: | 0.7 g |

Table 2: Standard version

The following transducer version is available as standard version. It is only necessary to quote the **Order No.:**

| Nominal frequency | Measuring range by changing connections | Output signal | Power supply DC or 40...400 Hz | Setting time | Order No. |
|-------------------|---|---------------|--------------------------------|--------------|-----------|
| 50/60 Hz | 0 ... 1.0 A / 5 A | 4 ... 20 mA | 85 ... 230 V | 300 ms | 133 760 |

The complete order code 552-4... .. according to "Table 3: Specification and ordering information" must be stated for versions other than the basic version and for special configurations.

Table 3: Specification and ordering information (see also Table 2: Standard version)

| Description | *Blocking code | No-go with blocking code | Article No./ Feature |
|-----------------------------------|---------------------------------|--------------------------|----------------------|
| SINEAX I552 | Order Code 552 - xxxx xx | | 552 - |
| Features, Selection | | | |
| 1. Mechanical design | | | |
| Housing P13/70 for rail mounting | | | 4 |
| 2. Nominal input frequency | | | |
| 50 / 60 Hz | | | 1 |
| 400 Hz | | | 3 |

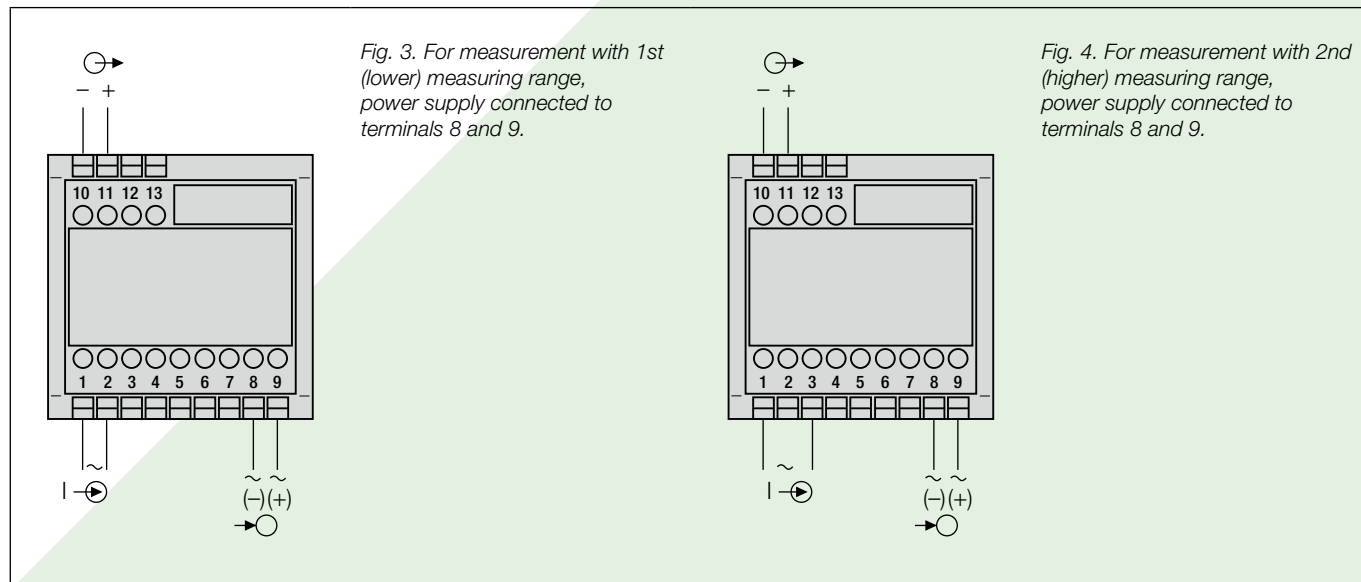
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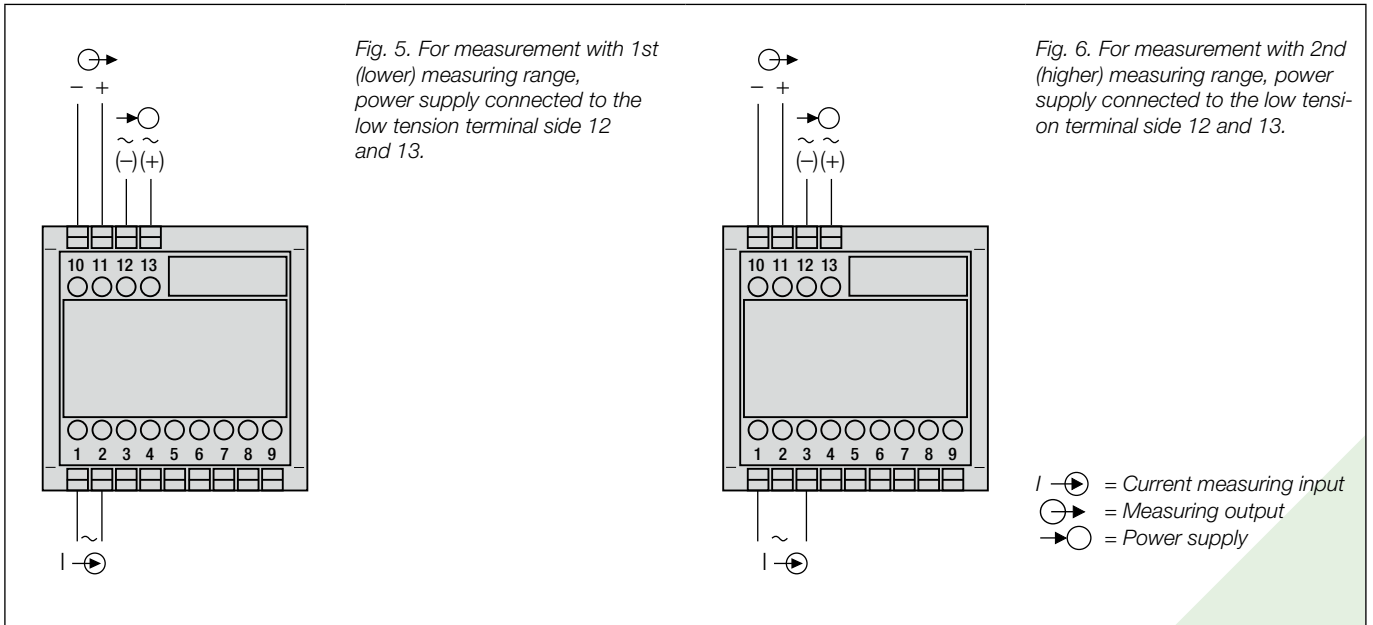
| Description | *Blocking code | No-go with blocking code | Article No./ Feature |
|--|---------------------------------|--------------------------|----------------------|
| SINEAX I552 | Order Code 552 - xxxx xx | | 552 - |
| Features, Selection | | | |
| 3. Measuring range | | | |
| 0 ... 1 / 5 A | | | 1 |
| 0 ... 1.2 / 6 A | | | 2 |
| Non-standard 0 ... 0.1/0.5 to 0 ... < 1.2 / 6 Measuring range end value ratio 1 : 5 | [A] | | 9 |
| 4. Output signal | | | |
| 0 ... 20 mA, $R_{ext} \leq 750 \Omega$ | | | 1 |
| 4 ... 20 mA, $R_{ext} \leq 750 \Omega$ | | | 2 |
| Non-standard 0 ... 1.00 to 0 ... < 20 0.2 ... 1 to < (4 ... 20) | [mA] | | 9 |
| 0 ... 10 V, $R_{ext} \geq 5 k\Omega$ | | | A |
| Non-standard 0 ... 1.00 to 0 ... < 10 0.2 ... 1 to 2 ... 10 | [V] | | Z |
| 5. Power supply | | | |
| 85 ... 230 V DC/AC | | | 1 |
| 24 ... 60 V DC/AC | | | 2 |
| 24 V AC / 24 ... 60 V DC, low tension | | | 5 |
| 6. Setting time | | | |
| 0.3 s | | | 1 |
| 50 ms | | | 2 |

* Lines with letter(s) under «no-go» cannot be combined with preceding lines having the same letter under "Blocking code".

Electrical connections



SINEAX I552 Transducer for AC current



Dimensional drawing

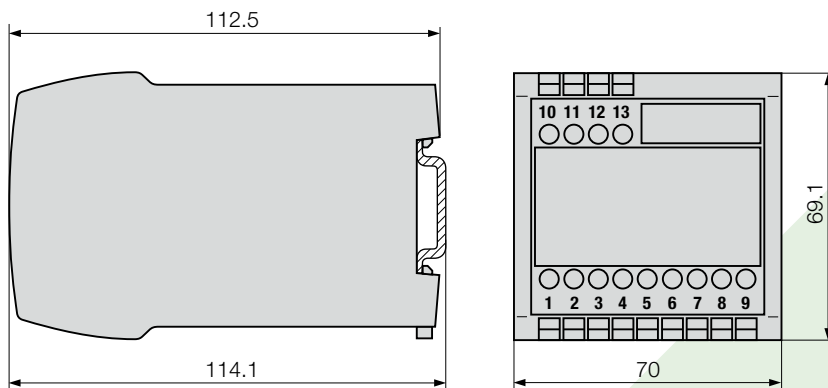


Fig. 7. SINEAX I552 in housing **P13/70** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022).

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