

SINEAX I552

Transducer for AC current

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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.

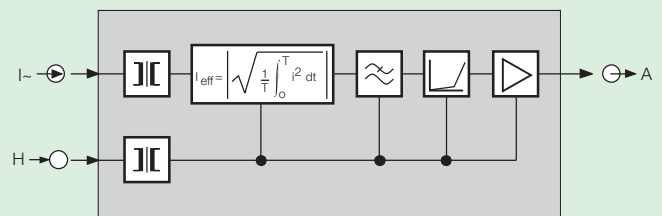


Fig. 2. Block diagram.

Technical data

General

Measured quantity: AC current
 Sine or distorted wave forms
 RMS value measurement

Measuring principle: Logarithmic method

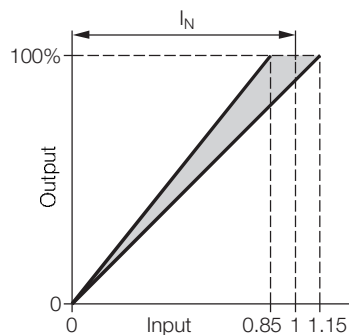
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Measuring input E →

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 (± 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 →

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: $R_{ext} \text{ max. [k}\Omega] = \frac{15 \text{ V}}{I_{AN} \text{ [mA]}}$
 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: $R_{ext} \text{ [k}\Omega] \geq \frac{U_A \text{ [V]}}{2 \text{ mA}}$
Current limit under overload: ≤ $1.5 \cdot I_{AN}$ at current output
Approx. 10 mA at voltage output
Voltage limit under $R_{ext} = \infty$: ≤ 25 V

Residual ripple in output current: ≤ 0.5% p.p. at setting time 300 ms
≤ 2% p.p. at setting time 50 ms
Setting time: 50 ms or 300 ms

Power supply H →

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 ± 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: $0.5 \cdot R_{ext} \text{ max.}$
Voltage: $2 \cdot R_{ext} \text{ min.}$
Warm-up time: ≤ 5 min.

Influence effects (maxima): included in basic error

Frequency: 40 ... 400 Hz, ± 0.3%
30 ... 1000 Hz, ± 0.5%
Crest factor: 1 ... 2.5, ± 0.2%
> 2.5 ... 6, ± 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

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

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

Connecting terminals

Connection elements: Screw-type terminals with indirect
wire pressure
Permissible cross section
of the connection leads: ≤ 4.0 mm² single wire or
2 x 2.5 mm² fine wire

Germanischer Lloyd

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

Environmental conditions

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

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

SINEAX I552

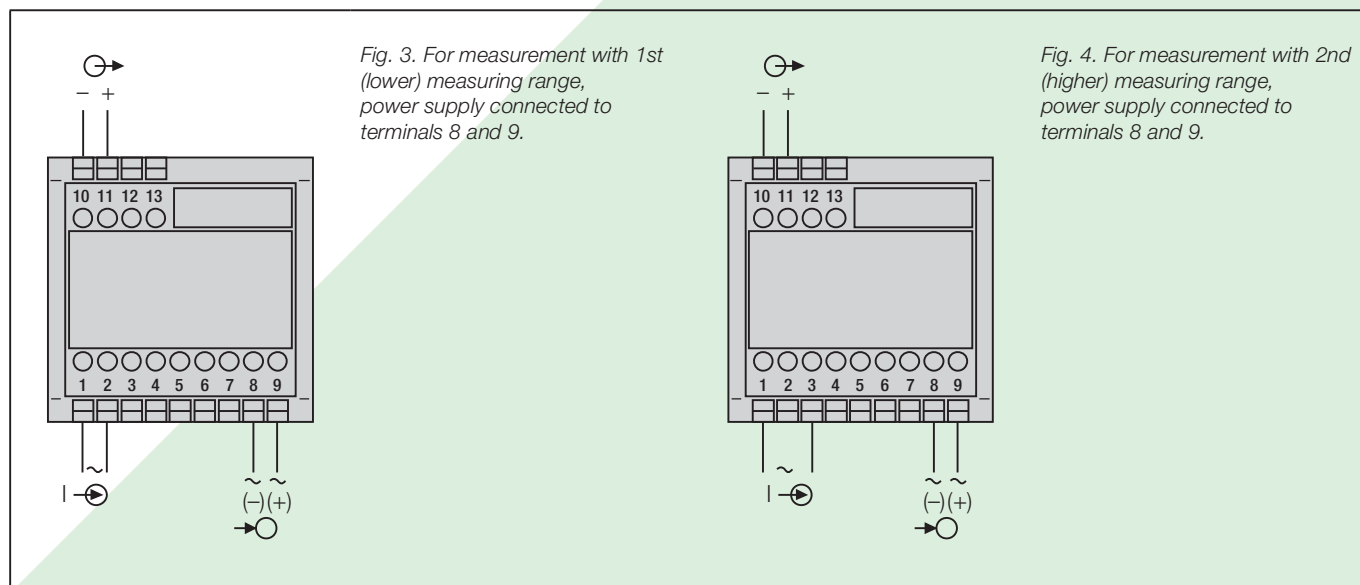
Transducer for AC current

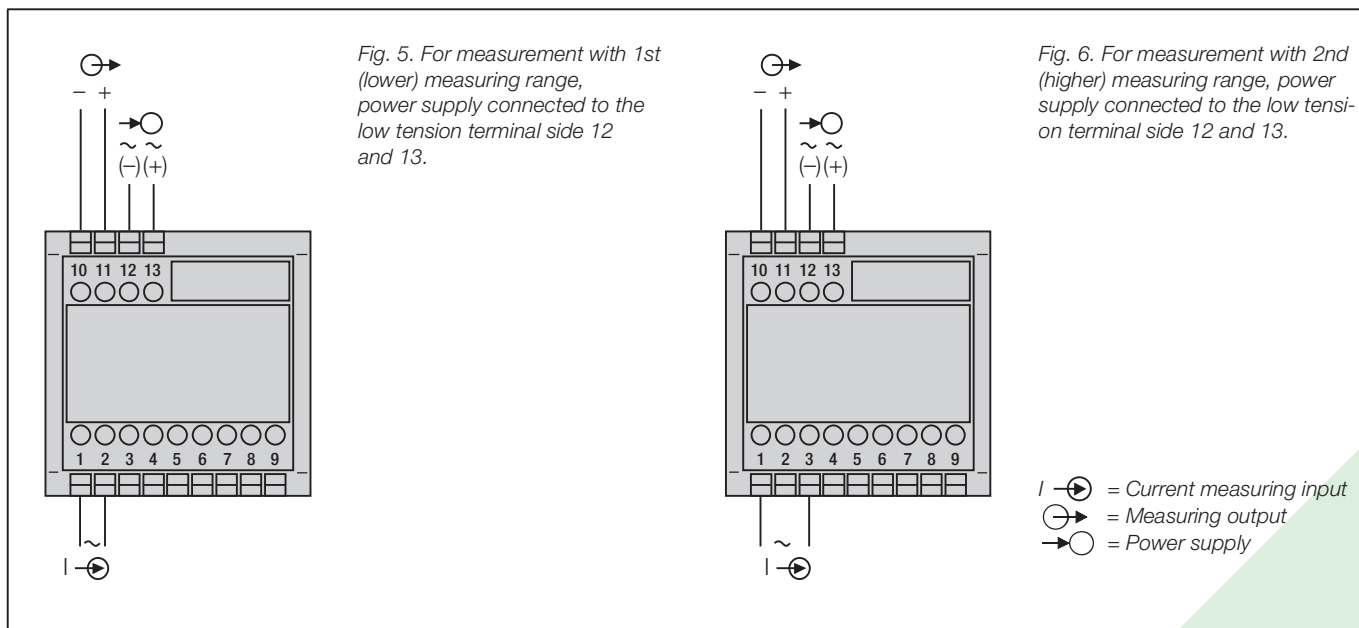
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Description	*Blocking code	No-go with blocking code	Article No./ Feature
SINEAX I552	Order Code 552 - xxxx xx		552 -
Features, Selection			
3. Measuring range			
0 ... 1 / 5 A			1
0 ... 1.2 / 6 A			2
Non-standard 0 ... 0.1/0.5 to 0 ... < 1.2 / 6 Measuring 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





Dimensional drawing

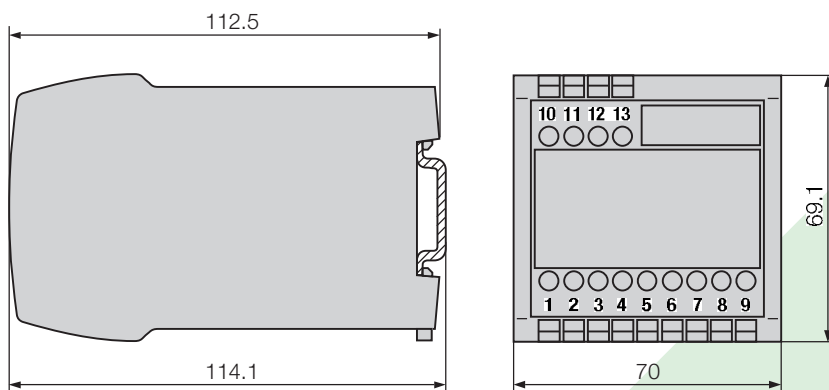


Fig. 7. SINEAX I552 in housing **P13/70** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022).