

SINEAX I552

Transducer for AC current

With power supply

RMS value measurement, with 2 measuring ranges

Carrying rail housing P13/70



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

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_{\sim} is galvanically separated from the mains network using a transformer.

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

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

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.

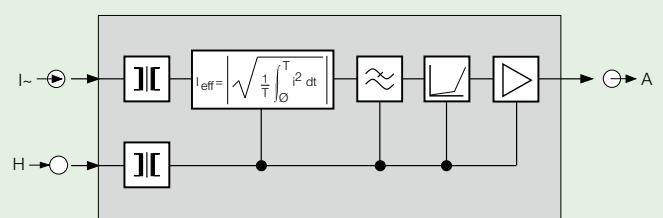


Fig. 2. Block diagram.

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 →

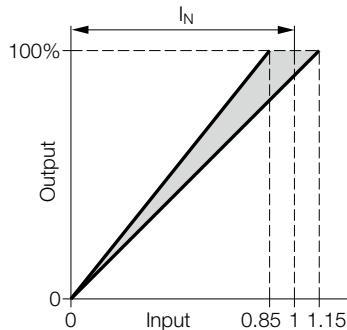
Nominal frequency f_N : 50/60 or 400 Hz

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 ($\pm 15\%$)



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 · I_N	—	continuously	—
20 · 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:

$$R_{\text{ext}} \text{ max. } [\text{k}\Omega] = \frac{15 \text{ V}}{I_{\text{AN}} [\text{mA}]}$$

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:

$$R_{\text{ext}} [\text{k}\Omega] \geq \frac{U_{\text{A}} [\text{V}]}{2 \text{ mA}}$$

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 →

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 $\pm 0.2\%$
 $> 2.5 \dots 6$ $\pm 0.5\%$

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: Altitude: Indoor use statement!	$\leq 75\%$, no dew 2000 m max.
Installation data			
Mechanical design:	Housing P13/70	EN 60 068-2-6:	Vibration
Material of housing:	Lexan 940 (polycarbonate), flammability Class V-0 acc. to UL 94, self-extinguishing, non-dripping, free of halogen	Acceleration:	$\pm 2\text{ g}$
Mounting:	For rail mounting	Frequency range:	10 ... 150 ... 10 Hz, rate of frequency sweep: 1 octave/minute
Mounting position:	Any	Number of cycles:	10, in each of the three axes
Weight:	Approx. 0.3 kg	EN 60 068-2-27:	Shock
Connecting terminals			
Connection elements:	Screw-type terminals with indirect wire pressure	Acceleration:	3 x 50 g 3 shocks each in 6 directions
Permissible cross section of the connection leads:	$\leq 4.0\text{ mm}^2$ single wire or $2 \times 2.5\text{ mm}^2$ fine wire	EN 60 068-2-1/-2/-3:	Cold, dry heat, damp heat
Environmental conditions			
Operating temperature:	– 10 to + 55 °C	IEC 1000-4-2/-3/-4/-5/-6	Electromagnetic compatibility
Storage temperature:	– 40 to + 70 °C	EN 55 011:	
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

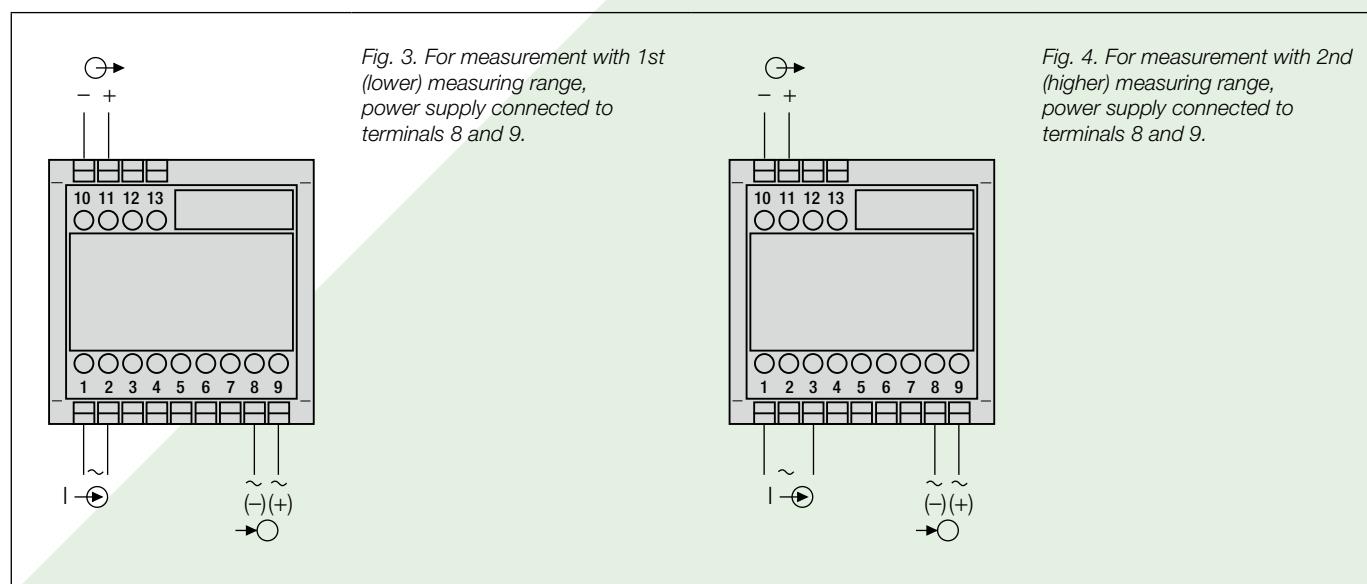
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Description	*Blocking code	No-go with blocking code	Article No./Feature
SINEAX I552	Order Code 552 - xxxx xx		552 -
Features, Selection			
3. Measuring range			
0 ... 1 / 5 A			1
0 ... 1.2 / 6 A			2
Non-standard 0 ... 0.1/0.5 to 0 ... < 1.2 / 6 Measuring 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, $R_{ext} \geq 5 \text{ k}\Omega$			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



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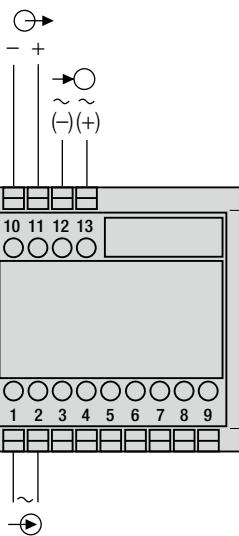


Fig. 5. For measurement with 1st (lower) measuring range, power supply connected to the low tension terminal side 12 and 13.

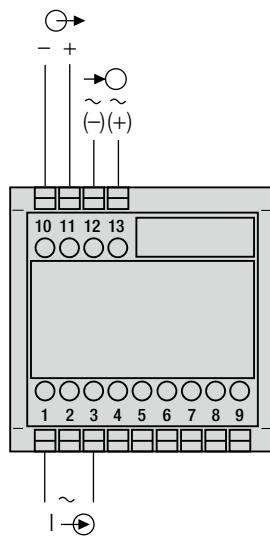


Fig. 6. For measurement with 2nd (higher) measuring range, power supply connected to the low tension terminal side 12 and 13.

= Current measuring input
 = Measuring output
 = Power supply

Dimensional drawing

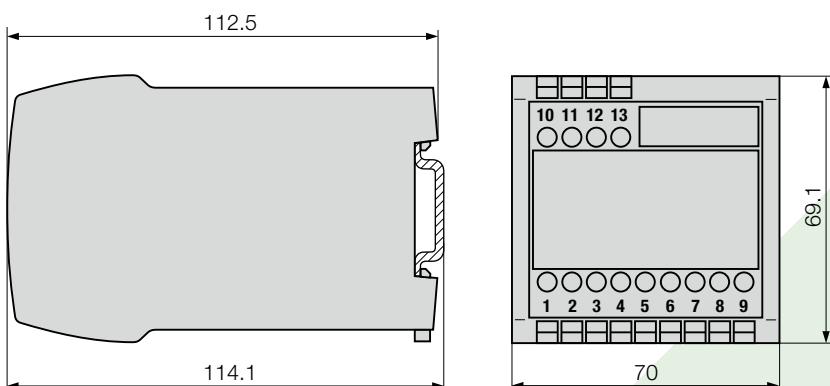


Fig. 7. SINEAX I552 in housing P13/70 clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).


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