SINEAX I 552
Transducer for AC current

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

Application

The transducer **SINEAX I 552** (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.

*Fig. 1. Transducer SINEAX I 552 in housing **P13/70** clipped onto a top-hat rail.*

Features / Benefits

- **Measuring input: AC current, sine or distorted wave forms, true 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

$$I_{eff} = \left| \sqrt{\frac{1}{T}\int_{o}^{T} i^2 \, dt} \right|$$

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.

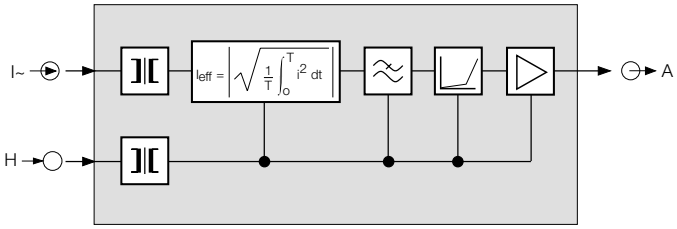


Fig. 2. Block diagram.

Table 1: Standard versions

The following transducer versions are available as standard versions. 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	0 … 20 mA	85 … 230 V	300 ms	133 752
	0 … 1.0 A / 5 A	4 … 20 mA			133 760
	0 … 1.2 A / 6 A	0 … 20 mA			133 778
	0 … 1.2 A / 6 A	4 … 20 mA			133 786

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.

SINEAX I 552
Transducer for AC current

Technical data

General

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

Measuring principle: Logarithmic method

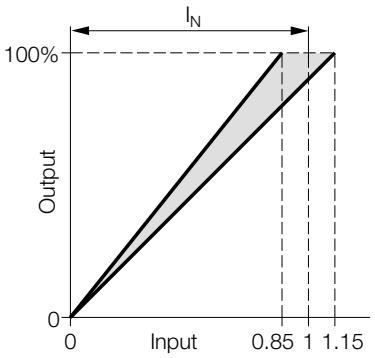
Measuring input E

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 · 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_{ext} max. [kΩ] = $\frac{15\ V}{I_{AN}\ [mA]}$

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

Residual ripple in output current: ≤ 1.5 · 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 40…400 Hz)

Table 2: Rated voltages and permissible variations

Rated voltage	Tolerance
85 … 230 V DC / AC	DC – 15 … + 33% AC ± 15%
24 … 60 V DC / AC	

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

Power consumption: ≤ 1.5 W resp. ≤ 3 VA

Accuracy (acc. to DIN/IEC 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 ± 2 Hz

Curve shape: Sine-wave

Crest factor: $\sqrt{2}$

Power supply: In rated range

Output burden: Current: 0.5 · R_{ext} max.
Voltage: 2 · R_{ext} 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, DIN 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 DIN 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

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

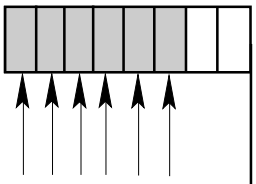
Connection element:	Screw-type terminals with indirect wire pressure
Permissible cross section of the connection leads:	≤ 4.0 mm² single wire or 2 × 2.5 mm² fine wire

Environmental conditions

Climatic rating:	Climate class 3 acc. to VDI/VDE 3540
Operating temperature:	– 10 to + 55 °C
Storage temperature:	– 40 to +70 °C
Relative humidity of annual mean:	≤ 75%

Table 3: Specification and ordering information (see also Table 1: Standard versions)

Order Code **552 -**			
Features, Selection		*SCODE	no-go
1. Mechanical design			
4) Housing P13/70 for rail mounting			
2. Nominal input frequency			
1) 50 / 60 Hz			
3) 400 Hz			
3. Measuring range			
1) 0 … 1 / 5 A			
2) 0 … 1.2 / 6 A			
9) Non-standard 0 … 0.1/0.5 to 0 … < 1.2/6 Measuring range end value ratio 1 : 5	[A]		
4. Output signal			
1) 0 … 20 mA, R_{ext} ≤ 750 Ω			
2) 4 … 20 mA, R_{ext} ≤ 750 Ω			
9) Non-standard 0 … 1.00 to 0 … < 20 0.2 … 1 to < (4 … 20)	[mA]		
A) 0 … 10 V, R_{ext} ≥ 5 kΩ			
Z) Non-standard 0 … 1.00 to 0 … < 10 0.2 … 1 to 2 … 10	[V]		
5. Power supply			
1) 85 … 230 V DC/AC			
2) 24 … 60 V DC/AC			
5) 24 V AC / 24 … 60 V DC, low tension			
6. Setting time			
1) 0.3 s			
2) 50 ms			



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

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Electrical connections

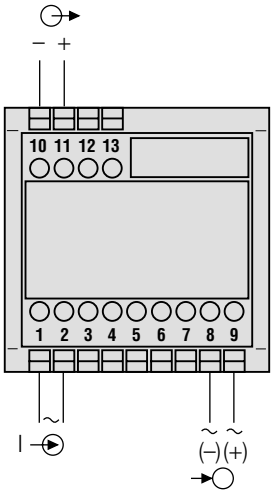

Fig. 3. For measurement with 1st (lower) measuring range, power supply connected to terminals 8 and 9.

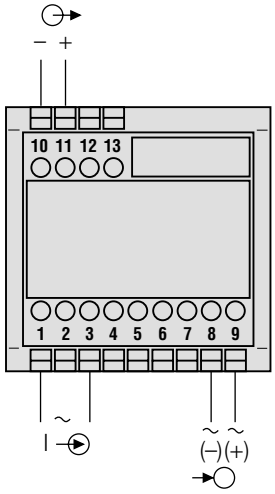

Fig. 4. For measurement with 2nd (higher) measuring range, power supply connected to terminals 8 and 9.

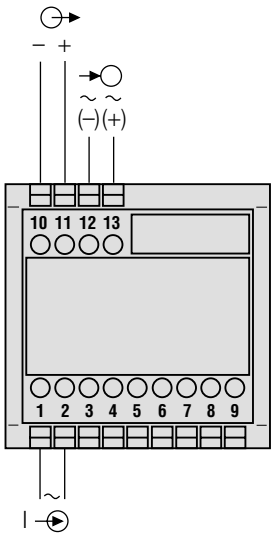

Fig. 5. For measurement with 1st (lower) measuring range, power supply connected to the low tension terminal side 12 and 13.

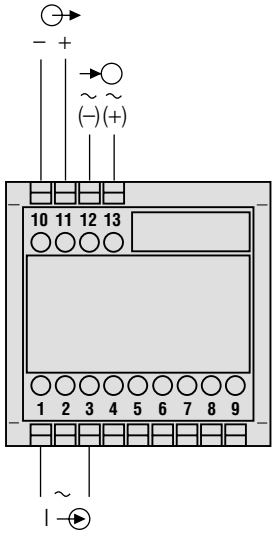

Fig. 6. For measurement with 2nd (higher) measuring range, power supply connected to the low tension terminal side 12 and 13.

I = Current measuring input
= Measuring output
= Power supply

Dimensional drawing

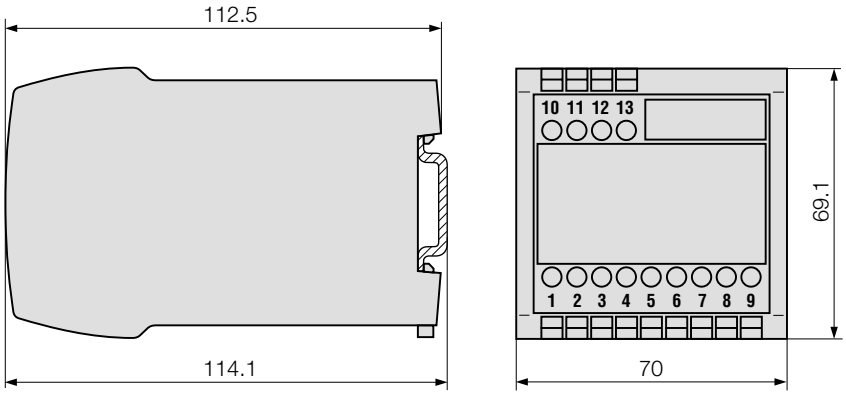

*Fig. 7. SINEAX I 552 in housing **P13/70** clipped onto a top-hat rail (35 × 15 mm or 35 × 7.5 mm, acc. to EN 50 022).*

Printed in Switzerland • Subject to change without notice • Edition 03.99 • Data sheet No. I 552 Le

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