

SINEAX U 543

Transducer for AC voltage

Self-powered
Carrying rail housing P8/35



Application

The transducer **SINEAX U 543** (Fig. 1) converts a sinusoidal AC voltage signal into an output signal that can serve several receiving instruments such as indicators, recorders, alarm units etc.

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. SINEAX U 543 transducer in housing P8/35 clipped onto a top-hat rail.

Features / Benefits

- Self-powered / Less wiring expense
- Low power consumption / Smaller VT's can be used
- Standard version as per Germanischer Lloyd

Layout and mode of operation

The transducer comprises a transformer W, a rectifier unit G and a low-pass filter T (Fig. 2).

The measured variable is isolated from the electronics by the transformer W, and is rectified and smoothed in the rectifier unit G following. The amplifier amplifies the resultant signal and converts it into the load-independent DC signal.

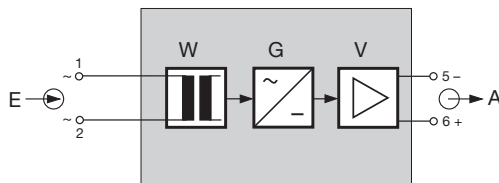


Fig. 2. Block diagram.

Table 1: Standard versions

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

| Description | Measuring range | Output signal | Order No. |
|--|-----------------|---------------|-----------|
| Transducer for AC voltage, nominal frequency 50 / 60 Hz in housing P8/35 | 0... 57.74 V | 0... 5 mA | 129 701 |
| | 0... 57.74 V | 0...20 mA | 129 727 |
| | 0... 63.5 V | 0... 5 mA | 129 735 |
| | 0... 63.5 V | 0...20 mA | 129 751 |
| | 0...100 V | 0... 5 mA | 129 769 |
| | 0...100 V | 0...20 mA | 129 785 |
| | 0...110 V | 0... 5 mA | 129 793 |
| | 0...110 V | 0...20 mA | 129 818 |
| | 0...120 V | 0... 5 mA | 137 134 |
| | 0...120 V | 0...20 mA | 137 142 |
| | 0...250 V | 0... 5 mA | 129 826 |
| | 0...250 V | 0...20 mA | 129 842 |
| | 0...500 V | 0... 5 mA | 136 441 |
| 0...500 V | 0...20 mA | 136 459 | |

Please complete the Order Code 543-4... . acc. to "Table 2: Specification and ordering information" for versions with user-specific input ranges and/ or variable sensitivity.

Technical data

Measuring input E

Nominal frequency: 50 / 60 Hz
 Nominal input voltage U_N
 (measuring range end value): Measuring range limit values
 0...20 to 0...600 V

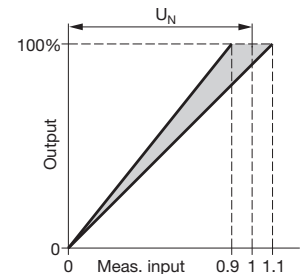
Own consumption at nominal frequency 50 Hz:

| I_{AN} [mA] | [VA] |
|---------------|------|
| 1 | 1.2 |
| 5 | 1.4 |
| 10 | 1.6 |
| 20 | 2.0 |

Setting (special feature):

Admissible alteration of full scale output, variable sensitivity, adjustable with potentiometer

Setting range approx. $0.9 \dots 1.1 \cdot U_N$ (approx. $\pm 10\%$)



Overload capacity:

| Measured quantity U_N | Number of applications | Duration of one application | Interval between two successive applications |
|-------------------------|------------------------|-----------------------------|--|
| $1,2 \times U_N$ | — | continuously | — |
| $2 \times U_N$ | 10 | 1 s | 10 s |

Measuring output A

Standard ranges: 0...1, 0...5, 0...10 or 0... 20 mA
 Burden voltage: 15 V
 External resistance: $R_{ext} \text{ max. [k}\Omega\text{]} = \frac{15 \text{ V}}{I_{AN} \text{ [mA]}}$
 I_{AN} = full output value

Not superimposed DC voltage U_A : 0...10 V
 External resistance $\geq 200 \text{ k}\Omega$

Current limit under overload: $\leq 1.7 \cdot I_{AN}$
 Voltage limit under $R_{ext} = \infty$: $\leq 54 \text{ V}$
 Residual ripple: $\leq 1\% \text{ p.p.}$
 Response time: $\leq 300 \text{ ms}$

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Transducer for AC voltage

Accuracy (acc. to EN 60 688)

Reference value: Output end value
 Basic accuracy: Class 0.5

Reference conditions:

Ambient temperature: 15 ... 30 °C
 Input: 20 ... 100%
 Frequency: $f_N \pm 2$ Hz
 Output burden: Current: $0.5 \cdot R_{ext}$ max.
 Voltage: $2 \cdot R_{ext}$ min.

Additional error:

Temperature influence
 (-10 ... 55 °C) $\pm 0.2\% / 10$ K

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)
 Pollution degree: 2
 Installation category: III (at ≤ 300 V to ground)
 II (at > 300 V to ground)
 Test voltage: 50 Hz, 1 min. acc. to EN 61 010-1
 3700 V, measuring input versus measuring output and outer surface
 490 V, measuring output versus outer surface

Installation data

Mechanical design: Housing P8/35
 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. 0.26 kg

Connecting terminals

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

Environmental conditions

Operating temperature: -10 à + 55 °C
 Storage temperature: -40 à + 70 °C
 Relative humidity of annual mean: $\leq 75\%$

Electrical connections

| Connection | Connecting terminals |
|---------------------------------|----------------------|
| Measuring input E \rightarrow | 1~ and 2~ |
| Measuring output A \leftarrow | 5- and 6+ |

Table 2: Specification and ordering information

(see also Table 1: "Standard versions")

| Order Code 543 - | |
|--|-----------------------|
| Features, Selection | |
| 1. Mechanical design | |
| 4) Housing P8/35 for rail mounting | 4 |
| 2. Measuring range | |
| A) 0 ... 100/ $\sqrt{3}$ V | . A |
| B) 0 ... 110/ $\sqrt{3}$ V | . B |
| C) 0 ... 120/ $\sqrt{3}$ V | . C |
| D) 0 ... 100 V | . D |
| E) 0 ... 110 V | . E |
| F) 0 ... 116.66 V | . F |
| G) 0 ... 120 V | . G |
| H) 0 ... 125 V | . H |
| J) 0 ... 133.33 V | . J |
| K) 0 ... 150 V | . K |
| L) 0 ... 250 V | . L |
| M) 0 ... 400 V | . M |
| N) 0 ... 500 V | . N |
| Z) Non-standard [V] <input type="text"/> | . Z |
| Lines M, N, Z: Max. 250 V nominal value of the network against earth (operating voltage acc. to EN 61 010) | |
| 3. Output signal | |
| 1) 0... 5 mA, $R_{ext} \leq 3$ k Ω | . . 1 |
| 2) 0...10 mA, $R_{ext} \leq 1,5$ k Ω | . . 2 |
| 3) 0...20 mA, $R_{ext} \leq 750$ Ω | . . 3 |
| 4) 0... 1 mA, $R_{ext} \leq 15$ k Ω | . . 4 |
| A) 0...10 V, $R_{ext} \geq 200$ k Ω | . . A |
| Z) Non-standard [V] <input type="text"/> | . . Z |
| 0...1 to 0...<10 | |
| 4. Measuring range adjustable | |
| 0) Meas. range end value permanently set | . . . 0 |
| 1) Measuring range can be adjusted approx. $\pm 10\%$ | . . . 1 |
| 5. Test records | |
| 0) Without test records | 0 |
| D) Test records in German | D |
| E) Test records in English | E |

Dimensional drawing

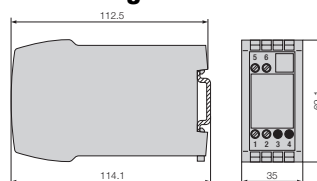


Fig. 3. SINEAX U 543 in housing P8/35 clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).