

SINEAX U 539

Transducer for AC voltage

With power supply
Carrying rail housing P8/35

Application

The transducer **SINEAX U 539** (Fig. 1) converts a sinusoidal AC voltage 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

- **Measuring input: AC voltage, sine wave forms**

Measured variable	Measuring range limits
AC voltage	0 ... 50 to 0 ... 600 V

- **Measuring output: Unipolar and live zero output variables**
- **Also available with output signal 4 ... 20 mA in 2-wire connection**
- **Measuring principle: Rectifier method**
- **Standard as marine version per Lloyd's Register of Shipping**

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	Output signal	Power supply	Order No.
50/60 Hz	0 ... 100 V	0 ... 20 mA	230 V AC 4-wire connection	136 532
	0 ... 250 V			136 540
	0 ... 500 V			126 963
	0 ... 100 V			136 574
	0 ... 250 V	4 ... 20 mA	24 V DC 4-wire connection	136 582
	0 ... 100 V			136 699
	0 ... 250 V			136 706
	0 ... 500 V			126 971

Please complete the Order Code 539-41... according to Table 2: "Specification and Ordering Information" for versions with user-specific input and/or output ranges.

Technical data

Measuring input E

Nominal frequency f_N : 50 / 60 Hz
 Nominal input voltage U_N
 (measuring range end value): Measuring range limit values
 0 ... 50 to 0 ... 600 V
 Own consumption:
 $< U_N \cdot 50 \mu\text{A}$ at $U_N \leq 150 \text{ V}$
 $< U_N \cdot 20 \mu\text{A}$ at
 $U_N > 150 \text{ V}$ to $\leq 400 \text{ V}$
 $< U_N \cdot 5 \mu\text{A}$ at $U_N > 400 \text{ V}$
 Operating voltage: Max. 300 V acc. to EN 61 010



Fig. 1. Transducer SINEAX U 539 in housing P8/35 clipped onto a top-hat rail.

Overload capacity:

Measured quantity U_N	Number of applications	Duration of one application	Interval between two successive applications
$1.2 \cdot U_N$	---	continuously	---
$2 \cdot U_N$	10	1 s	10 s

Measuring output A

Load-independent
DC current:

0 ... 1.0 to 0 ... 20 mA
 resp. live zero
 0.2 ... 1 to 4 ... 20 mA

Burden voltage:

15 V

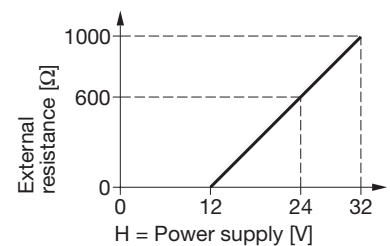
External resistance:

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

I_{AN} = Output current end value

With 2-wire connection

Standard ranges 4 ... 20 mA
 External resistance R_{ext} dependent
 on power supply H (12 ... 32 V DC)



$$R_{\text{ext max.}} [\text{k}\Omega] = \frac{H [\text{V}] - 12 \text{ V}}{20 \text{ mA}}$$

Load-independent
DC voltage:

0 ... 1 to 0 ... 10 V
 resp. live zero
 0.2 ... 1 to 2 ... 10 V

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External resistance:	$R_{\text{ext}} \text{ min. [k}\Omega] \geq \frac{U_A \text{ [M]}}{10 \text{ mA}}$
Residual ripple in output current:	< 30 mA
Voltage limit under $R_{\text{ext}} = \infty$:	< 40 V
Residual ripple in output current:	$\leq 1\%$ p.p.
Setting time:	< 300 ms

Power supply H

AC voltage:	24, 110, 115, 120, 230 or 400 V, $\pm 15\%$, 50 / 60 Hz Power consumption approx. 3 VA
DC voltage:	24 V – 15 / + 33% Power consumption approx. 1.5 W or 24 V, – 50 / + 33% at 2-wire connection and output 4...20 mA
DC or AC voltage:	DC, AC power pack (DC or 40 - 400 Hz) 85 - 230 V or 24 - 60 V DC – 15/+ 33%, AC $\pm 15\%$ Power consumption ≤ 1.5 W resp. ≤ 3 VA

Accuracy (acc. to EN 60 688)

Reference value:	Output end value
Accuracy:	Class 0.5 ($U_N \leq 500$ V) Class 1 ($U_N > 500$ V)

Reference conditions:

Ambient temperature	15 ... 30 °C
Input frequency	50 Hz
Curve shape	Sine-wave, Distortion factor < 1%
Output burden	Current: $0.5 \cdot R_{\text{ext}}$ max. Voltage: $2 \cdot R_{\text{ext}}$ min.
Power supply	In rated range

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 (at ≤ 300 V) II (at > 300 V)
Rated insulation voltage (versus earth):	300 V input 300 V power supply AC 50 V power supply 24 V DC 50 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 AC versus out- put as well as outer surface 490 V, power supply 24 V DC versus output as well as outer surface 490 V, output versus outer surface
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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
Weight:	Approx. 280 g with AC power supply Approx. 210 g with DC power supply Approx. 125 g with 2-wire connection Approx. 220 g with DC, AC power pack

Connecting terminals

Connection element:	Screw-type terminals with indirect wire pressure
Permissible cross section of the connection leads:	$\leq 4,0$ mm ² single wire or $2 \times 2,5$ mm ² fine wire

Environmental conditions

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

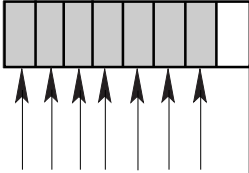
Ambient tests

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:	3×50 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. 12 259-98 HH
Ambient category:	C
Vibration:	0.7 g

Table 2: Specification and ordering information (see also Table 1: Standard versions)

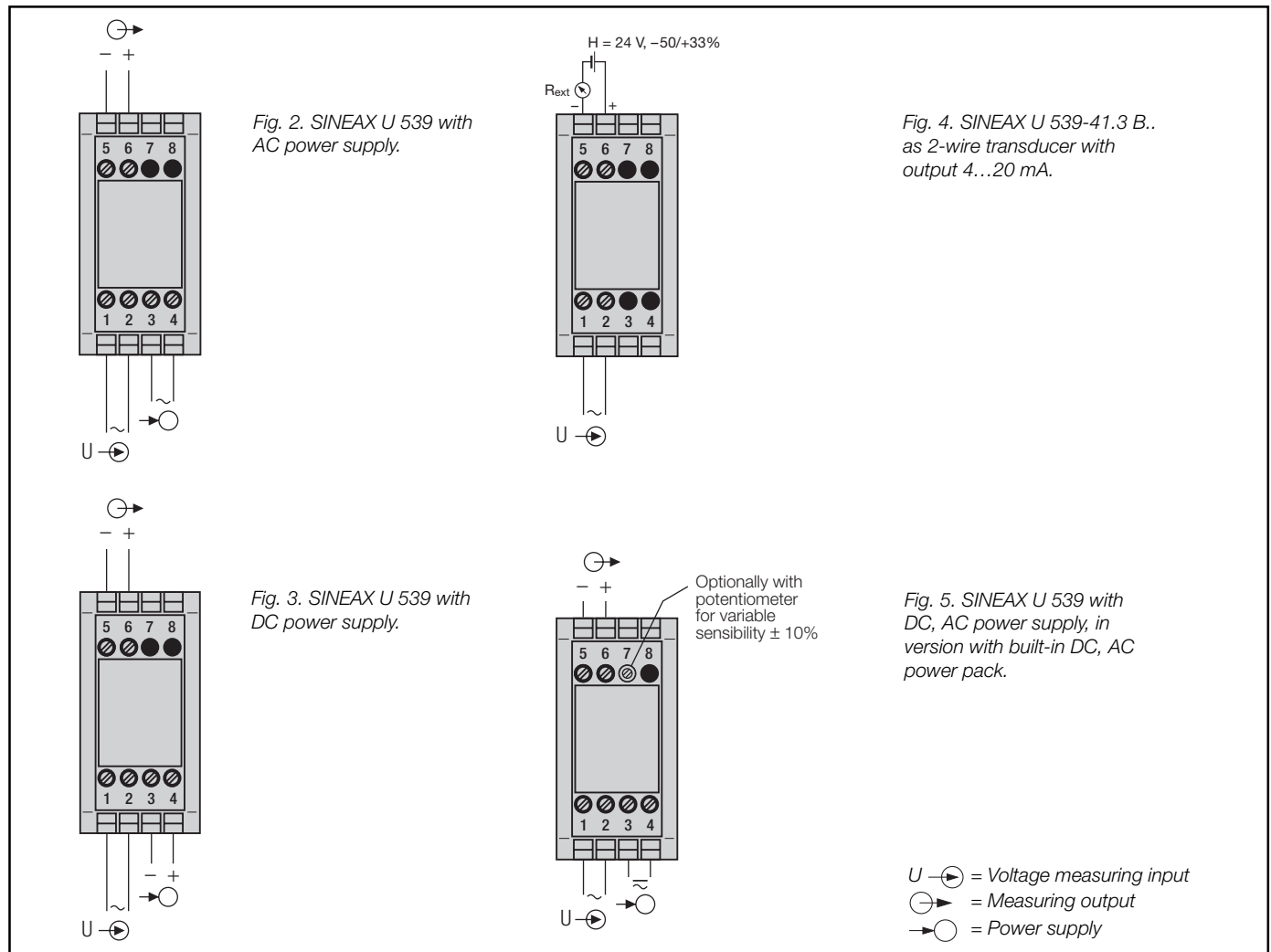
Order Code 539 -				
Features, Selection	*SCODE	no-go		
1. Mechanical design 4) Housing P8/35 for rail mounting			4
2. Nominal input frequency 1) 50 / 60 Hz			.	1.....
3. Measuring range A) 0 ... 100 V B) 0 ... 250 V C) 0 ... 500 V Z) Non-standard [M] <input type="text"/>			..	A.....
			..	B.....
			..	C.....
			..	Z.....
4. Output signal 1) 0 ... 20 mA, $R_{ext} \leq 750 \Omega$ 2) 4 ... 20 mA, $R_{ext} \leq 750 \Omega$ 3) 4 ... 20 mA, 2-wire connection, R_{ext} dependent on power supply 9) Non-standard [mA] <input type="text"/> 0 ... 1 to 0 ... < 20 0.2 ... 1 to < (4 ... 20) A) 0 ... 10 V, $R_{ext} \geq 1 k\Omega$ Z) Non-standard [M] <input type="text"/> 0 ... 1.00 to 0 ... < 10 0.2 ... 1 to 2 ... 10	A A B A A A		..	1.....
			..	2.....
			..	3.....
			..	9.....
			..	A.....
			..	Z.....
5. Power supply 1) 24 V, 50/60 Hz 2) 110 V, 50/60 Hz 3) 115 V, 50/60 Hz 4) 120 V, 50/60 Hz 5) 230 V, 50/60 Hz 6) 400 V, 50/60 Hz, max. 300 V versus earth A) 24 V DC B) 24 V DC via output circuit at 2-wire connection C) 24 ... 60 V DC, AC (DC, AC power pack) D) 85 ... 230 V DC, AC (DC, AC power pack)	C C C C C C C C C C	B B B B B B B A A B B	..	1.....
			..	2.....
			..	3.....
			..	4.....
			..	5.....
			..	6.....
			..	A.....
			..	B.....
			..	C.....
			..	D.....
6. Measuring range adjustable 0) Measuring range end value permanently set (standard) 1) Measuring range can be adjusted approx. $\pm 10\%$ Line 1: Only in combination with DC, AC power pack, feature 5, line C or D!		C	..	0.....
			..	1.....
7. Test certificate 0) Without test certificate D) Test certificate in German E) Test certificate in English			..	0.....
			..	D.....
			..	E.....

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

SINEAX U 539

Transducer for AC voltage

Electrical connections



Dimensional drawing

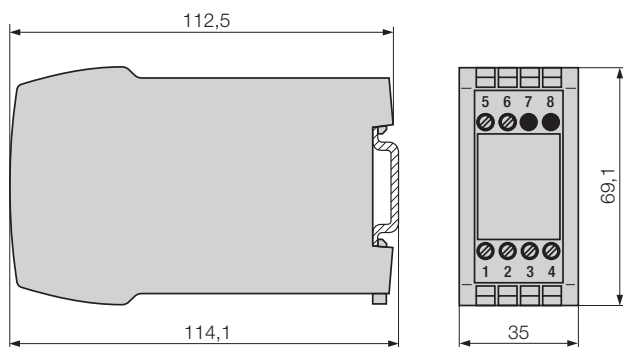


Fig. 6. SINEAX U 539 in housing P8/35 clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).

Standard accessories

1 Operating Instructions in three languages: German, French, English