

SINEAX U 539

Transducer for AC voltage

With power supply
Carrying rail housing P8/35



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

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	4 ... 20 mA	230 V AC	146 995
	0 ... 250 V	4 ... 20 mA	4-wire connection	147 000
	0 ... 500 V	4 ... 20 mA	4-wire connection	147 018
	0 ... 100 V	4 ... 20 mA	24 V DC 2-wire connection	136 699
	0 ... 500 V	4 ... 20 mA	24 V DC 2-wire connection	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 \ominus

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
 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 \ominus

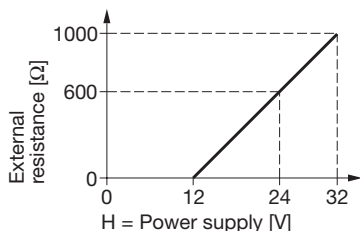
Load-independent DC current: 0 ... 1.0 to 0 ... 20 mA resp. live zero 0.2 ... 1 to 4 ... 20 mA
 Burden voltage: 15 V
 External resistance: $R_{\text{ext}} \text{ max. } [\text{k}\Omega] \leq \frac{15 \text{ V}}{I_{\text{AN}} [\text{mA}]}$
 I_{AN} = Output current end value

SINEAX U 539

Transducer for AC voltage

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

External resistance:

$$R_{\text{ext min.}} [\text{k}\Omega] \geq \frac{U_A [\text{V}]}{10 \text{ mA}}$$

Current limit
under overload:

< 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 \rightarrow ○

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 con-
nection 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
 $\leq 1.5 \text{ W}$ resp. $\leq 3 \text{ VA}$

Accuracy (acc. to EN 60 688)

Reference value: Output end value

Accuracy: Class 0.5 ($U_N \leq 500 \text{ V}$)
Class 1 ($U_N > 500 \text{ V}$)

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 $\leq 300 \text{ V}$)
II (at $> 300 \text{ V}$)

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
output 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

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:

$\leq 4.0 \text{ mm}^2$ single wire or
 $2 \times 2.5 \text{ mm}^2$ fine wire

Environmental conditions

Operating temperature:

-10 to $+55 \text{ }^\circ\text{C}$

Storage temperature:

-40 to $+70 \text{ }^\circ\text{C}$

Relative humidity of
annual mean:

$\leq 75\%$

Altitude:

2000 m max.

Indoor use statement!

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Transducer for AC voltage

Ambient tests		EN 60 068-2-1/-2/-3:	Cold, dry heat, damp heat
EN 60 068-2-6:	Vibration	IEC 1000-4-2/-3/-4/-5/-6	
Acceleration:	± 2 g	EN 55 011:	Electromagnetic compatibility
Frequency range:	10 ... 150 ... 10 Hz, rate of frequency sweep: 1 octave/minute	Germanischer Lloyd	
Number of cycles:	10, in each of the three axes	Type approval certificate:	No. 12 259-98 HH
EN 60 068-2-27:	Shock	Ambient category:	C
Acceleration:	3 × 50 g 3 shocks each in 6 directions	Vibration:	0.7 g

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

Description	*Blocking code	No-go with blocking code	Article No./ Feature
SINEAX U 539	Order Code 539 - xxxx xxx		539 –
Features, Selection			
1. Mechanical design			
Housing P8/35 for rail mounting			4
2. Nominal input frequency			
50 / 60 Hz			1
3. Measuring range			
0 ... 100 V			A
0 ... 250 V			B
0 ... 500 V			C
Non-standard 0 ... 50 to 0 ... 600 V [M]			Z
4. Output signal			
0 ... 20 mA, $R_{ext} \leq 750 \Omega$	A		1
4 ... 20 mA, $R_{ext} \leq 750 \Omega$	A		2
4 ... 20 mA, 2-wire connection, R_{ext} dependent on power supply	B		3
Non-standard 0 ... 1 to 0 ... < 20 [mA] 0.2 ... 1 to < (4 ... 20)	A		9
0 ... 10 V, $R_{ext} \geq 1 k\Omega$	A		A
Non-standard 0 ... 1.00 to 0 ... < 10 [M] 0.2 ... 1 to 2 ... 10	A		Z
5. Power supply			
24 V, 50/60 Hz	C	B	1
110 V, 50/60 Hz	C	B	2
115 V, 50/60 Hz	C	B	3
120 V, 50/60 Hz	C	B	4
230 V, 50/60 Hz	C	B	5
400 V, 50/60 Hz, max. 300 V versus earth	C	B	6
24 V DC	C	B	A
24 V DC via output circuit at 2-wire connection	C	A	B
24 ... 60 V DC, AC (DC, AC power pack)		B	C
85 ... 230 V DC, AC (DC, AC power pack)		B	D

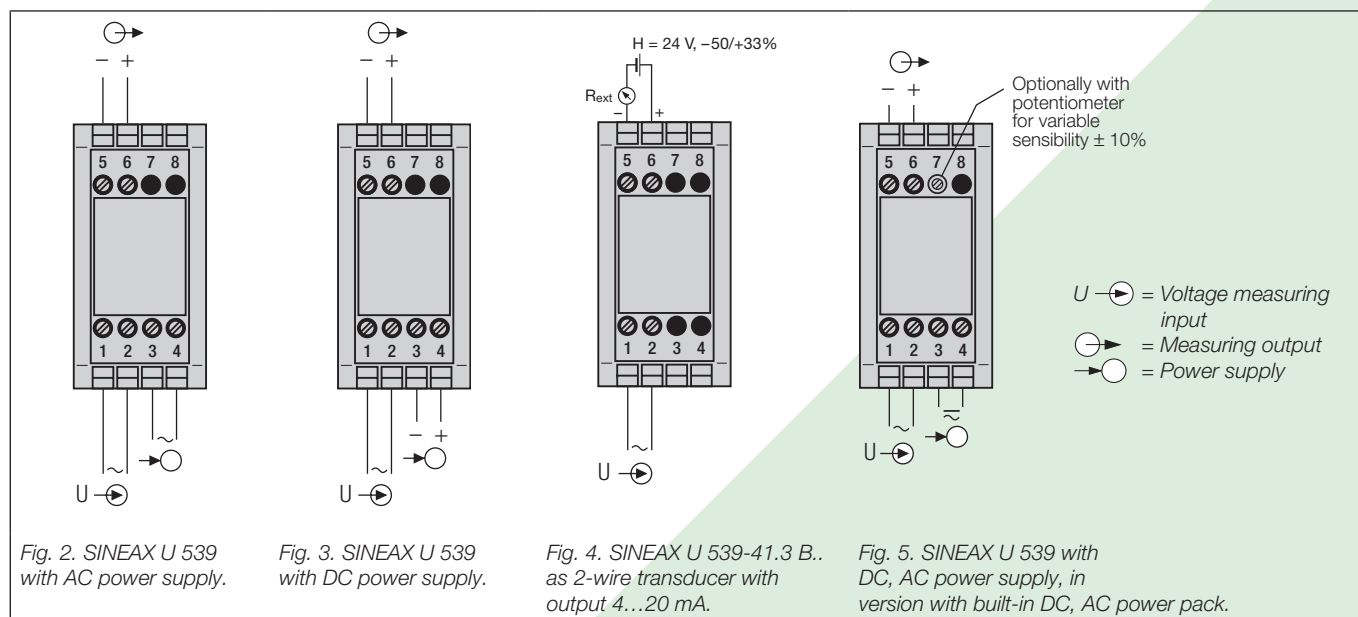
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Description	*Blocking code	No-go with blocking code	Article No./ Feature
SINEAX U 539	Order Code 539 - xxxx xxx		539 -
Features, Selection			
6. Measuring range adjustable			
Measuring range end value permanently set (standard)			0
Measuring range can be adjusted approx. $\pm 10\%$ Only in combination with DC, AC power pack, feature 5, line C or D!		C	1
7. Test certificate			
Without test certificate			0
Test certificate in German			D
Test certificate in English			E

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

Electrical connections



Dimensional drawing

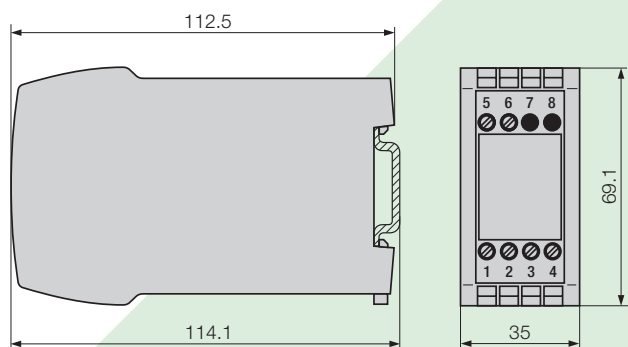


Fig. 6. SINEAX U 539 in housing P8/35 clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).

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