

SINEAX P 600

Transducer for AC and DC currents or voltages

In housing E16 for rail mounting



Application

The transducer **SINEAX P 600** (Fig. 1) is suited to convert the active power of undulatory voltage and current (containing AC and DC components) into a load-independent DC signal proportional to the measured variable. No AC input transformers are used in order to seize the DC components.

Construction and mode of operation

The SINEAX P 600 is a solid state instrument working on the time-division-multiplication (TDM) principle and measuring power according to the physical definition

$$P = \frac{1}{T} \int_0^T u \cdot i \, dt$$

The input quantities U_E and I_E are matched to the required internal level by means of the input amplifiers V_1 , V_2 . The multiplier M following multiplies correlated momentary values of voltage and current correctly in respect of the sign in all four quadrants.

The multiplier M also provides isolation between the current input and the other circuits.

The DC-to-DC transformer W isolates the voltage path from the output circuit. The output amplifier V_3 converts the output voltage of the transformer W into a load-independent DC signal I_A .

The mains transformer T supplies the power packs (not shown in Fig. 2) of the various function stages and isolates all circuits from the power supply U_S .

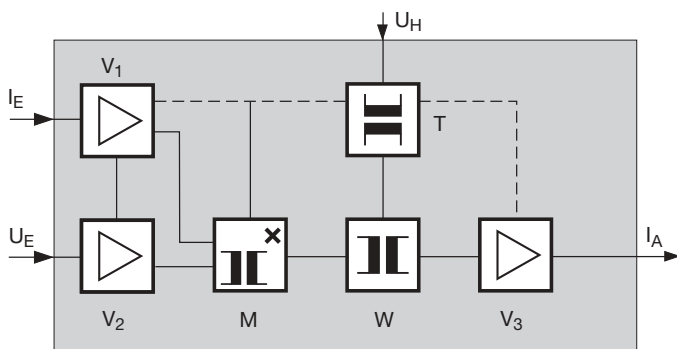


Fig. 2. Block diagram.

Technical data

Input

Voltage: Any value between
0...300 mV and 800 V
± 150 mV and ± 800 V

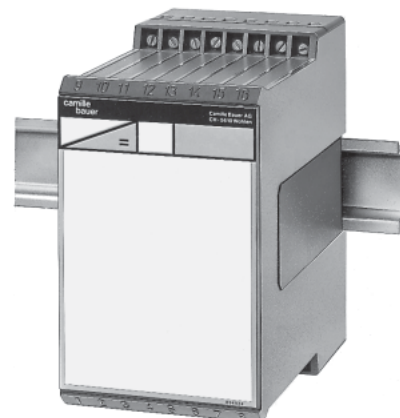


Fig. 1. Transducer SINEAX P600 in housing E16 clipped onto a top-hat rail.

Current:	Direct 0...1 and 0...500 mA ± 1 and ± 500 mA via shunt 0...300 mV and 0...3 V ± 150 mV and ± 3 V
Consumption with voltage input:	0.1 mA
Voltage drop with current input, direct:	Approx. 300 mV
Limits of calibration range:	0.75 ... 1.5 $U_N \cdot I_N$ Restriction: For calibration factor > 1.2 ... 1.5 the max. peak factor, for which the specified accuracy applies, is reduced to max. peak factor max. peak factor: $\frac{2.4}{\text{calibration factor}}$
Frequency range:	DC / 10...70...400 Hz
Overload capacity:	1.5 U_N continuously 2 U_N during 10 s 4 U_N during 0.5 s max. 1100 V peak 2 I_N continuously 10 I_N during 10 s when input via shunt max. 10 V
Peak factor:	2
Output:	0...1, 0...5, 0...10, 0...20 mA ± 1, ± 5, ± 10, ± 20 mA 4...20 mA
Burden voltage:	0 to ± 15 V
Residual ripple:	≤ 2% p.p. / from 10 Hz
Time response:	Time constant 120 ms Response time 300 ms

Accuracy:	Class 0.5
Non-linearity:	Between 0 – 120% U_E and I_E : $\leq 0.2\%$
Temperature effect per 10°C:	$\leq 0.25\%$
Dependence on external resistance:	$\leq 0.1\%$ at ΔR_{ext} max.
Power supply influence:	Between 0.8 and 1.2 U_H : $\leq 0.1\%$ per 20%
Power supply:	220 or 110 V, $\pm 20\%$, 40 to 70 Hz, 4 VA 24 V DC, approx. 3 W
Test voltage:	2 kV / 50 Hz / 1 min. all circuits against each other and against housing
Climatic rating:	Operating temperature – 10...+ 55 °C Storage temperature – 40...+ 70 °C Relative humidity of annual mean $\leq 75\%$
Electrical connections:	Screw-type terminals with indirect wire pressure, suited for max. $2 \times 2.5 \text{ mm}^2$ or $1 \times 6 \text{ mm}^2$
Housing protection:	IP 40 acc. to EN 60 529 Terminals IP 20
Electrical standards:	Acc. to EN 61 010-1
Housing:	Type E16 (Dimensions see Section "Dimensional drawing")
Weight:	Approx. 600 g (AC power) Approx. 400 g (DC power)

Application

The SINEAX P 600 transducer is employed to determine the active power of an AC voltage and an AC current with superimposed DC component (or DC with high AC ripple) for the purpose of indication, recording, control and/or data processing – both at the measuring location and over longer distances at control rooms. Several receiving instruments (indicators, controllers, recorders) can be connected in series in the output circuit. In this case, attention should be paid that the total loop resistance (sum of instrument input resistance plus lead resistance) does not exceed their permissible external resistance $R_{A \text{ max.}}$ of the transducer. The following diagram shows an example of the most important application.

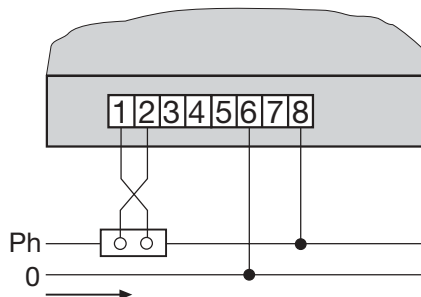


Fig. 3. Connection via shunt.

Electrical connections

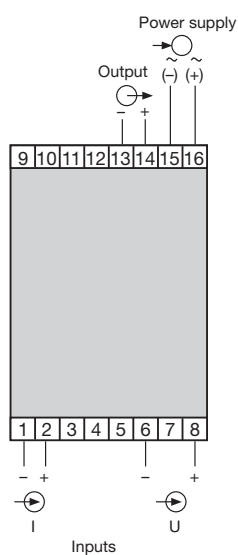


Fig. 4

Dimensional drawing

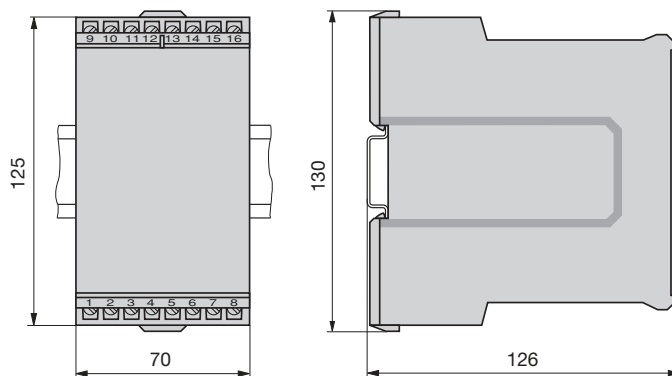


Fig. 5. SINEAX P 600 in housing E16 clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).