Measuring transducers

G 400 for phase angle
PF 400 for cos φ proportional

The G 400 measures the angle between sine wave formed current and voltage.
The output signal is proportional to the angle in degrees.

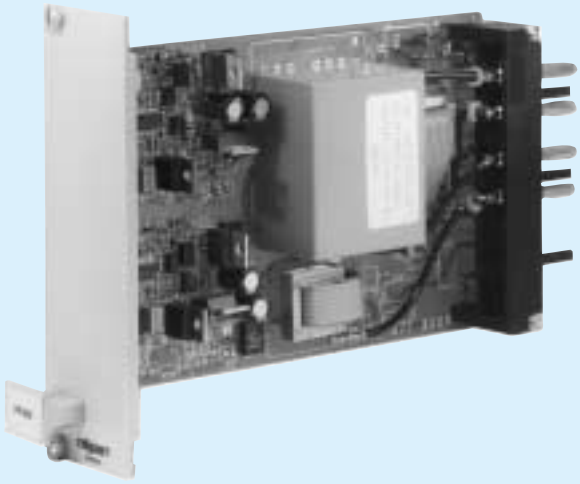
There are two models, one for single-phase and one for 3-phase systems.

The PF 400 for cos φ measures the angle between sine wave formed current and voltage. The output signal is proportional to cos phi. There are two models, one for single-phase and one for three-phase systems.

The transducers in plastic cases are mounted directly on profiled bar 35 EN 500022. Connection to selfopening clamps for 6 mm² wires.
Transducers for mounting in 19" racks can be delivered in different application types (see special leaflet). The rack modules are 8 TE wide and in a 19" rack is place for 10 modules.
The transducers are manufactured according to IEC 688.

PF400-FA

PF400-FB



Order facts:

	Enclosed for mounting on profiled bar 35 EN 50022		19" rack module (width 8 TE)	
	Angle deg	cos φ	Angle deg	cos φ
	Type	**Type**	**Type**	**Type**
Single phase	**G 400-15x**	**PF 400-15x**	**G 400R-15x**	**PF 400R-15x**
Three phase	**G 400-35x**	**PF 400-35x**	**G 400R-35x**	**PF 400R-35x**

Replace **x** with last digit for output according to table below

Output	External resistance load	Last digit **x**
0 -5 or ± 5 mA	0-3000 Ω	**1**
0 -10 or ± 10 mA	0-1500 Ω	**2**
0 -20 or ± 20 mA	0- 750 Ω	**3**
4 -20 mA	0- 750 Ω	**4**
0 -10 or ± 10 V	> 700 Ω	**5**

Order form:

Measuring transducer for cos φ, three phase

Type	**PF 400-354**
Connection	110 V, 5A, 50 Hz
Range	cap. 0,5-1-0,5 ind.
Output	4 - 12 - 20 mA
Power supply	230 VAC
Case for DIN-rail	

Technical data

Input	
Voltage	any value between 10 and 500V (rack version max 300 V)
Consumption (burden)	< U_{in} × 2 mA, VA
Current	any value between 0,5 and 7,5 A
Consumption approx.	0,2 VA
Frequency	50 or 60 Hz
Measuring ranges	min 60 deg., max 360 deg.
Common measuring ranges	cap 0,5-1-0,5 ind cap 0,9-1-0,9 ind
Output	
Current output signal	min 0-1 mA, max 0-20 mA
Range Load	0...5/10/20 mA, 4-20 mA max 15 V
Current limitation	< 30 mA
Voltage: Burden	0-10 V > 700 Ω
Ripple	< 1% p.p.

General data

Accuracy	class 0,5 according to IEC 688 0,2 on request
Linearity error	< 0,1%
Response time	2 periods
Temperature influence	< 0,1% / 10°C
Temperature range	□25...+60°C operation □40...+70°C storage
Test voltage	5,6 kV, 50 Hz, 1 min (rack version 3,7 kV)
Power supply	24, 110, 230 VAC ± 15%, 47-70 Hz, ca 2 VA 24-130 VDC ± 20%, ca 2,5 W
Weight	0,5 kg
Options on request	

Standards

General standards for measuring transducers EN 60688, IEC 688

EMC	emission EN 50081-2 immunity EN 50082-2 *
Safety	EN 61010-1, IEC 1010-1
Inputs	overvoltage cat III
Outputs	overvoltage cat II
Pollution degree	2

*) At certain frequences can minor deviations from class accuracy occur during the disturbance

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Design

The two input quantities voltage and current are transformed in the input transformer to a level adapted to the internal electronics and give at the same time galvanic separation.

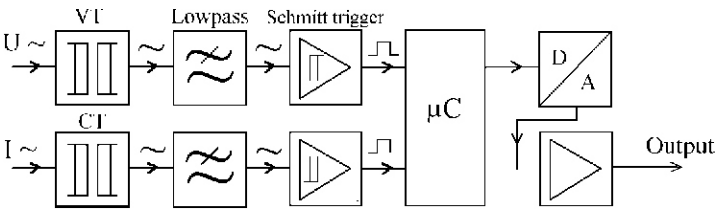
The noise on the input signals is filtered away in the phase true lowpass filter.

In the following zero cross detector (Schmitt trigger) is the input sine wave converted to a square wave.

The micro processor calculates the exact time difference T1 between the two input signals. Out of the relation T1/T is either the phase angle (G) or the cosine (PF) between voltage and current calculated.

The AC power supply comes from a transformer that gives a galvanic separation. Those parts that need separate power get it via a rectifying stage. The DC power comes from a switched unit that gives galvanic separation and covers the span from 24 to 130 VDC.

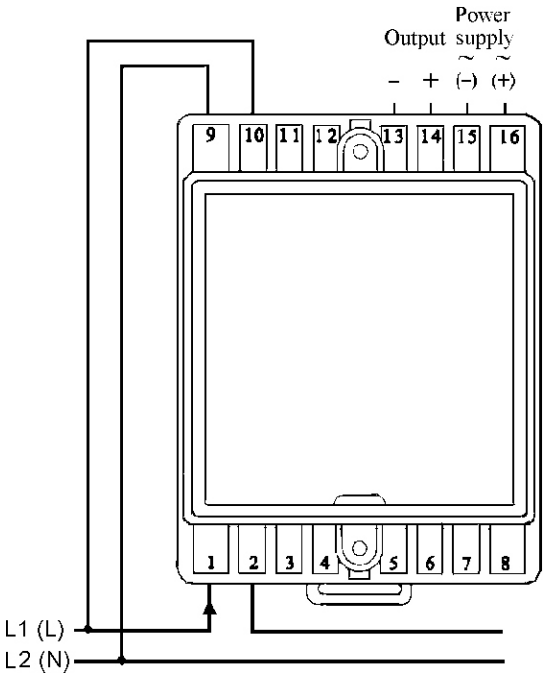
GPF400BB



Connecting diagrams

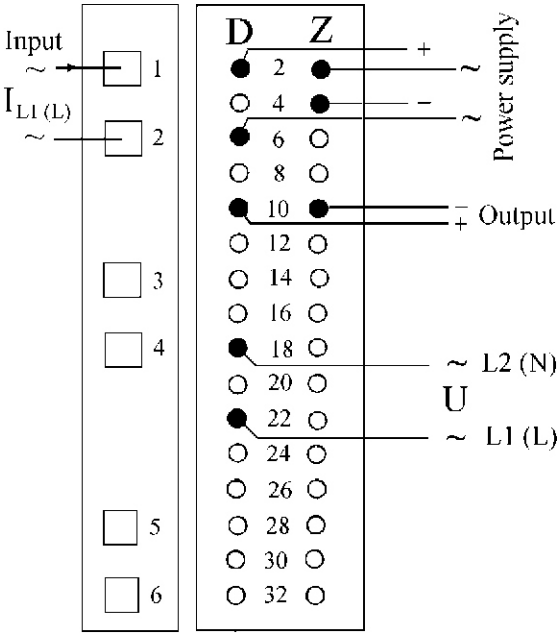
G/PF 400

GPF400AE



G/PF 400R

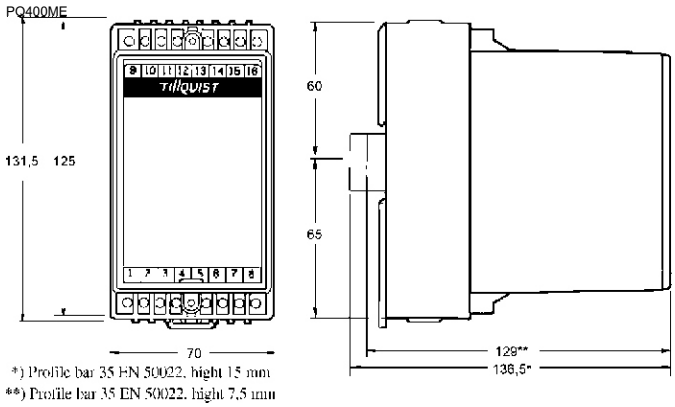
GPF400RE



Dimensions (mm)

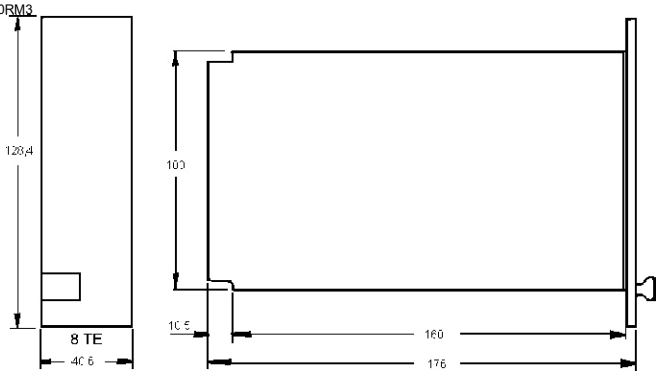
G/PF 400

PQ400ME



G/PF 400R

400RM3



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