Measuring transducers

PQ 400 combined transducer for active and reactive power

The measuring transducers **PQ 400** are used for simultaneously measuring of active and reactive power in 3-phase systems.

There are types for 3-phase 3 wire unbalanced and for 3-phase 4 wire unbalanced load.

The transducers are connected to the mains directly or via measuring transformers. They have galvanic separation between in- and output and power supply.

The transducers are made for mounting in 19" rack and have a width of 10 TE, which gives place for 8 modules in a rack. The transducers are manufactured according to standard IEC688.

When measuring on equipment powered by frequency inverters with pulse width mudulated (PWM) wave form, the transducer must be modfied for this.

PQ400-FA

PQ400-FB

Order facts:

	Enclosed for mounting on profiled bar 35 EN 50022	19" rack module (wide 10 TE)
	Type	**Type**
3 phase 3 wire unbalanced load	**PQ 400-09xx**	**PQ 400R-09xx**
3 phase 4 wire unbalanced load	**PQ 400-11xx**	**PQ 400R-11xx**
Replace **xx** with last digits for output according to table below		
Output	External resistance load	Last digits **xx**
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:

Combined active/reactive power transducer

Type	**PQ 400-1144**
Connection	11/0,11 kV, 500/5 A, 50 Hz
Ranges	0 - 10 MW, -5...0...+5 Mvar
Outputs	4-20 mA, 4-12-20 mA
Power supply	230 VAC
Case for DIN bar	

Technical data

Input

Voltage	any value between 60 and 500 V (rackversion 300 V)
Consumption (burden)	U_{in} x 1 mA, VA per phase
Current	any value between 0,5 and 5 A
Consumption (burden)	< 0,05 VA per phase
Permissible measuring range	any value between 0,75-1,3 x apparent power (other values on request)
Apparent power at 1 phase	$U_{in} \times I_{in}$
at 3 phase	$U_{in} \times I_{in} \times \sqrt{3}$

When measuring transformer is used calculate upon primary values for U_{in} and I_{in}. By measuring ranges in both directions, e.g. 10-0-100 MW, calculate the factor on the largest part, i.e. on 100 MW

Frequency	50 or 60 Hz
Overload	Current 2 × I_{in} continuously 10 × I_{in} during 15 s, 40 × I_{in} during 1 s, but 200 A max Voltage 1,5 × U_{in} continuously, 2 x U_{in} during 10 s

Output

Output signal (span)	min 0-1 mA, max 0-20 mA
Standard ranges	0...5/10/20 mA, 4-20 mA
Load	max 15 V
Current limitation	< 30 mA
Voltage	0-10 V
Burden	> 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 0-90%	< 80 ms
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(rackversion 3,7 kV)
Power supply	24, 110, 230 VAC ±15%, 47-70 Hz, ca 4 VA 24-130 VDC ±20%, ca 4 W
Weight	0,6 kg

Options on request.

Standards

General standards for measuring transducersEN 60688, IEC688

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

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

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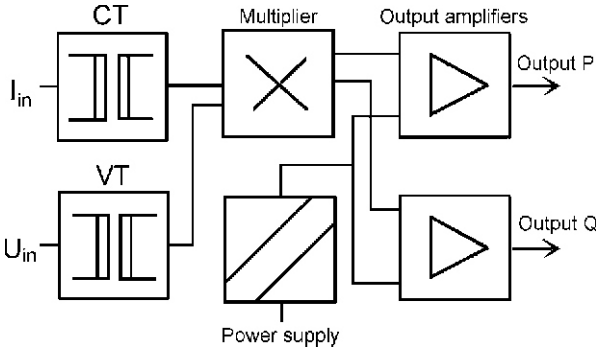
Design

The transducer is operating with the principle of pulse duration modulation (TDM-principle). Transformers on the input take care of the isolation of the current and voltage inputs from the electronics and also transform the input signals to proper levels.

In the multiplier unit current and voltage signals are multiplied to form signals proportional to the active and reactive power. These signals are taken to two separat output amplifiers to get the wanted output signal and to reach the galvanic separation between the two output signals.

The power supply feeds the electronics and is in case of AC power galvanicly isolated via a transformer. In case of DC power a switched unit is used which gives galvanic separation and covers the whole span 24-130 VDC.

PQ400B2E

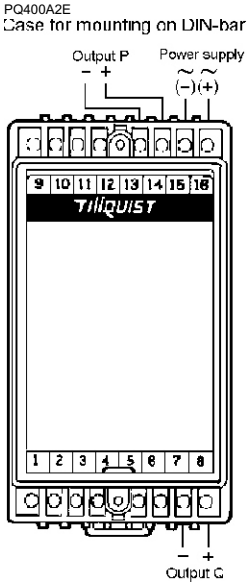


Connecting diagrams

(Same diagram for connecting to current- and/or voltagetransformers)

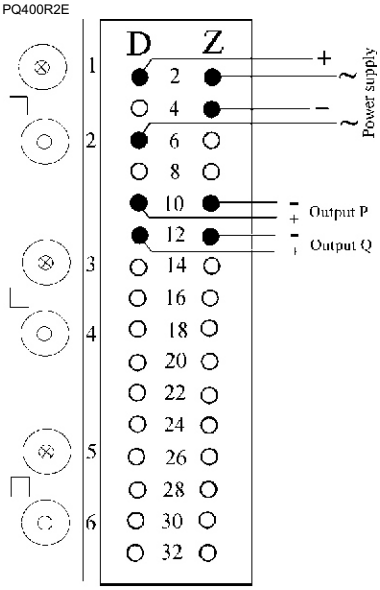
PQ 400

PQ400A2E

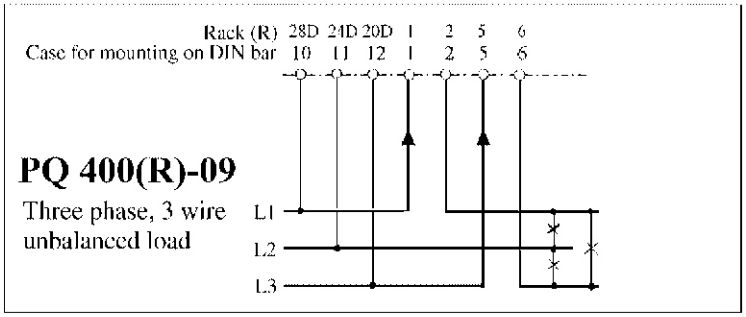


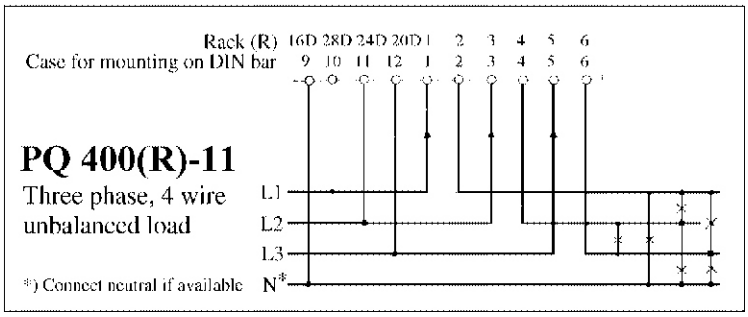
PQ 400R

PQ400R2E



PQ4005E

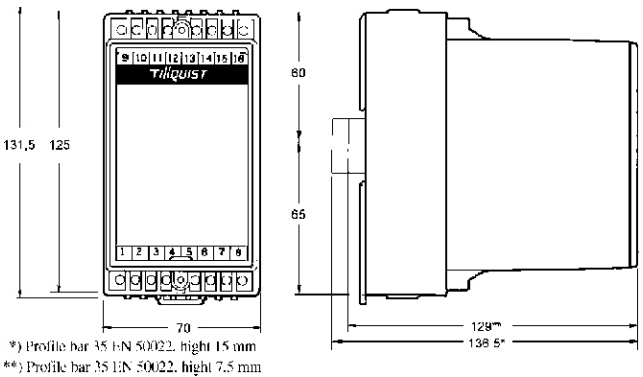




Dimensions

PQ 400

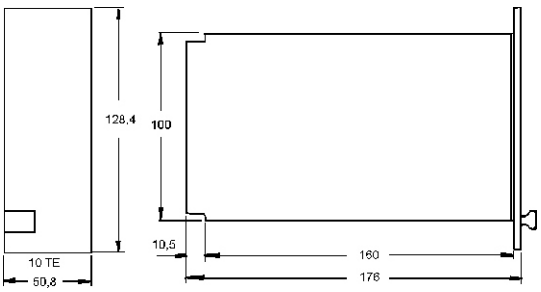
PQ400ME



*) Profile bar 35 EN 50022, hight 15 mm
**) Profile bar 35 EN 50022, hight 7,5 mm

PQ 400R

PQ400RM



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