P11

Transducer for Active or Reactive Power

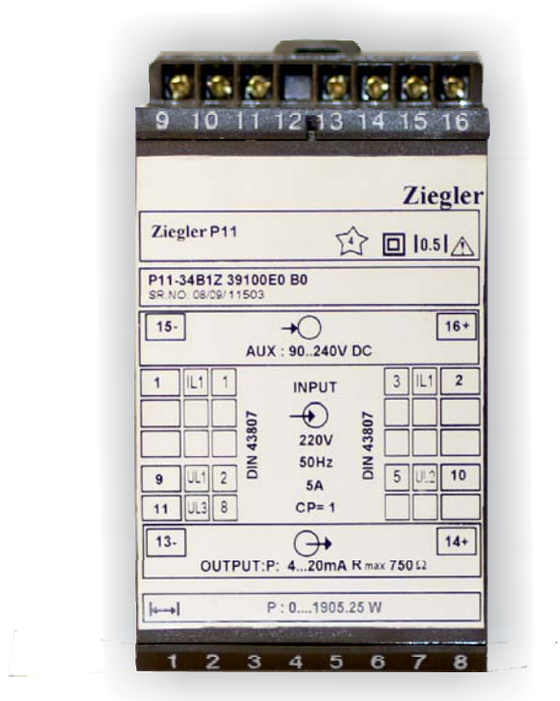


Fig. 1. P11
transducer in housing **E16**
clipped onto a top-hat DIN rail.

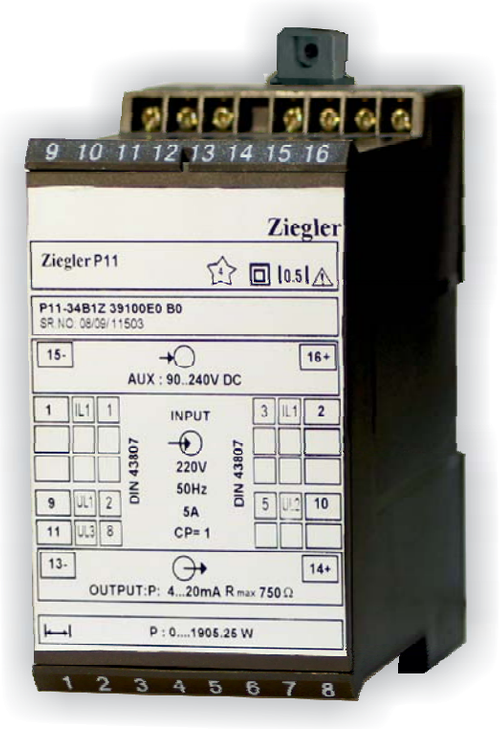


Fig. 2. P11 transducer
in housing **E16** screw hole
mounting brackets pulled out.

Application

The transducer (Figs. 1 and 2) converts to active or reactive power of a single-phase AC or three-phase system with balanced or unbalanced loads. The output signal is proportional to the measured value of the active or reactive power and is either a load-independent DC current or a load-independent DC voltage.

Input and output are electrically isolated from each other. The output is ungrounded, short and open-circuit proof and may be operated for any length of time in the open and shorted states.

The output signal is limited to approx. 1.3 x I_{AN}.

The unit is designed to withstand impulse voltages to IEC and ANSI/IEEE regulations.

Features / Benefits

- Measuring inputs : Sine or distorted wave - forms of nominal input currents and nominal input voltages

Measured variable	Nominal input current	Nominal input voltage
Power	0.01 to 10 A	10 to 660 V

- **Measuring output:** DC current signal (load-independent) or DC voltage signal (load-independent)
- Measuring principle : TDM system (Time Division Multipexing - pulse duration modulation)
- 1/2/3 wattmeter method
- Narrow housing, 70 mm / Saves space and therefore costs
- Snaps onto a DIN rail or screws onto a wall or panel/ Adaptable to the circumstances at the place of installation
- Manufactured in SMD technology / Compact and reliable
- Screw terminals suitable for multistrand or solid wires / Easy wiring without problems
- Two isolated outputs (Optional)
- Electric isolation between output 1 and output 2 is 500V.

Technical Data

General

Measured quantity : Active power, reactive power

Measuring principle : Time-Division-Multiplication (pulse duration modulation) all-electronic, input and output isolated

Admissible measuring range end values (calibration factor c) ① to ⑥ :
≥ 0.75 to $1.3 \cdot U_N \cdot I_N$ (single-phase AC power)
≥ 0.75 to $1.3 \cdot \sqrt{3} \cdot U_N \cdot I_N$ (three-phase power)

Calculation of "c" in a single - phase system:

$$C = \frac{\text{unipolar range end value}}{U_N \cdot I_N}$$

Calculation of "c" in a three-phase system:

$$C = \frac{\text{unipolar range end value}}{U_N \cdot I_N \cdot \sqrt{3}}$$

When input connections are via a transformer, the primary values of U_N and I_N should be used in the calculation.

Measuring input E

Nominal frequency f_N ⑦ : 50 or 60 Hz

Nominal input voltage U_N ⑧ : 100/$\sqrt{3}$, 110/$\sqrt{3}$, 100, 110, 200, 230, 400 or 500 V

Nominal input current I_N : 1, 2 or 5 A

Own consumption : < 0.1 VA per current circuit
U_N: 1 mA per voltage circuit

Sensitivity : < 0.05% of range end value

Overload capacity :

Measured quantity I_N U_N	Number of appli-cations	Duration of one application	Interval between two successive applications
2 x I_N	contin.	———	———
10 x I_N	5	15 s	5 min.
20 x I_N	5	1 s	5 min.
40 x I_N*	1	1 s	———
1.5 x U_N	contin.	———	———
2 x U_N	10	10 s	10 s
4 x U_N	1	2 s	———

* But max. 250 A

Measuring output A

Output signals: : Load-independent DC voltage U_A
OR
Load-independent DC current I_A

Standard ranges of U_A ⑩ to ⑬ : 0...10 / 1...5 / –10...0...10 V

Load capacity 20 mA

External resistance for one output

$$R_{ext}\,\text{min.}\,[k\Omega] > \frac{U_A\,[V]}{20\,mA}\ \text{for one output}$$

R_{ext} [kΩ] > 10kΩ / V for two output

Standard ranges of I_A ⑭ to ⑯ : 0...1/0...5/0...10/0...20/4...20 mA
: –1...0...1/–2.5...0...2.5/–5...0...5/ –10...0...10/–20...0...20 mA

Burden voltage: ± 15 V for 1 output

Burden voltage: ± 12V for 2 outputs

External resistance

$$R_{ext}\,\text{max.}\ [k\Omega] \leq \frac{\text{Burden voltage}}{I_{AN}\,[mA]}$$

I_{AN} = Full output value

Voltage limit under $R_{ext} = \infty$: Approx. 40 V

Current limit under overload : Approx. 1.3 x I_{AN} with current
Approx. 30 mA with voltage output

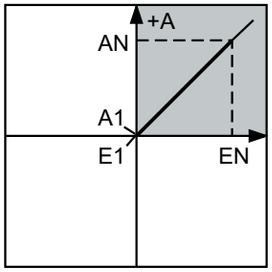
Span adjustment : Approx. ± 2%

Ripple in output current ⑱ : ≤ 1% p.p.

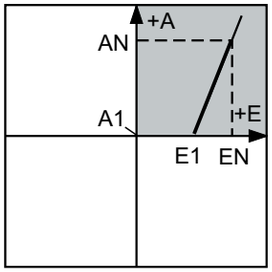
Response time : < 300 ms

Output characteristic

Typical examples

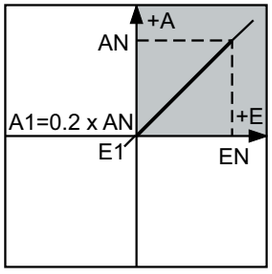


Characteristic 'A'
Input E1...EN
Output A1...AN



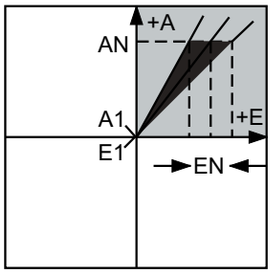
Characteristic 'B'
Input E1...EN
Output A1...AN

Given better resolution at top of range



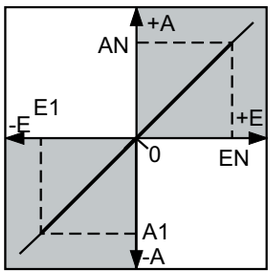
Characteristic 'C'
Input E1...EN
Output A1...AN

Live-zero output signal

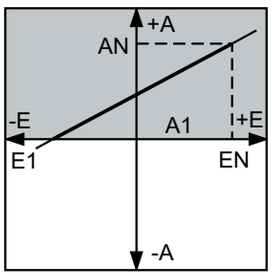


Characteristic 'D'
Input E1...EN ± 10%
Output A1...AN

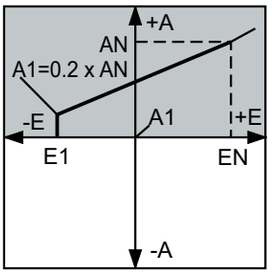
Variable sensitivity



Characteristic 'E'
Input E1...0...EN
Output A1...0...AN

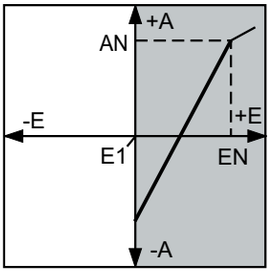


Characteristic 'F'
Input E1...EN
Output A1...AN



Characteristic 'G'
Input E1...EN
Output A1...AN

Live-zero output signal



Characteristic 'H'
Input E1...EN
Output A1...AN

Accuracy (acc. to DIN/IEC 688-1)

Reference value	:	Output span Exception: Characteristic 'E' : The largest of the 2 unipolar output levels Characteristic 'B' : The output according to characteristic 'H'
Basic accuracy	:	Class 0.5
Reference conditions		
Ambient temperature	:	23°C, ± 5 K
Input current	:	0...120% I_N· c
Input voltage	:	0...120% U_N
Power factor cosφ	:	0...1...0
Frequency	:	f_N ± 10%
Distortion factor	:	< 10%
Power supply	:	U_{HN} ± 10% (AC), U_{HN} –15 / +33% (DC)
External resistance	:	0...R_{ext} max. with current output R_{ext} min. ...∞ with voltage output
Influence effects (maxima):		
(included in basic error)		
Linearity error (current, voltage, cos f)	:	± 0.2% for one output ± 0.4% for two outputs
frequency influence f_N ± 5%	:	± 0.05%
Dependence on external resistance (Δ R_{ext} max.)	:	± 0.05%
Power supply influence U_{HN} ± 10%	:	± 0.05%

⑭ to ⑱ see section "Special features"

Additional errors

Temperature influence (–25...+55°C)	:	± 0.2% / 10 K for one output ± 0.3% / 10 K for two outputs
Frequency influence 45 – 65 Hz	:	± 0.5%
Stray field influence 0.5 mT	:	± 0.2%
Power supply influence U_{HN} ± 20%	:	± 0.2%
Influence of common mode voltage 220 V, 50 Hz or 10 V, 1 MHz	:	± 0.2%

HF surge voltage influence

acc. to IEC 255-4 Class III, 2.5 kV, 1 kV, 200 Ω 1 MHz, 400 Hz	:	± 4.0%
acc. to ANSI/IEEE C 37.90-1978 2.5 kV, 150 Ω 1 MHz, 50 Hz	:	± 1.0%

Power Supply

AC voltage (19) and (20)	:	24, 115, 120, 230 or 240 V, ± 15%, 42 to 70 Hz Power consumption approx. 5VA : 1 output Power consumption approx. 8VA : 2 output
DC voltage	:	24...90 VDC : (for 1 output) 24...60 VDC : (for 2 output) 90...240 VDC : (for 1 output) 90...230 VDC : (for 2 output) Power consumption approx. 5W : 1 output Power consumption approx. 8W : 2 output

Note :
For self powered transducer, the input VA burden ≤ 8.2 VA

Environmental conditions

Climate rating	:	Climate class 3Z acc. to VDI/VDE 3540
Operating temperature	:	– 25 to + 55°C
Storage temperature range	:	– 40 to +70°C
Relative humidity of annual mean (21)	:	≤ 75%

Table 1 : Electromagnetic compatibility

The basic standards EN 50 081-2 and EN 50 082-2 were taken in account

Conducted interference from the instrument	EN 55 011	Group 1, Class A
HF radiation from complete instrument	EN 55 011	Group 1, Class A
Electrostatic discharge	IEC 1000-4-2	Direct: ± 8 kV air Indirect: ± 4 kV contact
HF field influence on instrument	IEC 1000-4-3	80 MHz … 1000 MHz: 10 V/m, 80% AM 1 kHz (ITU frequencies, 3 V/m)
Transient burst via connections	IEC 1000-4-4	± 2 kV, 5/50 ns, 5 kHz, > 2 min. capacitively coupled
Transient surge on power supply	IEC 1000-4-5	± 2 kV, 1.2/50 µsec, symmetrical ± 4 kV, 1.2/50 µsec, asymmetrical
HF interference via connections	IEC 1000-4-6	0.15 to 80 MHz: 10 V, 80% AM 1 kHz (ITU frequencies, 3 V) source 150 Ω

Regulations

Electrical standards	:	Acc. to IEC 348
Housing protection	:	IP 40 acc. to IEC 529 Terminals IP 20
Insulation group acc. to DIN 57 110 b:	:	A (instrument) C (terminals)
Test voltage	:	Input versus Output : 4KV, 50Hz, 1min Input versus Housing : 4KV, 50Hz, 1min Output versus Housing : 4KV, 50Hz, 1min Output1 versus Output2 : 500V, 50Hz, 1min

Installation Data

Mechanical design	:	Housing type **E16** Dimensions see section “Dimensional drawings”
Material of Housing	:	Lexan 940 (polycarbonate),Flammability Class V-0 according to UL 94, self-extinguishing, nondripping, free of halogen
Mounting	:	For snapping onto top-hat rail (35 x 15 mm or 35 x 7.5 mm) acc. to EN 50 022 OR directly onto a wall or panel using the pull-out screw hole brackets
Mounting Position	:	Any
Electrical connections	:	Screw - type terminals with indirect wire pressure,for max. 2 x 2.5 mm^2 or 1 x 6 mm^2
Weight	:	Approx. 0.7 kg.

(19) to (21) see section “Special features”

Table : 2 : Special features

Nature of special features

Admissible measuring range end value

① Calibration factor ≥ 0.25 to 0.74
Limitation: Class 1, linearity error ± 0.4%

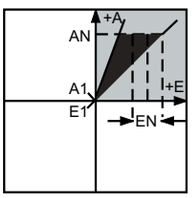
② Calibration factor ≥ 1.3 to 1.5
Limitation: Class 1, linearity error ± 0.4%

③ Zero displacement
10 to 125% in positive or negative direction

④ Variable sensitivity ± 5% of full scale value

⑤ Variable sensitivity ± 10% of full scale value
Limitation: Class 1 (not possible with zero displacement or live-zero output)

⑥ Two calibration factors
(c min. 0.25; c max. 1.5)
Limitation: The sensitivity ratio should not exceed 1 : 2.
Circuit change is achieved by soldering a wire link on the PCB.



Characteristic
Input E1…EN
Output A1…AN
interchangeable sensitivity
$1 \le k \le 2$

Example: **1. Measuring range:**
0...10 MW
3 x 50 000 / 100 V
2 x 100 / 5 A
c1 = 1.154
Output 0...20 mA
2. Measuring range:
0...5 MW
c2 = 0.577
Output 0...20 mA

Nominal frequency f_N

⑦ between 16 2/3 Hz and 500 Hz, other than the standard frequencies 50 or 60 Hz

Limitation:
Class 1, linearity error ± 0.4%
With frequency < 40 Hz:
Response time < 800 ms, $I_N \le 5$ A
Residual ripple < 2% p.p.

Nominal Input Voltage U_N

⑧ between 10 and 660 V, other than the standard values $100/\sqrt{3}$, $110/\sqrt{3}$, 100, 110, 200, 230, 400 or 500 V.

Limitation:
with U_N > 500 V overload capacity 2000 V, 2 s

Nominal input current I_N

⑨ between 0.01 and 10 A, other than the standard values 1, 2 or 5 A, Limitations : With I_N > 5 A
Power consumption < 0.3 VA per current circuit
Overload capacity of current circuits
2 x I_N continuous
10 x I_N for 10 s, max. 5 times at 5 min. intervals
40 x I_N for 1 s, max. 250 A, once only
$f_N \ge 40$ Hz
- with I_N > 8.3 A
Reference conditions $I_E \le 10$ A

Output signal A

⑩ Unipolar load-independent DC voltage*
Ranges between 0...1 and 0...15 V, other than the standard range 0...10 V

⑪ Bipolar symmetrical load-independent DC voltage*
Ranges between -1...0...1 and -15...0...15 V, other than the standard voltage ranges -10...0...10V.

⑫ Bipolar asymmetrical load-independent DC voltage ranges

– U_A	+ U_A	U_A total
min. – 1.0 V max. – 15 V	min. + 1 V max. + 15 V	min. 2 V max. 30 V

⑬ **Live-zero***
Ranges between 0.2...1 and 3...15 V, other than the standard range 1...5 V
* **Limitation:** U_{AN} < 4 V
Additional error:
Burden dependency ΔR_{ext} max. = 0.2%
Reference condition: external resistance 2 x R_{ext} min. ± 20%

⑭ Unipolar load-independent DC current
Ranges between 0...1 and 0...20 mA, other than the standard ranges 0...1 / 0...5 / 0...10 and 0...20 mA

⑮ Bipolar symmetrical load-independent DC current
Ranges between – 1.0...0...1.0 and – 20...0...20 mA, other than the standard ranges – 1...0...1 / – 2.5...0...2.5/ – 5...0...5 / – 10...0...10 and – 20...0...20 mA

⑯ Bipolar asymmetrical load-independent DC current ranges

– I_A	+ I_A	I_A total
min. – 1.0 mA max. – 20 mA	min. + 1 mA max. + 20mA	min. 2 mA max. 40 mA

⑰ **Live-zero**
Ranges between 1...5 and 4...20 mA, other than the standard range 4...20 mA

⑱ **Residual ripple in output current (for one output)**
≤ 0.5% p.p. instead of < 1% p.p.
Limitation: Response time < 800 ms instead of < 300 ms (not possible for nominal frequency < 50 Hz)

Power supply

⑲ with AC voltage
any voltage between 24 and 500 V, for one output &
for two outputs apart from the standard voltages
24, 115, 120, 230 and 240 V
Power consumption approx. 5VA for one output & 8VA
24 and 240 for two outputs, ± 15%, 42 to 70 Hz

Nature of special features

(20) without separate power supply connection
Power supply from voltage input signal *)
(24 V ≤ H ≤ 500 V, f_N 50 or 60 Hz for one output)
Limitation:
Reference condition: input voltage U_N ± 15%
Overload capacity of the input
1.2 · U_N continuous
1.5 · U_N 1 s
With U_N ≥ 170 V
Impulse withstand voltage acc. to IEC 255-4, Cl. II:
1 kV, 1.2/50 µs, 0.5 Ws or overload capacity of the voltage input max. 680 V~, 2 s

Nature of special features

The additional power taken from the input voltage signal is approx. 5 VA
**Standard connection between:
L1 and N with single phase AC current and
Open-Y connection.
Others between L1 and L2
(24 V ≤ H ≤ 240 V, f_N = 50 or 60 Hz for two output)

Climatic rating

(21) Climate class 3Z acc. to VDI / VDE 3540, but temperature continuously – 25 to + 55°C.
Relative humidity ≤ 90% annual mean (application class HVR acc. to DIN 40 040)

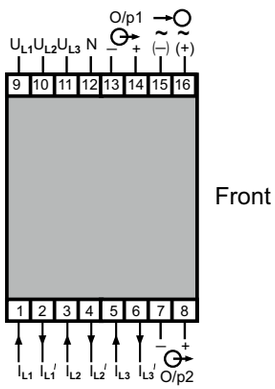
Electrical connections

U_{L1} , U_{L2} ,U_{L3}
I_{L1} , I_{L2} ,I_{L3}
N
} = Measuring Inputs

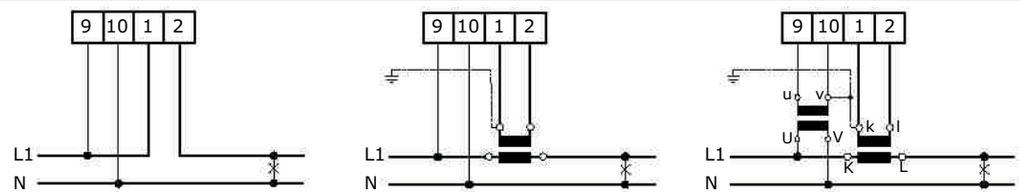
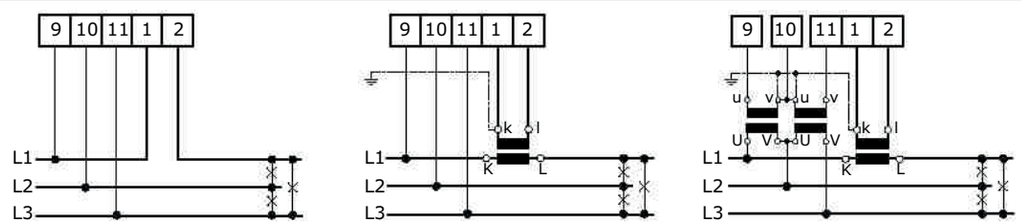
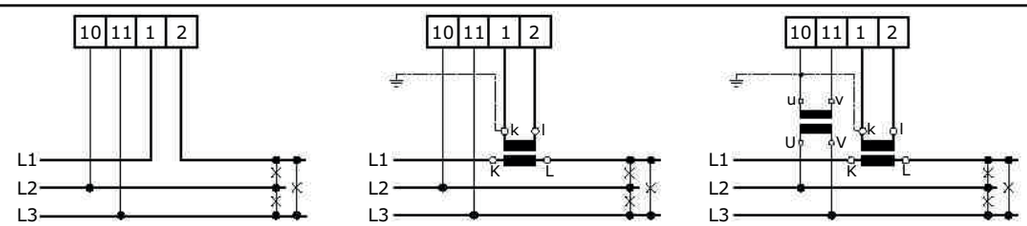
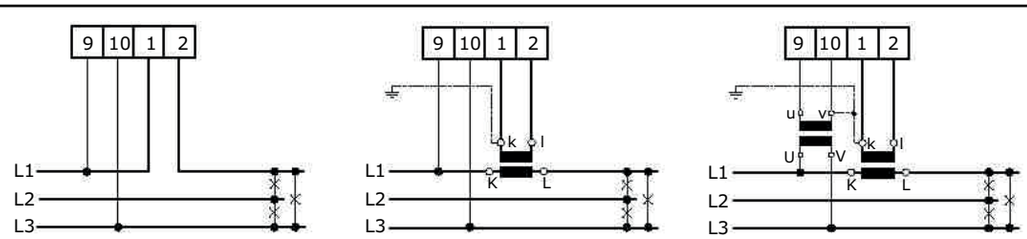
⊖► = Measuring output O/p1 & O/p2

→○ = Power supply

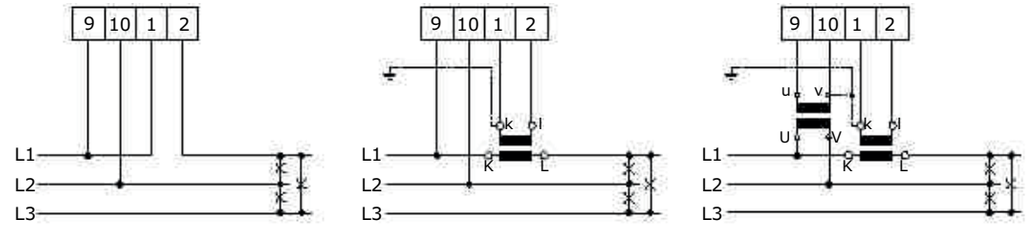
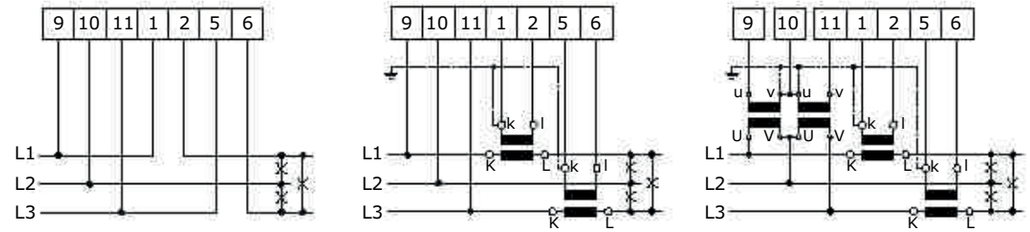
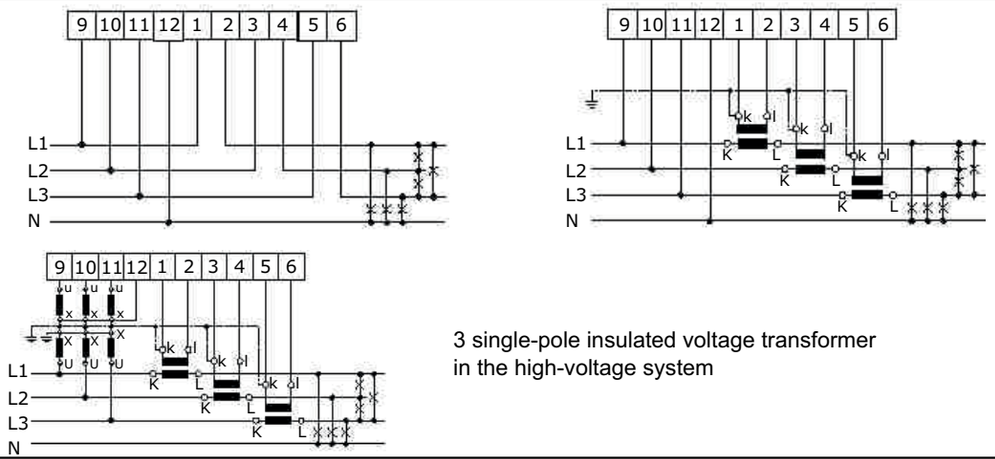
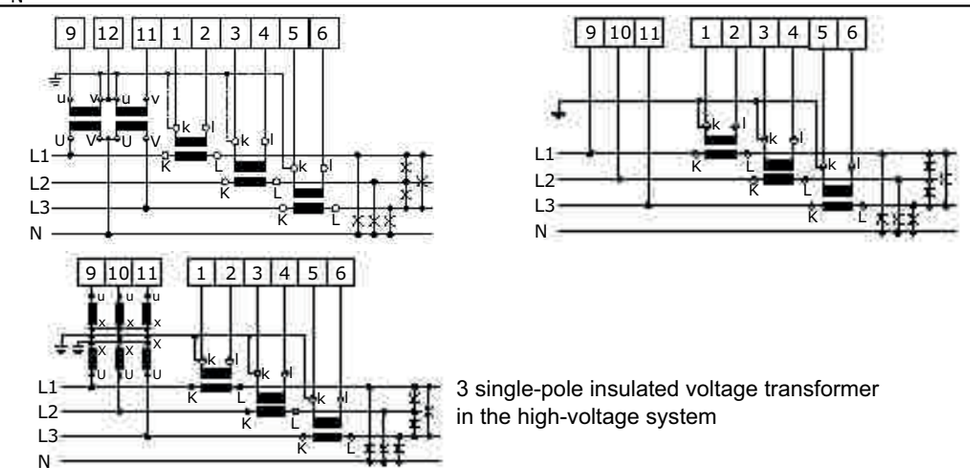
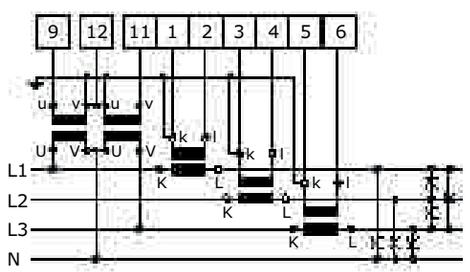
Note : Terminal 15 & 16 not to be used for self powered transducer



Measuring Inputs

Application	Terminal allocation
Active or reactive power measurement in single-phase AC network	
Active power measurement in 3-wire 3-phase network balanced load	
Reactive power measurement in 3-wire 3-phase network balanced load	
Active or reactive power measurement in 3-wire 3-phase network balanced load Phase shift U: L1-L3 I: L1	

Electrical connections

Measuring Inputs	
Application	**Terminal allocation**
Active or reactive power measurement in 3-wire 3-phase network balanced load Phase shift U: L1-L2 I: L1	
Active or reactive power measurement in 3-wire 3-phase network unbalanced load	
Active power measurement in 4-wire 3-phase network unbalanced load	 3 single-pole insulated voltage transformer in the high-voltage system
Active or reactive power measurement in 4-wire 3-phase network unbalanced load (special circuit)	 3 single-pole insulated voltage transformer in the high-voltage system
Active or reactive power measurement in 4-wire 3-phase network unbalanced load (special circuit)	 (Delta connection using 2 VT's L1 – N and L3 – N, Open-Y connection)

Dimensional Drawings

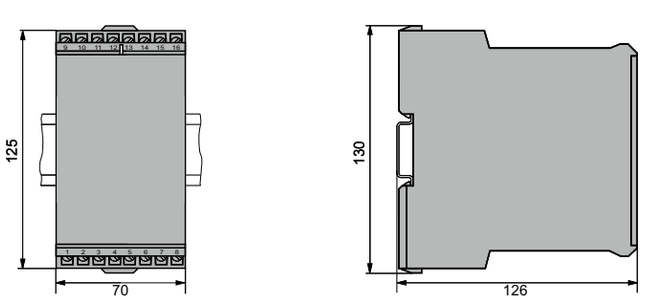


Fig. 3. P11 in housing E16 clipped onto a top hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).

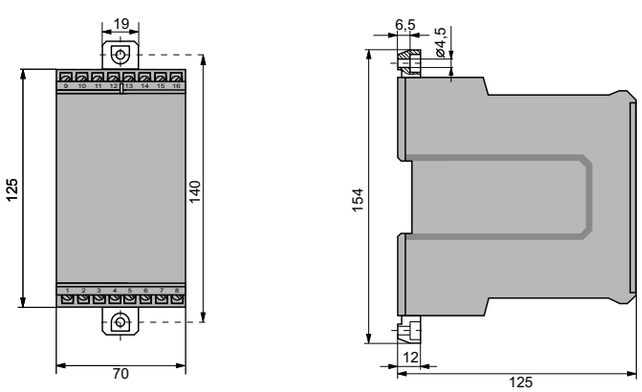


Fig. 4. P11 in housing E16 with the screw hole brackets pulled out for wall mounting.

Types of Power Transducer Nomenclatures

Types	System	Power Measurement Method	Models	
			Active	Reactive
1 Ph	----	1 Element / One Wattmeter	PE	QE
3 Ph 3W	Balanced Load	1 Element / One Wattmeter	PD	QD
3 Ph 3W	Unbalanced Load	2 Element / Two Wattmeter	PDU	QDU
3 Ph 4W	Unbalanced Load	3 Element / Three Wattmeter	PDN	QDN

P - Active Power , Q - Reactive Power

Specification and ordering information

Order Code P11 —			
Features,	***SCODE**	**no-go**	
1.Mechanical design			
3) Housing E16	B		3 . . . . .
2. Measuring mode			
4) Active power P	C		. 4 . . . . .
5) Reactive power Q			. 5 . . . . .
3. Application			
A) Single-phase AC	F		A . . . . .
B) 3-wire 3-phase balanced load	G		B . . . . .
C) 3-wire 3-phase balanced load, phase shift U: L1-L3, I: L1	H		C . . . . .
D) 3-wire 3-phase balanced load, phase shift U: L1-L2, I: L1	H		D . . . . .
E) 3-wire 3-phase unbalanced load	I		E . . . . .
F) 4-wire 3-phase unbalanced load	J		F . . . . .
G) 4-wire 3-phase unbalanced load, open-Y	J		G . . . . .
4. Nominal frequency ⑦			
1) 50 Hz			. 1 . . . . .
2) 60 Hz			. 2 . . . . .
9) Non - standard [Hz]			. 9 . . . . .
≥ 16.67 to 500 Restriction: Class 1.0, linearity error ± 0.4% With frequency < 40 Hz : response time < 800 ms, $I_N \leq 5A$ residual ripple < 2% p.p.			

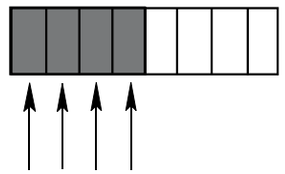
Order Code P11 — ▮▮

Features, Selection	*SCODE	no-go	
5. Nominal input voltage (measuring input) ⑧			
A) 100/√3 V;		GHIJ	. . A . . . . .
B) 110/√3 V;		GHIJ	. . B . . . . .
C) 100 V;			. . C . . . . .
D) 110 V;			. . D . . . . .
E) 200 V;			. . E . . . . .
F) 230 V;			. . F . . . . .
G) 400 V;			. . G . . . . .
H) 500 V;			. . H . . . . .
Z) Non-standard [V;V] ▮▮▮▮▮▮▮ ≥ 10.00; to 660;			. . Z . . . . .
With a 3 phase system the nominal input voltage to be shown as phase to phase voltage. For transformer connection add semicolon with primary/secondary voltage in V, e.g. 6600/110 (in line D) or 120;14400/120 (in line Z, non-standard). For uneven values show 2 positions after the comma			
6. Nominal input current (measuring input) ⑨			
1) 1 A;			. . . 1 . . . .
2) 2 A;			. . . 2 . . . .
3) 5 A;			. . . 3 . . . .
9) Non - standard [A;A] ▮▮▮▮▮▮▮ ≥ 0.01; to 10;			. . . 9 . . . .
For transformer connection add semicolon with primary/secondary current in A, e.g. 500/1 (in line 1) or 6.67;1600/6.67 (in line 9, non-standard). For uneven values show 2 positions after the comma			
7. Measuring range P ⑥			
0) Not provided for active power measurement		D	0 . . . . .
9) Measuring range P ▮▮▮▮▮▮▮		E	9 . . . . .
Specify measuring range in W, kW or MW; attention to the calibration factor. E.g. 0...1000 W, –40...0...40 kW, 0...100 MW. For 2 measuring ranges (see also Section "Technical data") select the highest range and the second range to be shown in feature 18			
8. Calibration P ①②			
0) cP does not apply		D	. 0 . . . . .
1) Calibration factor cP ≥ 0.75 to 1.3; Class 0.5	T	E	. 1 . . . . .
2) Calibration factor cP ≥ 0.25 to 0.74; Class 1.0	T	E	. 2 . . . . .
3) Calibration factor cP > 1.3 to 1.5; Class 1.0	T	E	. 3 . . . . .
9) Calibration factor cP1/cP2 ▮▮▮▮▮▮▮ Limit cP ≥ 0.25 to 1.5; cP1:cP2 > 1 to ≤ 2	U	E	. 9 . . . . .
Calculation of the calibration factor c see Section "Technical data". For 2 measuring ranges specify both calibration factors in line 9			
9. Measuring range Q ⑥			
0) Not provided for reactive power measurement	Y		. . 0 . . . . .
9) Measuring range Q ▮▮▮▮▮▮▮			. . 9 . . . . .
Specify measuring range in Var, kVar, MVar; attention do calibration factor! E.g. 0...1000 Var, –40...0...40 kVar, 0...100 MVar. For 2 measuring ranges (see also Section "Technical data") select the highest range and the second range to be shown in feature 19 (Page 12)			

⑦ to ⑨ see Section "Special features"

Order Code P11 — ▮▮▮▮ ▮▮▮▮

Features, Selection	*SCODE	no-go
10. Calibration Q ① ②		
0) cQ does not apply		D
1) Calibration factor cQ ≥ 0.75 to 1.3; Class 0.5	T	E
2) Calibration factor cQ ≥ 0.25 to 0.74; Class 1.0	T	E
3) Calibration factor cQ > 1.3 to 1.5; Class 1.0	T	E
9) Calibration factor cQ1/cQ2 ▮▮▮▮▮▮▮▮	U	E
Limit cQ ≥ 0.25 to 1.5; cQ1:cQ2 > 1 to ≤ 2		
Calculation of the calibration factor c see Section “Technical data”. For 2 measuring ranges specify both calibration factors in line 9		
11. Output signal P (measuring output 1)	L	
0) Output P does not apply		D
1) 0...10 V	N	E
2) 1... 5 V		E
3) – 10... 0...10 V .		E
9) Non-standard [V] ▮▮▮▮▮▮▮▮		E
A) 0... 1 mA .		E
B) 0... 5 mA .		E
C) 0...10 mA .		E
D) 0...20 mA .		E
E) 4...20 mA .	N	E
F) – 1 ... 0... 1 mA .		E
G) – 2.5... 0... 2.5 mA .		E
H) – 5 ... 0... 5 mA .		E
J) – 10 ... 0...10 mA .		E
K) – 20 ... 0...20 mA .		E
Z) Non-standard [mA] ▮▮▮▮▮▮▮▮		E
Line 9: 0...1.00 to 0...15 ⑩ 0.2...1 to 3...15 ⑬ –1.00...0...1.00 to –15...0...15 ⑪ bipolar asymmetrical ||Umax|| ≥ 1 to 15 V ⑫ Line Z: 0...> 1.00 to 0...< 20 ⑭ 1...5 to < (4...20) ⑰ > (–1.00...0...1.00) to < (–20...0...20) ⑮ bipolar asymmetrical $\|\|I_{max}\|\|$ ≥ 1 to 20 mA ⑯		
12. Output signal Q (measuring output 1)	L	
0) Output P does not apply		E
1) 0...10 V	N	D
2) 1... 5 V		D
3) – 10... 0...10 V .		D
9) Non-standard [V] ▮▮▮▮▮▮▮▮		D
A) 0... 1 mA .		D
B) 0... 5 mA .		D
C) 0...10 mA .		D
D) 0...20 mA .		D
E) 4...20 mA .	N	D
F) – 1 ... 0... 1 mA .		D
G) – 2.5... 0... 2.5 mA .		D
H) – 5 ... 0... 5 mA .		D
J) – 10 ... 0...10 mA .		D
K) – 20 ... 0...20 mA .		D
Z) Non-standard [mA] ▮▮▮▮▮▮▮▮		D
Lines 9 and Z: Limit values for non-standard signals see feature 11		



① ② and ⑥ see Section “Special features”

Order Code P11 —

Features, Selection	*SCODE	no-go	
13. Power supply			
0) Internal from voltage measuring input (≥ 24 to 500 V AC) ⑳			0 . . . .
1) 24 V, 50/60 Hz			1 . . . .
3) 115 V, 50/60 Hz			3 . . . .
4) 120 V, 50/60 Hz			4 . . . .
6) 230 V, 50/60 Hz			6 . . . .
7) 240 V, 50/60 Hz			7 . . . .
9) Non-standard 50/60 Hz [V] [redacted] > 24 to 500 ⑲			9 . . . .
A) 24... 90 V DC, –15/+33%		M	A . . . .
B) 90...240 V DC, –15/+33%			B . . . .
C) 24...60 V DC, -15 / +33% (for 2 output)		KL	C . . . .
D) 85...230 V DC, -15 / +33% (for 2 output)		KM	D . . . .
14. Special features			
0) Without	Y		. 0 . . . . . .
1) With			. 1 . . . . . .
Without special features (line 0): Order Code complete. With special feature (line 1): The features to be omitted must be marked hereafter with / (slant line) in the order code until reaching the required feature			
15. Zero displacement ③			
A) Zero displacement, P-output	N	EY	. . A . . . . .
B) Zero displacement, Q-output	N	DY	. . B . . . . .
10 to 125% in positive or negative direction, e.g. –20...0...20 MW into 0...10 mA or 4...20 mA			
16. Smaller residual ripple in measuring output ⑱			
A) ≤ 0.5% p.p. instead of < 1% p.p. Restriction: Time response < 800 ms instead of < 300 ms (not possible for nominal frequencies < 50 Hz) (for current signals only)		Y	. . . A . . . .
17. Measuring range adjustable (variable sensitivity) ④⑤			
A) Approx. ± 5%		NY	. . . . A . . .
B) Approx. ± 10%		NY	. . . . B . . .
Restriction: Accuracy class 1.0. Not possible with zero displacement or live-zero output			
18. Second measuring range P ⑥			
Z) Measuring range Specify measuring range in W, kW or MW. Specify calibration factor in feature 8, line 9 (Page 9)		ETY	. . . . . Z . .
19. Second measuring range Q ⑥			
Z) Measuring range Specify measuring range in Var, kVar or MVar. Specify calibration factor in feature 10, line 9 (Page 9)		DTY	. . . . . . Z .
20. Improved climatic rating (DIN 40 040) ㉑			
A) Application class HVR instead of HVE ((standard)		Y	. . . . A
21.Output Signal P or Q (measuring output 2) Refer Sr. No. 11 or 12	M		

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

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