RISH *Ducer* P11 Transducer for active or reactive power

in housing E16 for rail and wall mounting

Application

The transducer RISH Ducer (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 ´ I_{AN}. The unit is designed to withstand impulse voltages to IEC and ANSI/IEEE regulations.

Fig. 1. RISH Ducer P11 transducer in housing E16 clipped onto a top-hat rail.

Features / Benefits

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

Meas. variables	Nominal input current	Nominal input voltage
Active or reactive power	0.01 to 10 A	10 to 660 V

- Measuring output: DC current signal (load-independent) or DC voltage signal
- Measuring principle: TDM system
- 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 multistoried 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 · U_N · I_N (single-phase AC power)
≥ 0.75 to 1.3 · 3 · U_N · 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:

$$c = \frac{\text{unipolar range end value}}{U_N \cdot I_N \setminus 3}$$

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 (7): 50 or 60 Hz
Nominal input voltage U_N (8): 100/ 3 , 110/ 3 , 100, 110, 200, 230, 400 or 500 V
Nominal input current I_N 9: 1, 2 or 5 A
Own consumption: < 0.1 VA per current circuit
Sensitivity: U_N · 1 mA per voltage circuit
< 0.05% of range end value

Overload capacity:

Measured quantity I_N, U_N	Number of applications	Duration of one application	Interval between two successive applications
2 x I_N	continuously	---	---
10 x I_N	5	15 s	5 min.
40 x I_N[1]	1	1 s	---
1.5 x U_N	continuously	---	---
2 x U_N	10	10 s	10 s
4 x U_N	1	2 s	---

[1] 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
$R_{ext}[k\Omega] > \frac{U_A\,[V]}{20\ mA}$ for one output
$R_{ext}[k\Omega] > U_A/V$ for one output

Standard ranges of I_A [14] to [17]: 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 one output
Burden voltage ± 12 V for two output
External resistance

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

I_{AN} = Full output value

Voltage limit under $R_{ext} = \infty$: Approx. 40 V
Current limit under overload: Approx. 1.3 ´ I_{AN} with current output
Approx. 30 mA with voltage output
Span adjustment: Approx. ± 2%
Output current ripple 18 : < 1% p.p.
Response time: < 300 ms

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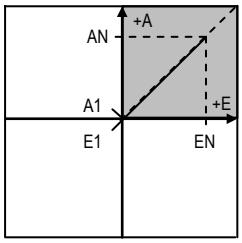
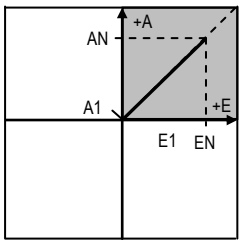
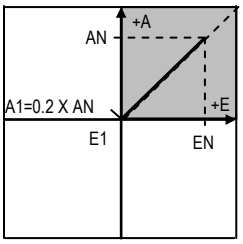
Output characteristic



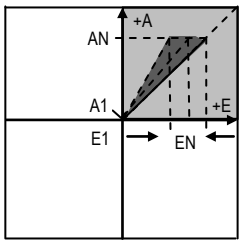
Characteristic a
Input E1...EN
Output A1...AN



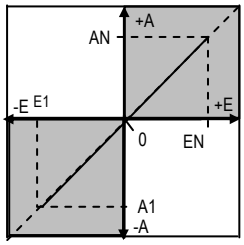
Characteristic b
Input E1...EN
Output A1...AN
Given better resolution at top of range



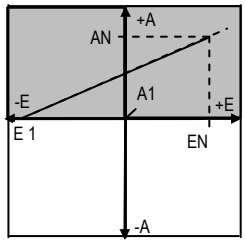
Characteristic c
Input E1...EN
Output A1...AN
Live-zero output signal



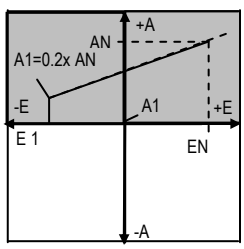
Characteristic d
Input E1...EN ± 10%
Output A1...AN
Variable sensitivity



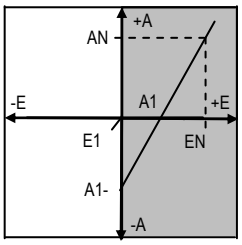
Characteristic e
Input E1...0...EN
Output A1...0...AN



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 (according 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% $I_N \cdot c$
Input voltage	0...120% U_N
Power factor cos φ	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
Influence effects (maxima)	R_{ext} min. … ∞ with voltage output
Included in basic error	
Linearity error	± 0.2 % for one output
current, voltage, cosφ	± 0.4 % for two o utput
Frequency influence f_N ±5%	± 0.05%
Dependence on external resistance (ΔR_{ext} max.)	± 0.05%
Power supply influence U_{HN} ± 15%	± 0.05%
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 acc. to ANSI/IEEE C37.90-1978 2.5 kV, 150 Ω 1 MHz, 50 Hz	± 2.0% ± 1.0%
Power supply →○	
AC voltage 19 and 20:	24, 115, 120, 230 or 240 V, ± 15%, 42 to 70 Hz Power consumption approx. 5 VA for one o/p Power consumption approx. 8 VA for two o/p
DC voltage:	24...90 (24...60V for Two output) or 90...240 V, –15 / + 33%, Power consumption approx. 5 W for one o/p Power consumption approx. 8W for two o/p

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, no dripping, free of halogen

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Mounting:	For snapping onto top-hat rail (35 ´ 15 mm or 35 ´ 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 ´ 2.5 mm^2 or 1 x 6 mm^2
Weight:	Approx. 0.7 kg
Regulations	
Electrical standards:	Acc. to IEC 348
Housing protection:	IP 40 acc. to EN 60 529 Terminals IP 20
Insulation group acc. to DIN 57 110 b:	A (instrument) C (terminals)
Test voltage	4 kV / 50 Hz / 1 in-between electrically isolated circuits and versus housing 500 V / 50Hz / 1min. between output 1 versus output 2 for two output only

Environmental conditions

Climatic 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%

(21) *see Section "Special features"*

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. capacitive coupled
Transient surge on power supply	IEC 1000-4-5	± 2 kV, 1.2/50 µs, symmetrical ± 4 kV, 1.2/50 µs, 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

Table 2: Specification and ordering information

Order Code P11 –											
Features, Selection	***SCODE**	**no-go**									
1. Mechanical design											
3) Housing E16			3	.	.	.	.	.	.	.	.
2. Measuring mode											
4) Active power P	D		.	4	.	.	.	.	.	.	.
5) Reactive power Q	E		.	5	.	.	.	.	.	.	.

Order Code P11 –											
Features, Selection	***SCODE**	**no-go**									
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											
1) 50 Hz			.	1	.	.	.	.	.	.	.
2) 60 Hz			.	2	.	.	.	.	.	.	.
9) Non-standard ≥ 16.67 to 500 Restriction: Class 1.0, linearity error ± 0.4% With frequency < 40 Hz: response time < 800 ms, $I_N \leq 5$ A residual ripple < 2% p.p.			.	9	.	.	.	.	.	.	.

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Order Code P11 – | | | | | | | | | | |

Features, Selection	*SCODE	no-go
5. Nominal input voltage (measuring input) (8)		
A) 100/ 3 V;		GHIJ
B) 110/ 3 V;		GHIJ
C) 100 V;		
D) 110 V;		
E) 200 V;		
F) 230 V;		
G) 400 V;		
H) 500 V;		
Z) Non-standard [V;V]		
≥ 10.00; to 660;		
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;		
2) 2 A;		
3) 5 A;		
9) Non-standard ≥ 0.01; to 10; [A;A]		
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		

Order Code P11 – | | | | | | | | | | |

Features, Selection	*SCODE	no-go
7. Measuring range P [6]		
0) Not provided for active power measurement		D
9) Measuring range P		E
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 [1] [2]		
0) cP does not apply		D
1) Calibration factor cP ≥ 0.75 to 1.3; Class 0.5	T	E
2) Calibration factor cP ≥ 0.25 to 0.74; Class 1.0	T	E
3) Calibration factor cP > 1.3 to 1.5; Class 1.0	T	E
9) Calibration factor cP1/cP2	U	E
Limit cP ≥ 0.25 to 1.5; cP1:cP2 > 1 to ≤ 2		
Calculation of the calibration factor c sees 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		E
9) Measuring range Q		D
Specify measuring range in Var, k Var, M Var; attention do calibration factor! E.g. 0...1000 Var, –40...0...40 k Var, 0...100 M Var. For 2 measuring ranges (see also Section "Technical data") select the highest range and the second range to be shown in feature 19		
10. Calibration Q [1] [2]		
0) cQ does not apply		E
1) Calibration factor cQ ≥ 0.75 to 1.3; Class 0.5	T	D
2) Calibration factor cQ ≥ 0.25 to 0.74; Class 1.0	T	D
3) Calibration factor cQ > 1.3 to 1.5; Class 1.0	T	D
9) Calibration factor cQ1/cQ2	U	D
Limit cQ ≥ 0.25 to 1.5; cQ1:cQ2 > 1 to ≤ 2		
Calculation of the calibration factor c sees Section "Technical data". For 2 measuring ranges specify both calibration factors in line 9		

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Order Code P11 –																			
Features, Selection	***SCODE**	**no-go**																	
11. Output signal P (measuring output 1)	K																		
0) Output P does not apply		D	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1) 0...10 V		E	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2) 1... 5 V	N	E	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3) – 10... 0...10 V		E	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9) Non-standard [V]		E	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
A) 0... 1 mA		E	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
B) 0... 5 mA.		E	B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C) 0...10 mA .		E	C	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
D) 0...20 mA.		E	D	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
E) 4...20 mA.	N	E	E	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
F) – 1 ... 0... 1 mA.		E	F	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G) – 2.5... 0... 2.5 mA.		E	G	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H) – 5 ... 0... 5 mA.		E	H	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
J) – 10 ... 0...10 mA.		E	J	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
K) – 20 ... 0...20 mA.		E	K	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Z) Non-standard [mA]		E	Z	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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 $\|\|U_{max}\|\| \geq 1$ 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 $\|\|I_{max}\|\| \geq 1$ to 20 mA [16]																			
12. Output signal Q (measuring output 1)	L																		
0) Output Q does not apply		E	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1) 0...10 V.		D	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2) 1... 5 V .	N	D	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3) – 10... 0...10 V.		D	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9) Non-standard [V]		D	.	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
A) 0... 1 mA.		D	.	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
B) 0... 5 mA.		D	.	B	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
C) 0...10 mA.		D	.	C	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
D) 0...20 mA.		D	.	D	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
E) 4...20 mA.	N	D	.	E	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
F) –1 ... 0... 1 mA.		D	.	F	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
G) –2.5... 0... 2.5 mA .		D	.	G	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
H) –5 ... 0... 5 mA .		D	.	H	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
J) –10 ... 0...10 mA .		D	.	J	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
K) –20 ... 0...20 mA.		D	.	K	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Z) Non-standard [mV]		D	.	Z	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lines 9 and Z: Limit values for non-standard signals see feature 11																			

10 to 17 see Section "Special features"

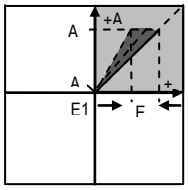
RISH *Ducer* P11 Transducer for active or reactive power

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] > 24 to 500 19			9 . . . .
A) 24… 90 V DC, –15/+33%		M	
B) 90...240 V DC, –15/+33% C) 24…60 V DC ,-15/ +33%		KL	
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) 4 5			
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		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		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		

RISH *Ducer* P11 Transducer for active or reactive power

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 1.5Limitation: 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) imitation: 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 ≤ k ≤ 2

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

Nature of special features
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 ≤5 A Residual ripple < 2% p.p.
Nominal input voltage U_N
⑧ between 10 and 660 V, other than the standard values 100/ 3, 110/ 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 xI_N continuous 10 x IN for 10 s, max. 5 times at 5 min. intervals 40 x IN for 1 s, max. 250 A, once only f_N ≥ 40 Hz *With I_N > 8.3 A* Reference conditions I_E ≤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 range – 10...0...10 V
12 Bipolar asymmetrical load-independent DC voltage* Ranges

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

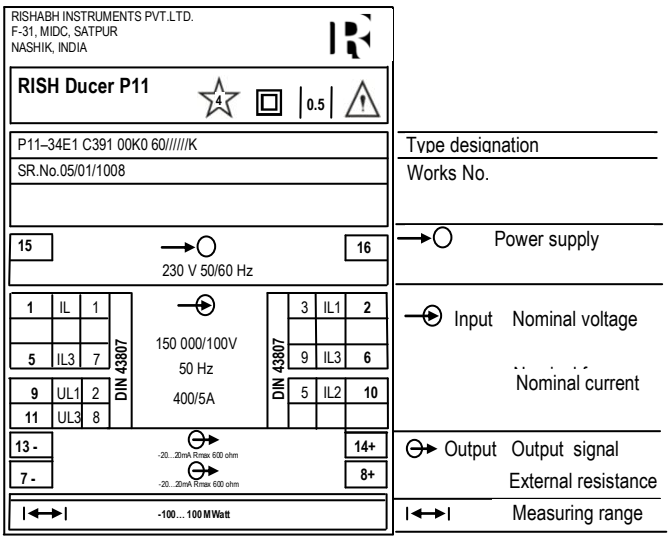
13 Live-zero* Ranges between 0.2...1 and 3...15 V, other than the standard range 1...5 V * Limitation: U_{AN} < 4 V Additional error: Burden dependency Δ R_{ext} max. = 0.2% Reference condition: external resistance 2 ´ R_{ext} min. ± 20%
14 Unipolar load-independent DC current Ranges between 0...1 and 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

Nature of special features
16 Bipolar asymmetrical load-independent DC current Ranges

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

17 Live-zero Ranges between 1...5 and 4...20 mA, other than the standard range 4...20 mA
Residual ripple in output current (for one output)
18 ≤ 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 & 24 and 240 for two outputs, ± 15%, 42 to 70 Hz Power consumption approx. 5VA for one output & 8VA for two outputs apart from the standard voltages 24, 115, 120, 230 and 240 V
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) (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 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)

Type label



Electrical connections

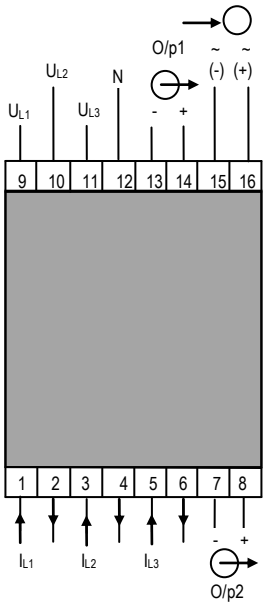
U_{L1} U_{L2} U_{L3}

I_{L1} I_{L2} I_{L3}

= Measuring inputs

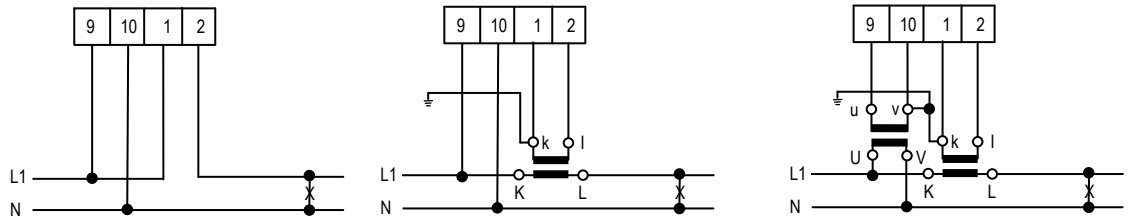
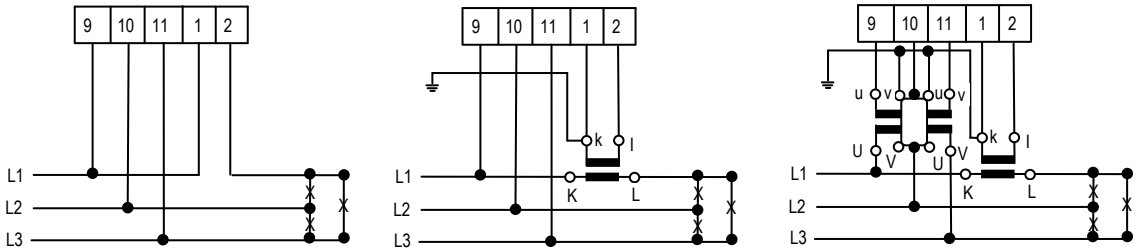
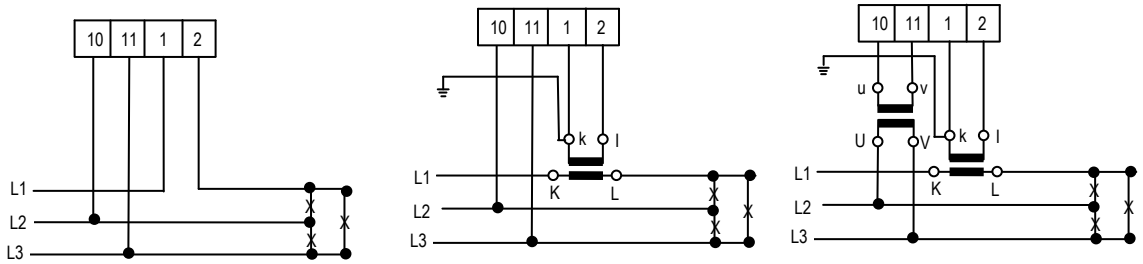
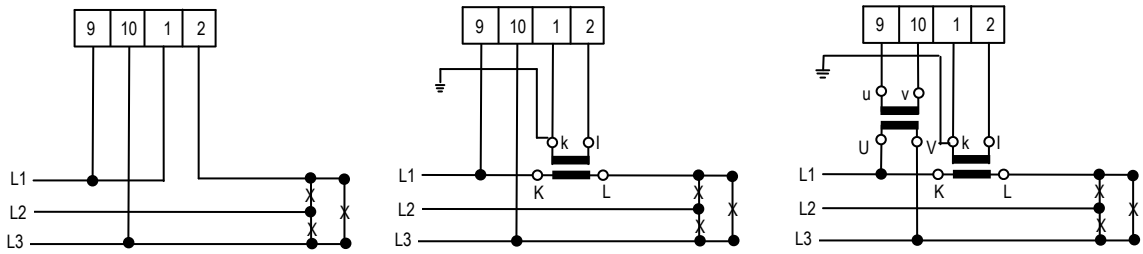
= Measuring output, O/p 1 & O/p 2

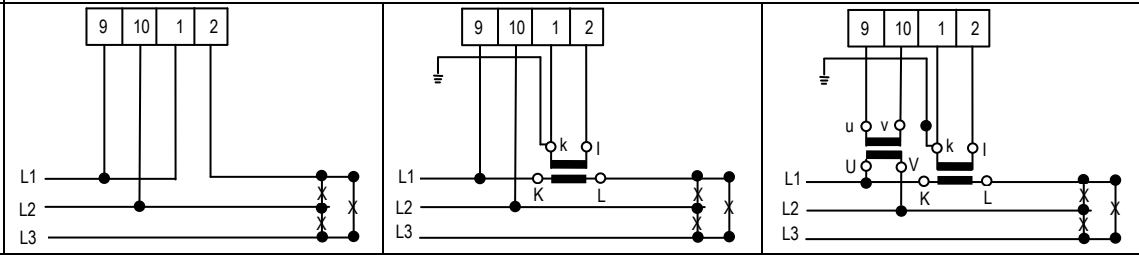
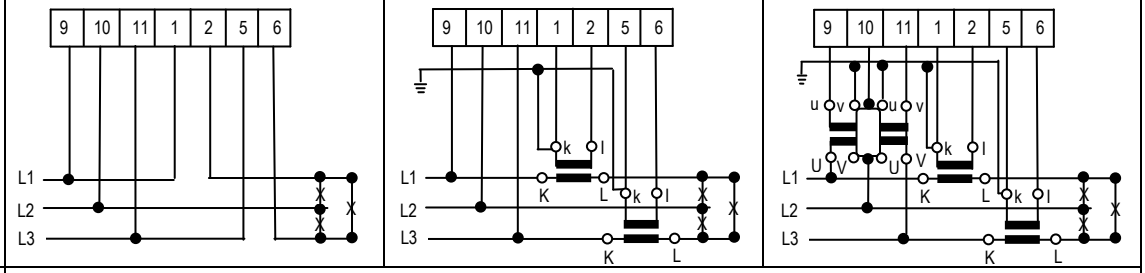
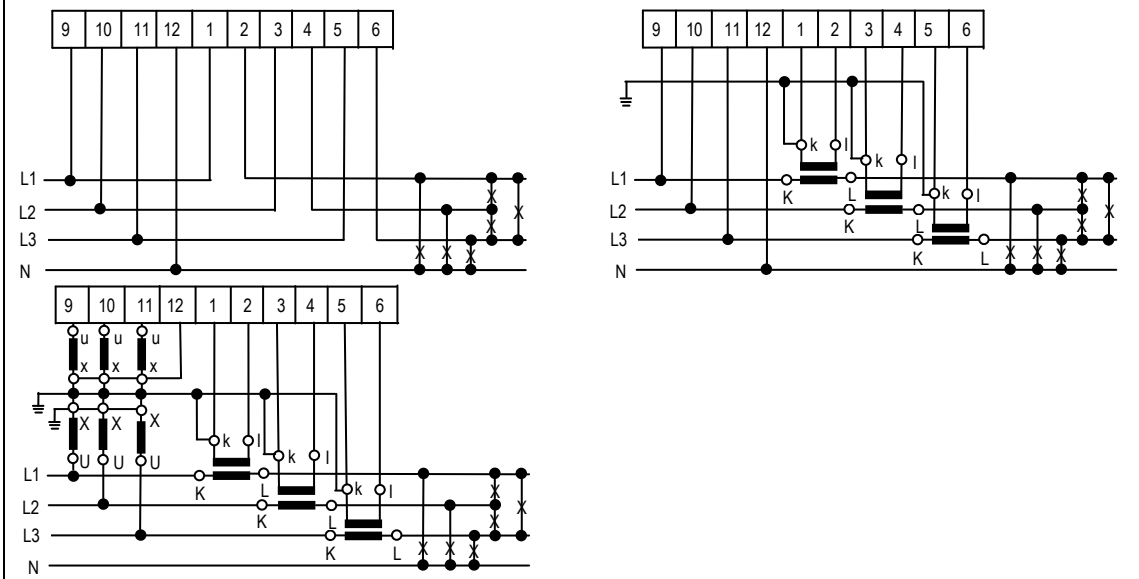
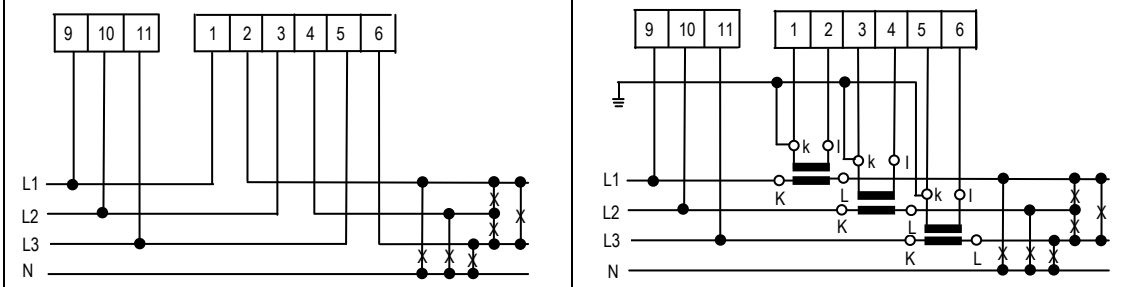
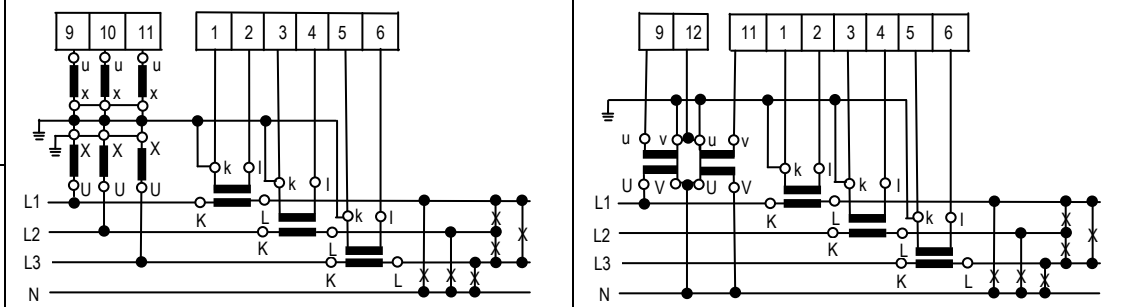
= Power supply



Front

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	

Application	Measuring inputs 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
Reactive power measurement in 4-wire 3-phase network unbalanced load	
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

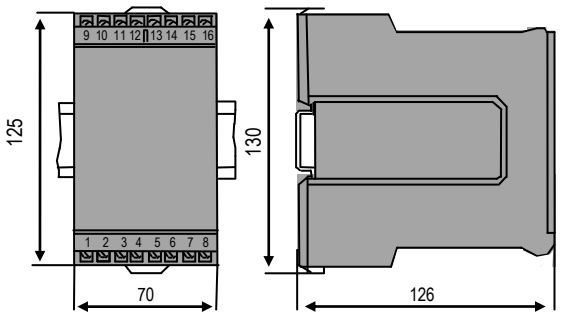


Fig. 3.RISH Ducer P11 in housing E16 clipped onto a hat rail (35'15mm or 35'7.5 mm,acc. to EN 50 022)

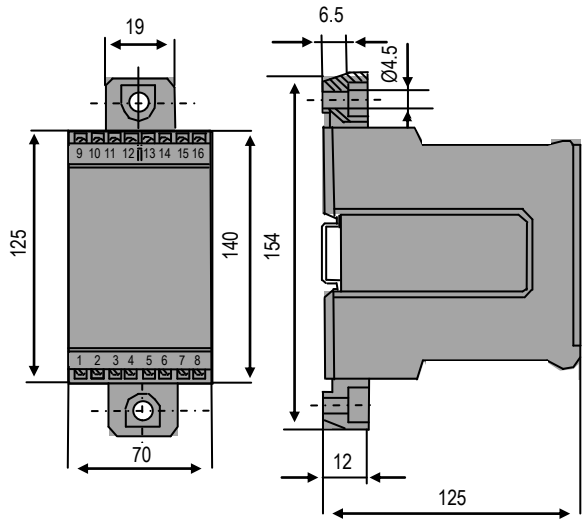


Fig. 4. RISH Ducer P11 in housing E16 with the screw hole brackets pulled out for wall mounting.