

P43 PROGRAMMABLE TRANSDUCER OF 3-PHASE POWER NETWORK PARAMETERS

Features



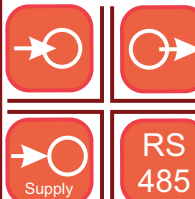
Input



Outputs

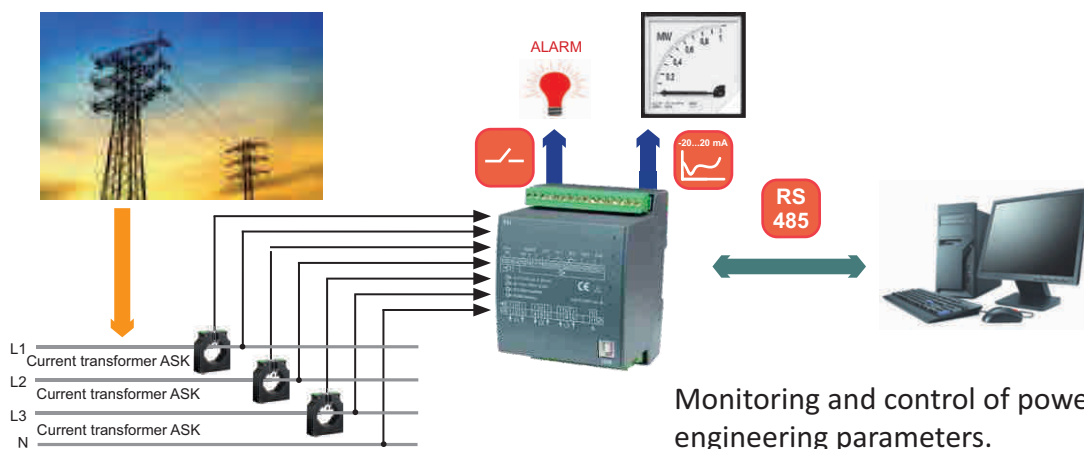


Galvanic Isolation



- Measurement and conversion of power network parameters in 4-wire balanced or unbalanced systems.
- Tetraquadrantic energy measurement (Ep+, Ep-, EQL, EQc).
- Measurement of 15, 30 or 60 minutes' mean active power (synchronization by an internal clock or a walking window) with the archiving function of 1000 last samples.
- Programmable current and voltage transformer ratios.
- Programmable parameters through the RS-485 interface or USB when using the free LPCon program.
- RS-485 communication interface with MODBUS protocol.
- Detection and signalling of incorrect phase sequence.
- THD measurement.

Example of Application



Measured Quantities and Measuring Ranges

Measured value	Measuring range	L1	L2	L3	Σ	Basic error
Current 1/5A L1...L3	0.02...6 A a.c.*	●	●	●		±0.2%
Voltage L-N	2.9...276 V a.c.*	●	●	●		±0.2%
Voltage L-L	10...480 V a.c.*	●	●	●		±0.5%
Frequency	47.0...63.0 Hz	●	●	●		±0.2%
Active power	-1.65 kW...1.4 W...1.65 kW*	●	●	●	●	±0.5%
Reactive power	-1.65 kvar...1.4 var...1.65 kvar*	●	●	●	●	±0.5%
Apparent power	1.4 VA...1.65 kVA*	●	●	●	●	±0.5%
Tangens	-1.2...0...1.2	●	●	●	●	±1%
Power factor PF	-1...0...1	●	●	●	●	±0.5%
Input active energy	0 .. 99 999 999.9 kWh*				●	±0.5%
Output active energy	0 .. 99 999 999.9 kWh*				●	±0.5%
Inductive reactive energy	0...99 999 999.9 kvarh*				●	±0.5%
Capacitive reactive energy	0...99 999 999.9 kvarh*				●	±0.5%
THD	0...100%	●	●	●		5%

* - for ratio Ki=Ku=1. Current ratio Ki programmable in the range 1...1000. Voltage ratio Ku programmable in the range 1...4000

Outputs

Type of output	Properties
Relay output	0, 2 or 4 relays, voltageless NO contacts, load: 250 V a.c./ 0.5 A a.c.
Impulse energy output	O/C passive, acc. to EN 62053-31, impuls constant: 5000..20000 imp/kWh programmable, independent on Ki, Ku ratio settings
Analog output	0, 2 or 4 programmable outputs: -20...0..20 mA, R _{load} = 0...250 Ω, accuracy 0.2%

Digital Interface

Type of interface	Transmission protocol	Mode	Rate
RS-485 Modbus	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8; 9.6; 19.2; kbit/s
USB 1.1/ 2.0	MODBUS RTU	8N2	9.6 kbit/s

External Features

Overall dimensions	96 x 120 x 100 mm	fixing on a 35mm DIN rail
Weight	0.3 kg	
Protection grade	for casing: IP40	for terminals: IP10

Rated Operating Conditions

Supply voltage	85 .. 253 V a.c. , 40 .. 400 Hz, 90 .. 320 V d.c. or 20 .. 40 V a.c., 40 .. 400 Hz, 20 .. 60 V d.c.	Power input ≤ 6 VA
Power input	in voltage circuit ≤ 0.05 VA	in current circuit ≤ 0.05 VA
Input signal	<ul style="list-style-type: none"> 0 .. 0.005 .. 1.2In; 0.05 .. 1.2 Un for measurement of current and voltage; 0 .. 0.1 .. 1.2In; 0 .. 0.1 .. 1.2Un for measurement of coefficients Pf_i, $tg\phi_i$ 	<ul style="list-style-type: none"> signal frequency 47 .. 63 Hz sinusoidal signal (THD ≤ 8%)
Power factor	-1 .. 0 .. 1	
Analog outputs	-24 .. -20 .. 0 .. 20 .. 24 mA	
Temperature	ambient: -10...23...55°C	storage: -30...70°C
Humidity	25 .. 95%	inadmissible condensation
Additional error (in % of the intrinsic error)	from output signals frequency < 50%	from ambient temperature changes < 50%/ 10%
Operating position	any	
External magnetic field	0 .. 400 A/m	
Short duration overload (5 s)	voltage input: 2 Un (max. 1000 V)	current input: 10 In
Admissible peak factor	current intensity: 2	voltage: 2

Safety and Compatibility Requirements

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	
Installation category	III	acc. to EN 61010-1
Maximal phase-to-earth voltage	300 V	
Altitude a.s.l.	< 2000 m	

Additional Errors in % The Intrinsic Error

From frequency of input signals	< 50%
From ambient temperature changes	< 50%/ 10%
For THD > 8%	< 100%

Connection Diagram

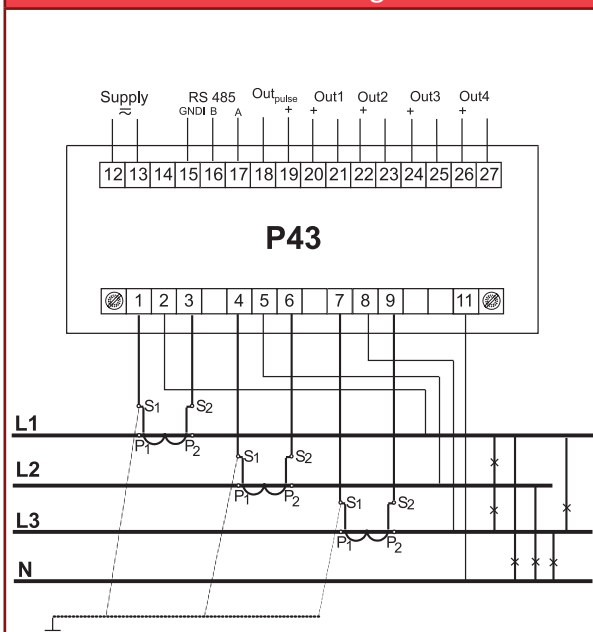


Fig. 1 Exemplary connection diagram for 4-wire network.

Ordering

P43 -	X	X	X	X	XX	X	X
Current input In:							
1 A (X/1)	1						
5 A (X/5)	2						
Voltage input (phase/phase-to-phase) Un:							
3 x 57.7/100 V	1						
3 x 230/400 V	2						
Supply voltage:							
85..253 V a.c., 90..320 V d.c.	1						
20..40 V a.c., 20..60 V d.c.	2						
Output type:							
without analog outputs, 4 relays	1						
2 analog outputs, 2 relays	2						
4 analog outputs, without relays	3						
Version:							
standard					00		
custom-made*					XX		
Language:							
Polish						P	
English						E	
other						X	
Acceptance tests:							
without extra quality requirements							0
with an extra quality inspection certificate							1
acc. to customer's requirements*							X

* version code will be established by the manufacturer

Example of order:

The code: **P43 - 2 2 1 3 00 E 7** means:

- P43** - transducer of P43 type
- 2** - input current: 5 A
- 2** - input voltage: 3 x 230/400 V
- 1** - supply voltage: 85..253 V a.c., 90..320 V d.c.
- 3** - 4 analog outputs, without relays
- 00** - standard version
- E** - English language
- 7** - with an extra quality inspection certificate.

See Also



Current transformers.



Analysers of network parameters ND1.



Meter of network parameters N13.