# P43 PROGRAMMABLE TRANSDUCER OF 3-PHASE POWER NETWORK PARAMETERS

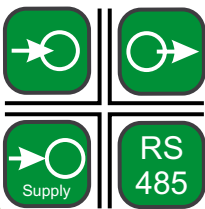**LUMEL** EVERYTHING COUNTS

## FEATURES

MOD BUS

RTC

eCon

P,Q C|L L|C

## INPUT:

AC

- 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 eCon software.
- RS-485 communication interface with MODBUS protocol.
- Detection and signalling of incorrect phase sequence.
- THD measurement.

CE

## EXAMPLE OF APPLICATION



ALARM

-20...20 mA

RS 485

Monitoring and control of power engineering parameters.

L1 Current transformer
L2 Current transformer
L3 Current transformer
N

## OUTPUTS:

-20...20 mA

RS 485

USB

## 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 φ | -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

## GALVANIC ISOLATION:

RS 485

Supply

## 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...500 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 × 120 × 100 mm | fixing on a 35mm DIN rail |
|---|---|---|
| Weight | 0.3 kg | |
| Protection grade | for casing: IP40 | for terminals: IP10 |

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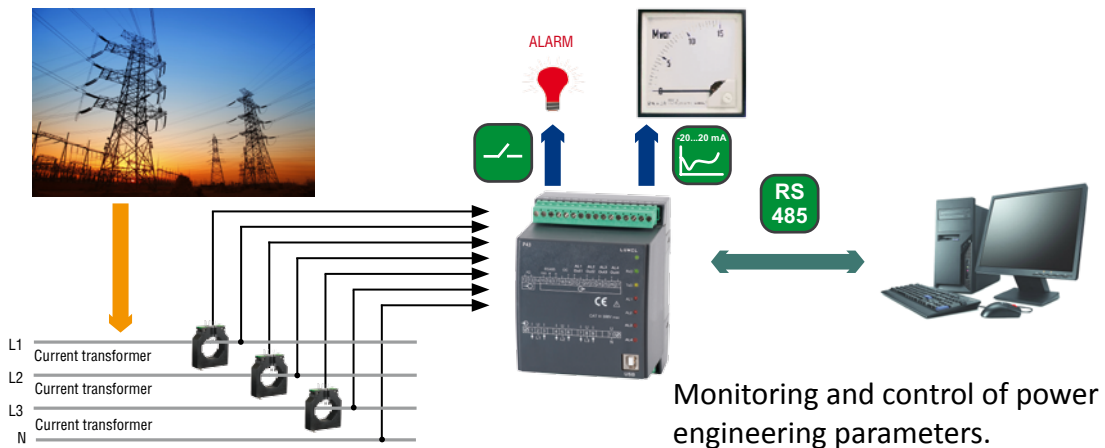tel.: (+48 68) 45 75 130, 45 75 132
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## RATED OPERATING CONDITIONS

| | | |
|---|---|---|
| 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 | • 0 .. 0.002 .. 1.2 In; 0.05 .. 1.2 Un for the measurement of current and voltage;<br>• 0 .. 0.1 .. 1.2 In; 0 .. 0.1 .. 1.2 Un or the measurement of coefficients $Pf_i$, $tg\varphi_i$ | • signal frequency 47 .. 63 Hz<br>• sinusoidal signal (THD ≤ 8%) |
| Power factor | -1 .. 0 .. 1 | |
| Analog outputs | -24..-20 ..0..20..24 mA, $R_{load}$ = 0...250 Ω | -22..-20.. 0..20..22 mA, $R_{load}$ = 0...500 Ω |
| 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 | acc. to EN 61010-1 |
| Installation category | III | |
| Maximal phase-to-earth voltage | 300 V | |
| Altitude a.s.l. | < 2000 m | |

## ADDITIONAL ERRORS IN % OF THE INTRINSEC ERROR

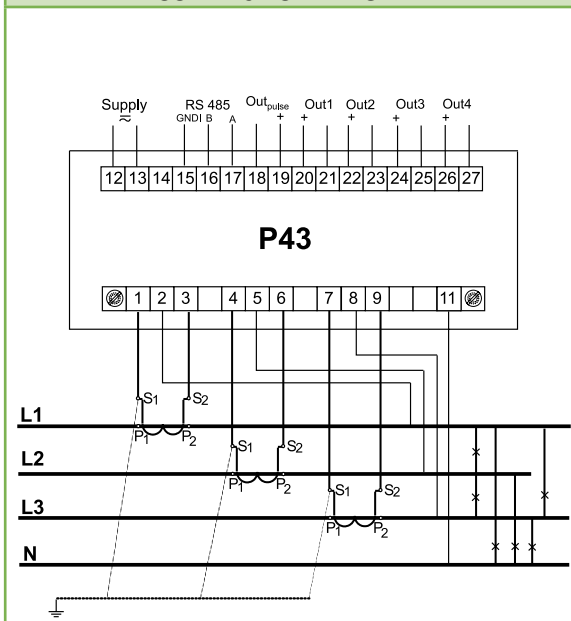| | |
|---|---|
| From frequency of input signals | < 50% |
| From ambient temperature changes | < 50%/ 10% |
| For THD > 8% | < 100% |

## CONNECTION DIAGRAM



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

## ORDERING

| Code | Description |
|---|---|
| P43 211300M0 | 3-phase transducer of power network parameters P43 input I 5A(X/5); input U 3 x 57,7/100V; supply 85-253Vac, 90-320Vdc; 4 x analog output, without relays; documentation and descriptions in Polish and English, test certificate |
| P43 221300M0 | 3-phase transducer of power network parameters P43 input I 5A(X/5); input U  3 x 230/400V; supply 85-253Vac, 90-320Vdc; 4 x analog output, without relays; documentation and descriptions in Polish and English, test certificate |
| P43 221100M0 | 3-phase transducer of power network parameters P43 input I 5A(X/5); input U  3 x 230/400V; supply 85-253Vac, 90-320Vdc; 4 x relay, without analog outputs; documentation and descriptions in Polish and English, test certificate |
| P43 211100M0 | 3-phase transducer of power network parameters P43 input I 5A(X/5); input U  3 x 57,7/100V; supply 85-253Vac, 90-320Vdc; 4 x relay, without analog outputs; documentation and descriptions in Polish and English, test certificate |
| P43 111300M0 | 3-phase transducer of power network parameters P43 input I 1A(X/1); input U 3 x 57,7/100V; supply 85-253Vac, 90-320Vdc; 4 x analog output, without relays; documentation and descriptions in Polish and English, test certificate |
| P43 121300M0 | 3-phase transducer of power network parameters P43 input I 1A(X/1); input U  3 x 230/400V; zsupply 85-253Vac, 90-320Vdc; 4 x analog output, without relays; documentation and descriptions in Polish and English, test certificate |
| P43 121100M0 | 3-phase transducer of power network parameters P43 input I 1A(X/5); input U  3 x 230/400V; supply 85-253Vac, 90-320Vdc; 4  x relay, without analog outputs; documentation and descriptions in Polish and English, test certificate |
| P43 111100M0 | 3-phase transducer of power network parameters P43 input I 1A(X/1); input U 3 x 57,7/100V; supply 85-253Vac, 90-320Vdc; 4 x relay, without analog outputs; documentation and descriptions in Polish and English, test certificate |