P10/P10A TRANSDUCER OF NETWORK PARAMETERS

- Measurement and conversion of power network parameters in 3 or 4-wire, balanced or unbalanced systems.
- Measurement of 15, 30 or 60 minutes’ mean active power (synchronization by the internal clock or the walking window).
- Measurement of harmonic distortion coefficients (THD) and harmonics up to the 25 th for voltages and phase currents.
- Configurable analog (4) and alarm (4) outputs.
- 3 two-state inputs to control tariffs of watt-hour meters.
- Programmable parameters using push-buttons or through the RS-485 interface by means of the free LPConfig software.
- Indication of the real time and occurrence time of extreme values.
- Battery support of configuration data and transducer state at supply decay.

EXAMPLE OF APPLICATION

MEASURED PARAMETERS AND MEASURING RANGES

<table>
<thead>
<tr>
<th>Measured value</th>
<th>Indication range</th>
<th>Intrinsic error</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage U</td>
<td>100 V (Ku = 1)</td>
<td>± (0.2% m.v + 0.1% of range)</td>
<td>Ru = 1... 4000</td>
</tr>
<tr>
<td></td>
<td>400 V (Ku = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>for Ku ≠ 1,...400 kV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current I</td>
<td>1.000 A (Ki = 1)</td>
<td>± (0.2% m.v + 0.1% of range)</td>
<td>Ki = 1... 20000</td>
</tr>
<tr>
<td></td>
<td>5.000 A (Ki = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>for Ki ≠ 1,...20.000 kA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active power P</td>
<td>0.0...(-)1999.9 W (Wh)</td>
<td>± (0.5% m.v + 0.1% of range)</td>
<td></td>
</tr>
<tr>
<td>Mean active power P mean</td>
<td>for Ku ≠ 1, Ki ≠ 1 (-)1999.9 MW (MWh)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active energy EnP, EnP mean</td>
<td>for Ku ≠ 1, Ki ≠ 1</td>
<td>± (0.5% m.v + 0.2% of range)</td>
<td></td>
</tr>
<tr>
<td>Apparent power S</td>
<td>0.0...1999.9 VA (VArh)</td>
<td>± (0.5% m.v + 0.2% of range)</td>
<td></td>
</tr>
<tr>
<td>Apparent energy EnS, EnS mean</td>
<td>for Ku ≠ 1, Ki ≠ 1: 1999.9 MVA (MVAh)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactive power Q</td>
<td>0.0...(-)1999.9 var (varh)</td>
<td>± (0.5% m.v + 0.2% of range)</td>
<td></td>
</tr>
<tr>
<td>Reactive energy Enb, Enb mean</td>
<td>for Ku ≠ 1, Ki ≠ 1: (-)1999.9 Mvar (Mvarh)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active power factor Pf</td>
<td>- 1.00...0.00... 1.000</td>
<td>± 1% m.v ± 2c</td>
<td>Pf = P/S (power factor)</td>
</tr>
<tr>
<td>Coefficient tgp (reactive power to active power ratio)</td>
<td>- 99.9...0... 99.9</td>
<td>± 1% m.v ± 2c (error in the range -60...0...+60°)</td>
<td></td>
</tr>
<tr>
<td>Frequency f</td>
<td>20.0... 500.0 Hz</td>
<td>± 0.5% m.v</td>
<td></td>
</tr>
<tr>
<td>THD U, THD I</td>
<td>Harmonic I up to the 25 th</td>
<td>± 5% m.v ± 2c</td>
<td>error in the range 10...120% U, I, 47...52 Hz</td>
</tr>
<tr>
<td>Harmonic I up to the 25 th</td>
<td>0.2... 200%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where: Ku - ratio of voltage transformer, Ki - ratio of current transformer, m.v - measured value, c - the least significant display digit, z - counter from impulse input

INPUTS

- ASK current transformer
- Supply
- RS 485

Output type | Properties
--- | ---
Two-state binary | 3 two-state inputs 0/24 V d.c. ± 50% to control 4 tariffs of active, reactive and apparent energy counters
**OUTPUTS**

- **Output type**
  - Properties
- **Relay output**
  - 4 relays, voltageless NO contacts, load capacity 250 V a.c./0.5 A a.c.
- **Analog output**
  - P10: 4 programmable outputs 0…20 mA, 4…20 mA, 0.5 mA or 0…10 mA, accuracy 0.2%
  - P10A: 4 programmable outputs -5…0…+ 5 mA, or on request, -20 …0…+20 mA, accuracy 0.2%

**DIGITAL INTERFACE**

- **Type of interface**
  - Transmission protocol
  - Mode
  - Baud rate
  - RS-485: MODBUS
  - RTU: 8N2, 8E1, 8O1; ASCII: 8N1, 7E1, 7O1
  - 06, 12, 24, 48, 96, 192 Kbit/s

**EXTERNAL FEATURES**

- **Readout field**
  - LCD display
  - 2 x 16 characters
- **Overall dimensions**
  - 152 x 73.4 x 118.2 mm
  - fixing on a 35 mm DIN rail
- **Weight**
  - 0.5 kg with packaging
- **Protection grade**
  - for casing: IP40
  - from terminal side: IP20

**RATED OPERATING CONDITIONS**

- **Supply voltage**
  - 85…250 V a.c. (40…400 Hz) or d.c.
  - power input ≤ 10 VA
- **Power input**
  - in voltage circuit ≤ 0.02 VA
  - in current circuit ≤ 0.1 VA
- **Input signal**
  - 0.001…1.2 ln
  - 0.001…1.2 Un for the measurement of current, voltage, power and energy in a 4-wire network;
  - 0.001…1.2 In
  - 0.1…1.2 Un for the measurement of current, voltage, power and energy in a 3-wire network;
  - 0.001…1.2 ln for frequency;
  - 0.05…0.5 1.2 Un for PI and tg δ factors;
  - When:
    - signal frequency 45…65 Hz
    - sinusoidal signal (THD ≤ 8%)
- **Power factor**
  - -1…0.1
- **Preheating time**
  - 5 min.
- **Temperature**
  - ambient: 0…23…55°C
  - storage: -20…85°C
- **Humidity**
  - 25…95% inadmissible condensation
- **Operating position**
  - any
- **External magnetic field**
  - 0…40…400 A/m
- **Short duration overload (5 s)**
  - voltage input: 2Un (max. 1000 V)
  - current input: 10 I
- **Admissible peak factor current intensity**
  - 2 voltage: 2
  - from ambient temperature changes: <50%/10°C

**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**
  - double
- **Pollution level**
  - 2
- **Installation category**
  - III
- **Maximum phase-to-earth voltage**
  - 600 V
- **Altitude a.s.l.**
  - < 2000 m

**ORDERING**

- **P10 / P10 A**
- **X**
- **X**
- **X**
- **XX**
- **X**

**Connection diagram**

- **Control input RS485**
- **Analog output**
- **Connection diagram**
- **Semi-indirect measurement in a 4-wire**

**See Also:**

- N10 - network parameters meter
- Current transformers from 5 A up to 6 kA.
- ND1 - Analyser of network parameters

For more information about LUMEL's products please visit our website: www.lumel.com.pl

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