PROGRAMMABLE DIGITAL PANEL METERS

N12P Type

1. APPLICATION

N12P programmable digital panel meters are destined for measurements of a.c. voltage, a.c. current, active, reactive and apparent power, cosφ, tgφ, φ, frequency, active, reactive and apparent energy, 15 minutes' active power 10 minutes' voltage, 10 seconds' frequency. Additionally, they enable the indication of the current hour. The 5 or 4 digit read-out field (14 or 20 mm high digits) in red or green colour ensures a good readability at a long distance.

N12P meters realize following functions:

- signalling of the set value exceeding,
- automatic setup of the decimal point,
- programming of the measurement repetition rate,
- programming of the averaging kind: arithmetic mean, progressive window,
- programming of the voltage and current ratio,
- programming of the alarm output and analogue output with a reaction to any optional measured value, independently of currently displayed value,
- storage of maximal and minimal values and all input values,
- zero balancing of counters: active, reactive and apparent energy,
- synchronizing of 15 minutes' power, 10 minutes' voltage,
- monitoring of set up parameter values,
- blocking of the parameter introduction by means of a password,
- conversion of the measured quantity into any optional quantity on the base of an individual linear characteristic,
- handling of the interface in MODBUS protocol, in ASCII and also RTU mode,
- conversion of the measured quantity into a standard programmed current or voltage signal,
- highlighting of any optional measuring unit acc. the order.

2. TECHNICAL DATA

Rated operation conditons:

- supply voltage depending on the code execution	85...230...253 V a.c. d.c. 20...24...40 V a.c. d.c. or 20... 50 V d.c.
- frequency of the supply a.c. voltage	40...50...440 Hz
- ambient temperature	0...23...50°C
- relative humidity	< 75% (inadmissible water vapour condensation)
Power consumption	max 7 VA
Storage temperature	-20...+85°C
Read-out field:	
- N12P4	7 segment LED, 4 displays and 2 alarm diodes
- N12P5	7 segment LED, 5 displays, 2 alarm diodes and 2 diodes to highlight the unit
Indication range of the digital display:	
- N12P4	-1999...9999
- N12P5	-19999...99999
Handling by means of 4 keys	

Relay outputs:

- programmable alarm thresholds,
- three types of alarm,
- hysteresis defined by means of the lower and upper alarm thresholds,
- signalling of the alarm operation by means of diodes,
- programmable time lag of alarm operation,
- two relay outputs,
- voltageless make contacts
- max. load capacity:

- voltage	250 V a.c., 150 V d.c.
- current	5 A, 30 V d.c., 250 V a.c.
- max. resistance load	1250 VA, 150 W

Analogue output:

- programmed current output	0/4...20 mA
- load resistance	≤ 500 Ω
- programmed voltage output	0...10 V
- load resistance	≥ 500 Ω
- galvanically insulated output	
- resolution	0.01% of the range
- basic error	± (0.1% i.v. + 0.2% u.r.l.)[1]

Digital output:

- RS-485 interface
- MODBUS transmission protocol
- ASCII: 8N1, 7E1, 7O1
- RTU: 8N2,8E1, 8O1

- baud rate	2400, 4800, 9600 bit/sec.
- max. response time on the question frame	300 ms
Resistance against voltage decays	acc. EN 61000-6-2
Electromagnetic compatibility:	
- immunity	acc. EN 61000-6-2
- emission	acc. EN 61000-6-4

LUMEL S.A., ul. Sulechowska 1, 65-022 Zielona Góra, Poland / tel.: +48 68 329 53 02, +48 68 329 53 04, fax: +48 68 325 40 91 / e-mail:export@lumel.com.pl / www.lumel.com.pl

Parameters of the N12P meter

Kind of input	Indication range		Basic error [2]
	5 digits	4 digits	
Rms voltage	1...100.0	1...100.0	±(0.1% i.v. + 0.2% u.r.l.)
Rms voltage	4...400.0	4...400.0	±(0.1% i.v. + 0.2% u.r.l.)
Rms current	0.01...1.000	0.01...1.000	±(0.1% i.v. + 0.2% u.r.l.)
Rms current	0.05...5.000	0.05...5.000	±(0.1% i.v. + 0.2% u.r.l.)
Frequency	10.00...100.00	10.00...99.99	±(0.1% i.v. + 0.1% u.r.l.)
Active power	-19999...19999*	-1999...1999*	±(0.1% i.v. + 0.5% u.r.l.)
Reactive power	-19999...19999*	-1999...1999*	±(0.1% i.v. + 0.5% u.r.l.)
Apparent power	0...19999*	0...1999*	±(0.1% i.v. + 0.5% u.r.l.)
cosφ	-1.000...1.000	-1.000...1.000	±(0.1% i.v. + 1% u.r.l.)[3]
tgφ	-100.0...100.0	-100.0...100.0	±(0.1% i.v. + 1% u.r.l.)[3]
φ	0...359.9	0...359.9	±(0.1% i.v. + 1% u.r.l.)[3]
Active energy	-19999...99999*	-1999...9999*	±(0.1% i.v. + 0.5% u.r.l.)
Reactive energy	-19999...99999*	-1999...9999*	±(0.1% i.v. + 0.5% u.r.l.)
Apparent energy	0...19999*	0...9999*	±(0.1% i.v. + 0.5% u.r.l.)
15 minutes' active power	-19999...19999*	-1999...1999*	±(0.1% i.v. + 0.5% u.r.l.)
10 minutes' voltage	1...100.0	1...100.0	±(0.1% i.v. + 0.2% u.r.l.)
10 minutes' voltage	4...400.0	4...400.0	±(0.1% i.v. + 0.2% u.r.l.)
10 seconds' frequency	10.00...100.00	10.00...99.99	±(0.1% i.v. + 0.1% u.r.l.)
Current time	0.00...23.59	0.00...23.59	1 sec./24 h

* The range of the displayed value is equal to the transformation ratio product, maximal voltage rate, maximal current rate (Tru · Tri · Umax · Imax)

[2] i.v. - indicated value
u.r.l. - upper limit of the measuring sub-range

[3] error in a range 10...120% of the I, U range

Safety requirements	acc. EN 61010-1:
- installation category	III
- pollution degree	2
- working voltage in relation to the earth	600 V a.c.
Preheating time	15 min
Protection level:	
- ensured by the housing	IP 50
- ensured from the terminal side	IP 20
External dimensions	96 x 48 x 93 mm
Cut-out dimensions in the panel	$(92^{+0.6} \times 45^{+0.6})$ mm
Weight	200 g

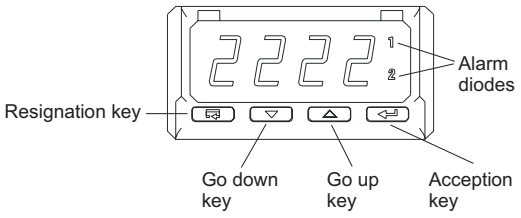
3. FRONTAL VIEW AND HANDLING

After switching the meter on the meter type and the program version appear on the display. After ca 10 sec., the meter automatically transits into the measurement mode and displays the value of the input signal. The meter automatically blanks unsignificant zeros. The exceeding of the alarm threshold is signalled by means of alarm diodes 1 and 2.

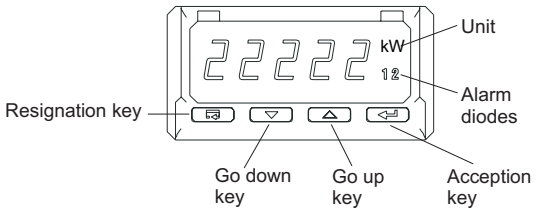
The meter automatically highlights the basic measured value.

Description of the N12P meter frontal plate.

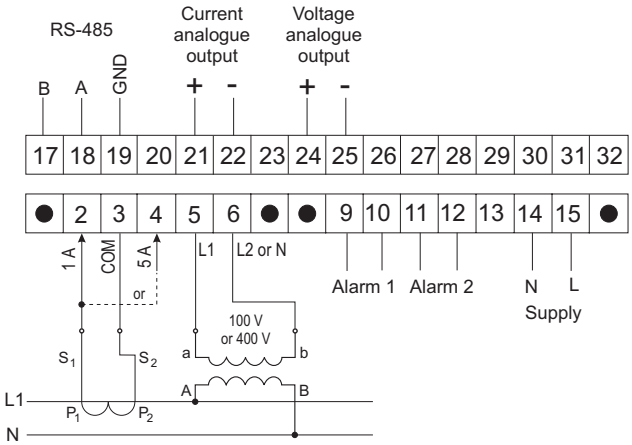
a/ 4 - digit version



b/ 5 - digit version



4. CONNECTION OF INPUT SIGNALS TO TERMINALS



5. ORDERING CODES

N12 DIGITAL METERS	X	X	X	X	X	XX	X	XXX

Inputs:
single-phase parameters ..... **P**
acc. order* ..... **X**

Kind of displays:
4-digit display field (20 mm) **4**
5-digit display field (14 mm) **5**

Display colour:
red **0**
green **1**

Supply voltage:
85...230...253 V a.c./d.c. **1**
20...24...40 V a.c. or 20... 50 V d.c. **2**

Kind of terminals:
socket-plug with screw connections **0**
socket-plug with self-locking connections **1**

Version:
standard **00**
custom-made ..... **XX**

Acceptance tests:
without a quality inspection certificate **0**
with a quality inspection certificate **1**
acc. customer's agreement* ..... **X**

Unit field - Introduce the highlighted unit symbol

* *The number code is established by the manufacturer*

ORDERING EXAMPLE:

Code **N12P-5-0-1-0-00-1-kW** means: single-phase parameter meter with 5 displays of red colour, voltage supply: 230 V a.c., d.c., socket plug terminals with screw connections, standard version, with a quality inspection certificate, with the highlighted kW unit.

March 2006

LUMEL S.A., ul. Sulechowska 1, 65-022 Zielona Góra, Poland / tel.: +48 68 329 53 02, +48 68 329 53 04, fax: +48 68 325 40 91 / e-mail:export@lumel.com.pl / www.lumel.com.pl