LUMEL

METER OF NETWORK PARAMETERS ND20 TYPE

QUICK START MANUAL

CE

Note: The full version of the user's manual is inserted in the www.lumel.com.pl/en/ web site.

1. METER SET
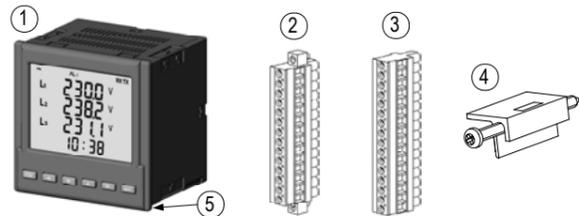
1. meter .... 1 pc
2. plug with 14 screw terminals.............. 1 pc
3. plug with 16 screw terminals.............. 1 pc
4. holder to fix the meter in the panel .... 4 pcs
5. seal .... 1 pc
6. quick start manual .... 1 pc
7. guarantee card .... 1 pc

2. OPERATIONAL SAFETY

In the safety service scope, the meter meets to requirements of the EN 61010-1 standard.

Observations concerning the operational safety:

- All operations concerning transport, installation and commissioning as well as maintenance must be carried out by qualified, skilled personnel, and national regulations for the prevention of accidents must be observed.
- Before switching the meter on, one must check the correctness of connections to the network.
- Before removing the meter housing, one must switch the supply off and disconnect measuring circuits.

- The removal of the meter housing during the guarantee contract period causes its cancellation.
- The ND20 meter is destined to be installed and used in industrial electromagnetic environment conditions.
- A switch or a circuit-breaker should be located near the device, easy accessible by the operator and suitably marked.

3. FIXING WAY

Fix the meter in the panel by means of four screw holders acc. to the fig. 1. Dimensions of the panel cut-out: 92.5$^{+0.6}$ x 92.5$^{+0.6}$ mm dimensions. The material thickness from which the panel is made from should not exceed 15 mm.
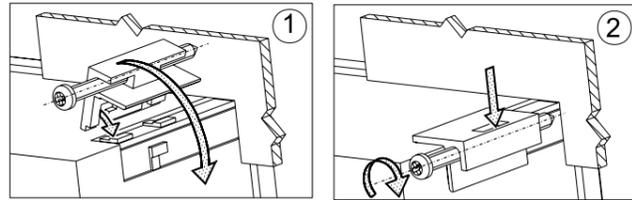
Fig.1. Meter fixing way.

4. METER DIMENSIONS
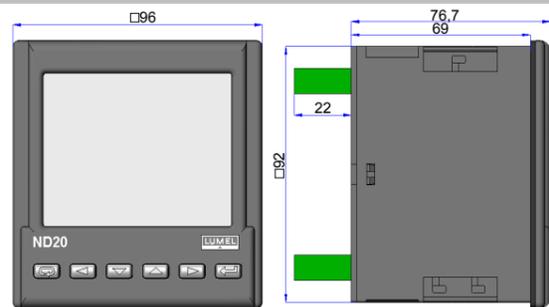
Fig.2. Meter overall dimensions.

5. CONNECTION DIAGRAMS

Supply RS 485 OU$_{imp}$ AL1 OUA 1 (option)
GNDII B A

27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12

ND20

11 | 9 8 7 | 6 5 4 | 3 2 1

N L$_3$ L$_2$ L$_1$
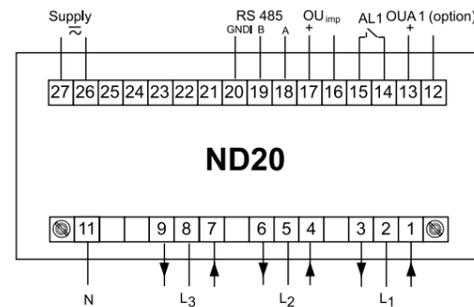
Fig.3. Diagram of meter terminals.

6. METER CONFIGURATION

One can carry out the meter configuration by means of the free LPCon software available on the web site: www.lumel.com.pl or in the meter menu acc. to the user's manual.

Configuration transmission through the RS 485 interface
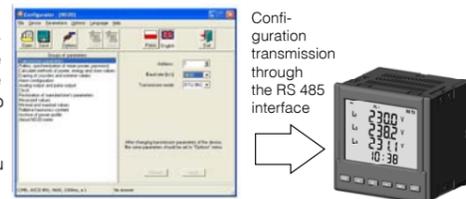
7. STARTING TO WORK

After switching the supply on, the meter performs the displays test, displays the meter name nd20, program version, rated current and voltage, and next displays measured values.

The character message informing about abnormalities can appear on the display (fig.6).

- The entry in the programming mode is carried out by pressing and holding down the push-button during ca 3 sec. The entry in the programming mode is protected by the access code. In case of lack such a code, the program transit into the programming option. The inscription SET (in the first row) and the first group of PRr parameters are displayed. The monitoring of parameters is always available by pressing and holding down the push-button during ca 3 sec.

Manufacturer's settings of the RS485 interface: address:1; mode: 8N2; baud rate: 9600 (response time: 750 ms).
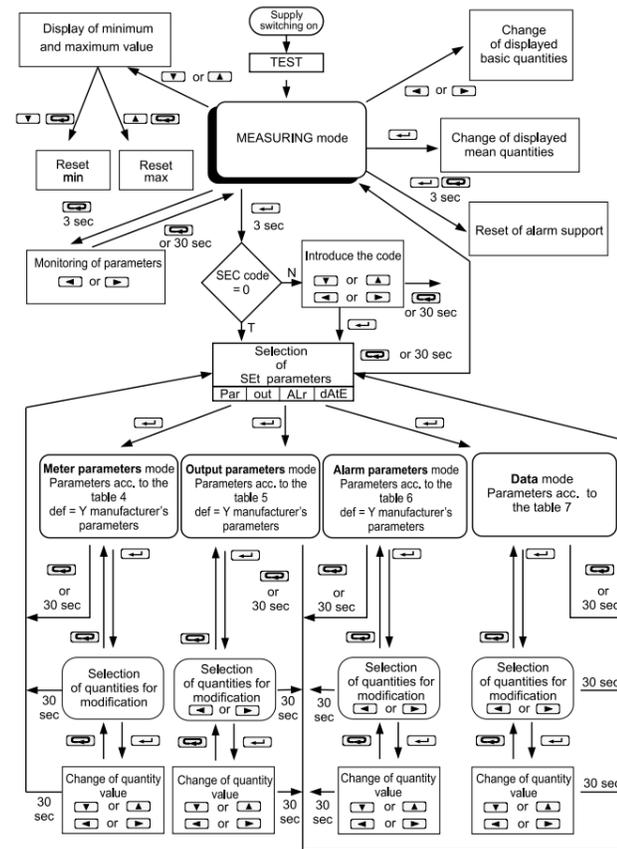
Fig.5. Meter service menu.

8. ERROR CODES

Err L3 L2	- error of phase sequence, one must interchange the connection of phase 2 and phase 3.
Err1	- when the voltage or current is too small when measuring:
	- PFi, tgφ$_i$, cos, THD, Harmonic below 10% Un, In,
	- f below 10% Un,
	- I$_{(N)}$ below 10% In;
bAd Freq	- when measuring harmonics and THD, if the frequency value is beyond the interval 48 – 52 Hz for 50Hz and 58 – 62 for 60 Hz;
Err bat	- is displayed when the battery of the internal RTC clock is used up. The measurement is carried out after switching the supply on and every day at midnight. One can disable the message by the push-button. The disabled message remains inactive till the renewed switching of the meter on.
Err CAL, Err EE	- are displayed when the meter memory is damaged. The meter must be sent to the manufacturer.
Err PAr	- are displayed when operating parameters in the meter are incorrect. One must restore manufacturer's parameters (from the menu level or through RS-485). One can disable the message by the push-button.
Err Enrg	- are displayed when energy values in the meter are incorrect. One can disable the message by the push-button. Incorrect energy values are reset.

Fig.7. Programming matrix.
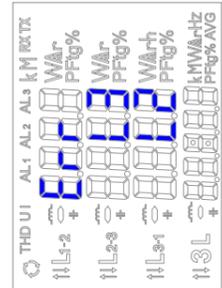
Fig.6. Phase sequence error.

9. TECHNICAL DATA

Admissible basic error:
Frequency, current, phase voltage: ±0.2 %
Active, reactive, apparent power, phase-to-phase voltage, angle φ: ±0.5 %
Power factor PF, tangent φ, cosinus φ: ±1 %
Active, reactive energy: ±0.5 %
THD: ±5 %

Caution! For the correct current measurement, a voltage value higher than 0.05 Un is required, on one of the phase at least.

Power input: In the supply circuit ≤ 6 VA, in the voltage and current circuits ≤ 0.05 VA
Relay output: relay with load capacity 250 V~/ 0.5 A~
Analog current output 0(4)...20...24 mA R$_0$ ≤ 250 Ω
Protection level ensured by the housing from frontal side: IP 65
RS485 serial interface – MODBUS RTU
Impulse output of energy. OC type passive output.

10. REFERENCE AND RATED OPERATING CONDITIONS

- supply voltage: 85..253 V d.c or a.c (40...400) Hz
  20..40 V d.c or a.c (40...400) Hz
- input signal: 0 .. 0.005...1.2I$_n$; 0.05...1.2U$_n$ for current, voltage
  0 .. 0.1..1.2I$_n$; 0..0.1..1.2U$_n$; for power factor PF$_i$,tφ$_i$
  frequency 47..63 Hz; sinusoidal (THD ≤ 8%)
- power factor: -1...0...1
- ambient temperature: -25..23..+55 ºC
- storage temperature: -30..+70 ºC
- relative humidity: 25 ... 95 % (condensation inadmissible)
Standards fulfilled by the meter: EN 61000-6-2, EN 61000-6-4, EN 61010-1