

PROGRAMMABLE DIGITAL PANEL METERS

N120 Type



1. APPLICATION

N120 programmable digital panel meters are destined for measurement of the number of pulses, number of rotations, number of working hours, frequency, period and rotational speed. These meters additionally enable the indication of the present time. 5 or 4-digit display field (14 or 20mm height digits), in red or green colour, ensures a good legibility at a long distance.

N120 meters can work with all accessible in the market, voltageless rotation sensors or with 5... 24 V a.c., d.c. voltage outputs.

They realized other additional functions as:

- possibility of the input signal rescaling,
- counting of pulses, up and down,
- automatic clearing of counters at the set value,
- possibility of external clearing stoppage and zero-run of counters,
- signalling of the set alarm value exceeding,
- signalling of the measuring range exceeding,
- automatic setting of the decimal point,
- programmable indication resolution,
- programmable measurement repetition rate,
- storage of maximal and minimal values,
- monitoring of set parameters values,
- blocking of the parameter introduction by means of a password,
- conversion of the measured quantity into any arbitrary quantity on the base of an individual linear characteristic,
- supply of sensors: 24 V d.c.,
- highlighting of any arbitrary measuring unit acc. the order,
- handling of the interface in MODBUS protocol, in ASCII and also RTU mode,
- conversion of the measured quantity into a current or voltage programmable signal,
- conversion of pulse number, rotations or working hours into a programmable quantity of pulses sent to the pulse output.

2. TECHNICAL DATA

Rated operations conditions:

- supply voltage depending on the code version

85...230...253 V a.c., d.c.
20...24... 40 V a.c.
or 20... 50 V d.c.

- frequency of the supply a.c. voltage 40...50...440 Hz
- ambient temperature -20...23...60°C
- air relative humidity < 95%, (inadmissible power water condensation)

Power consumption max. 7 VA

Storage temperature -20...+85°C

Display field:

- for N1204 type 7-segment LED, 4 displays and 2 alarm diodes
- for N1205 type 7-segment LED, 5 displays, 2 alarm diodes, 2 diodes to underlight the unit

Indication range of the digital display:

- for N1204 type -1999... +9999
- for N1205 type -19999... +99999

Handling by means of 4 keys 

Relay outputs:

- programmable alarm thresholds,
- three types of alarms,
- 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 d.c., a.c., 30 V d.c., 250 V a.c.
 - resistance load 1250 VA, 150 W

Analogue output:

- programmable current: 0/4...20 mA, load resistance $\leq 500 \Omega$,
- programmable voltage: 0...10 V, load resistance $\geq 500 \Omega$,
- galvanically insulated,
- resolution: 0.01 % of the range,
- basic error: $\pm (0.1 \% \text{ i.v.} + 0.2 \% \text{ u.r.l.})$.

Digital output:

- RS-485, MODBUS protocol,
- ASCII: 8N1, 7E1, 7O1
- RTU: 8N2, 8E2, 8O1
- programmable baud rate: 2400, 4800, 9600 bit/sec
- max response time on the question frame: 300 ms

Pulse outputs:

- voltageless output of OC type
- range of connected voltages 5... 24 V d.c.
- galvanically insulated

Pulse inputs:

- voltageless (transoptor input)
- range of connected voltages 5... 24 V d.c.
- galvanically insulated

Sensor supply

24 V d.c./max 30 mA
(galvanically insulated)

Resistance of voltage decays acc. EN 61000-6-2

Electromagnetic compatibility:

- immunity acc. EN 61000-6-2
- emission acc. EN 61000-6-4

Safety requirements (acc. EN 61010-1):

- installation category III
- pollution degree 2
- working voltage in relation to the earth 600 V a.c.

Parameters of the N120 type:

- long-lasting exceeding of the upper range 10%
- galvanically insulated input 5... 24 V a.c., d.c.
- maximal frequency of the counter working 20 kHz

Kind of input	Indication range		Basic error
	5 digits	4 digits	
Number of pulses	0...99999	0...9999	0.01% u.r.l.
Number of rotations	0...99999	0...9999	0.01% u.r.l.
Number of working hours	0...99999	0...9999	1 sec / 24 h
Frequency	0.05...9.999 Hz	0.05...9.999 Hz	0.02% u.r.l.
Frequency	10.00...99.99 Hz	10.00...99.99 Hz	0.02% u.r.l.
Frequency	100.0...1000.0 Hz	100.0...999.9 Hz	0.2% i.v.
Rotational speed	0...10000 rpm	0...9999 rpm	0.02% u.r.l.
Rotational speed	10000...99999 rpm	none	0.2% i.v.
Period	0...999.99 ms	0...999.9 ms	0.01% u.r.l.
Period	1.0000...9.9999 s	1.000...9.999 s	0.02% u.r.l.
Period	10...99999 s	10...9999 s	1 sec
Up-to-dated time	0.00...23.59	0.00...23.59	1 sec /24 h

where: u.r.l. = upper range limit of the measured sub-range
i.v. = indicated value

Protection level:

- through the housing IP 50
- from the terminal side IP 20

Measurement time programmable, min 100 ms

Preheating time 5 min

External dimensions 96 × 48 × 93 mm (with terminals)

Cut-out dimensions in the panel (92^{+0.6} × 45^{+0.6}) mm

Weight 200 g

3. FRONTAL VIEW AND HANDLING

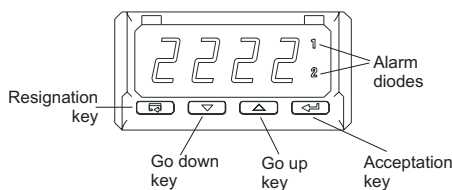
After switching the meter on, the meter type and the program version appear on the display. After ca 10 sec, the meter automatically follows to the measurement mode and the output signal value appears on the display.

The meter automatically blanks insignificant zeros and settles the decimal point in dependence on the input signal. The exceeding of the alarm threshold is signalled by means of alarm diodes 1 and 2.

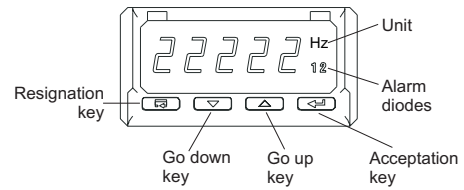
The meter automatically displays the basic unit of the measured quantity (that function does not exist for the execution with four 20 mm displays).

Description of the N120 meter frontal plate.

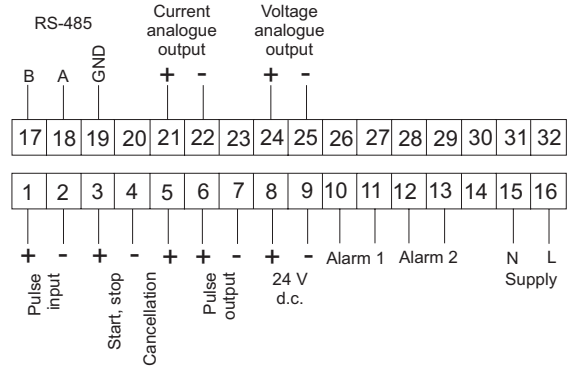
a/ 4 - digit version



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: rotations, frequency, period, pulse number 0 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: N120-5-0-1-1-00-1-Hz means: a rotation meter, with a 5-digit LED, red display colour, 230 V a.c., d.c. supply voltage, socket -plug with self-locking connections, standard version, delivered with a quality inspection certificate and with the highlighted Hz unit.