

PROGRAMMABLE DIGITAL PANEL METERS

N12 type



1. APPLICATION

N12 programmable digital panel meters are destined for measurement of d.c. voltage, d.c. current, temperature, resistance and other non-electrical quantities converted into an electrical signal.

They realized other additional functions as:

- signalling of the set alarm value exceeding,
- signalling of the measuring range exceeding,
- 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 optional quantity on the base of an individual linear characteristic,
- supply of two-wire object transducers (24 V), in the N12S execution,
- highlighting of any optional measuring unit acc. the order,
- handling on the interface in MODBUS protocol, in ASCII and also RTU mode,
- conversion of the measured quantity into a current or voltage programmable signal.

2. TECHNICAL DATA

• Rated operations conditions :

- supply voltage depending on the code execution

85... <u>230</u> ...253 V a.c., d.c.
20 ... <u>24</u> ... 40 V a.c. , d.c.
- frequency of the supply a.c. voltage

40 ... <u>50</u> ...440 Hz

- ambient temperature

0... <u>23</u> ... 50°C

- air relative humidity

< 75% , (inadmissible power water condensation)

• Power consumption

max. 5 VA

• Storage temperature

-20°C ...+85°C

• Display field:

- for N12T4, N12S4, N12H4 types

7-segment LED,	4 displays and 2 alarm diodes
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- for N12T5, N12S5, N12H5 types

7-segment LED,	5 displays, 2 alarm diodes,
	2 diodes to underlight the unit

• Indication range of the digital display:

- for N12T4, N12S4, N12H4 types

-1999 ... +9999

- for N12T5, N12S5, N12H5 types

-19999 ... +19999

• Handling by means of 4 keys



• Relay outputs:

- programmable alarm threshold,
- 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

• **Two-wire supply of object transducers**

Only in the N12S meter (galvanically insulated) 24 V d.c./max 25 mA

• **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, 8E1, 8O1,
- programmable baud rate: 2400, 4800, 9600 bit/sec

• **Resistance of voltage decays:**

acc. EN 50082-2

• **Electromagnetic compatibility:**

- immunity acc. EN 50082-2
- emission acc. EN 50081-2

• **Safety requirements:**

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

• **Parameters of the N12H type:**

- indication ranges: 4-digit execution: 5-digit execution:
 -199.9 ... +600.0 V - 600.0...+600.0 V
 -1.000 ... +1.000 A -1.000...+1.000 A
 -1.999 ...+5.000 A -5.000...+5.000 A
- input resistance for the range:
 - voltage $R_i > 2.7 \text{ M}\Omega$
 - current 1 A $R_i = 50 \text{ m}\Omega \pm 10\%$
 - current 5 A $R_i = 10 \text{ m}\Omega \pm 10\%$
- long-lasting exceeding of the upper range 10%
- basic error $\pm (0.1\% \text{ i.v.} + 0.2\% \text{ u.r.l.})$
- additional error from ambient temperature change $\pm (0.1\% \text{ u.r.l./}10\text{K})$

• **Parameters of the N12S type:**

- indication ranges: -1.000 ... +1.000 V
 -10.00 ... +10.00 V
 -19.99 ... +20.00 mA
 -199.9 ...+200.0 mA
- input resistance for:
 - voltage range $R_i > 1 \text{ M}\Omega$
 - current range $R_i < 5 \Omega$
- long-lasting exceeding of the upper range 10%
- basic error $\pm (0.1\% \text{ i.v.} + 0.2\% \text{ u.r.l.})$
- additional error from ambient temperature change $\pm (0.1\% \text{ u.r.l./}10 \text{ K})$

• **Parameters of the N12T type:**

Thermocouples

Sensor	Measuring range	Basic error
J (Fe-CuNi)	(-100...+1200) °C	$\pm (0.1\% \text{ i.v.} + 0.2\% \text{ u.r.l.})$
K (NiCr-NiAl)	(-100...+1370) °C	$\pm (0.1\% \text{ i.v.} + 0.2\% \text{ u.r.l.})$
N (NiCrSi-NiSi)	(-100...+1300) °C	$\pm (0.1\% \text{ i.v.} + 0.2\% \text{ u.r.l.})$
E (NiCr-CuNi)	(-100...+1000) °C	$\pm (0.1\% \text{ i.v.} + 0.2\% \text{ u.r.l.})$
R (PtRh13-Pt)	(-50...+1760) °C	$\pm (0.1\% \text{ i.v.} + 0.2\% \text{ u.r.l.})$
S (PtRh10-Pt)	(-50...+1760) °C	$\pm (0.1\% \text{ i.v.} + 0.2\% \text{ u.r.l.})$
Voltage measurement	(-10...+70) mV	$\pm (0.1\% \text{ i.v.} + 0.1\% \text{ u.r.l.})$

Characteristics acc. I.E.C.

Resistance thermometers:

- current flowing through the resistance thermometer: < 0.17 mA,
- resistance of conductors connecting the resistance thermometer or the potentiometer transmitter to the meter: < 20 Ω / 1 conductor

Sensor	Measuring range	Basic error
Pt100	(-199...+850) °C	± (0.1% i.v. + 0.2% u.r.l.)
Pt500	(-199...+850) °C	± (0.1% i.v. + 0.2% u.r.l.)
Pt1000	(-199...+850) °C	± (0.1% i.v. + 0.2% u.r.l.)
Cu100	(-50...+180) °C	± (0.1% i.v. + 0.3% u.r.l.)
Ni100	(-60 ... +180) °C	± (0.1% i.v. + 0.3% u.r.l.)
Resistance measurement	(0...400) Ω	± (0.1% i.v. + 0.1% u.r.l.)
Resistance measurement	(0...4000) Ω	± (0.1% i.v. + 0.1% u.r.l.)

Where:
i.v. = indicated value
u.r.l. = upper range limit of the measuring subrange

Characteristics acc. IEC 751+A1+A2

• Additional errors in rated conditions of operation when measuring the temperature:

- compensation of reference junction temperature changes ± 0.2% u.r.l.
- compensation of conductor resistance changes ± 0.2% u.r.l.
- from ambient temperature changes ± 0.1% u.r.l./10K

• Protection level:

- through the housing IP50
- from the terminal side IP20

• Measurement time

programmable, min 125 ms

• Preheating time

15 min

• External dimensions

96 x 48 x 93 mm (with terminals)

• Weight

200 g

3. FRONTAL VIEW AND HANDLING

After switching the meter on, the meter type and the program version appear on the display.

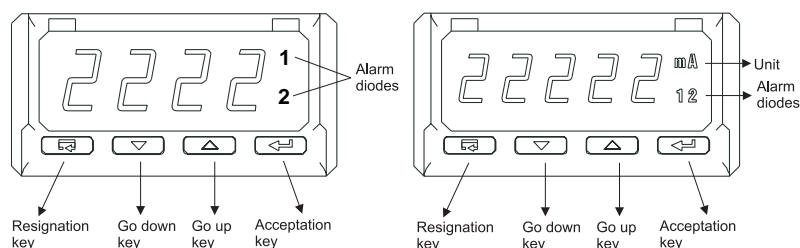
After ca 10 sec, the meter automatically follows to the measurement mode and the output signal value appears on the display.

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).

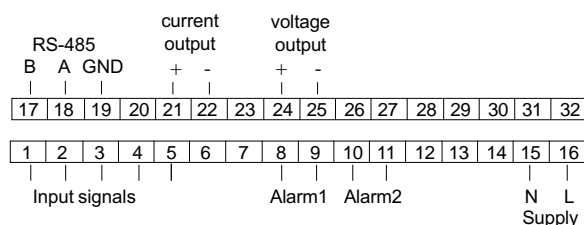
Description of the N12 meter frontal plate.



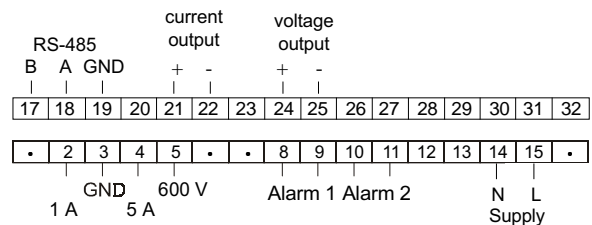
4. CONNECTION SCHEMES

Ways of output signal connections to different executions of the N12 meter.

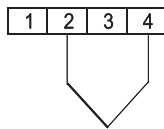
a/ Description of the terminal strip in N12S, N12T meters



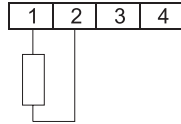
b/ Description of the terminal strip in the N12H meter



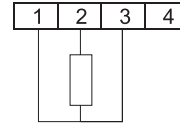
c/ Connection of input signals in the N12T meters



Thermocouple or voltage: -10 ... +70 mV

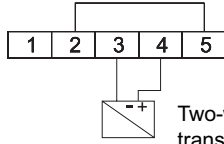
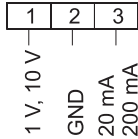


Resistance thermometer in a two-wire system or resistance measurement

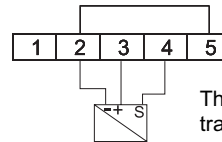


Resistance thermometer in a three-wire system

d/ Connection of input signals in N12S meters.



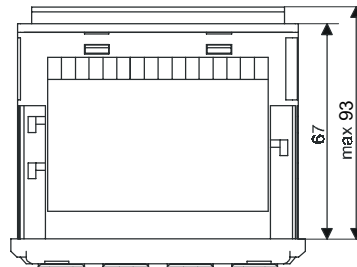
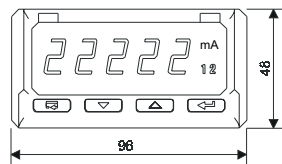
Two-wire transducer



Three-wire transducer

5. EXTERNAL DIMENSIONS

- cut-out dimensions in the panel: (92^{+0.6} x 45^{+0.6}) mm
- panel thickness: max 15 mm
- panel material: any arbitrary material



6. METER EXECUTIONS AND ORDERING CODES

N12 DIGITAL METERS	X	X	X	X	X	XX	X	XXX
Inputs:								unit field*)
temperature programmable input	T							
1 V d.c., 10 V d.c., 20 mA d.c., 200 mA d.c.	S							
600 V d.c., 1 A d.c., 5 A d.c.	H							
rotations, frequency, period, pulse number	O							
single-phase parameters	P							
indicator for synoptic pannel	B							
acc. order *	X							
Number of digits on the display:								
4 digits, digit height = 20 mm		4						
5 digits, digit height = 14 mm + unit		5						
Display colour:								
- red			0					
- green			1					
Supply voltage:								
230 V a.c. d.c.				1				
24 V a.c. d.c.				2				
Kind of terminals:								
- socket plug with screw connections						0		
- socket-plug with self-locking connections						1		
Execution:								
- standard execution						00		
- custom-made execution *						XX		
Acceptance tests:								
- without a quality inspection certificate							0	
- with a quality inspection certificate							1	
- acc. customer's agreement							X	
Unit field - Introduce the unit symbol to be highlighted								XXX

* The number code is established by the manufacturer.

ORDERING EXAMPLE:

CODE: N12-T-4-1-1-0-00-1 °C means: a temperature meter, with a 4-digit LED, green display colour, 230 V a.c. d.c. supply voltage, socket-plug with screw connections, standard execution, delivered with a quality inspection certificate, with the highlighted °C unit.

QUALITY PROCEDURES: According ISO 9001 international requirements.

For more detailed information please write to or phone our Export Department

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