PROGRAMMABLE DIGITAL PANEL METERS
N11 Type

1. APPLICATION
N11 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. The 5 and 4-digit readout field (digits of 14 and 20 mm) ensures a good visibility from a long distance.

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 arbitrary quantity on the base of an individual linear characteristic,
- automatic compensation of the reference cold junction temperature in the N11T version,
- automatic compensation of wire resistance in the N11T version,
- supply of two-wire object transducers (24 V), in the N11S execution,
- highlighting of any arbitrary measuring unit acc. the order.

2. TECHNICAL DATA
Rated operations conditions:
- supply voltage depending on the code version: 85...253 V a.c., 20...40 V a.c., d.c. and 20...50 V d.c.
- frequency of the supply a.c. voltage: 40...440 Hz
- ambient temperature: 0...23...50°C
- relative humidity: <95%, (inadmissible power water condensation)

Power consumption: max. 5 VA
Storage temperature: -20...+65°C
Display field (two versions):
- for N11T4, N11S4, N11H4 types: 7-segment LED, 4 displays and 2 alarm diodes
- for N11T5, N11S5, N11H5 types: 7-segment LED, 5 displays, 2 alarm diodes, 2 diodes to highlight the unit

Indication range of the digital display:
- for N11T4, N11S4, N11H4 types: -1999...+9999
- for N11T5, N11S5, N11H5 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 threshold,
- 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.
  - resistance load: 1250 VA, 150 W

Two-wire supply of object transducers
Only in the N11S meter (galvanically insulated): 24 V d.c./max 25 mA

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:
  - supply: 300 V
  - input: 600 V (N11H)
  - input: 50 V (N11T)
  - input: 50 V (N11S)
  - relay outputs: 300 V
  - supply of two-wire object transducers: 50 V

PARAMETERS OF THE N11H type:
- indication ranges: -199.9...600.0 V
  -1.000...1.000 A
  -1.999...5.000 A
- input resistance for the range:
  - voltage: Ri > 2.7 MΩ
  - current 1 A: Ri = 50 Ω ±10%
  - current 5 A: Ri = 10 Ω ±10%
  - long-lasting exceeding of the upper range: 10%
  - basic error: ±(0.1% i.v. + 0.2% u.r.l.)
  - additional error from ambient temperature change: ±(0.1% u.r.l./10 K)

PARAMETERS OF THE N11S 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: Ri > 1 MΩ
  - current range: Ri < 5 Ω
  - long-lasting exceeding of the upper range: 10%
  - basic error: ±(0.1% i.v. + 0.2% u.r.l.)
  - additional error from ambient temperature change: ±(0.1% u.r.l./10 K)

PARAMETERS OF THE N11T type:
Thermocouples

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

Characteristics acc. EN 60584-1 (TC) and EN 60751 (RTD)

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

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Measuring range</th>
<th>Basic error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100</td>
<td>(-199...+850)°C</td>
<td>± (0.1% i.v. + 0.1% u.r.l.)</td>
</tr>
<tr>
<td>Pt500</td>
<td>(-199...+850)°C</td>
<td>± (0.1% i.v. + 0.2% u.r.l.)</td>
</tr>
<tr>
<td>Pt1000</td>
<td>(-199...+850)°C</td>
<td>± (0.1% i.v. + 0.2% u.r.l.)</td>
</tr>
<tr>
<td>Cu100</td>
<td>(-50...+180)°C</td>
<td>± (0.1% i.v. + 0.3% u.r.l.)</td>
</tr>
<tr>
<td>Ni100</td>
<td>(-60...+180)°C</td>
<td>± (0.1% i.v. + 0.3% u.r.l.)</td>
</tr>
</tbody>
</table>

Resistance measurement (0...400) ± (0.1% i.v. + 0.3% u.r.l.)

Resistance measurement (0...4000) ± (0.1% i.v. + 0.2% u.r.l.)

Characteristics acc. EN 60584-1 (TC) and EN 60751 (RTD)

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./10 K

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

Protection level:
- through the housing IP 60
- from the terminal side IP 20

Preheating time 15 min

External dimensions 96 x 48 x 84 mm (with terminals)

Cut-out dimensions in the panel (92+0.6 x 45+0.6) mm

Weight 200 g

3. FRONT VIEW AND SERVICING

After switching the meter on, the meter type and the program version appear on the display. After ca 10 sec, the meter automatically transits to the measurement mode and the output signal value appears on the display. The meter automatically blanks unsignificant 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 highlights the basic unit of the measured quantity (that function does not exist for the execution with four 20 mm displays).

4. CONNECTION SCHEMES

Ways of input signal connections to different versions of the N11 meter.

5. ORDERING CODES

N11 METER

<table>
<thead>
<tr>
<th>Inputs:</th>
<th>1 V d.c., 10 V d.c., 20 mA d.c., 200 mA d.c.</th>
<th>600 V d.c., 1 A d.c., 5 A d.c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kind of displays:</td>
<td>4-digit display field (20 mm).</td>
<td>5-digit display field (14 mm).</td>
</tr>
<tr>
<td>Display colour:</td>
<td>red</td>
<td>green</td>
</tr>
<tr>
<td>Supply voltage:</td>
<td>85...253 V a.c./d.c.</td>
<td>1...40 V a.c. and 20...50 V d.c.</td>
</tr>
<tr>
<td>Kind of terminals:</td>
<td>socket-plug with screw connections</td>
<td>socket-plug with self-locking connections</td>
</tr>
<tr>
<td>Version:</td>
<td>standard</td>
<td>custom-made</td>
</tr>
<tr>
<td>Acceptance tests:</td>
<td>without a quality inspection certificate</td>
<td>with a quality inspection certificate</td>
</tr>
<tr>
<td>Unit field</td>
<td>Introduce the highlighted unit symbol</td>
<td></td>
</tr>
</tbody>
</table>

ORDERING EXAMPLE

CODE: N11 T 4 1 1 0 0 0 8 °C means: a temperature meter, with a 4-digit LED, green display colour, 85...253 V a.c./d.c. supply voltage, socket-plug with screw connections, standard version, delivered without a quality inspection certificate, with the highlighted °C unit.

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