

DIGITAL METERS WITH A MULTICOLOUR BARGRAPH

NA3 - one-channel

NA5 - one-channel

NA6 - two-channel



1. APPLICATION

Digital-analogue meters of NA series with a multicolour bargraph have a universal input destined to measure: temperature, resistance, shunt voltage, standard signals, d.c. voltage and d.c. current. They can find application in various industrial fields, e.g. food industry, pumping stations and sewage-treatment plants, chemical industry, weather stations, brewing industry and many other fields where they are destined for visualisation of the measured value and evaluation of the monitored manufacturing process change trend. They can also find application in automation systems where programmable controllers are applied.

NA meters can have optionally: analogue continuous outputs, relay outputs, OC type outputs and RS-485 digital output. These meters are programmed by means of a keyboard and through RS-485

NA meters realise following functions:

- measurement of the input quantity and displaying it on the LED display and on the bargraph,
- evaluation of the input signal into the indication on the base of the individual linear characteristic,
- arithmetical: raising to a power, extraction of roots (additionally in NA6, operations in channels: summation, subtraction, multiplication, division),
- programming of the bargraph colour and resolution,
- signalling of the set alarm value exceeding,
- recording of the measured signal in programmed time intervals,
- memorisation of maximal and minimal values,
- programming of the measurement averaging time,
- programming of the indication resolution,
- lockout of parameter introduction by means of a password,
- conversion of the measured quantity into an output voltage or current signal,
- servicing of the RS-485 interface in MODBUS protocol, both in ASCII and RTU mode.

2. TECHNICAL DATA

Table 1

INPUTS:	NA3	NA5, NA6
Pt100	(-200...+850)°C	(-200...+850)°C measuring sub-range: 320°C
Pt500	(-200...+850)°C	(-200...+850)°C measuring sub-range: 230°C
Pt1000	(-200...+850)°C	(-200...+850)°C measuring sub-range: 290°C
J (Fe-CuNi)	(-30...+1100)°C	(-100...+1100)°C measuring sub-ranges: 350°C, 700°C
K (NiCr-NiAl)	(-50...+1370)°C	(-100...+1370)°C measuring sub-ranges: 450°C, 950°C
N (NiCrSi-NiSi)	(-100...+1300)°C	(-100...+1300)°C measuring sub-ranges: 550°C, 1000°C
E (NiCr-CuNi)	(-20...+850)°C	(-100...+850)°C measuring sub-ranges: 250°C, 520°C
R (PtRh13-Pt)	(0...+1760)°C	
S (PtRh10-Pt)	(0...+1760)°C	
T (Cu-CuNi)	(-50...+400)°C	
Resistance measurement	0... 400 Ω 0... 4000 Ω	0... 10 kΩ measuring sub-ranges: 110 Ω, 220 Ω, 460 Ω, 950 Ω, 2100 Ω, 5000 Ω
Voltage measurement	0... 60 mV input resistance > 9 MΩ 0... 3 V input resistance > 4 MΩ 0... 10 V input resistance > 4 MΩ 0... 200 V input resistance > 4 MΩ 0... 600 V input resistance > 4 MΩ	± 300 mV input resistance > 9 MΩ ± 600 V input resistance > 4,2 MΩ measuring sub-ranges: 19 mV, 35 mV, 75 mV, 155 mV, 5 V, 11 V, 22 V, 45 V, 90 V, 180 V, 360 V
Current measurement	0... 5 mA input resistance 4 Ω 0... 20 mA input resistance 4 Ω 0... 2 A input resistance 10 mΩ ±10% 0... 5 A input resistance 10 mΩ ±10%	± 40 mA input resistance < 4 Ω ± 5 A input resistance 10 mΩ ±10% measuring sub-ranges: 5 mA, 11 mA, 23 mA, 1,8 A, 3,8 A
Intensity of the current flowing through the resistance thermometer:	< 170 μA	< 400 μA
Resistance of wires linking the resistance thermometer with the meter:	< 20 Ω/wire	

Thermocouple characteristics, acc. EN 60584-1

Resistance thermometer characteristics, acc. IEC 751+A1+A2.

OUTPUTS:

• Analogue outputs:

- galvanically isolated, with a resolution 0.025% of the range.
- current programmed: 0/4...20 mA, load resistance ≤ 500 Ω
- voltage programmed: 0...10 V, load resistance ≥ 500 Ω
- output response time 100 ms
- output error 0.2% of the range
- additional error from ambient temperature change ± (0.1% of the range/10K)

● Relay outputs:

- 2 relays (NA3) or 4 relays (NA5, NA6),
- voltageless make contacts - maximal load:
 - 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
- programmed alarm thresholds,
- three types of alarms,
- hysteresis defined by means of the lower and upper alarm threshold,
- signalling of alarm operation on the bargraph.

● 2 (NA3) or 8 (NA5, NA6) outputs of OC type (open collector):

voltageless, of OC type with npn transistor (maximal load 25 mA)
range of added voltages: 5... 24 V d.c.

● Digital outputs:

- interface RS-485,
- transmission protocol MODBUS,
 - ASCII 8N1, 7E1, 7O1,
 - RTU 8N2, 8E1, 8O1, 8N1,
- baud rate 2400, 4800, 9600 bauds,
- maximal response time to the query frame 300 ms

● Memory parameters:

- meter memory (recording):
 - NA3 750 samples
 - NA5, NA6 750 samples (channel 1 or 2)
or 375 samples (channel 1)
+ 375 samples (channel 2)
- minimal recording interval 1 s

● Basic error:

- NA3 0.2% ± 1 digit
- NA5, NA6 0.1% ± 1 digit

● Additional error from ambient temperature changes:

- NA3 0.1% of the range/10K
- NA5, NA6 0.05% of the range/10K

● Averaging time

- min 200 ms
- min 500 ms (temp. ranges)

● Rated operation conditions:

- supply voltage depending on the version code
 - 95...230...253 V a.c./d.c.
 - 20...24...40 V a.c./d.c.
- frequency of the supply voltage 40...50/60...440 Hz
- ambient temperature - 10...23...55°C
- storage temperature - 25... + 85°C
- relative humidity < 95% (no condensation)
- pre-heating time of the meter 10 minutes
- working position any

● Sustained overload:

- thermocouples, resistance thermometers 1%
- voltage, current and resistance measurement 10%

● Short duration overload (3 s):

- inputs of sensors 30 V
- voltage input > 2.5 V 10 Un (< 1000 V)
- current input: 10 In

● Display field:

NA3-F	4 seven-segment LED displays digit height: 7 mm indication range: -1999...9999 multicolour bargraph of 82 mm length 45 segments in 3-colour version 25 segments in 7-colour version
NA3-B	Multicolour bargraph as above
NA3-D	4 seven-segment LED displays digit height: 14 mm indication range: -1999...9999
NA5	4 seven-segment LED displays digit height: 7 mm indication range: -1999...9999 multicolour bargraph of 88 mm length 55 segments in 3-colour version 29 segments in 7-colour version
NA6	2 x 4 seven-segment LED displays digit height: 7 mm indication range: -1999...9999 multicolour bargraph of 88 mm length 48 segments in 3-colour version 27 segments in 7-colour version

● Bargraph resolution

programmable

● Bargraph accuracy

± 0.5 segment

● Servicing

3 keys:   

● Protection grade ensured:

- by the housing:
 - NA3 IP 40
 - NA5, NA6 IP 50
- from terminal side IP 20

● Dimensions:

- NA3 96 x 24 x 125 mm
(with terminals)
- NA5, NA6 48 x 144 x 100 mm
(with terminals)

● Cut-out dimensions in the panel:

- NA3 22.2^{+0.5} x 92^{+0.5} mm
- NA5, NA6 44^{+0.5} x 137.5^{+0.5} mm

● Weight

< 0.4 kg

● Power consumption:

- NA3 < 8 VA
- NA5, NA6 < 12 VA

● Resistance against voltage decay

according EN 61000-6-2

● Electromagnetic compatibility:

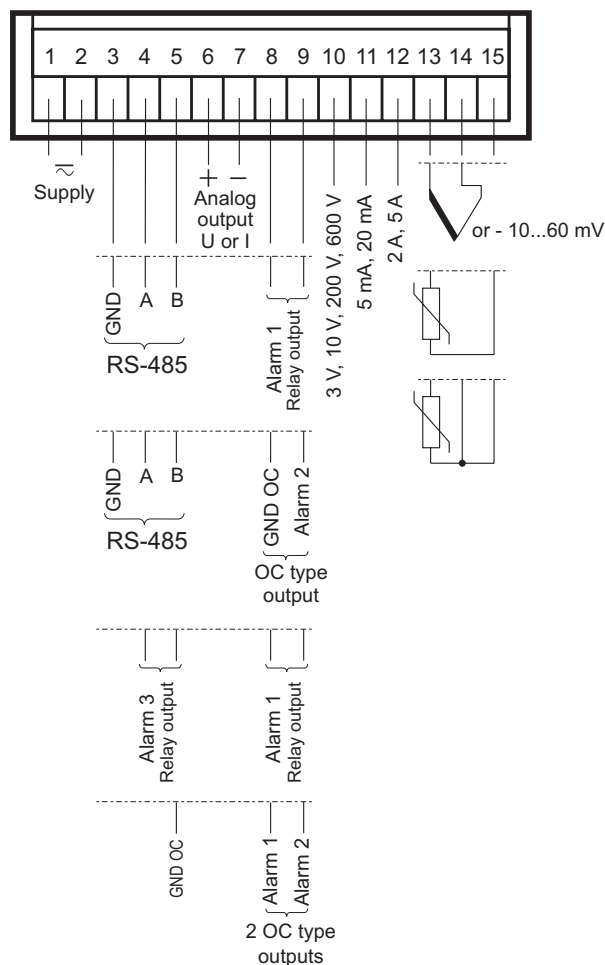
- immunity EN 61000-6-2
- emission EN 61000-6-4

● Safety requirements according EN 61010-1:

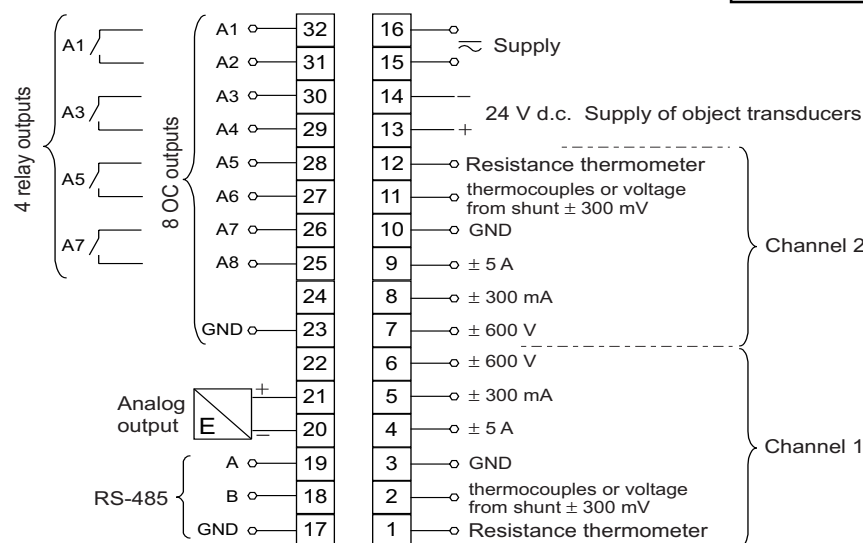
- installation category III
- pollution level 2
- working voltage in relation to the ground 600 V a.c.

3. EXTERNAL CONNECTION DIAGRAMS

NA3 Meter

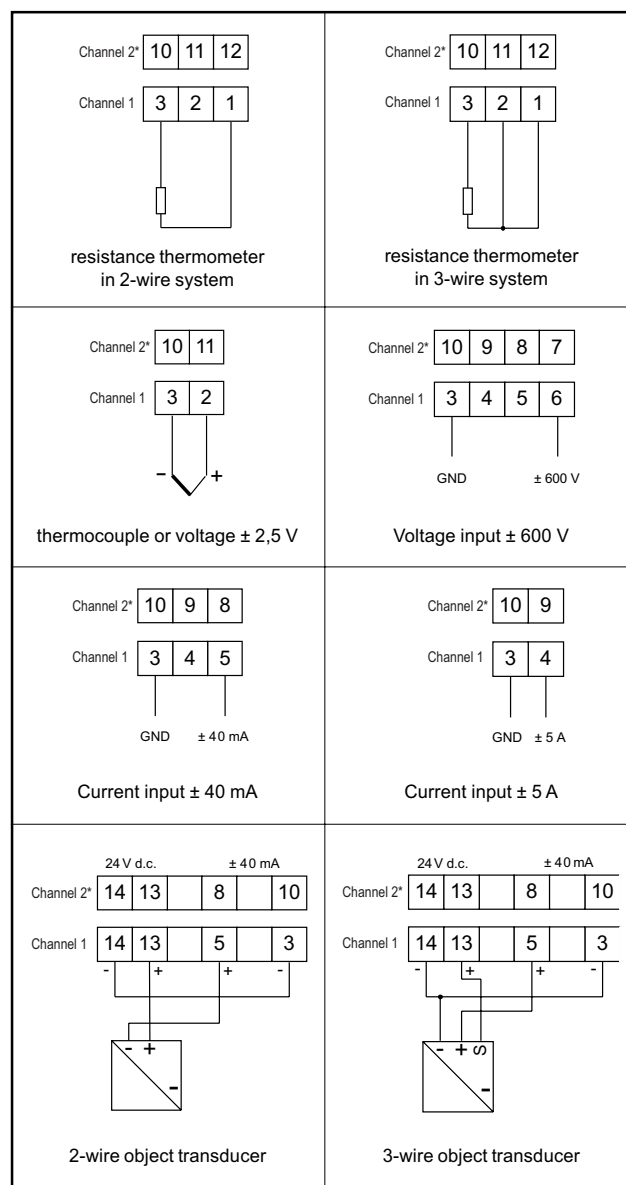


NA5, NA6 meters



Description of the terminal strip

Connection way of input signals to NA5 and NA6 meters



* lack of channel 2 in the NA5 meter

To avoid any mistake when ordering please respect the coding procedure:

NA5 METER WITH BARGRAPH	X	X	X	X	X	X	X	X	XX	X
Bargraph colour:										
3 colours (R, G, R + G)	T									
7 colours (R, G, B, R+G, R+B, G+B, R+G+B)	M									
Display colour:										
without display	0									
red	R									
green	G									
blue	B									
Input signal:										
universal input (see table 1)	U									
on order	X									
Analogue output signal:										
without analogue output	0									
current programmed, 0/4...20 mA	1									
voltage programmed, 0...10 V	2									
on order	X									
Digital output signal:										
without output	0									
RS-485 digital output	1									
Additional outputs:										
without output	0									
4 relay outputs	4									
8 OC outputs	8									
on order	X									
Supply:										
95...253 V a.c./d.c.	1									
20... 40 V a.c./d.c.	2									
on order	X									
Kind of terminals:										
socket - screw plug	0									
on order ¹⁾	X									
Execution:										
standard	00									
custom-made ²⁾	XX									
Acceptance test:										
without a quality inspection certificate	0									
with an extra quality inspection certificate	1									
according customer's agreement ³⁾	X									

3) After agreeing with the manufacturer

4) Possible execution with self-locking sockets

5) In the meter without the LEDdisplay, one must order the RS-485 digital output signal

NA6 METER WITH BARGRAPHS	X	XX	X	X	X	X	X	X	XX	X
Bargraph colour:										
3 colours (R, G, R + G)	T									
7 colours (R, G, B, R+G, R+B, G+B, R+G+B)	M									
Display colour (on channels 1 and 2):										
without LED displays	00									
red - red	RR									
red - green	RG									
red - blue	RB									
green - red	GR									
green - green	GG									
green - blue	GB									
blue - red	BR									
blue - green	BG									
blue - blue	BB									
Input signal:										
universal input (table 1)	U									
on order	X									
Analogue output signal:										
without output	0									
current programmed, 0/4...20 mA	1									
voltage programmed, 0...10 V	2									
on order	X									
Digital output signal:										
without output	0									
RS-485 digital output	1									
Additional outputs:										
without output	0									
4 relays outputs	4									
8 OC outputs	8									
on order	X									
Supply:										
95...253 V a.c./d.c.	1									
20... 40 V a.c./d.c.	2									
Kind of terminals:										
socket - screw plug	0									
on order ¹⁾	X									
Execution:										
standard	00									
custom-made ²⁾	XX									
Acceptance test:										
without a quality inspection certificate	0									
with an extra quality inspection certificate	1									
according customer's agreement ³⁾	X									

3) After agreeing with the manufacturer

4) Possible execution with self-locking sockets

5) In the meter without LED displays, one must order the RS-485 digital output signal.

Example of NA5 ordering:

Code: NA5-M-G-U-1-1- 4-1- 0- 00- 0 means:

- M** - NA5 meter with a 7-colour bargraph,
- G** - digital LED display of green colour,
- U** - universal input signal (see table 1),
- 1** - current analogue output signal 0/4...20 mA,
- 1** - RS-485 digital output signal,
- 4** - additional outputs consisting of 4 relays,
- 1** - supply: 95...253 V a.c./d.c.,
- 0** - socket-screw plug terminals,
- 00** - standard version,
- 0** - without an extra quality inspection certificate.

Example of NA6 ordering:

Code: NA6-M-GB-U-1-1- 4-1- 0- 00- 0 means:

- M** - NA6 meter with two 7-colour bargraphs,
- GB** - digital LED displays of green colour in the channel 1 and blue colour in the channel 2,
- U** - universal input (table 1),
- 1** - current analogue output signal 0/4....20 mA,
- 1** - RS-485 digital output signal,
- 4** - additional outputs consisting of 4 relays,
- 1** - supply: 95...253 V a.c./d.c.,
- 0** - socket-screw plug terminals,
- 00** - standard version,
- 0** - without a quality inspection certificate.

