

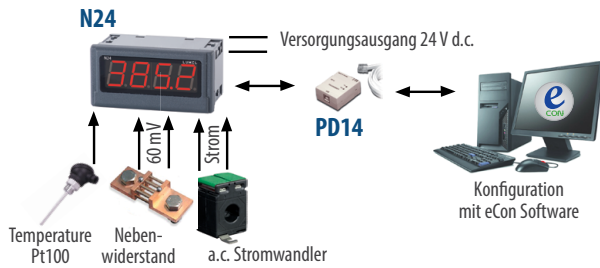
	N24	N25	N20	N20PLUS	N20Z	N20ZPLUS	N20HPLUS	N21
Eingang	fest eingestellt N24T, N25T: Pt100, J, K N24S, N25S: 0/4...20 mA, ±60 mV d.c., ±10 V d.c. N24H, N25H: ±100, ±250, ±400 V d.c., ±1/5 A d.c. N24Z, N25Z: 100, 250, 400 V a.c., 1/5 A a.c., 20...500 Hz		fest eingestellt Pt100, J, K 0/4...20 mA, ±20 mA 0...60 mV, 0...75 mV, 0...10 V, ±10 V		fest eingestellt 1 A, 5 A a.c. 100 V, 250 V, 400 V a.c. 20...500 Hz		fest eingestellt ±100, ±400 V d.c.	universell Pt100 J, K ±20 mA, ±10 V, ±60 mV
Ausgang	Sensorversorgung (24 V/ 30 mA) für S und T Geräte-Versionen (Option)		• 2 x OC • Sensorversorgung (24V/ 30 mA)		• 2 x OC			• 1 x Relais NO, 250 V~/0,5 A~, • Sensorversorgung 24 V d.c. ± 5%, 30 mA
Schnittstelle	-	-	-	RS-485 Modbus Slave	-	RS-485 Modbus Slave		-
Display	rot LED 4-stellig (20 mm)	rot LED 5-stellig (14 mm)	3-farbiges universelles LED 5-stellig (14 mm)					OLED 128 x 32 Pixel bersteinfarbig, programmierbar
Spannungsversorgung	24 V a.c., 110 V a.c., 230 V a.c., 85...253 V a.c./d.c., 20...40 V a.c./d.c. (Option)		85...253 V oder 20...40 V a.c./d.c. (für N20, N20Z, N20ZPLUS) 85...253 V oder 20...40 V a.c./ 20...60 V d.c. (für N20PLUS, N20HPLUS)					universell 22..60 V a.c. / 20..60 V d.c. (Klemmen 12-13) 60..253 V a.c. / 60..300 V d.c. (Klemmen 13-14)
Schutzart frontseitig	IP65							
Abmessungen	96 x 48 x 64 mm							
Programmierung	Software eCon (über Programmiergerät PD14)		Software eCon (über Programmiergerät PD14 - N20, N20Z oder über die Schnittstelle RS-485 - N20PLUS, N20HPLUS und N20ZPLUS mit PD10)					Software eCon (über miniUSB)
Zusatzfunktionen	• Anzeigebereich programmierbar							
			• Schnittstelle RS-485 Modbus Slave • - nur für N20PLUS / N20ZPLUS / N20HPLUS					• vertikale Anzeige



	N30U	N30H	N30o
Eingang	universell Pt100/500/1000 J, K, N, E, R, S ±20 mA 0...10 V, -10...60 mV 400, 4000 Ω	universell 1/5 A d.c., 100/500 V d.c.	universell Impulseingang (Impulszahl, Frequenz, Drehzahl, Periode, Laufzeit, Encoder)
Ausgang	4 x Relais (2 NO + wahlweise 2 NOC), 1 x Analogausgang 0/4...20 mA oder 0...10 V - Option, 1 x Impulsausgang im Messgerät N30P - Option, Sensorversorgung (24 V/ 30 mA) in N30U und N30O (für Versorgung 85...253 V)		
Schnittstelle	RS-485 Modbus Slave - Option		
Display	3-farbiges universelles Display LED 5-stellig (14 mm)		
Spannungsversorgung	85...253 V a.c./d.c. oder 20...40 V a.c., 20...60 V d.c.		85...253 V a.c./d.c. oder 20...40 V a.c./d.c.
Schutzart frontseitig	IP65		
Abmessungen	96 x 48 x 93 mm		
Programmierung	Software eCon (über die Schnittstelle RS-485) oder über Tastatur		
Zusatzfunktionen	• Umwandlung eines beliebigen Messwertes in analoges Spannungs- oder Stromsignal • Speicherung von Minimal- und Maximalwerten für gemessene Größen • individuelle 21-Punkt Kennlinie für Anzeigebereich		

ANWENDUNGSBEISPIELE

Strommessung in einer Galvanisererei



ADAPTERRAHMEN 96x48 mm auf 96x96 mm

- Adapterrahmen für den Einbau von 96 x 48 mm Geräten in 96 x 96 mm Aussparungen.
Bestellcode: 20-810-01-00004



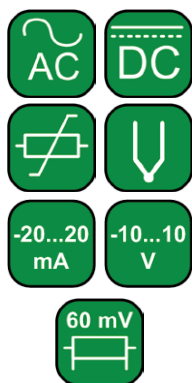
	NA3	NA5PLUS	NA6PLUS
Eingang	universell Pt100/500/1000, J, K, N, E, R, S, T 0...5/20 mA d.c., 0...2/5 A d.c., 0...60 mV d.c., 0...10/600 V d.c., 0...3/10/600 V d.c. 0...4 kΩ	programmierbar Pt100/500/1000, J, K, N, E, R, S, T ± 40 mA d.c., ± 5 A d.c., ± 300 mV d.c., ± 0...600 V d.c., 0...5 kΩ	
Ausgang	1 x Relais oder 2 x OC (Option); 1 x Analogausgang (Option)	4 x Relais oder 8 x OC (Option); 1 x Analogausgang (Option)	
Schnittstelle	RS-485 Modbus Slave		
Balkenanzeige	3 oder 7-farbige universelle horizontale Balkenanzeige	3- oder 7-farbige universelle vertikale Balkenanzeige	2 x 3- oder 2 x 7-farbige universelle vertikale Balkenanzeige
Display	LED 4-stellig (7 mm) oder 4-stellig (14 mm)	LED 4-stellig (7 mm)	2 x LED 4-stellig (7 mm)
Spannungsversorgung	95...253 V a.c./d.c. or 20...40 V a.c./ 20...60 V d.c.		
Schutzart frontseitig	IP40	IP50	
Abmessungen	96 x 24 x 125 mm	48 x 144 x 100 mm	
Programmierung	Software eCon (über die Schnittstelle RS-485) oder über Tastatur		
Zusatzfunktionen	<ul style="list-style-type: none"> • 2-Punkt-Kennlinie für Anzeigebereich (NA5PLUS und NA6PLUS) • arithmetische Funktion x^2, \sqrt{x}, (+, -, *, / - nur in NA6PLUS) • Registrierung des Messsignals in einprogrammierten Zeitintervallen (800 Proben) 	<ul style="list-style-type: none"> • Speicher von Minimal- und Maximalwerten • Passwortsperre der Parametereingabe • Verarbeitung des Messwerts in ein Spannungs- oder Stromausgangssignal 	

N24 DIGITAL PANEL METERS

FEATURES:



INPUTS:



OUTPUTS:

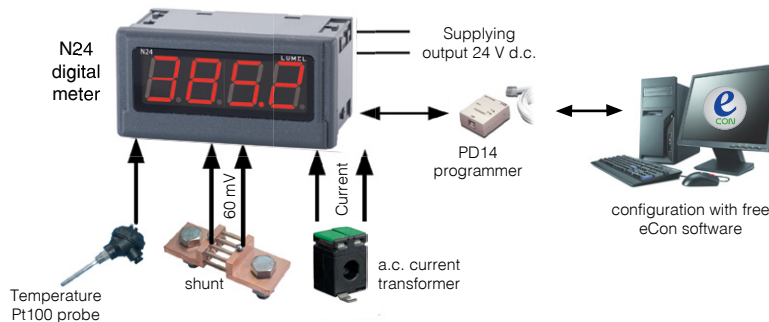


GALVANIC ISOLATION:



- Destined for measurement of d.c. voltage or d.c. current, temperature through Pt100 resistance thermometers, J, K thermocouples, a.c. voltage and a.c. current.
- 4 LED digit displays with 20 mm digit high.
- Parameters programmable by PD14 programmer:
 - precision of displayed results (decimal point),
 - measurement averaging time,
 - recounting of indications (individual characteristic),
 - automatic or manual compensation: cold junction temperature for measurement with thermocouples or wire resistance for measurement with Pt100 (N24T).

EXAMPLE OF APPLICATION



- Measurement and display:
- temperature
 - analog signals
 - d.c. current and voltage
 - rms current and voltage.

INPUTS

Type	Measuring ranges	Parameters	Overloads	Errors
N24S	-11 mV...-10 mV...60 mV...66 mV	Input resistance >1 MΩ	Short duration overload (1s): - voltage input: 10 Un - current input: 5 In Sustained overload: 110% Un, 110% In	Basic error: ± (0.2% of range + 1 digit) Additional error from ambient temperature changes: ± (50% of basic error/10K)
	-66 mV...-60 mV...60 mV...66 mV			
	-0.5 V...0 V...10 V...11 V			
	-11 V...-10 V...10 V...11 V			
	-1 mA...0 mA...20 mA...22 mA	Input resistance 10 Ω ±1%		
	3.6 mA...4 mA...20 mA...22 mA	Input resistance 10 Ω ±1%		
N24T	Pt100	-50°C...150°C	Short duration overload (1s) Input of sensors: 30 V	Basic error: ± (0.2% of range + 1 digit) Additional errors: • compensation of cold junction temperature changes: ± 0.2% of range, • from ambient temperature changes: ± (50% of basic error/10K).
		-50°C...400°C		
	Thermo-couple J	-50°C...1200°C		
	Thermo-couple K	-50°C...1370°C		
N24Z	1...100...120 V a.c.	Input resistance > 2 MΩ	Short term overload (1s): voltage input: 2 Un (< 1000V), current input: 10 In Sustained overload: 150% Un (for 400 V input), 120% (for remaining inputs), 120% In	Basic error: • voltage and current: ± (0.5% of range + 1 digit) in frequency range 20...500 Hz • frequency: ± (0.02% of range + 1 digit) Additional error from ambient temperature changes: ± (50% of basic error/10K)
	2.5...250...300 V a.c.			
	4...400...600 V a.c.			
	20...500 Hz (in voltage range: 24...480 V)	Input resistance 10 mΩ ±10%		
	0.01...1...1.2 A a.c.			
	0.05...5...6 A a.c.	Input resistance 2 mΩ ±10%		
N24H	0...100...110 V d.c.	Input resistance > 2 MΩ	Short term overload (1s): voltage input: 2 Un (< 1000V), current input: 10 In Sustained overload: 150% Un (for ± 400 V input), 120% (for remaining inputs), 120% In	Basic error: ± (0.2% of range + 1 digit) Additional error from ambient temperature changes: ± (50% of basic error/10K)
	0...250...275 V d.c.			
	-120...-100...100...120 V d.c.			
	-300...-250...250...300 V d.c.	Input resistance 10 mΩ ±10%		
	-600...-400...400...600 V d.c.			
	-1.2...-1...1...1.2 A d.c.			
	-6...-5...5...6 A d.c.	Input resistance 2 mΩ ±10%		

OUTPUTS

For N24S and N24T	Output for supply external transducers	24 V ± 5%, 30 mA
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N24 DIGITAL PANEL METERS

EXTERNAL FEATURES

Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 64 mm (with terminals)	panel cut-out: 92 ^{+0.6} x 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	ensured by the housing: IP65	from the terminal side: IP 20
Display	4-digit LED display, 20 mm high, red colour	indication range: -1999...9999

RATED OPERATING CONDITIONS

Supply voltage	230 V ± 10% a.c. (45...65 Hz); 110 V ± 10% a.c. (45...65 Hz) 24 V ± 10% a.c. (45...65 Hz); 85...253 V a.c. (40...400 Hz) or d.c.; 20...40 V a.c. (40...400 Hz) or d.c.	input power consumption: 6 VA
Temperature	ambient: -10...23...55°C	storage: -25...85 °C
Relative humidity	≤ 95%	condensation inadmissible
Operating position	any	
Preheating time	30 min	
Averaging time	≥ 0.5 s	1 second default set

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution grade	2	
Installation category	III (for the 400 V option - category II)	
Maximal phase-to-earth operating voltage	for supply circuits: 300 V, for measuring circuits: 600 V - cat. II	
	for other circuits: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS

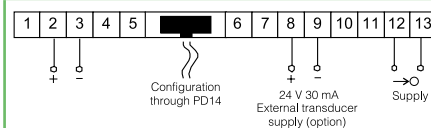


Fig. 1. Electrical connections of the N24S meter

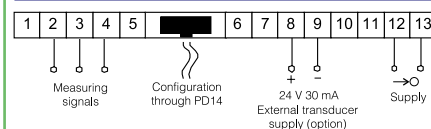


Fig. 2. Electrical connections of the N24T meter.

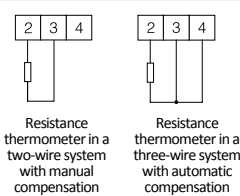


Fig. 3. Connections of N24T measuring inputs

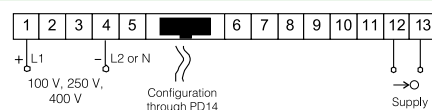


Fig. 4. Electrical connections of N24Z and N24H meters for the measurement of voltage (and frequency only in N24Z)



Fig. 5. Electrical connections of N24Z and N24H meters for the current measurement

ORDERING

TABLE 1. ORDERING CODES:

	N24 -	X	X	X	XX	XX	X	X
Input kind:								
standard: voltage, current		S						
temperature: thermocouples, resistance thermometers		T						
a.c. signals		Z						
d.c. signals: high voltage and high current		H						
Input:								
see table 2		X						
Supply:								
230 V a.c.							1	
110 V a.c.							2	
24 V a.c.							3	
85...253 V a.c./d.c. with supply output 24 V/30 mA*							4	
20...40 V a.c./d.c. with supply output 24 V/30 mA*							5	
Unit:								
see table 3					XX			
Version:								
standard							00	
non-standard settings							NS	
custom-made**							XX	
Language:								
Polish								P
English								E
other**								X
Acceptance tests:								
without extra requirements								0
with an extra quality inspection certificate								1
acc. to customer's request**								X

* - The output is only in N24S and N24T meters
** - After agreeing with the manufacturer

TABLE 2. INPUT SIGNALS

Nr	N24S	N24T	N24Z	N24H
1	0...20 mA	Pt100: -50...150°C	100 V a.c.	±100 V d.c.
2	4...20 mA	Pt100: -50...400°C	250 V a.c.	±250 V d.c.
3	0...60 mV	Thermocouple J	400 V a.c.	±400 V d.c.
4	0...10 V	Thermocouple K	1 A a.c.	±1 A d.c.
5	± 60 mV		5 A a.c.	±5 A d.c.
6	± 10 V		20...500 Hz	0...100 V d.c.
7				0...250 V d.c.

TABLE 3. CODES OF PRINTED UNITS:

Code	Unit	Code	Unit	Code	Unit
00	without unit	06	mA	12	bar
01	°C	07	kA	13	kPa
02	%	08	kV	14	MPa
03	A	09	Hz	XX	on order
04	V	10	turns		
05	mV	11	rpm		

TABLE 4. EXAMPLE OF NON-STANDARD SETTINGS:

Parameter	Range/Value
Decimal point	000,0 for I, U
Averaging time	1 s
Upper measurement overflow	9999
Lower measurement overflow	-1999
Individual characteristic	enabled
Parameter a of the individual characteristic	5
Parameter b of the individual characteristic	0

Order example 1 :

The code **N24Z-2 1 04 00 E 0** means
N24Z - digital meter for a.c. signals
2 - input: 250 V a.c.
1 - supply: 230 V a.c.
04 - unit: V
00 - standard version
E - English language
0 - without extra requirements

Order example 2 :

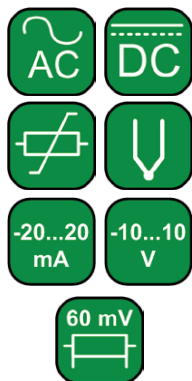
The code **N24S-1 4 02 NS E 1** means:
N24S - digital meter for d.c. signals
1 - input: 0...20mA
4 - supply: 85...253 V a.c. with supply output: 24V/30mA
02 - unit: %
NS - non-standard settings, display range: 0...100.0
E - English language
1 - with an extra quality inspection certificate

N25 DIGITAL PANEL METERS

FEATURES:



INPUTS:



OUTPUTS:

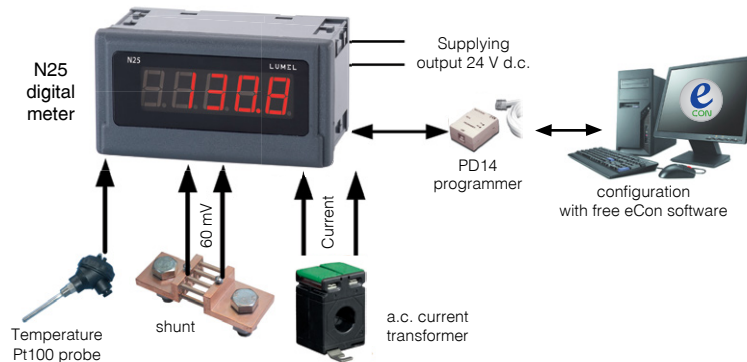


GALVANIC ISOLATION:



- Destined for measurement of d.c. voltage or d.c. current, temperature through Pt100 resistance thermometers, J, K thermocouples, a.c. voltage and a.c. current.
- 5 LED digit displays with 14 mm digit high.
- Parameters programmable by PD14 programmer:
 - precision of displayed results (decimal point),
 - measurement averaging time,
 - recounting of indications (individual characteristic),
 - automatic or manual compensation: cold junction temperature for measurement with thermocouples or wire resistance for measurement with Pt100 (N25T).

EXAMPLE OF APPLICATION



Measurement and display:

- temperature
- analog signals
- d.c. current and voltage
- rms current and voltage.

INPUTS

Type	Measuring ranges	Parameters	Overloads	Errors
N25S	-11 mV...-10 mV...60 mV...66 mV	Input resistance >1 MΩ	Short duration overload (1s): - voltage input: 10 Un - current input: 5 In Sustained overload: 110% Un, 110% In	Basic error: ± (0.2% of range + 1 digit) Additional error from ambient temperature changes: ± (50% of basic error/10K)
	-66 mV...-60 mV...60 mV...66 mV			
	-0.5 V...0 V...10 V...11 V			
	-11 V...-10 V...10 V...11 V			
	-1 mA...0 mA...20 mA...22 mA			
N25T	3.6 mA...4 mA...20 mA...22 mA	Input resistance 10 Ω ±1%	Short duration overload (1s) Input of sensors: 30 V	Basic error: ± (0.2% of range + 1 digit) Additional errors: • compensation of cold junction temperature changes: ± 0.2% of range, • from ambient temperature changes: ± (50% of basic error/10K).
	Pt100	Current flowing through the sensor: < 300 µA. Resistance of wires connecting RTD with the meter: - max 5 Ω (per wire) for automatic compensation - max 10 Ω (per wire) for manual compensation		
	Pt100	-50°C...150°C		
	Pt100	-50°C...400°C		
	Thermo-couple J	-50°C...1200°C		
N25Z	Thermo-couple K	-50°C...1370°C	Short term overload (1s): voltage input: 2 Un (< 1000V), current input: 10 In Sustained overload: 150% Un (for 400 V input), 120% (for remaining inputs), 120% In	Basic error: • voltage and current: ± (0.5% of range + 1 digit) in frequency range 20...500 Hz • frequency: ± (0.02% of range + 1 digit) Additional error from ambient temperature changes: ± (50% of basic error/10K)
	1...100...120 V a.c.	Input resistance > 2 MΩ		
	2.5...250...300 V a.c.			
	4...400...600 V a.c.			
	20...500 Hz (in voltage range: 24...480 V)			
0.01...1...1.2 A a.c.	Input resistance 10 mΩ ±10%			
N25H	0.05...5...6 A a.c.	Input resistance 2 mΩ ±10%	Short term overload (1s): voltage input: 2 Un (< 1000V), current input: 10 In Sustained overload: 150% Un (for ± 400 V input), 120% (for remaining inputs), 120% In	Basic error: ± (0.2% of range + 1 digit) Additional error from ambient temperature changes: ± (50% of basic error/10K)
	0...100...110 V d.c.	Input resistance > 2MΩ		
	0...250...275 V d.c.			
	-120...-100...100...120 V d.c.			
	-300...-250...250...300 V d.c.			
-600...-400...400...600 V d.c.	Input resistance 10 mΩ ±10%			
N25H	-1.2...-1...1...1.2 A d.c.	Input resistance 10 mΩ ±10%	Short term overload (1s): voltage input: 2 Un (< 1000V), current input: 10 In Sustained overload: 150% Un (for ± 400 V input), 120% (for remaining inputs), 120% In	Basic error: ± (0.2% of range + 1 digit) Additional error from ambient temperature changes: ± (50% of basic error/10K)
	-6...-5...5...6 A d.c.	Input resistance 2 mΩ ±10%		

OUTPUTS

For N25S and N25T	Output for supply external transducers	24 V ± 5%, 30 mA
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N25 DIGITAL PANEL METERS

EXTERNAL FEATURES

Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 64 mm with terminals	
Protection grade (acc. to EN 60529)	ensured by the housing: IP65	from the terminal side: IP 20
Display	5-digit LED display, 14 mm high, red colour	indication range: -19999...99999

RATED OPERATING CONDITIONS

Supply voltage	230 V ± 10% a.c. (45...65 Hz); 110 V ± 10% a.c. (45...65 Hz) 24 V ± 10% a.c. (45...65 Hz); 85...253 V a.c. (40...400 Hz) or d.c.; 20...40 V a.c. (40...400 Hz) or d.c.	input power consumption: 6 VA
Temperature	ambient: -10...23...55 °C	storage: -25...85 °C
Relative humidity	≤ 95%	condensation inadmissible
Operating position	any	
Preheating time	30 min	
Averaging time	≥ 0.5 s	1 second default set

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution grade	2	
Installation category	III (for the 400 V option - category II)	
Maximal phase-to-earth operating voltage	for supply circuits: 300 V, for measuring circuits: 600 V - cat. II	
	for other circuits: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS

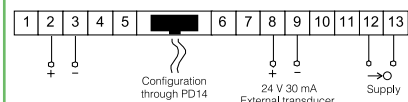


Fig. 1. Electrical connections of the N25S meter

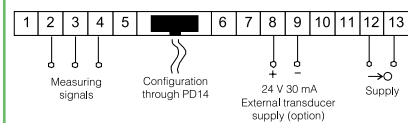
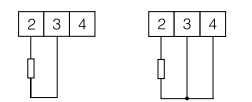
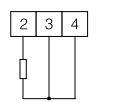


Fig. 2. Electrical connections of the N25T meter



Resistance thermometer in a two-wire system with manual compensation



Resistance thermometer in a three-wire system with automatic compensation

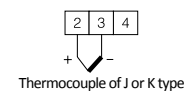


Fig. 3. Connections of N25T measuring inputs

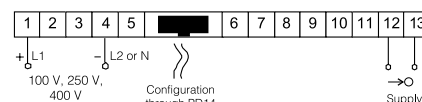


Fig. 4. Electrical connections of N25Z and N25H meters for the measurement of voltage (and frequency only in N25Z)

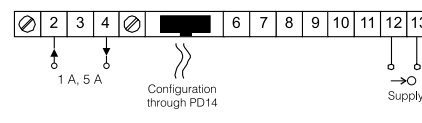


Fig. 5. Electrical connections of N25Z i N25H meters for the current measurement

ORDERING

TABLE 1. ORDERING CODES:

	N25 -	X	X	X	XX	XX	X	X
Input kind:								
standard: voltage, current		S						
temperature: thermocouples, resistance thermometers		T						
a.c. signals		Z						
d.c. signals: high voltage and high current		H						
Input:								
see table 2			X					
Supply:								
230 V a.c.							1	
110 V a.c.							2	
24 V a.c.							3	
85...253 V a.c./d.c. with supply output 24 V/30 mA*							4	
20...40 V a.c./d.c. with supply output 24 V/30 mA*							5	
Unit:								
see table 3					XX			
Version:								
standard							00	
non-standard settings							NS	
custom-made**							XX	
Language:								
Polish								P
English								E
other**								X
Acceptance tests:								
without extra requirements								0
with an extra quality inspection certificate								1
acc. to customer's request**								X

* - the output is only in N25S and N25T meters
** - after agreeing with the manufacturer

TABLE 2. INPUT SIGNALS

Nr	N25S	N25T	N25Z	N25H
1	0...20 mA	Pt100: -50...150 °C	100 V a.c.	±100 V d.c.
2	4...20 mA	Pt100: -50...400 °C	250 V a.c.	±250 V d.c.
3	0...60 mV	Thermocouple J	400 V a.c.	±400 V d.c.
4	0...10 V	Thermocouple K	1 A a.c.	±1 A d.c.
5	± 60 mV		5 A a.c.	±5 A d.c.
6	± 10 V		20...500 Hz	0...100 V d.c.
7				0...250 V d.c.

TABLE 3. CODES OF PRINTED UNITS:

Code	Unit	Code	Unit	Code	Unit
00	without unit	06	mA	12	bar
01	°C	07	kA	13	kPa
02	%	08	kV	14	MPa
03	A	09	Hz		
04	V	10	turns	XX	on order
05	mV	11	rpm		

TABLE 4. EXAMPLE OF NON-STANDARD SETTINGS:

Parameter	Range/Value
Decimal point	000,0 for I, U
Averaging time	1 s
Upper measurement overflow	99999
Lower measurement overflow	-19999
Individual characteristic	enabled
Parameter a of the individual characteristic	5
Parameter b of the individual characteristic	0

Order example 1 :

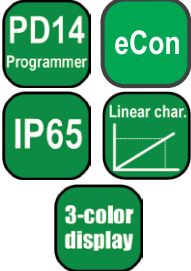
The code **N25Z-2 1 04 00 E 0** means:
N25Z - digital meter for a.c. signals
2 - input: 250 V a.c.
1 - supply: 230 V a.c.
04 - unit: V
00 - standard version
E - English language
0 - without extra requirements

Order example 2 :

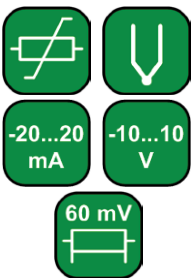
The code **N25S-1 4 02 E 1** means:
N25S - digital meter for d.c. signal
1 - input: 0...20mA
4 - supply: 85...253 V a.c.
02 - unit: %
NS - non-standard settings, display range: 0...100.0
E - English language
1 - with an extra quality inspection certificate

N20 DIGITAL PANEL METER

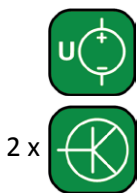
FEATURES:



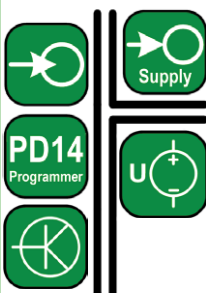
INPUTS:



OUTPUTS:

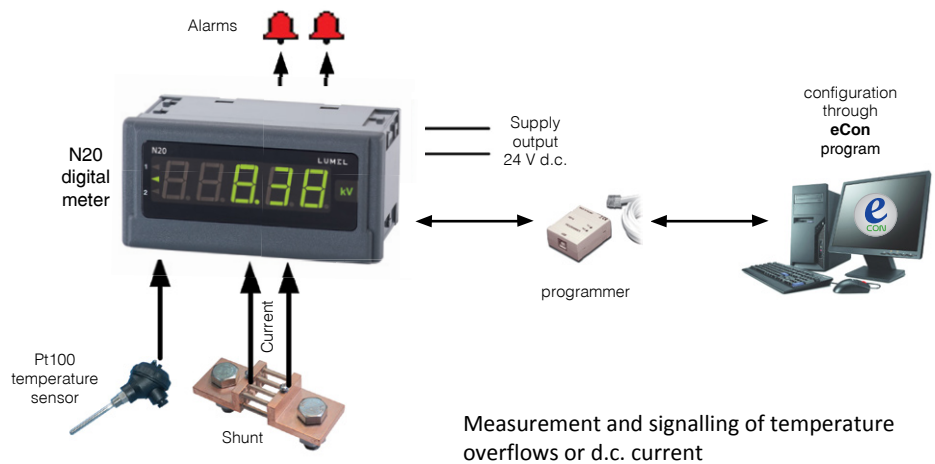


GALVANIC ISOLATION:



- Measurement of voltage or d.c. current and temperature (Pt100, J, K):
- Three-colour LED display (5 digits, 14 mm high).
- 2 alarm outputs of OC type.
- Galvanic separation between the supply, measuring inputs and the programmer input.
- Programmable parameters through the PD14 programmer:
 - recounting of indications (individual characteristic),
 - two alarms of OC type operating in 6 working modes,
 - display colour programmable in three intervals,
 - thresholds of displayed overflows,
 - highlight of the unit,
 - automatic or manual compensation: temperature of cold ends (for J, K) or wire resistance (for Pt100),
 - measurement averaging time.
- Supply of object transducers.

EXAMPLE OF APPLICATION



INPUTS

Kind of inputs	Measuring range	Parameters	Basic error
Voltage input	-11...-10...60...66 mV -1...0...10...11 V -11...10...10...11 V	Input resistance: >1 MΩ	± (0.2% of range + 1 digit)
Current input	-1...0...20...22 mA 3,6...4...20...22 mA -22...-20...20...22 mA	Input resistance: 10 Ω ± 1% Input resistance: 10 Ω ± 1% Input resistance: 5 Ω ± 1%	
Temperature measurement Pt100	- 50...400°C		
Temperature measurement through J thermocouple	- 50...1200°C		
Temperature measurement through K thermocouple	- 50...1370°C		

OUTPUTS

Kind of inputs	Features
Alarm outputs	• 2 alarm outputs of OC type
Outputs for external supply of transducers	• 24 V ± 5%, 30 mA

EXTERNAL FEATURES

Readout field	5 digital LED displays. Indication range -19999...99999 Digit height: 14 mm	Three-colour display (changes of colour depend on the displayed value): red, green, orange.
Weight	< 0.25 kg	
Overall dimensions	96 × 48 × 64 mm	Panel cut-out: 92 ^{+0,6} × 45 ^{+0,6} mm
Protection grade (acc. to EN 60529)	From frontal side: IP65	From terminal side: IP10

N20 DIGITAL PANEL METER

RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (45...65 Hz) or d.c., 20...40 V a.c. (45...65 Hz) or d.c.	Power consumption < 6 VA
Temperature	Ambient: -10...23...55°C	Storage: -25...85°C
Relative humidity	< 95%	Condensation inadmissible
Operating position	any	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Safety requirements		acc. to EN 61010-1
Galvanic isolation between supply and measuring input	3.2 kV d.c.	

CONNECTION DIAGRAMS

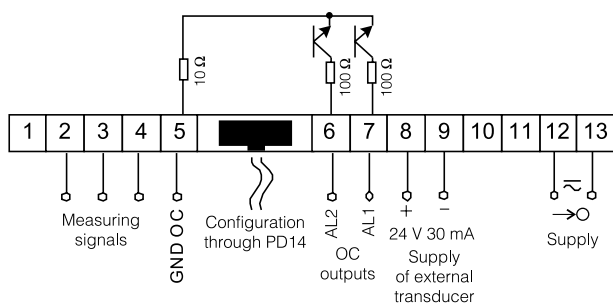


Fig. 1 Electrical connections of N20 meter.

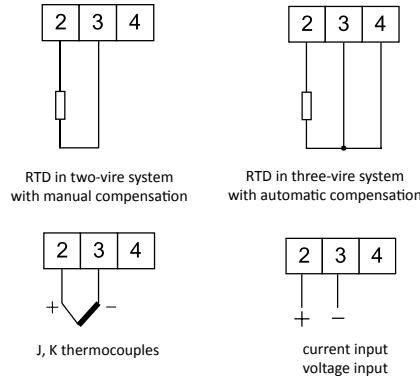


Fig. 2 Connections of measuring inputs.

ORDERING

TABLE 1. ORDERING CODES:

	N20 -	X	X	XX	XX	X
Input:						
Pt100: -50...400°C		1				
Thermocouple J: -50...1200°C		2				
Thermocouple K: -50...1370°C		3				
0...20 mA		4				
4...20 mA		5				
± 20 mA		6				
0...60 mV		7				
0...10 V		8				
± 10 V		9				
Supply:						
85...253 V a.c./d.c.			1			
20...40 V a.c./d.c.			2			
Unit:						
unit code number acc. to table 2				XX		
Version:						
standard						00
custom-made*						XX
non-standard settings						99
Acceptance tests:						
without extra requirements						8
with an extra quality inspection certificate						7
acc. to customer's request*						X

* - after agreeing with the manufacturer

TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	without unit	17	µm	34	bar
01	V	18	mm	35	rad
02	A	19	cm	36	Ω
03	mV	20	m	37	kΩ
04	kV	21	km	38	%
05	MV	22	l	39	°
06	mA	23	l/s	40	turns
07	kA	24	l/h	41	rps
08	MA	25	ms	42	rpm
09	°C	26	s	43	rph
10	°F	27	h	44	m/h
11	K	28	N	45	km/h
12	Hz	29	kN	46	imp
13	kHz	30	Pa		
14	Ah	31	hPa		
15	kAh	32	kPa	XX	on order ¹⁾
16	m/s	33	MPa		

1) - after agreeing with the manufacturer

Highlight of the measured value	ON
Automatic compensation of terminal temperature	OFF
Manual compensation of terminal temperature	0
Averaging time	1 s
Upper overflow of measurement	99999
Lower overflow of measurement	-19999
Individual characteristic	ON
Parameter <i>a</i> of the individual characteristic	10.0
Parameter <i>b</i> of the individual characteristic	0
Kind of the alarm output 1 operation	ON
Upper value to switch the alarm 1 - Aon	40.00
Lower value to switch the alarm 1 - Aoff	0.00
Delay of the alarm 1 switching time	0 second
Kind of the alarm output 2 operation	n-on
Upper value to switch the alarm 2 - Aon	44.00
Lower value to switch the alarm 2 - Aoff	40.00
Delay of the alarm 2 switching time	0 second

- means: N20 meter with current input on 4...20 mA, supply: 20...40 V a.c./d.c., executed acc. to given detailed parameter description by the user, without extra quality requirements

Caution! When ordering a meter with parameters different than standard, one must give values of **ALL** parameters.

ORDER EXAMPLES

Example 1

The code **N20 - 9 1 01 00 8** - means: N20 meter with voltage input on ± 10 V, supply: 85... 253 V a.c., without extra quality requirements, „V“ unit

Example 2

The code **N20 - 5 2 38 99 8** + description of non-standard settings

Parameter	Range/Value
Displayed colour of the upper measured value	red
Displayed colour of the median measured value	green
Displayed colour of the lower measured value	orange
Upper threshold - KpH	44.00
Lower threshold - KpL	40.00
Decimal point	000.00



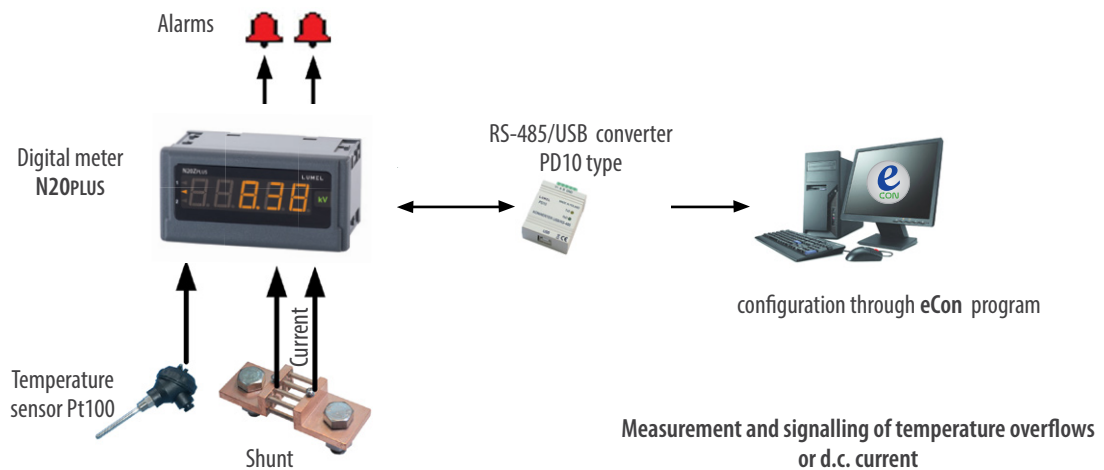
N20PLUS

- DIGITAL PANEL METER WITH RS-485

- Measurement of d.c. current or voltage and temperature (Pt100, J, K).
- Three-colour LED display (5 digits, 14 mm high).
- **Digital output RS-485 - Modbus RTU protocol.**
- Two alarm outputs of OC type.
- Programmable parameters through RS-485 interface using the free eCon software:
 - recounting of indications (individual characteristic),
 - two alarms of OC type operating in 6 working modes,
 - display colour programmable in three intervals,
 - thresholds of displayed overflows,
 - highlight of the unit,
 - automatic or manual compensation: temperature of cold ends (for J, K) or wire resistance (for Pt100),
 - measurement averaging time.
- Additional output 24 V d.c. for supplying of object transducers.



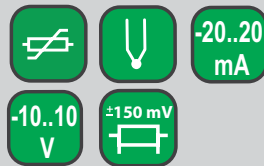
EXAMPLE OF APPLICATION



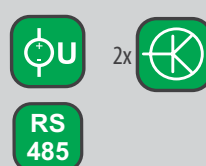
FEATURES



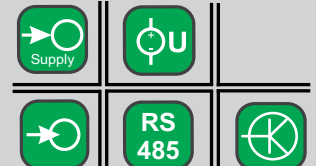
INPUTS



OUTPUTS



GALVANIC ISOLATION



TECHNICAL DATA

INPUTS

Input type	Measuring range	Parameters	Basic error
Voltage input	-1 mV...0 mV...150 mV...165 mV -82.5 mV...-75 mV...75 mV...82.5 mV -1 mV...0 mV...75 mV...82.5 mV -165 mV...-150 mV...150 mV...165 mV -1...0...10...11 V -11...10...10...11 V	Input resistance: > 1 M Ω	\pm (0.2% of range + 1 digit)
Current input	-1...0...20...22 mA 3.6...4...20...22 mA -22...-20...20...22 mA	Input resistance: 10 Ω \pm 1% Input resistance: 10 Ω \pm 1% Input resistance: 5 Ω \pm 1%	
Temperature measurement Pt100	-50...400°C		
Temperature measurement through J thermocouple	-50...1200°C		
Temperature measurement through K thermocouple	-50...1370°C		

OUTPUTS

Output type	Features
Alarm outputs	• 2 alarm outputs of OC type
Output for external supply of transducers	• 24 V \pm 5%, 30 mA

DIGITAL INTERFACE

Interface type	Transmission protocol	Modes	Baudrate
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbit/s

EXTERNAL FEATURES

Readout field	5 digit LED display - indication range: -19999...99999 digit height: 14 mm	Three-colour display (changes of colour depend on the displayed value): red, green, orange.
Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 64 mm	panel cut-out: 92 ^{+0.6} x 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from terminal side: IP 10

RATED OPERATING CONDITIONS

Supply	85...253 V a.c. (45...65 Hz) or d.c., 20...40 V a.c. (45...65 Hz) / 20...60 V d.c.	Power consumption < 6 VA
Temperature	ambient: -10...23...55°C	storage: -25...85°C
Relative humidity	< 95%	condensation inadmissible
Operating position	any	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Safety requirements		acc. to EN 61010-1

CONNECTION DIAGRAMS

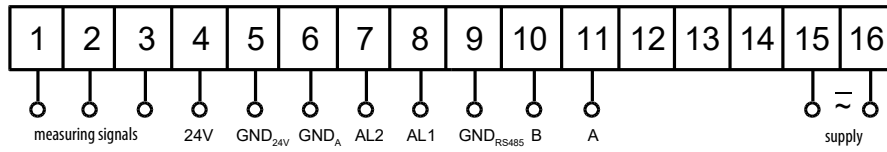


Fig. 1 Electrical connections of the N20PLUS meter.

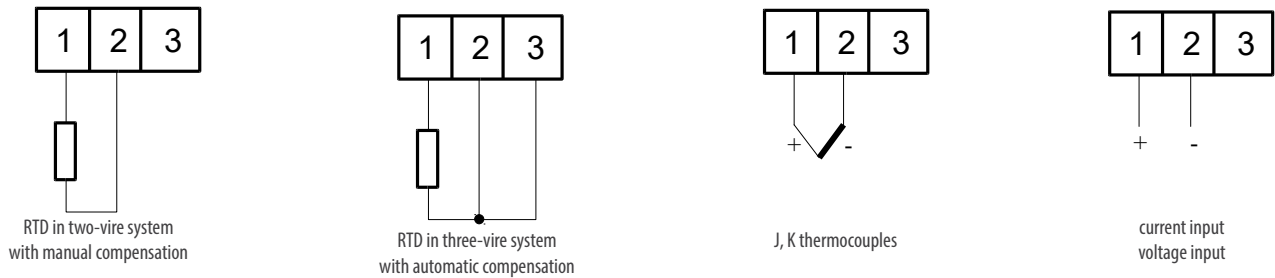


Fig. 2 Connections of measuring signals.

ORDERING

TABLE 1. ORDERING CODE:

	N20PLUS	X	X	XX	XX	X	X
Input:							
Pt100: -50...400 °C	1						
Thermocouple J: -50...1200 °C	2						
Thermocouple K: -50...1370 °C	3						
0...20 mA	4						
4...20 mA	5						
± 20 mA	6						
0...75 mV	7						
0...10 V	8						
± 10 V	9						
0...150 mV	A						
± 75 mV	B						
± 150 mV	C						
Supply:							
85...253 V a.c./d.c.	1						
20...40 V a.c./ 20...60 V d.c.	2						
Unit:							
unit code number acc. to table 2				XX			
Version:							
standard						00	
custom-made						XX	
Language:							
Polish							P
English							E
Acceptance test:							
without additional quality requirements							0
with an extra quality inspection certificate							1
with an extra calibration certificate							2
acc.to customer's request*							X

* only after agreeing with the manufacturer

TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	without unit	17	µm	34	bar
01	V	18	mm	35	rad
02	A	19	cm	36	Ω
03	mV	20	m	37	kΩ
04	kV	21	km	38	%
05	MV	22	l	39	°
06	mA	23	l/s	40	obr
07	kA	24	l/h	41	rps
08	MA	25	ms	42	rpm
09	°C	26	s	43	rph
10	°F	27	h	44	m/h
11	K	28	N	45	km/h
12	Hz	29	kN	46	imp
13	kHz	30	Pa		
14	Ah	31	hPa	XX	on order ¹⁾
15	kAh	32	kPa		
16	m/s	33	MPa		

¹⁾ -only after agreeing with the manufacturer

ORDERING EXAMPLE:

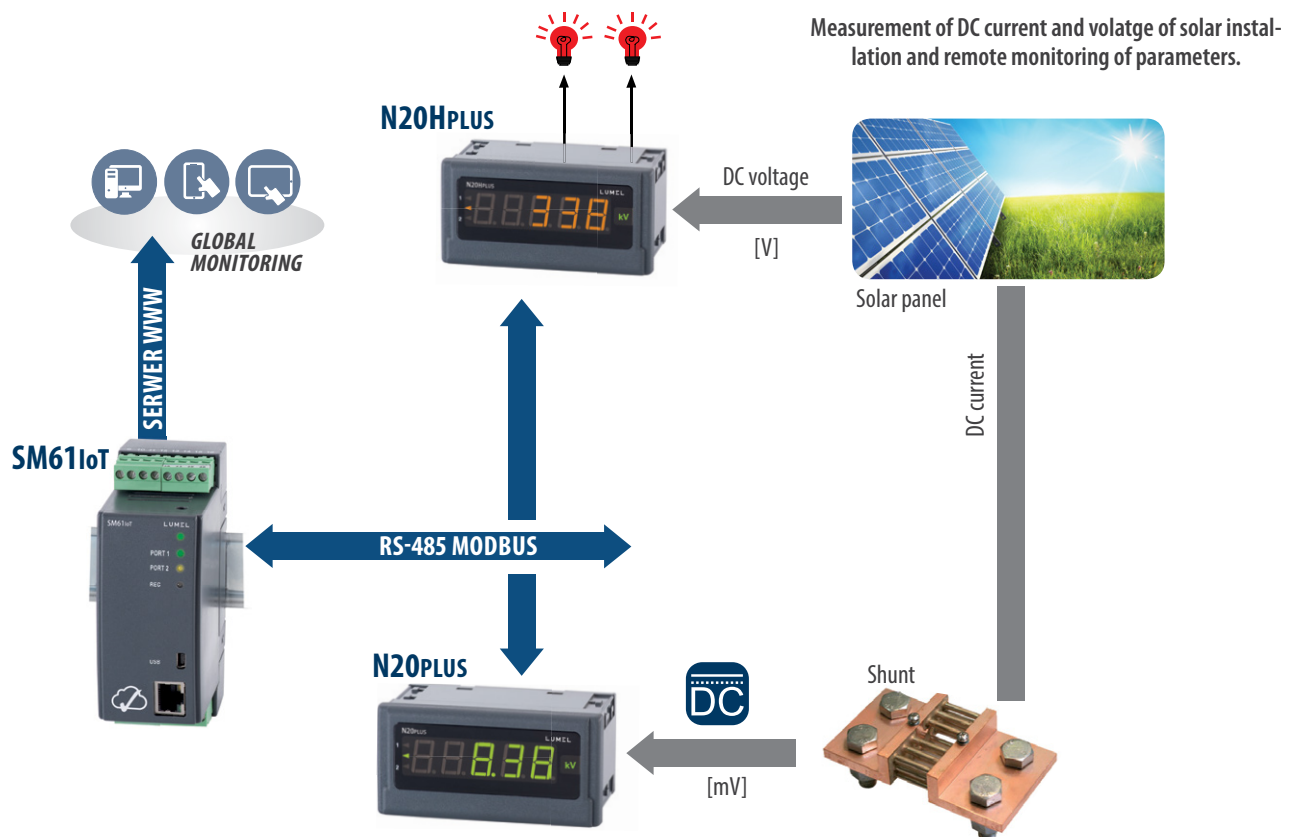
The Code N20PLUS_910100E0 - means: N20ZPLUS meter with voltage input on ± 10 V, supply 85... 253 V a.c., standard version, user's manual in English, without additional quality requirements. Unit,V"



N20HPLUS - DIGITAL PANEL METER WITH RS-485

- Measurement of d.c. voltage.
- Three-colour LED display (5 digits, 14 mm high).
- Digital output RS-485 - Modbus RTU protocol.
- Two alarm outputs of OC type.
- Programmable parameters through RS-485 interface using the free eCon software:
 - two alarms of OC type operating in 6 working modes,
 - display colour programmable in three intervals,
 - thresholds of displayed overflows,
 - highlight of the unit,
 - measurement averaging time.
- Conversion of indications based on individual characteristics.
- Power supply: 85 ... 253 V AC / DC or 20 ... 40 V AC / DC.
- IP65 housing protection degree.

EXAMPLE OF APPLICATION



FEATURES



INPUTS



OUTPUTS



GALVANIC ISOLATION



TECHNICAL DATA

INPUTS

Input type	Measuring range	Params	Basic error
Voltage input	-1 V...0 V...100 V...120 V -120 V...100 V...100 V...120 V -1 V...0 V...400 V...480 V -480 V...400 V...400 V...480 V	Input resistance: >2 MΩ	± (0.2% of range + 1 digit)

OUTPUTS

Output type	Features
Alarm outputs	• 2 alarm outputs of OC type

DIGITAL INTERFACE

Interface type	Transmission protocol	Modes	Baudrate
RS-485	MODBUS RTU	8N2, 8E1, 801, 8N1	4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbit/s

EXTERNAL FEATURES

Readout field	5 digit LED display - indication range: -19999...99999 digit height: 14 mm	Three-colour display (changes of colour depend on the displayed value): red, green, orange.
Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 64 mm	panel cut-out: 92 ^{+0.6} x 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from terminal side: IP 10

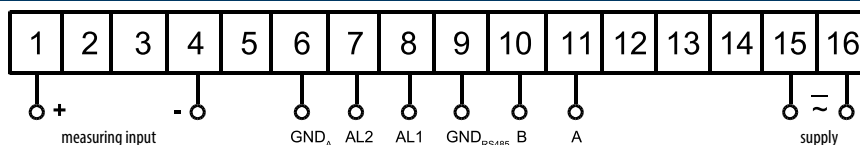
RATED OPERATING CONDITIONS

Supply	85...253 V a.c. (45...65 Hz) or d.c., 20...40 V a.c. (45...65 Hz) / 20...60 V d.c.	Power consumption < 6 VA
Temperature	ambient: -10...23...55°C	storage: -25...85°C
Relative humidity	< 95%	condensation inadmissible
Operating position	any	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Safety requirements		acc. to EN 61010-1

DESCRIPTION OF TERMINAL STRIP



ORDERING

TABLE 1. ORDERING CODE:

	N20HPLUS	X	X	XX	XX	X	X
Input:							
0...100 V		1					
± 100 V		2					
0...400 V		3					
± 400 V		4					
Supply:							
85...253 V a.c./d.c.			1				
20...40 V a.c./20...60 V d.c.			2				
Unit:							
unit code number acc. to table 2				XX			
Version:							
standard						00	
custom-made*						XX	
Language:							
Polish							P
English							E
Acceptance test:							
without additional quality requirements							0
with an extra quality inspection certificate							1
with an extra calibration certificate							2
acc. to customer's request							X

* -only after agreeing with the manufacturer

TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	without unit	17	µm	34	bar
01	V	18	mm	35	rad
02	A	19	cm	36	Ω
03	mV	20	m	37	kΩ
04	kV	21	km	38	%
05	MV	22	l	39	°
06	mA	23	l/s	40	obr
07	kA	24	l/h	41	rps
08	MA	25	ms	42	rpm
09	°C	26	s	43	rph
10	°F	27	h	44	m/h
11	K	28	N	45	km/h
12	Hz	29	kN	46	imp
13	kHz	30	Pa		
14	Ah	31	hPa		
15	kAh	32	kPa	XX	on order ¹⁾
16	m/s	33	MPa		

¹⁾ -only after agreeing with the manufacturer

ORDERING EXAMPLE:

The Code N20HPLUS_410100E0 - means: N20HPLUS meter with voltage input on ±400V, supply 85...253 V a.c., standard version, user's manual in English, without additional quality requirements. Unit, V"

N20Z DIGITAL PANEL METER

FEATURES:



INPUTS:



OUTPUTS:

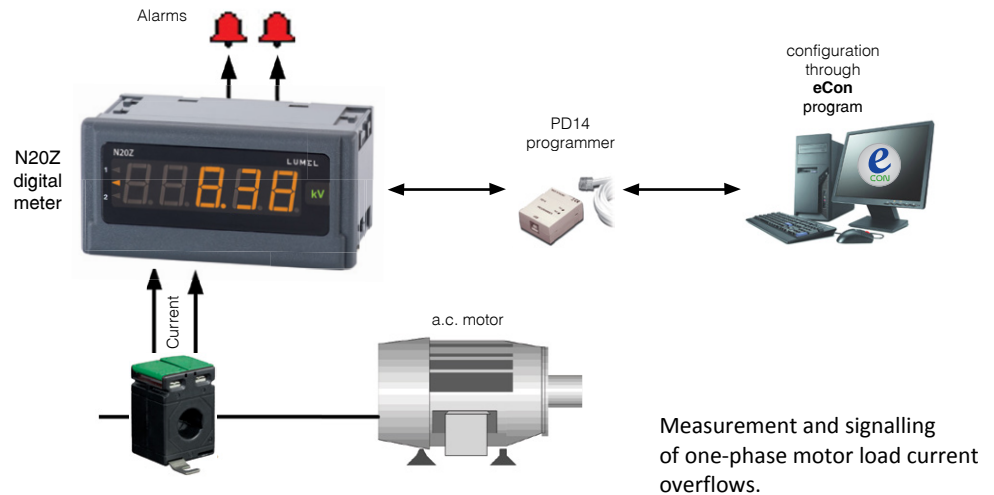


GALVANIC ISOLATION:



- Measurement of voltage, a.c. current or frequency,
- Three-colour LED display (5 digits, 14 mm high).
- Two alarm outputs of OC type.
- Programmable parameters through the PD14 programmer:
 - recounting of indications (individual characteristic),
 - two alarms of OC type operating in 6 working modes,
 - kind of measured signal: a.c. or a.c. + d.c. (True RMS),
 - display colour programmable in three intervals,
 - precision of displayed results (decimal point),
 - thresholds of displayed overflows,
 - highlight of the unit,
 - measurement averaging time.

EXAMPLE OF APPLICATION



INPUTS

Kind of input	Measuring range	Parameters	Basic error
Voltage input	1...100...120 V	Input resistance: > 2 MΩ	± (0.5% of range + 1 digit)
	2.5...250...300 V		
	4...400...480 V		
Current input	0.01...1...1.2 A	Input resistance: 50 mΩ ± 10% Input resistance: 10 mΩ ± 10%	± (0.5% of range + 1 digit)
	0.05...5...6 A		
Frequency (in the range of voltages: 24...480 V)	20...500 Hz	Input resistance: > 2 MΩ	± (0.2% of range + 1 digit)

OUTPUTS

Kind of input	Features
Alarm outputs	• 2 alarm outputs of OC type

EXTERNAL FEATURES

Readout field	5 digital LED displays. Indication range -19999...99999 Digit height: 14 mm	Three-colour display (changes of colour depend on the displayed value): red, green, orange.
Weight	< 0.25 kg	
Overall dimensions	96 × 48 × 64 mm	Panel cut-out: 92 ^{+0,6} × 45 ^{+0,6} mm
Protection grade (acc. to EN 60529)	From frontal side: IP65	From terminal side: IP10

N20Z DIGITAL PANEL METER

RATED OPERATING CONDITIONS

Supply	85...253 V a.c. (45...65 Hz) or d.c., 20...40 V a.c. (45...65 Hz) or d.c.	Power consumption < 6 VA
Temperature	Ambient: -10...23...55°C	Storage: -25...85°C
Relative humidity	< 95%	Condensation inadmissible
Operating position	any	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Safety requirements		acc. to EN 61010-1

CONNECTION DIAGRAMS

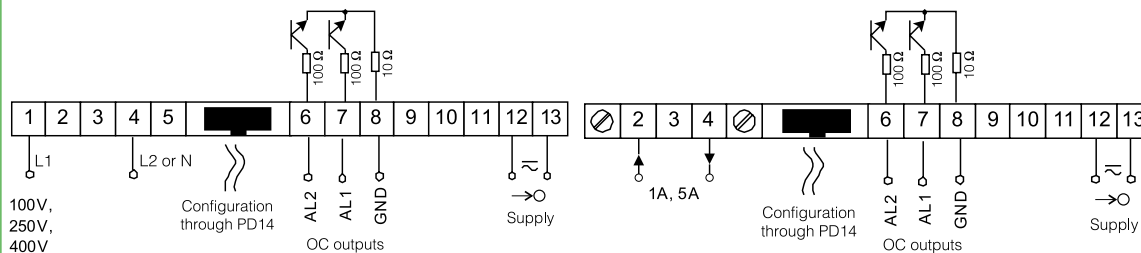


Fig. 1 Electrical connections of the N20Z meter with the measurement of voltage and frequency.

Fig. 2 Electrical connections of the N20Z meter with the measurement of current.

ORDERING

TABLE 1. ORDERING CODES:

	N20Z -	X	X	XX	XX	X
Input:						
100 V		1				
250 V		2				
400 V		3				
1 A		4				
5 A		5				
Frequency: 20...500 Hz		6				
Supply:						
85...253 V a.c./d.c.			1			
20...40 V a.c./d.c.			2			
Unit:						
unit code number acc. to table 2				XX		
Version:						
standard						00
custom-made*						XX
non standard settings						99
Acceptance tests:						
without extra requirements						8
with an extra quality inspection certificate						7
acc. to customer's request*						X

* - after agreeing with the manufacturer

TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	without unit	17	µm	34	bar
01	V	18	mm	35	rad
02	A	19	cm	36	Ω
03	mV	20	m	37	kΩ
04	kV	21	km	38	%
05	MV	22	l	39	°
06	mA	23	l/s	40	turns
07	kA	24	l/h	41	rps
08	MA	25	ms	42	rpm
09	°C	26	s	43	rph
10	°F	27	h	44	m/h
11	K	28	N	45	km/h
12	Hz	29	kN	46	imp
13	kHz	30	Pa		
14	Ah	31	hPa		
15	kAh	32	kPa	XX	on order ¹⁾
16	m/s	33	MPa		

1) - after agreeing with the manufacturer

ORDER EXAMPLES

Example 1

The code **N20Z - 3 1 01 00 8** - means: N20 meter with voltage input on 400 V, supply: 85...253 V a.c., without extra quality requirements, „V” unit

Example 2

The code **N20Z - 3 1 03 99 8 + description**

Parameter	Range/Value
Displayed colour of the upper measured value	red
Displayed colour of the median measured value	green
Displayed colour of the lower measured value	orange
Upper threshold - KpH	44.00
Lower threshold - KpL	40.00
Decimal point	000.00

Highlight of the measured unit	ON
Kind of input	AC
Averaging time	5 s
Upper overflow of measurement	99999
Lower overflow of measurement	-19999
Individual characteristic	ON
Parameter a of the individual characteristic	0.1
Parameter b of the individual characteristic	0
Kind of the alarm output 1 operation	on
Upper value to switch the alarm 1 - Aon	40.00
Lower value to switch the alarm 1 - Aoff	0.00
Kind of the alarm output 2 operation	n-on
Upper value to switch the alarm 2 - Aon	44.00
Lower value to switch the alarm 2 - Aoff	40.00

- means: N20Z meter with voltage input on 400 V, supply: 85...253 V a.c., executed acc. to given detailed parameter description by the user, without extra quality requirements („mV” unit - acc. to table 2).

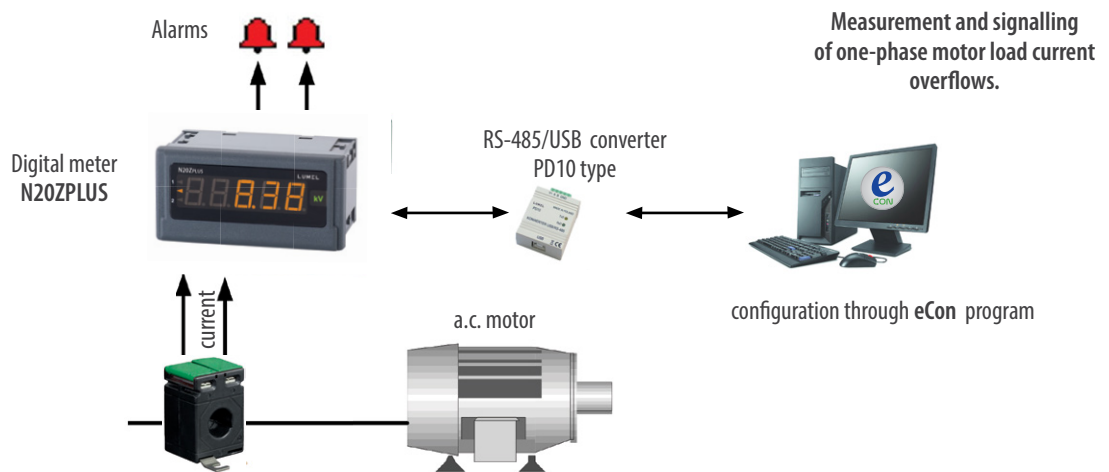


N20ZPLUS - DIGITAL PANEL METER WITH RS-485

- Measurement of voltage, a.c. current or frequency,
- Three-colour LED display (5 digits, 14 mm high).
- **Digital output RS-485 - Modbus RTU protocol.**
- Two alarm outputs of OC type.
- Programmable parameters through RS-485 interface using the free eCon software:
 - recounting of indications (individual characteristic),
 - two alarms of OC type operating in 6 working modes,
 - kind of measured signal: a.c. or a.c. + d.c. (True RMS),
 - display colour programmable in three intervals,
 - precision of displayed results (decimal point),
 - thresholds of displayed overflows,
 - highlight of the unit,
 - measurement averaging time.



EXAMPLE OF APPLICATION



FEATURES



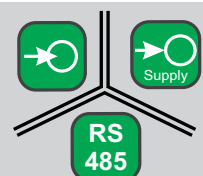
INPUTS



OUTPUTS



GALVANIC ISOLATION



TECHNICAL DATA

INPUTS

Input type	Measuring range	Parameters	Basic error
Voltage input	1...100...120 V	Input resistance >2 MΩ	± (0.5% of range+ 1 digit)
	2.5...250...300 V		
	4...400...480 V		
Current input	0.01...1...1.2 A	Input resistance: 50 mΩ ± 10% Input resistance: 10 mΩ ± 10%	± (0.5% of range+ 1 digit)
	0.05...5...6 A		
Frequency (in the range of voltages 24...480 V)	20...500 Hz	Input resistance: >2 MΩ	± (0.02% of range+ 1 digit)

TECHNICAL DATA

OUTPUTS

Output type	Features
Alarm outputs	• 2 alarm outputs of OC type

DIGITAL INTERFACE

Interface type	Transmission protocol	Modes	Baudrate
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbit/s

EXTERNAL FEATURES

Readout field	5 digit LED display - indication range: -19999...99999 digit height: 14 mm	Three-colour display (changes of colour depend on the displayed value): red, green, orange.
Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 64 mm	panel cut-out: 92 ^{+0.6} x 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from terminal side: IP 10

RATED OPERATING CONDITIONS

Supply	85...253 V a.c. / d.c., 20...40 V a.c. / 20...60 V d.c.	Power consumption < 6 VA
Temperature	ambient: -10...23...55°C	storage: -25...85°C
Relative humidity	< 95%	condensation inadmissible
Operating position	any	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Safety requirements		acc. to EN 61010-1

CONNECTION DIAGRAMS

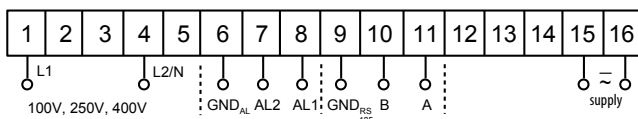


Fig. 1 Electrical connections of the N20ZPLUS meter with the measurement of voltage and frequency.

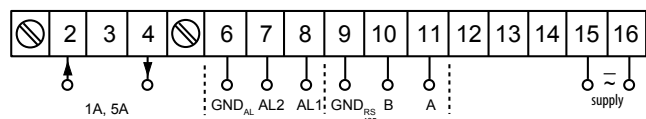


Fig. 2 Electrical connections of the N20Z meter with the measurement of current.

ORDERING

TABLE 1. ORDERING CODE:

N20ZPLUS -		X	X	XX	XX	X	X
Input:							
100 V	1						
250 V	2						
400 V	3						
1 A	4						
5 A	5						
frequency 20...500 Hz	6						
Supply:							
85...253 V a.c./d.c.	1						
20...40 V a.c./20...60 V d.c.	2						
Unit:							
unit code number acc. to table 2				XX			
Version:							
standard						00	
custom-made							XX
Language:							
Polish							P
English							E
Acceptance test:							
without additional quality requirements							0
with an extra quality inspection certificate							1
with an extra calibration certificate							2
acc.to customer's request*							X

* only after agreeing with the manufacturer

TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	without unit	17	µm	34	bar
01	V	18	mm	35	rad
02	A	19	cm	36	Ω
03	mV	20	m	37	kΩ
04	kV	21	km	38	%
05	MV	22	l	39	°
06	mA	23	l/s	40	obr
07	kA	24	l/h	41	rps
08	MA	25	ms	42	rpm
09	°C	26	s	43	rph
10	°F	27	h	44	m/h
11	K	28	N	45	km/h
12	Hz	29	kN	46	imp
13	kHz	30	Pa		
14	Ah	31	hPa		
15	kAh	32	kPa	XX	on order ¹⁾
16	m/s	33	MPa		

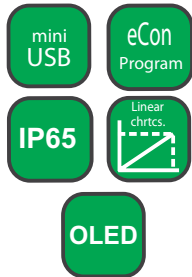
¹⁾ -only after agreeing with the manufacturer

ORDERING EXAMPLE:

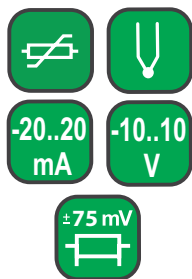
The Code N20ZPLUS - 3 1 01 00 P 0 - means: N20ZPLUS meter with voltage input on 400V, supply 85...253 V a.c., standard version, user's manual in English, without additional quality requirements. Unit,V"

N21 DIGITALES SCHALTAFELMESSGERÄT

NUTZEIGENSCHAFTEN:



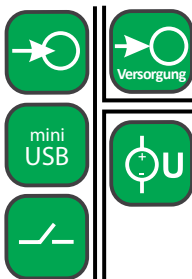
EINGÄNGE:



AUSGÄNGE:



GALVANISCHE TRENNUNG:

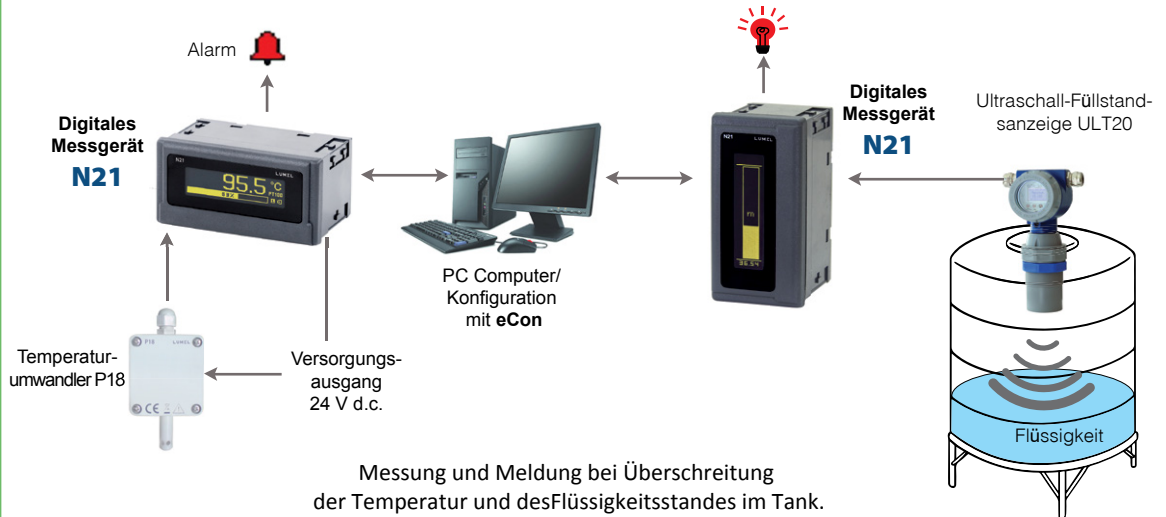


NEUE FUNKTION VERTIKALES DISPLAY



- Universeller Messeingang (Messung von Temperatur und Standardsignale).
- **Neuer Bereich für Gleichspannungsmessung: +/- 75mV.**
- Relais-Alarmausgang.
- **Visualisierung der Messung als horizontales oder vertikales Balkendiagramm - NEU!**
- Universelle Spannungsversorgung von 24 V bis zu 230 V a.c./d.c.
- Versorgungsausgang für Objektumwandler 24 V d.c.
- OLED Grafik-Display.
- Konfiguration des Messgeräts durch Mini-USB-Schnittstelle im kostenlosen eCon-Programm.
- Im eCon programmierbare Parameter:
 - Messgröße,
 - Umrechnung der Anzeigen (individuelle Kennlinie),
 - Kommastelle,
 - Betriebsart des Alarmausgangs,
 - Mittelungszeit,
 - benutzerdefinierte Anzeigeeinheit,
 - Wahl der Meldungssprache.

ANWENDUNGSBEISPIEL



EINGÄNGE

Eingangsart	Messbereich	Parameter	Grundfehler
Spannungseingang	-90 mV...-75 mV...75 mV...90 mV -12 V...-10 V...10 V...12 V	Eingangswiderstand > 200 kΩ Eingangswiderstand > 1 MΩ	± (0,1% des Bereiches + 1 Ziffer)
Stromeingang	-24 mA...-20 mA...20 mA...24 mA	Eingangswiderstand < 50 Ω ± 1%	
Temperaturfühler Pt100	- 200...850°C	durch den Fühler fließender Strom < 300 µA	
Thermoelement J	- 50...1200°C		
Thermoelement K	- 50...1370°C		

AUSGÄNGE

Ausgangsart	Eigenschaften
Alarmausgänge	Relais-Ausgang, Schließkontakt, Belastbarkeit 250 V~/0,5 A~, Anzahl der Umschaltungen 1x10 ⁵
Versorgungsausgang für externe Umwandler	24 V d.c. ± 5%, 30 mA

EXTERNE EIGENSCHAFTEN

Ablesefeld	OLED Display 128 x 32 Punkte, goldgelb	
Gewicht	< 0,25 kg	
Abmessungen	96 x 48 x 64 mm	Schalttafelausschnitt: 92 ^{+0,6} x 45 ^{+0,6} mm
Schutzgrad (nach EN 60529)	Frontseite: IP65	Klemmenseite: IP 20

N21 DIGITALES SCHALTAFELMESSGERÄT

NOMINALE BETRIEBSBEDINGUNGEN

Versorgungsspannung	22..60 V a.c. 50..400 Hz / 20..60 V d.c. (Klemmen 12-13) 60..253 V a.c. 40..400 Hz / 60..300 V d.c. (Klemmen 13-14)	Leistungsentnahme < 3 VA
Temperaturbereich	Umgebungstemperatur: -10...23...55°C	Lagertemperatur: -25...85°C
Relative Luftfeuchte	< 95%	ohne Kondensation
Betriebslage	beliebig	

SICHERHEITS- UND EMV ANFORDERUNGEN

Elektromagnetische Verträglichkeit	Störfestigkeit	nach Norm DIN EN 61000-6-2
	Störaussendung	nach Norm DIN EN 61000-6-4
Sicherheitsanforderungen		nach Norm DIN EN 61010-1
Galvanische Trennung	3,2 kV d.c.	

ANSCHLUSSPLÄNE

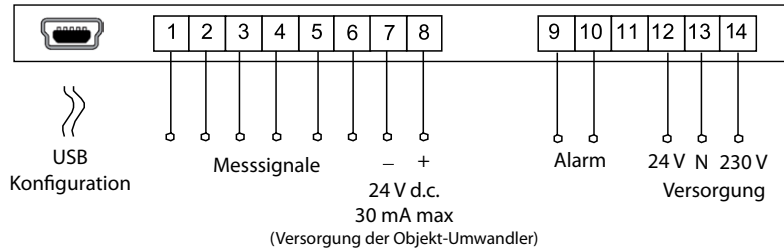


Abb. 1. Elektrischer Anschluss des Messgeräts N21

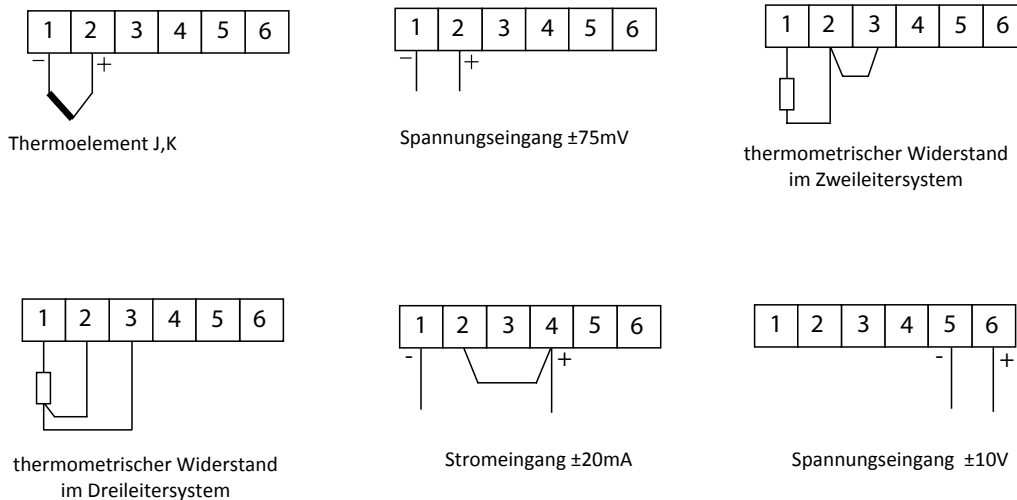


Abb. 2. Anschluss der Messsignale

BESTELLANGABEN

	N21 -	X	X	X	X
Version:					
horizontal		0			
vertikal		V			
Ausführung:					
standard		0			
Sprache:					
Polnisch				P	
Englisch				E	
Abnahmeprobe:					
ohne zusätzliche Ansprüche					0
mit zusätzlichem Qualitätskontrollezeugnis					1
mit Kalibrierungszertifikat					2

Standardmäßig im Messgerät N21:

- universeller Eingang
- Relais-Ausgang
- Versorgungsausgang 24 V d.c.
- Versorgungsspannung 24 V a.c./d.c., 230 V a.c./d.c.
- Mini-USB-Schnittstelle zur Konfiguration.

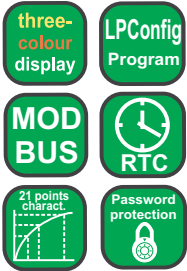
Bestellungsbeispiel:

Der Code **N21-00E0** bedeutet:

- N21** – Messgerät N21,
- 0** - horizontale Version,
- 0** - Standardausführung,
- E** - Betriebsanleitung auf Englisch,
- 0** - ohne zusätzliche Ansprüche.

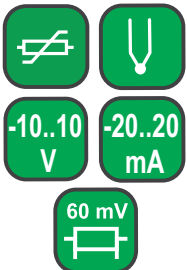
N30U DIGITAL PANEL METER

FEATURES:

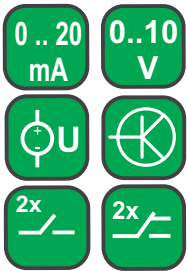


IP65

INPUTS:



OUTPUTS:



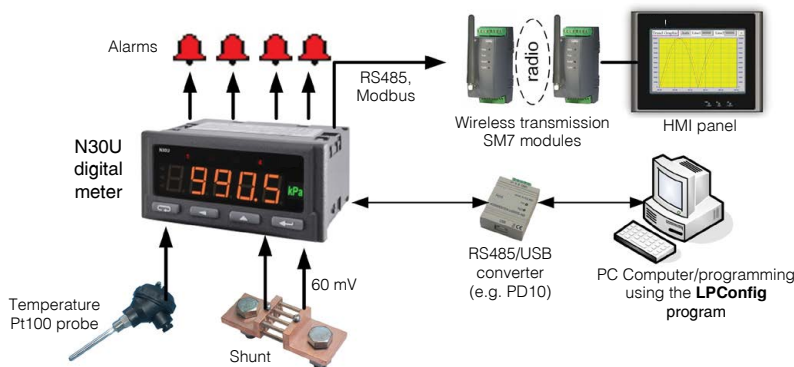
RS 485

GALVANIC ISOLATION:



- Measurement: temperature, resistance, standard signals.
- 3-colour display (14 mm high), programmable in 3 ranges of the measured value.
- Meter programming from keyboard or through the RS-485 interface by means of the free LPConfig program.
- 4 alarm outputs with signalling on LED diodes, working in 6 different modes.
- Conversion of any measured value into an analog signal 0/4...20 mA or 0...10 V.
- Storage of minimal and maximal values for all measured quantities.
- Supply of object transducers (ver. N30U-1XXXXXX).
- 21-point individual characteristic for the measured value.

EXAMPLE OF APPLICATION



Measurement and visualization of analog standard signals: Pt100, TC, 20 mA, 60 mV, 10 V. Measured parameters are transmitted to the HMI operator panel through radio modules.

INPUT

Input kind	Maximal measuring range	Class	Additional error
Pt100	-205...855°C (-200...850°C)	0.1	- due to automatic compensation of the reference junction temperature $\leq 1^\circ\text{C}$
Pt500			
Pt1000			
400 Ω	0...410 Ω (0...400 Ω)		- due to automatic compensation of the cable resistance for thermoresistors $\leq 0,5^\circ\text{C}$
4000 Ω	0...4010 Ω (0...4000 Ω)		
Thermocouple of J type	-200...1200 °C (-100...1200 °C)		- due to automatic compensation of the cables for resistance measurement $\leq 0,2\Omega$
Thermocouple of K type	-200...1370 °C (-100...1370 °C)		
Thermocouple of N type	-200...1300 °C (-100...1300 °C)		
Thermocouple of E type	-200...1000 °C (-100...1000 °C)		
Thermocouple of R type	-50...1768 °C (-50...1760 °C)		
Thermocouple of S type	-50...1768 °C (-50...1760 °C)		
Voltage input 0...10 V	-13...13 V (-10...10 V)	- from temperature changes 100 % of the class / 10 K	
Current input	-24...24 mA (-20...20 mA)		
Voltage input	-10...63 mV (0...60 mV)	0.5 sec./ 24h	
Current time	00.00...23.59		

OUTPUTS

Output kind	Properties	Remarks
Relay output	<ul style="list-style-type: none"> • 2 x relays, voltageless NOC contacts load-carrying capacity 250 V a.c./ 0.5 A a.c. • 2 x relays, voltageless switched contacts load-carrying capacity 250 V a.c./ 0.5 A a.c. 	
Analog output	<ul style="list-style-type: none"> • current programmable 0/4...20mA, load resistance $\leq 500 \Omega$ • voltage programmable 0...10 V load resistance $\geq 500 \Omega$ 	Error of analog output: 0.2% of the set range Additional error from temperature changes: 50% of the class/10K
OC output	• typu OC, passive npn, 30 V d.c./30 mA	Voltageless output
Auxiliary supply	• 24 V d.c./ 30mA	only for meter version: N30U-1XXXXXX

DIGITAL INTERFACE

Interface type	transmission protocol	modes	baud rates
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbit/s

N30U DIGITAL PANEL METER

EXTERNAL FEATURES

Readout field	5 digit LED display - indication range -19999..99999 digit height: 14 mm	three-color display (colour changes depending on displayed value): red, green, orange
Weight	< 0.2 kg	
Dimensions	96 × 48 × 93 mm	Panel cut-out: 92 ^{+0,6} × 45 ^{+0,6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from rear side: IP 10

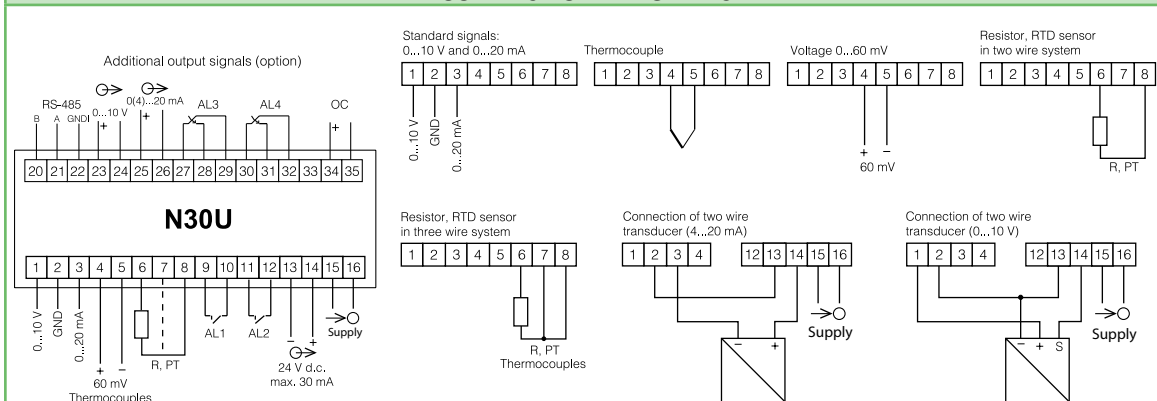
RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (40...400 Hz) or d.c., 20...40 V a.c. (40...400 Hz), 20...60 V d.c.	power consumption < 6 VA
Temperature	ambient: -25...+55°C	storage: -30...70°C
Relative humidity	25...95%	condensation inadmissible
Operating position	any	
External magnetic field	0...400 A/m	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution grade	2	
Installation category	III	
Maximal phase-to-earth operating voltage	for the supply circuit: 300 V for remaining circuits: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS



SEE ALSO:



Free LPConfig software for easy programming of products.



KD7 recorder with MODBUS master protocol for recording data measured by N30U.



Shunts for measurement DC current from 5A up to 15 kA.

ORDERING

TABLE 1. ORDERING CODES:

	N30U -	X	X	XX	XX	X	X
Supply:							
85...253 V a.c./d.c.		1					
20...40 V a.c., 20...60 V d.c.		2					
Additional outputs:							
lack		0					
OC output, RS-485, analog outputs		1					
OC output, RS-485, analog outputs switched-over relay outputs		2					
Unit:							
unit code acc. to the table 2			XX				
Version:							
standard			00				
custom-made*			XX				
Language:							
Polish						P	
English						E	
other*						X	
Acceptance tests:							
without extra requirements							0
with an extra quality inspection certificate							1
acc. to customer's request*							X

Order example: The code **N30U - 1 0 26 00 E 0** means
N30U - programmable N30U digital panel meter
1 - supply: 85...253 V a.c./d.c.
0 - lack of additional outputs
26 - unit "°C" acc. to tabel 2
00 - standard option
E - English language
0 - without extra requirements

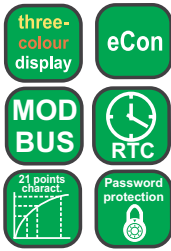
TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	lack of unit	20	kVAh	40	szt.
01	V	21	MVAh	41	imp
02	A	22	Hz	42	rps
03	mV	23	kHz	43	m/s
04	kV	24	Ω	44	l/s
05	mA	25	kΩ	45	obroty/min
06	kA	26	°C	46	rpm
07	W	27	°F	47	mm/min
08	kW	28	K	48	m/min
09	MW	29	%	49	l/min
10	var	30	%RH	50	m³/min
11	kvar	31	pH	51	pcs/h
12	Mvar	32	kg	52	m/h
13	VA	33	bar	53	km/h
14	kVA	34	m	54	m³/h
15	MVA	35	l	55	kg/h
16	kWh	36	s	56	l/h
17	MWh	37	h		
18	kvarh	38	m³	XX	on order*
19	Mvarh	39	obroty		

* - after agreeing with the manufacturer

N30H DIGITAL PANEL METER

FEATURES:

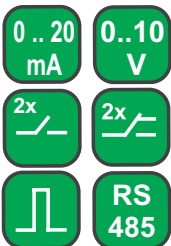


IP65

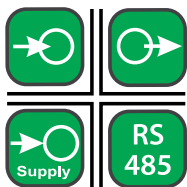
INPUTS:



OUTPUTS:

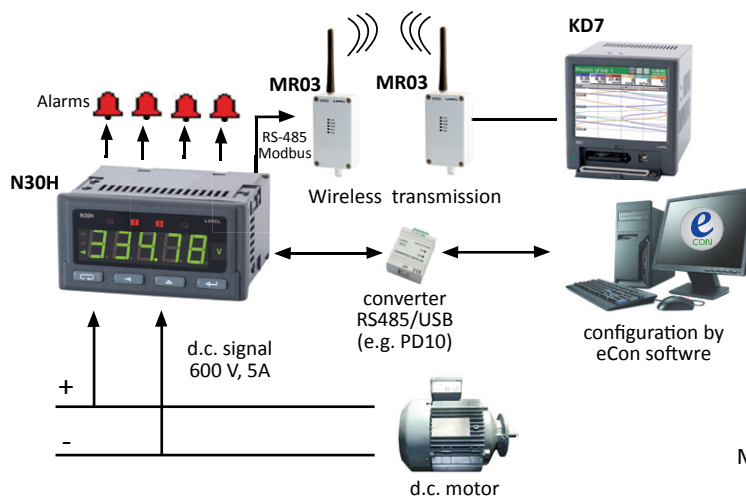


GALVANIC ISOLATION:



- Measurement: current and d.c. voltage up to 5 A and 600 V.
- Three-colour display (14 mm high), programmed in three intervals of the measured value.
- Meter programming from the keyboard or through the RS-485 interface by means of the free delivered eCon software.
- Four alarm outputs with signalling by LED diodes, operating in 6 different modes.
- Conversion of any measured value into a 0/4...20 mA, or 0...10 V analog signal.
- Storage of minimal and maximal values for all measured quantities.
- 21-point individual characteristic for the measured value.

EXAMPLE OF APPLICATION



Measurement and recording of d.c. motor voltage and current. Measured data are transmitted to the recorder via radio modules.

INPUTS

Input kind	Maximal measuring range	Class
+/- 500 V d.c.	-600...600 V d.c.	0.1
+/- 100 V d.c.	-130...130 V d.c.	0.1
+/- 5 A d.c.	-6...6 A d.c.	0.1
+/- 1 A d.c.	-2...2 A d.c.	0.1
Current time	00.00..23.59	0.5 second/24 h

OUTPUTS

Output kind	Properties	Remarks
Relay output	<ul style="list-style-type: none"> • 2 x relays, voltageless NO contacts, load-carrying capacity 250 V a.c./ 0.5 A a.c. • 2 x relays, voltageless switched contacts, load-carrying capacity 250 V a.c./ 0.5 A a.c. 	
Analog output	<ul style="list-style-type: none"> • current programmable 0/4...20 mA, load resistance ≤ 500 Ω • voltage programmable 0...10 V, load resistance ≥ 500 Ω • Error of output: 0.2% of the set range 	Additional error from temperature changes: 50% of class/10K
OC output	• OC type, passive npn, 30 V d.c./30 mA	voltage output

DIGITAL INTERFACES

Interface type	Transmission protocol	Modes	Baud rates
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8; 9.6; 19.2; 38.4, 57.6, 115.2 kbit/s

EXTERNAL FEATURES

Readout field	5-digit LED display - indication range -19999...99999 digit height: 14 mm	three-colour display (colour changes depending on displayed value): red, green, orange
Weight	< 0.2 kg	
Overall dimensions	96 × 48 × 93 mm	Panel cut-out: 92 ^{+0,6} × 45 ^{+0,6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from terminal side: IP 10

N30H DIGITAL PANEL METER

RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (40...400 Hz) or d.c., 20...40 V a.c. (40...400 Hz) or 20...60 V d.c.	
Temperature	ambient: -25...+55°C	storage: -33...70°C
Relative humidity	25...95%	condensation inadmissible
Operating position	any	
External magnetic field	0...400 A/m	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution grade	2	
Installation category	III	
Maximal phase-to-earth working voltage	for the supply circuit: 300 V	
	for the measuring input 600 V for analog input signals - cat. II (300 V - cat. III)	
	for remaining circuit: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS

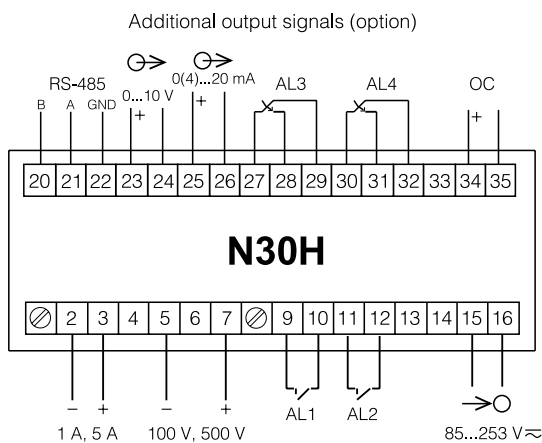


Fig. 1. Description of signals on connection terminals.

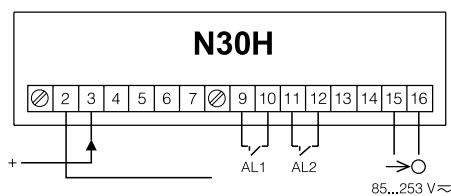


Fig. 2. Meter connection in the configuration for current measurement

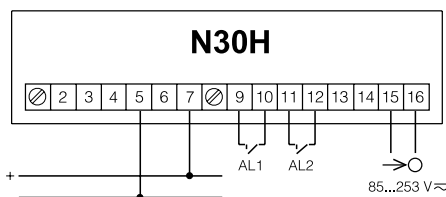


Fig. 3. Meter connection in the configuration for voltage measurement.

ORDERING

TABLE 1. ORDERING CODES:

	N30H -	X	X	XX	XX	X	X
Supply:							
85...253 V a.c. (40...400 Hz) or d.c.		1					
20...40 V a.c. (40...400 Hz) or 20...60 V d.c.		2					
Additional outputs:							
lack			0				
OC output, RS-485, analog outputs			1				
OC output, RS-485, analog outputs switched-over relay outputs			2				
Unit:							
unit code acc. to the table 2				XX			
Version:							
standard						00	
custom-made*						XX	
Language:							
Polish							P
English							E
other*							X
Acceptance tests:							
without extra requirements							0
with an extra quality inspection certificate							1
acc. to customer's request*							X

Order example:

The code **N30H - 1 0 01 00 E 0** means

- N30H - programmable N30H panel digital meter
- 1 - supply: 85...253 V a.c. (40...400 Hz) or d.c.
- 0 - lack of additional outputs
- 01 - unit "V" acc. to the table 2
- 00 - standard option
- E - English language
- 0 - without extra requirements

TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	lack of unit	20	kVAh	40	szt.
01	V	21	MVAh	41	imp
02	A	22	Hz	42	rps
03	mV	23	kHz	43	m/s
04	kV	24	Ω	44	l/s
05	mA	25	kΩ	45	obr/min
06	kA	26	°C	46	rpm
07	W	27	°F	47	mm/min
08	kW	28	K	48	m/min
09	MW	29	%	49	l/min
10	var	30	%RH	50	m³/min
11	kvar	31	pH	51	szt./h
12	Mvar	32	kg	52	m/h
13	VA	33	bar	53	km/h
14	kVA	34	m	54	m³/h
15	MVA	35	l	55	kg/h
16	kWh	36	s	56	l/h
17	MWh	37	h		
18	kvarh	38	m³	XX	on order*
19	Mvarh	39	obr		

* - after agreeing with the manufacturer

N300 DIGITAL PANEL METER

FEATURES:

- three-colour display
- eCon
- MOD BUS
- RTC
- 21 points charact.
- Password protection
- IP65

INPUTS:

- Hz
- Alarms
- Waveform icons

OUTPUTS:

- 0/4...20 mA
- 0...10 V
- Relay symbols
- 2x
- 2x
- RS 485

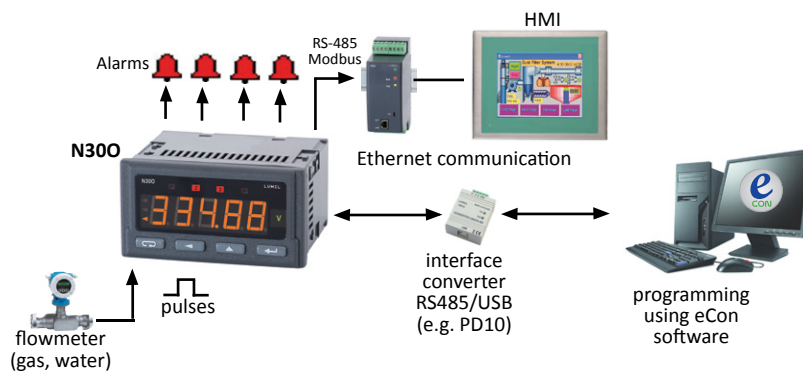
GALVANIC ISOLATION:

- Isolation symbols
- Supply
- RS 485



- Measurement: number of pulses, frequency, rotational speed, period, worktime counter.
- Two impulse counters, co-operation with encoders.
- Counter of actual and total values.
- 3-colour display (14 mm high), programmable in 3 ranges of the measured value.
- Meter programming from keyboard or through the RS-485 interface by means of the free eCon program.
- 4 alarm outputs with signalling on LED diodes, working in 6 different modes.
- Conversion of any measured value into an analog signal 0/4...20 mA or 0...10 V.
- Storage of minimal and maximal values for all measured quantities.
- Supply of object transducers (option).
- 21-point individual characteristic for the measured value.
- Mathematical function.
- Firmware updating (option).

EXAMPLE OF APPLICATION



Measurement and visualization of the water/gas flow. The measured value is transmitted to the operating panel via radio modules

INPUTS

Input signal:	Input kind	Indication range	Maximal frequency of input signal	Class	Remarks
Voltage 5...36 V d.c.	Number of pulses IN1/IN2	-19 999..99 999	10 kHz/ 8 kHz	±1 pulse	with signal filtering 2 kHz
	Frequency < 10 kHz	0.05..99 999 Hz	100 kHz	0.01	with signal filtering 100 Hz
	Frequency > 10 kHz	1...99 999 kHz (measuring range up to 1 MHz)	1 MHz	0.01	
	Rotational speed	0.05...99 999 [rpm]	100 kHz	0.01	
	Period t < 10 s	0.0001...11 [s]		0.01	
	Period t < 10 s	0.0001...3600 [s]		0.01	
	Worktime counter	0...99 999 [h]			0.5 sec/ 24 hours
Encoder	-19 999...99 999	10 kHz		with signal filtering 2 kHz	
Current time	00.00...23.59			0.5 sec/ 24 hours	

OUTPUTS

Output kind	Properties	Remarks
Relay output	<ul style="list-style-type: none"> • 2 x relays, voltageless NOC contacts load-carrying capacity 250 V a.c./ 0.5 A a.c. • 2 x relays, voltageless switched contacts load-carrying capacity 250 V a.c./ 0.5 A a.c. 	
Analog output	<ul style="list-style-type: none"> • current programmable 0/4...20mA, load resistance ≤ 500 Ω • voltage programmable 0...10 V load resistance ≥ 500 Ω 	Error of analog output: 0.2% of the set range Additional error from temperature changes: 50% of the class/10K
OC output	• typu OC, passive npn, 30 V d.c./30 mA	
Auxiliary supply	• 24 V d.c./ 30mA	

DIGITAL INTERFACE

Interface type	Transmission protocol	Modes	Baud rates
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbit/s

N300 DIGITAL PANEL METER

EXTERNAL FEATURES

Readout field	5-digit LED display - indication range -19999..99999 digit height: 14 mm	three-colour display (color changes depending on displayed value): red, green, orange
Weight	< 0.2 kg	
Overall dimensions	96 × 48 × 93 mm	Panel cut-out: 92 ^{+0.6} × 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from rear side: IP 10

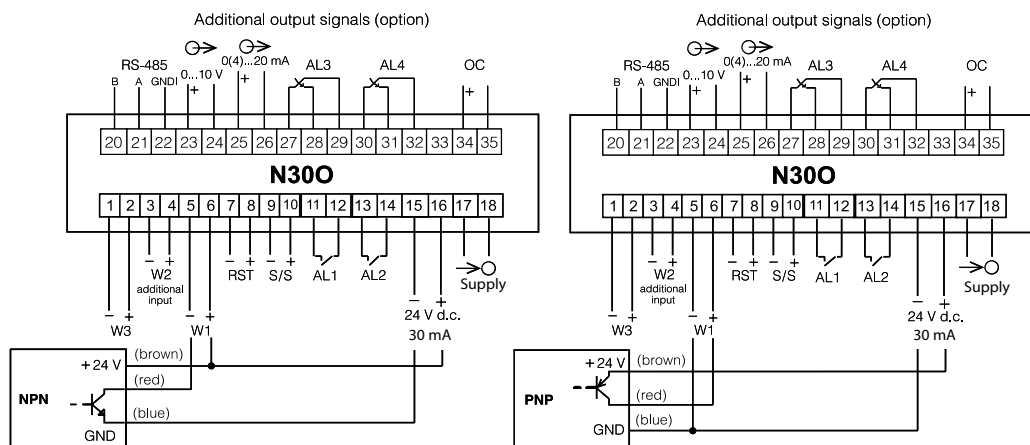
RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (40...400 Hz) or d.c., 20...40 V a.c. (40...400 Hz) or d.c.	power input < 6 VA
Temperature	ambient: -25...+55°C	storage: -33...70°C
Relative humidity	25...95%	condensation inadmissible
Operating position	any	
External magnetic field	0...400 A/m	

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution grade	2	
Installation category	III	
Maximal phase-to-earth operating voltage	for the supply circuit: 300 V for remaining circuits: 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAMS



Connections of the transducer with the OC output of NPN and PNP type.

ORDERING

TABLE 1. ORDERING CODES:

	N300	X	X	XX	XX	X	X
Supply:							
85...253 V a.c. (40...400 Hz) or d.c.	1						
20...40 V a.c. (40...400 Hz) or d.c.d.c.	2						
Additional outputs:							
lack	0						
OC output, RS-485, analog outputs	1						
OC output, RS-485, analog outputs switched-over relay outputs	2						
Unit:							
unit code acc. to the table 2			XX				
Version:							
standard				00			
custom-made*				XX			
Language:							
Polish						P	
English							E
other*							X
Acceptance tests:							
without extra requirements							0
with an extra quality inspection certificate							1

Order example: The code **N300 100100E0** means:
N300 - programmable N300 digital panel meter
1 - supply: 85...253 V a.c./d.c.
0 - lack of additional outputs
01 - unit "V" acc. to tabel 2
00 - standard option
E - English language
0 - without extra requirements

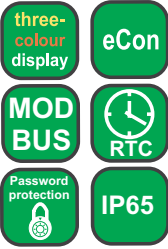
TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	lack of unit	20	kVAh	40	sz.
01	V	21	MVAh	41	imp
02	A	22	Hz	42	rps
03	mV	23	kHz	43	m/s
04	kV	24	Ω	44	l/s
05	mA	25	kΩ	45	obr/min
06	kA	26	°C	46	rpm
07	W	27	°F	47	mm/min
08	kW	28	K	48	m/min
09	MW	29	%	49	l/min
10	var	30	%RH	50	m ³ /min
11	kvar	31	pH	51	szt./h
12	Mvar	32	kg	52	m/h
13	VA	33	bar	53	km/h
14	kVA	34	m	54	m ³ /h
15	MVA	35	l	55	kg/h
16	kWh	36	s	56	l/h
17	MWh	37	h		
18	kvarh	38	m ³	XX	on order*
19	Mvarh	39	obr		

* - after agreeing with the manufacturer

N30P DIGITAL PANEL METER

FEATURES:

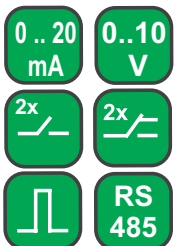


- Measurement of single-phase network parameters: voltage, current, active, reactive and apparent power, $\cos\phi$, $\text{tg}\phi$, ϕ , frequency, active, reactive and apparent energy, 15 minutes' active power, 10 minutes' voltage, 10 seconds' frequency.
- Three-colour display (14 mm high), in three intervals of the measured value.
- Meter programming from the keyboard or through the RS-485 interface by means of the free delivered eCon program.
- Four alarm outputs with signalling by LED diodes, operating in 6 different modes.
- Storage of minimal and maximal values for all measured quantities.
- Conversion of any measured value into a 0/4...20 mA or 0...10 V analog signal.
- Storage of minimal and maximal values for all measured quantities.
- Firmware updating (option).

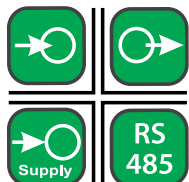
INPUTS:



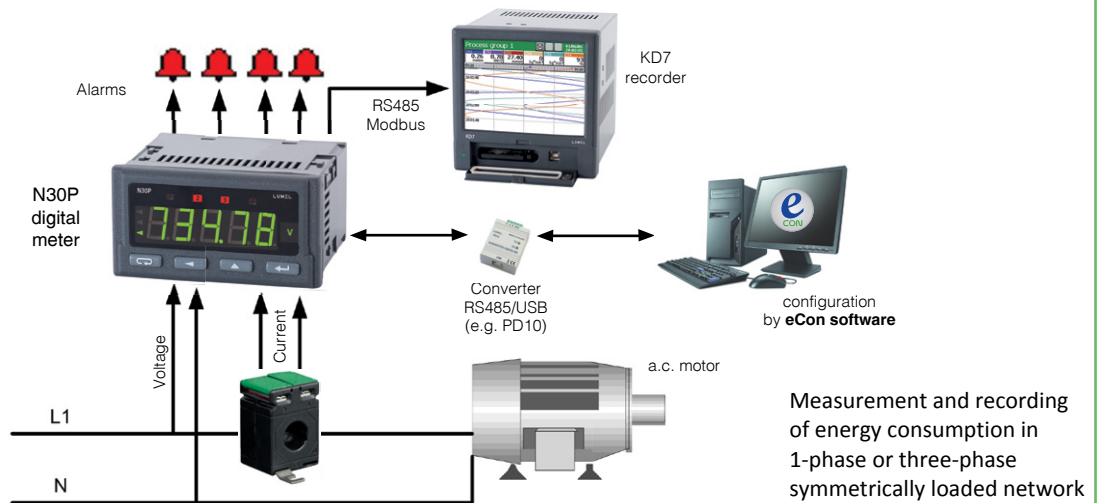
OUTPUTS:



GALVANIC ISOLATION:



EXAMPLE OF APPLICATION



INPUTS

Input kind	Measuring range	Rated operating conditions	Ratio values
Voltage input	0...100 V or 0...400 V	0.05...1.2 U_n	0.1...4000.0
Current input	0...1 A or 0...5 A	0.005...1.2 I_n	1...10000

MEASURING RANGES

Input kind	Indication range	Measuring range	Basic error
Current 1 A/5 A	0.000...60 kA	0.025...6.000 A a.c.	$\pm 0.2\%$
Voltage 100 V/400 V	0.0...1.92 MV	2.0...480 V a.c.	$\pm 0.2\%$
Frequency	45.00...100.00 Hz	45.00...66.00...100.00 Hz	$\pm 0.2\%$
Active power	-19999...99999 MW	-2.88 kW...1.40 W...2.88 kW	$\pm 0.5\%$
Reactive power	-19999...0.00...99999 Mvar	-2.88 kvar...1.40 var...2.88 kvar	$\pm 0.5\%$
Apparent power	0.00...99999 MVA	1.40 VA...2.88 kVA	$\pm 0.5\%$
Cos ϕ	-1...0...1	-1...0...1	$\pm 0.5\%$
Tangens ϕ	-1.2...0...1.2	-1.2...0...1.2	$\pm 1\%$
ϕ	0...359	0...359	$\pm 1\%$
Active energy	0...9 999 999.9 kWh	0...9 999 999.9 kWh	$\pm 0.5\%$
Reactive energy	0...9 999 999.9 kVarh	0...9 999 999.9 kVarh	$\pm 0.5\%$
Current time	0.00...23.59	0.00...23.59	1 sec/ 24 h

OUTPUTS

Output kind	Properties
Relay output	<ul style="list-style-type: none"> • 2 x relays, voltageless NO contacts, load-carrying capacity 250 V a.c./ 0.5 A a.c. • 2 x relays, voltageless change-over contacts, load-carrying capacity 250 V a.c./ 0.5 A a.c.
Analog output	<ul style="list-style-type: none"> • current programmable 0/4...20 mA, load resistance $\leq 500 \Omega$ • voltage programmable 0...10 V, load resistance $\geq 500 \Omega$ • resolution 0.01% of the range
Energy pulse output	<ul style="list-style-type: none"> • OC type output, passive of class A, acc. to EN 62053-31, supply voltage 18...27 V, current 10...27 mA. • Output pulse constant: 5000 imp./kWh, independently of K_u and K_i settings.

DIGITAL INTERFACES

Interface type	Transmission protocol	Mode	Baud rates
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8; 9.6; 19.2; 38.4 kbit/s

N30P DIGITAL PANEL METER

EXTERNAL FEATURES

Readout field	5 digit LED display - indication range -19999..99999 digit height: 14 mm	three-colour display (colour changes depending on displayed value): red, green, orange
Weight	< 0.2 kg	
Overall dimensions	96 × 48 × 93 mm	Panel cut-out: 92 ^{+0,6} × 45 ^{+0,6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from rear side: IP 10

RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (40...400 Hz) or d.c., 20...40 V a.c. (40...400 Hz) or d.c.	Power consumption: - in supply circuit < 6 VA - in voltage/current circuit < 0.05 VA
Temperature	ambient: -25...23...55°C	storage: -30...70°C
Relative humidity	25...95%	condensation inadmissible
Operating position	any	
External magnetic field	0...400 A/m	
Short duration overload (5 s)	voltage input: 2Un (max. 1000 V)	current input: 10 In

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	Noise immunity	acc. to EN 61000-6-2
	Noise emissions	acc. to EN 61000-6-4
Safety requirements		
Maximal phase-to-earth working voltage	for the supply circuit: 300 V	acc. to EN 61010-1
	for the measuring input 600 V for analog input signals - cat. II (300 V - cat. III)	
	for remaining circuit: 50 V	

CONNECTION DIAGRAMS

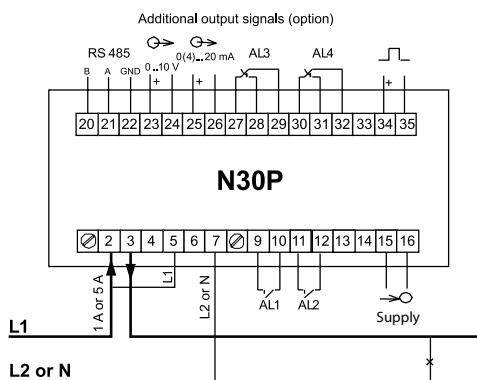


Fig. 1 Electrical connections of the N30P meter for direct measurements.

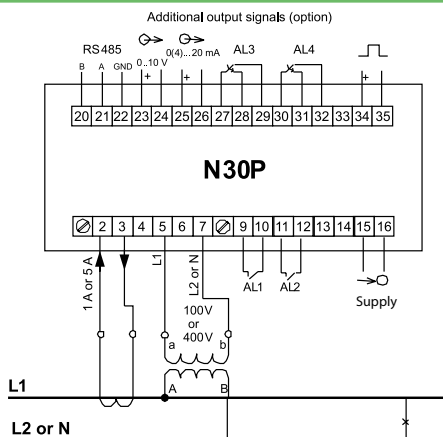


Fig. 2 Electrical connections of the N30P meter for indirect measurements.

ORDERING

TABLE 1. ORDERING CODES:

	N30P -	X	X	XX	XX	X	X
Supply:							
85...253 V a.c./d.c.		1					
20...40 V a.c./d.c.		2					
Additional outputs:							
lack			0				
pulse output, RS-485, analog outputs			1				
pulse output, RS-485, analog outputs switched-over relay outputs			2				
Unit:							
unit code acc. to the table 2				XX			
Version:							
standard						00	
custom-made*						XX	
Language:							
Polish							P
English							E
other*							X
Acceptance tests:							
without extra requirements							0
with an extra quality inspection certificate							1
acc. to customer's request*							X

Order example: The code **N30P - 1 0 01 00 E 0** means: programmable N30P panel digital meter, supply: 85...253 V AC/DC, lack of additional outputs, unit "V" acc. to codes table 2, standard execution, English language, without extra requirements.

TABLE 2. CODES OF HIGHLIGHTED UNIT:

Code	Unit	Code	Unit	Code	Unit
00	lack of unit	20	kVAh	40	szt.
01	V	21	MVAh	41	imp
02	A	22	Hz	42	rps
03	mV	23	kHz	43	m/s
04	kV	24	Ω	44	l/s
05	mA	25	kΩ	45	obr/min
06	kA	26	°C	46	rpm
07	W	27	°F	47	mm/min
08	kW	28	K	48	m/min
09	MW	29	%	49	l/min
10	var	30	%RH	50	m ³ /min
11	kvar	31	pH	51	obr/h
12	Mvar	32	kg	52	m/h
13	VA	33	bar	53	km/h
14	kVA	34	m	54	m ³ /h
15	MVA	35	l	55	kg/h
16	kWh	36	s	56	l/h
17	MWh	37	h	XX	on order*
18	kvarh	38	m ³		
19	Mvarh	39	obr		

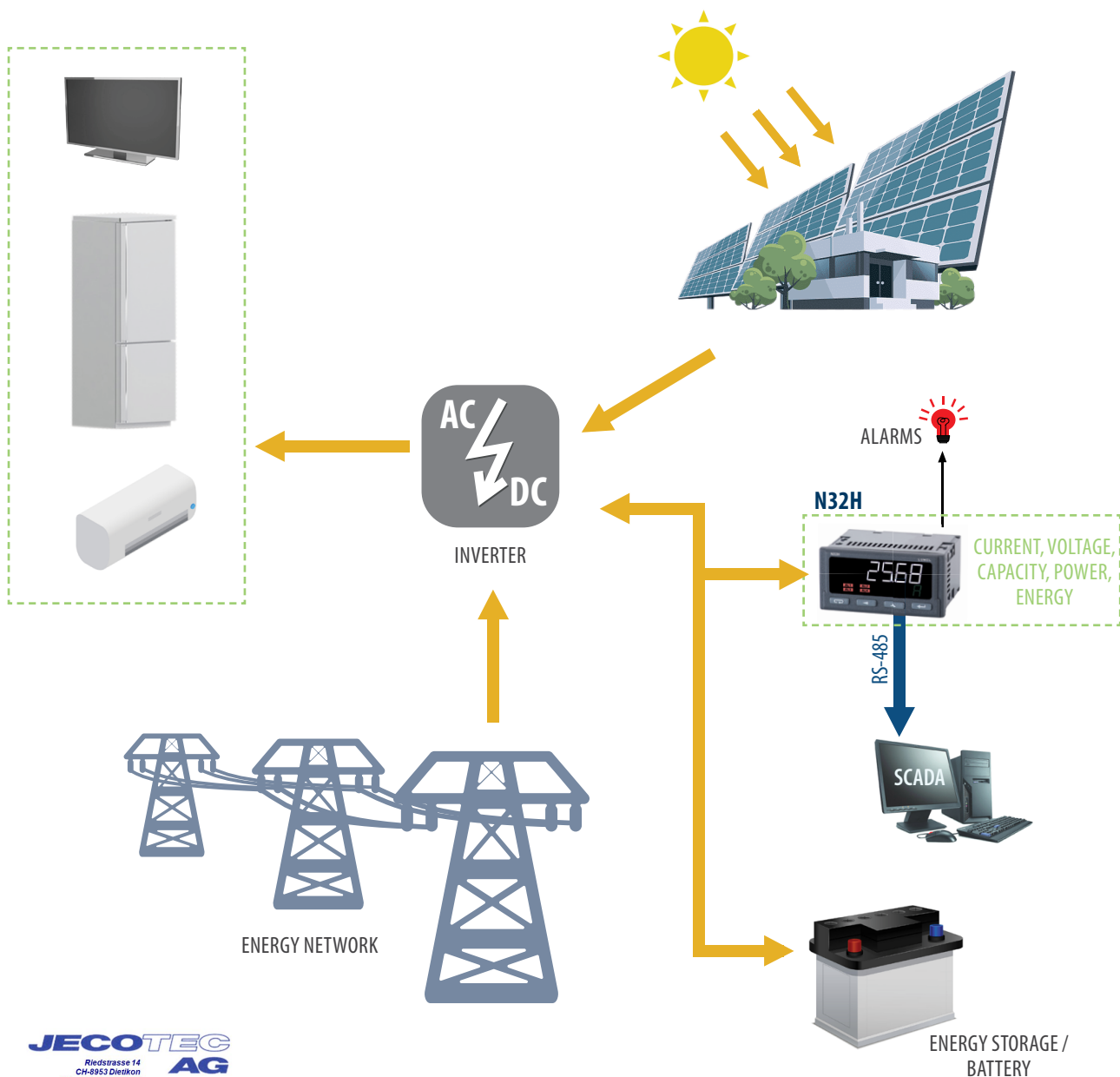
* - after agreeing with the manufacturer



N32H DIGITAL METER OF D.C. CIRCUIT PARAMETERS

- Voltage measurement $\pm 600\text{V}$ (maximum range display $\pm 1200\text{ V}$), current measurement via shunt, power, energy and capacity measurement of d.c. circuits.
- Two-line LCD display with high contrast and built-in backlighting.
- Possibility of displaying the measured value and time simultaneously or an second measured value or unit (automatically displayed unit of measured quantity).
- Wide range of voltage measurement at the shunt input up to 1500 mV.
- High sampling frequency of measured signals.
- Programming parameters via buttons or RS-485 interface and free e-con software.
- 4 alarm outputs with signaling on led diodes, working in 7 different modes (option).
- Pulse output to control energy consumption.
- Conversion of any measured value into an analog signal 0/4...20 mA or 0...10V (option).
- Memory of minimal and maximal values for all measured quantities.
- Automatic voltage measurement compensation function.

EXAMPLE OF APPLICATION



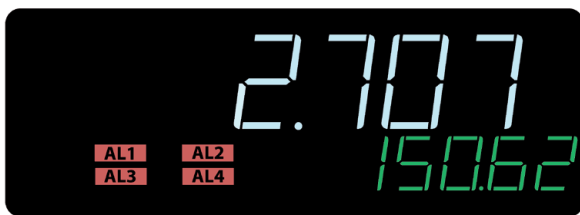
N32H - DIGITAL METER OF D.C. CIRCUIT PARAMETERS

FEATURES	INPUTS	OUTPUTS	GALVANIC ISOLATION

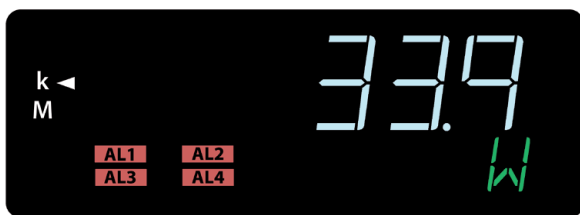
MEASURED QUANTITIES AND CALCULATED BY THE METER

- d.c. voltage U
- d.c. current I (indirectly through the shunt)
- d.c. power P
- averaged voltage in a given range U_{AV}
- averaged current in a given range I_{AV}
- power averaged in a given range P_{AV}
- capacity counter (accumulated current) CAP
- energy counter E
- maximum and minimum values in the given averaging period
- current time

DATA VISUALISATION



or



or

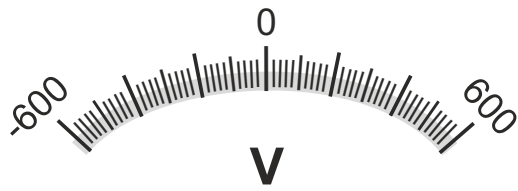


Two-line display.
Simultaneous preview of two measured values e.g. current and power.

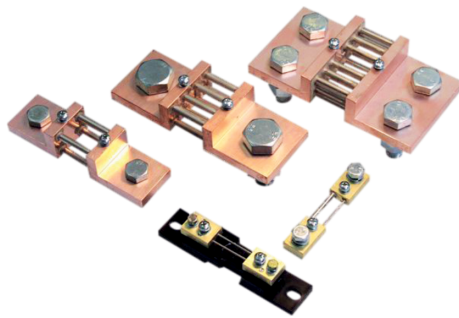
Automatically displayed unit of measured value and symbol of multiplier kilo, mega.

Preview of current time on the bottom line of the display.
Real-time clock with automatic winter/summer time change function.

BIDIRECTIONAL MEASURING INPUT



- 50 mV
- 60 mV
- 75 mV
- 100 mV
- 150 mV

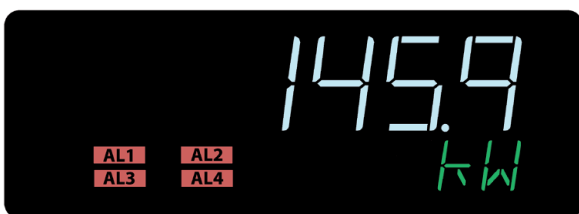


Bidirectional voltage measurement in a wide range of $\pm 600V$ (maximum indication range $\pm 1200V$) and bi-directional current measurement through a shunt. This function is useful, among others when monitoring the parameters of an energy storage system.

Universal input for measuring with any type of shunt with a wide voltage measurement range up to 1500 mV.

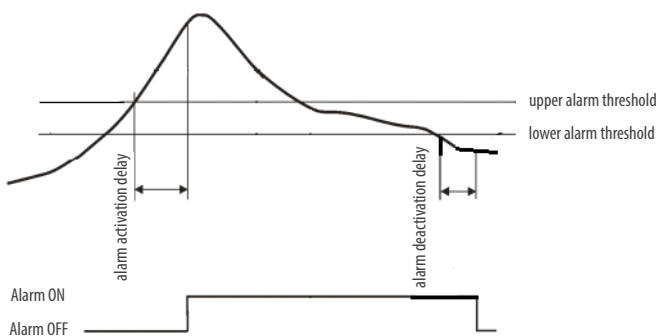
Automatic compensation of the voltage drop on the measuring shunt to support the correct measurements of voltage, power and energy in relation to the load.

ALARM FUNCTIONS



1 or 4 relay outputs with signaling on the display in the form of an active alarm number.

Each of the alarms can be configured to work in one of 7 modes, incl. REG mode for alarm control via RS-485 Modbus.

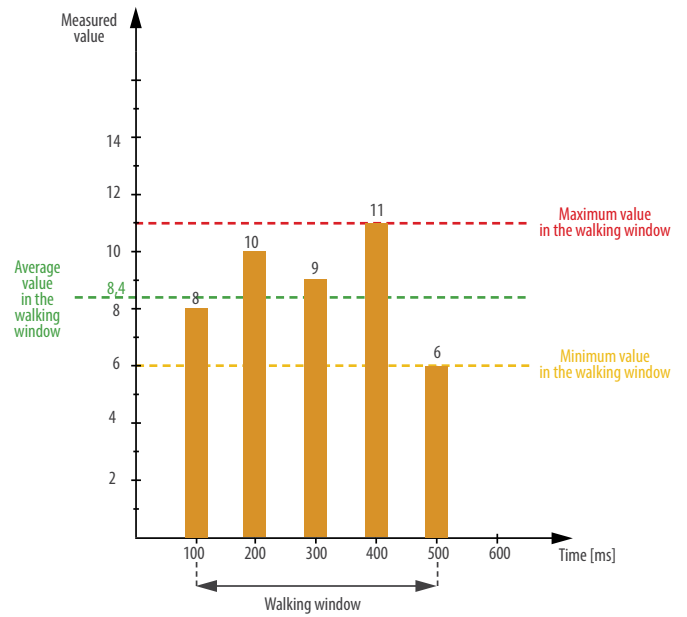
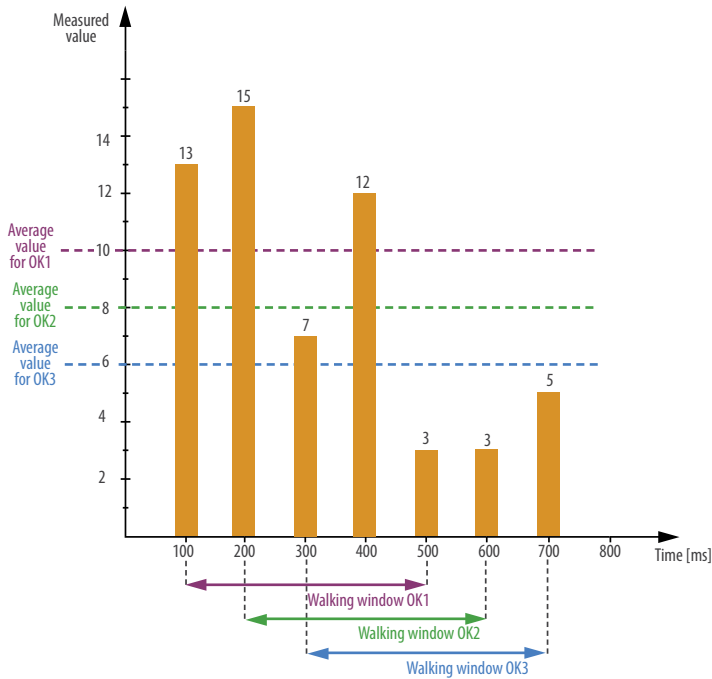


$t \geq$ time delay \rightarrow Alarm activated
For alarm operation both conditions (value and time delay) must be met

Programmable maintenance of alarm signaling. After the alarm event has ceased, the alarm status marker blinks on the display until it is deleted by the user.

Individually programmable parameters of switching on and switching off the alarm; this feature can be used to prevent „false“ alarms from occurring.

WALKING WINDOW ALGORITHM



Programmed averaging time according to the walking window algorithm with a given averaging time. This function is useful for measuring signals with high dynamics.

Possibility to measure the average, minimum or maximum value during the walking window.

TECHNICAL DATA

INPUTS AND MEASURING RANGES

Measured quantity	Nominal range	Maximum range of indications	Class
Voltages	50 V	-75...75 V	0.1
	100 V	-160...160 V	
	150 V	-300...300 V	
	300 V	-600...600 V	
	600 V	-1200...1200 V	
Currents (shunt voltage)		60000...60000 A (-1500...1500 mV)	
Capacity (accumulated current)		-99999...999999 MAh	±0.5 %
Power		all ranges	0.2 + shunt class
Energy		-99999...999999 MWh	±0.5 % + shunt class

OUTPUTS

Output type	Properties	Remarks
Relay output	<ul style="list-style-type: none"> 1 NO contact, load capacity 5A / 250V a.c.; 5A / 30V d.c. 3 relays with a changeover contact, load capacity 6A / 250V a.c.; 6A / 30V d.c.; 0,15A / 250V d.c. 	
Analog output	<ul style="list-style-type: none"> programmable current 0/4...20 mA, load resistant ≤ 500 Ω programmable voltage 0...10 V, load resistant ≥ 500 Ω 	Analog output error: 0.1% of the set range Additional error from temperature changes: 50% of class/10K
OC output	OC type, passive npn, 30 V d.c./30 mA	voltage free output

DIGITAL INTERFACE

Interface type	Transmission protocol	Mode	Baud rate
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	2.4, 4.8, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 115.2 kbit/s

EXTERNAL FEATURES

Readout field	1 row 6-digit; digits height 12.85 mm 2 rows: 5-digit; digits height 7.5 mm	high contrast LCD with backlight and programmable measuring unit
Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 93 mm	mounting hole: 92 ^{+0.6} x 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from terminal side: IP 10

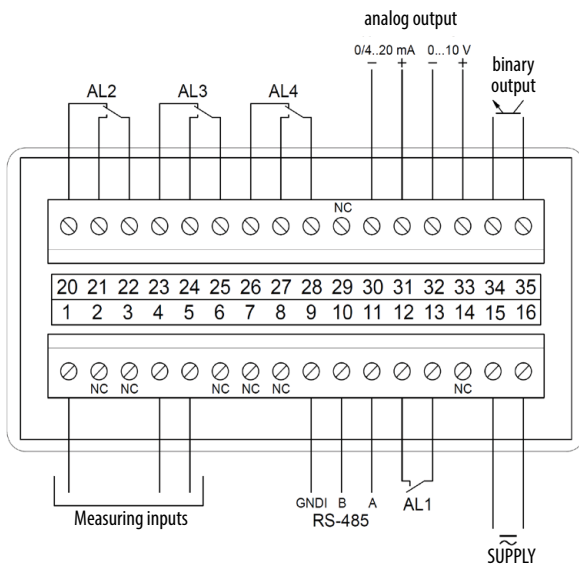
RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (40...400 Hz), 90...300 V d.c. 20...40 V a.c. (45...65 Hz) / 20...60 V d.c.	power consumption < 6 VA
Temperature	ambient: -25...23...55°C	storage: -30...70°C
Relative humidity	25...95%	without condensation
Operating position	any	
External magnetic field	0...400 A/m	

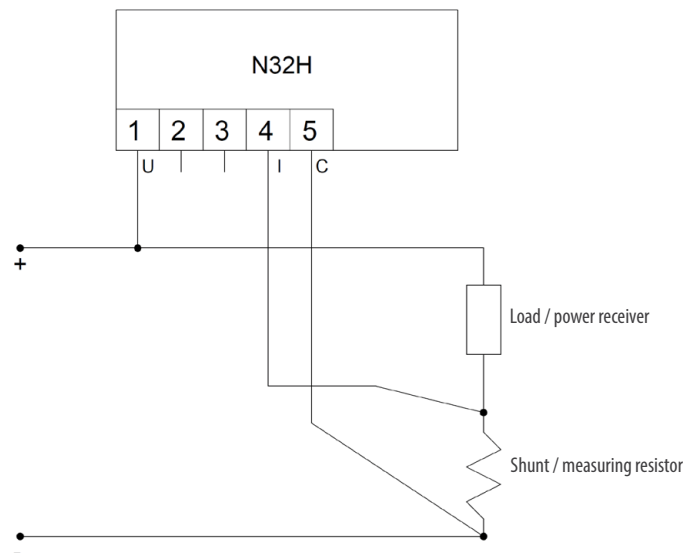
SAFETY AND COMPABILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	
Installation category	III	
Maximal phase-to-earth voltage	for supply circuits: 300 V	
	for other circuits: 50 V	
Altitude a.s.l.	< 2000 m	

CONNECTION DIAGRAMS



Description of signals on the connector strips



Meter connection

ORDERING CODE

N32H	X	X	XXXXXXX	X	X
Supply:					
85...253 V a.c., 90...300 V d.c.	1				
20..40 V a.c./ 20..60 V d.c.	2				
Dodatkové vyjścia:					
1 relay output, RS-485	1				
4 relay outputs, RS-485	2				
4 relay outputs, RS-485, 1 analog output	3				
Version:					
standard			000000		
custom-made*			XXXXXX		
Language:					
Polish/English					M
Acceptance tests:					
without additional quality requirements					0
with an extra quality inspection certificate					1
with an extra calibration certificate					2
acc. to customer's request					X

ORDERING EXAMPLE:

N32H130000000M0 means N32H meter with supply 85...253 V a.c., 90...300 V d.c. with 4 relay outputs, RS-485 interface and 1 analog output, in standard version, polish-english language version, without additional quality requirements.

* only after agreeing with the manufacturer



N32U DIGITAL PANEL METER

- Multi-purpose input for measuring: temperature, resistance, standard signals.
- Two-line LCD display with high contrast and built-in backlighting.
- Possibility of displaying the measured value and time simultaneously or an uncalculated quantity or unit (programmable unit of measured quantity).
- Meter programming from keyboard or through the RS-485 interface by means of the free eCon software.
- 4 alarm outputs with signalling on LED diodes, working in 7 different modes (option).
- Conversion of any measured value into an analog signal 0/4...20 mA or 0...10 V (option).
- Storage of minimal and maximal values for all measured quantities.
- Supply of object transducers.
- 32-point individual characteristic for the measured value.
- Mathematical functions for converting the measured value.

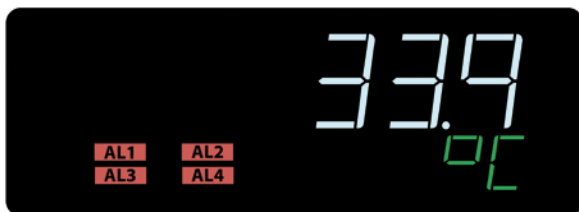
FEATURES	INPUTS	OUTPUTS	GALVANIC ISOLATION

DATA VISUALISATION



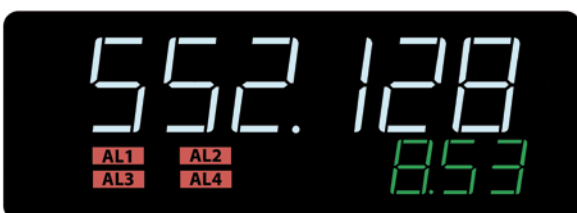
lub

Two-line display.
Simultaneous preview of the measured value (top line) and the input signal not scaled (bottom line).



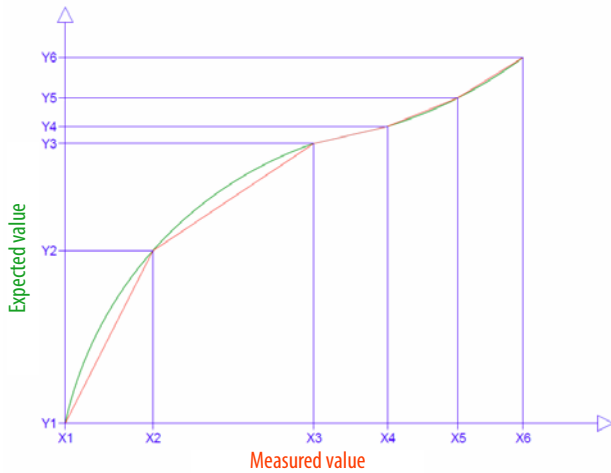
lub

Programmable measurement unit
chosen from 56 variants available
in the menu.



Preview of current time
on the bottom line of the display.
Real-time clock with automatic winter/
summer time change function.

INPUT SCALING



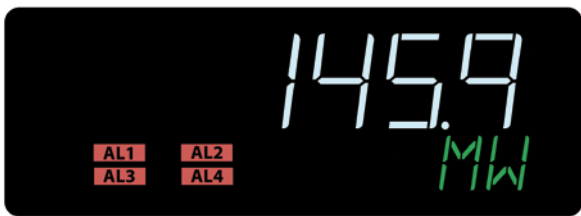
Conversion of the measured quantity based on 32-point individual characteristics. It allows for the mapping of signals from objects or sensors with non-linear characteristics.

$$\sqrt{x} \quad x^2 \quad (1/x)^2$$

$$\sqrt{(1/x)} \quad 1/x$$

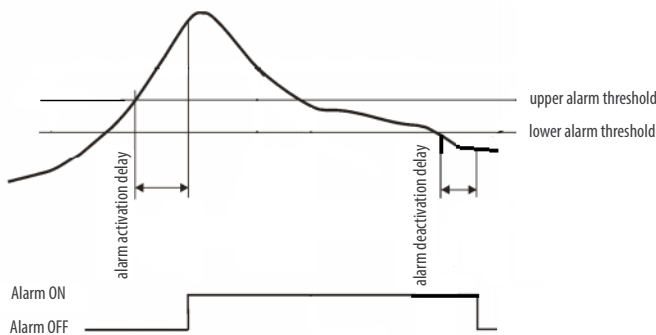
Conversion of the measured quantity by means of mathematical functions: \sqrt{x} , x^2 , $1/x$, $(1/x)^2$, $\sqrt{(1/x)}$

ALARM FUNCTIONS



1 or 4 relay outputs with the indication on the display as an active alarm number.

Each alarm can be configured to operate in one of 7 modes, including REG mode for alarm control through RS-485 Modbus.

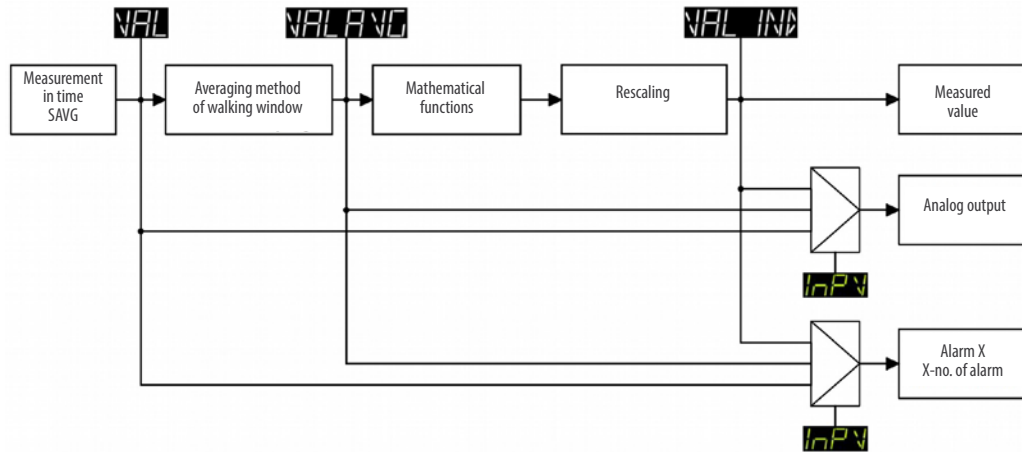


Programmable alarm signal holding. Once the alarm event has ceased, the alarm status marker flashes on the display until it is reset by the user.

Individually programmable parameters for alarm activation and deactivation delay; the function can be used to prevent "false" alarms.

$t \geq$ time delay --> Alarm activated
For alarm operation both conditions (value and time delay) must be met

ADVANCED MEASUREMENT CONVERSION FUNCTION

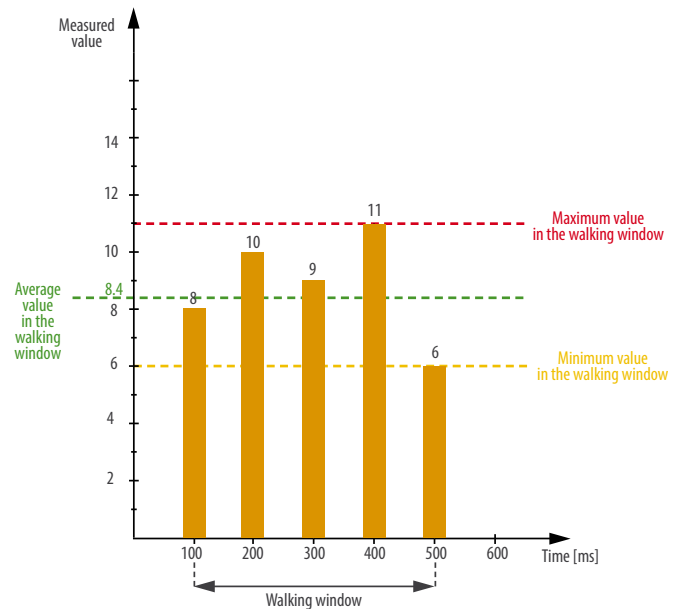
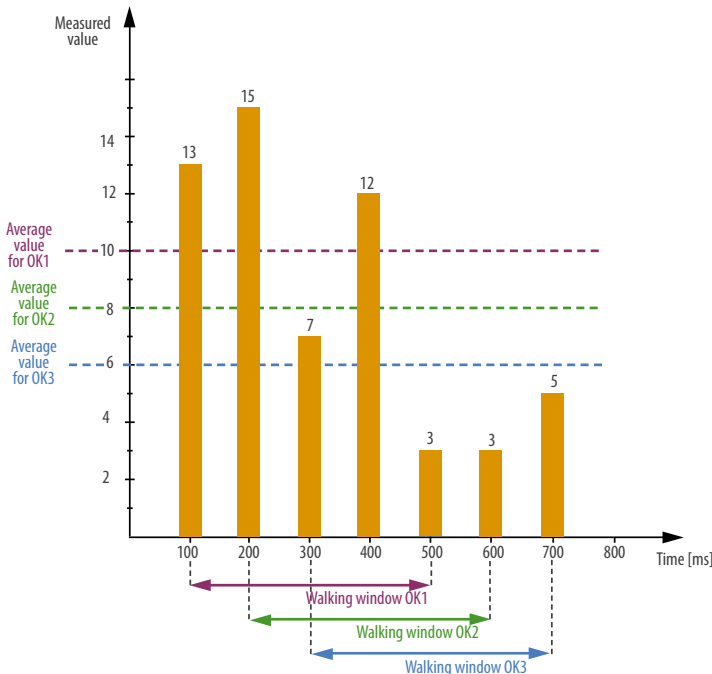


The measured value can be converted in series and the result can be displayed. After each conversion step, the signal can be used for retransmission on the analogue output or as an alarm source.

In practical use, the meter can read the value from an object-oriented transmitter and display the actual value within a limited range, e.g. pressure, level, etc. At the same time, the input signal not scaled can be retransmitted to the PLC.

This function can be useful in applications where the signal is dynamic. The display can show the values averaged over time (easier signal observation). On the analogue output instead, you can retransmit the signal without additional delays - this also applies to the alarm outputs.

WALKING WINDOW ALGORITHM



Programmed averaging time according to the walking window algorithm with a set averaging time. This function is useful for measuring high-dynamic signals.

Ability to measure the average, minimum or maximum value when displaying the walking window.

TECHNICAL DATA

INPUTS

Input type	Maximal measuring range	Class	Additional error
Pt100	-200...850°C (-200...850°C)	0.1	- due to automatic compensation of the reference junction temperature <1°C - due to automatic compensation of the cable resistance for thermoresistors < 0.5°C - due to automatic compensation of the cables for resistance measurement < 0.2 Ω (range 400 Ω) < 2 Ω (range 4000 Ω) - from temperature changes 50 % of the class/ 10 K
Pt1000	-200...850°C (-200...850°C)		
400 Ω	0...440 Ω (0...400 Ω)		
4000 Ω	0...4040 Ω (0...4000 Ω)		
Thermocouple of J type	-205...1000 °C (-200...1000 °C)		
Thermocouple of K type	-205...1200 °C (-200...1200 °C)		
Thermocouple of N type	-205...1372 °C (-200...1372 °C)		
Thermocouple of E type	-205...1372 °C (-200...1372 °C)		
Thermocouple of R type	-50...1768 °C (-50...1768 °C)		
Thermocouple of S type	-50...1768 °C (-50...1768 °C)		
Voltage input 10 V	-13...13 V (-10...10 V)		
Current input 20 mA	-24...24 mA (-20...20 mA)		
Current input 4...20 mA	3.6...22.0 mA (4...20 mA)		
Voltage input 60 mV	-75...75 mV (-60...60 mV)		
Voltage input 150 mV	-155...155 mV (-150...150 mV)		
Voltage input 300 mV	-310...310 mV (-300...300 mV)		
Current time	00.00...23.59	± 20 ppm	

OUTPUTS

Output type	Properties	Remarks
Relay output	<ul style="list-style-type: none"> 1 x NO contacts, load-carrying capacity 5A / 250 V a.c.; 5A / 30V d.c. 3 relays with changeover contact, load-carrying capacity 6A / 250V a.c.; 6A / 30V d.c.; 0,15A / 250V d.c. 	
Analog output	<ul style="list-style-type: none"> current programmable 0/4...20 mA, load resistance ≤ 500 Ω voltage programmable 0...10 V, load resistance ≥ 500 Ω 	Error of analog output: 0.1% of the set range Additional error from temperature changes: 50% of the class/10K
OC output	OC type, passive npn, 30 V d.c./30 mA	voltageless output
Auxiliary supply	24 V d.c./ 30mA	

DIGITAL INTERFACE

Interface type	Transmission protocol	Mode	Baud rate
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	2.4, 4.8, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 115.2 kbit/s

EXTERNAL FEATURES

Readout field	1 row: 6-digits; digits height 12.85 mm 2 row: 5-digits; digits height 7.5 mm	high contrast LCD with backlight and programmable measuring unit
Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 93 mm	mounting hole 92 ^{+0.6} x 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from terminal side: IP 10

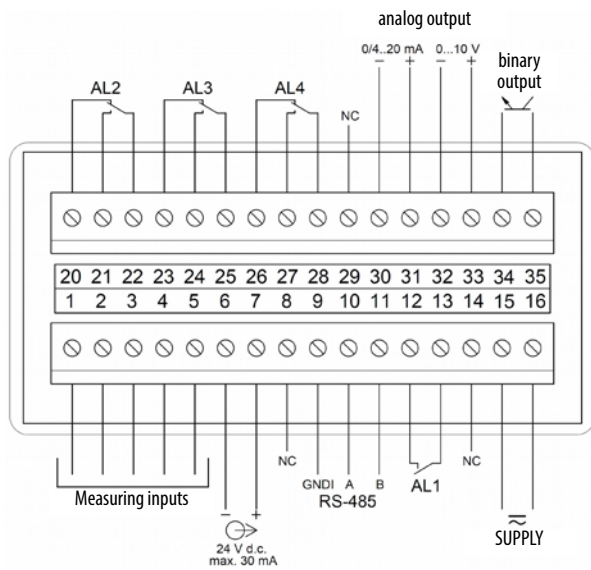
RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (40...400 Hz), 90...300 V d.c. 20...40 V a.c. (45...65 Hz) / 20...60 V d.c.	power consumption < 6 VA
Temperature	ambient: -25...23...55°C	storage: -30...70°C
Relative humidity	25...95%	without condensation
Operating position	any	
External magnetic field	0...400 A/m	

SAFETY AND COMPABILITY REQUIREMENTS

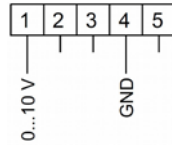
Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	
Installation category	III	
Maximal phase-to-earth voltage	for supply circuits : 300 V	
	for other circuits: 50 V	
Altitude a.s.l.	< 2000 m	

CONNECTION DIAGRAMS



Description of signals on the connection strips

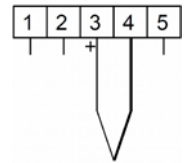
Standard signals 0...10 V
(range -13...13 V)



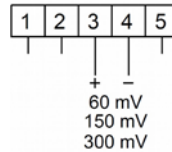
Standard signals 0/4...20 mA
(range -24...24 mA)



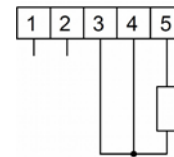
Thermocouples, thermoelectric sensors (thermocouple)



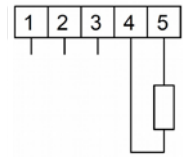
Standard shunts: 60 mV,
150 mV, 300 mV
(measuring range respectively:
-75...75 mV, -155...155 mV,
-310...310 mV)



Resistance sensors or resistor
in a three-wire system



Resistance sensors or resistor
in a two-wire system



Meter connection

ORDERING CODE

N32U	X	X	XXXXXXX	X	X
Supply:					
85...253 V a.c., 90...300 V d.c.	1				
20...40 V a.c./ 20...60 V d.c.	2				
Additional outputs:					
1 relay output, RS-485		1			
4 relay outputs, RS-485		2			
4 relay outputs, RS-485, 1 analog output		3			
Version:					
standard			0000000		
custom-made*			XXXXXXX		
Language:					
Polish/English					M
Acceptance tests:					
without additional quality requirements					0
with an extra quality inspection certificate					1
with an extra calibration certificate					2
acc. to customer's request					X

ORDERING EXAMPLE:

N32U 13000000M0 means N32U meter with supply 85... 253 V a.c., 90...300 V d.c., with 4 relay outputs, RS-485 interface and 1 analog output, in standard version, polish-english language version, without additional quality requirements.

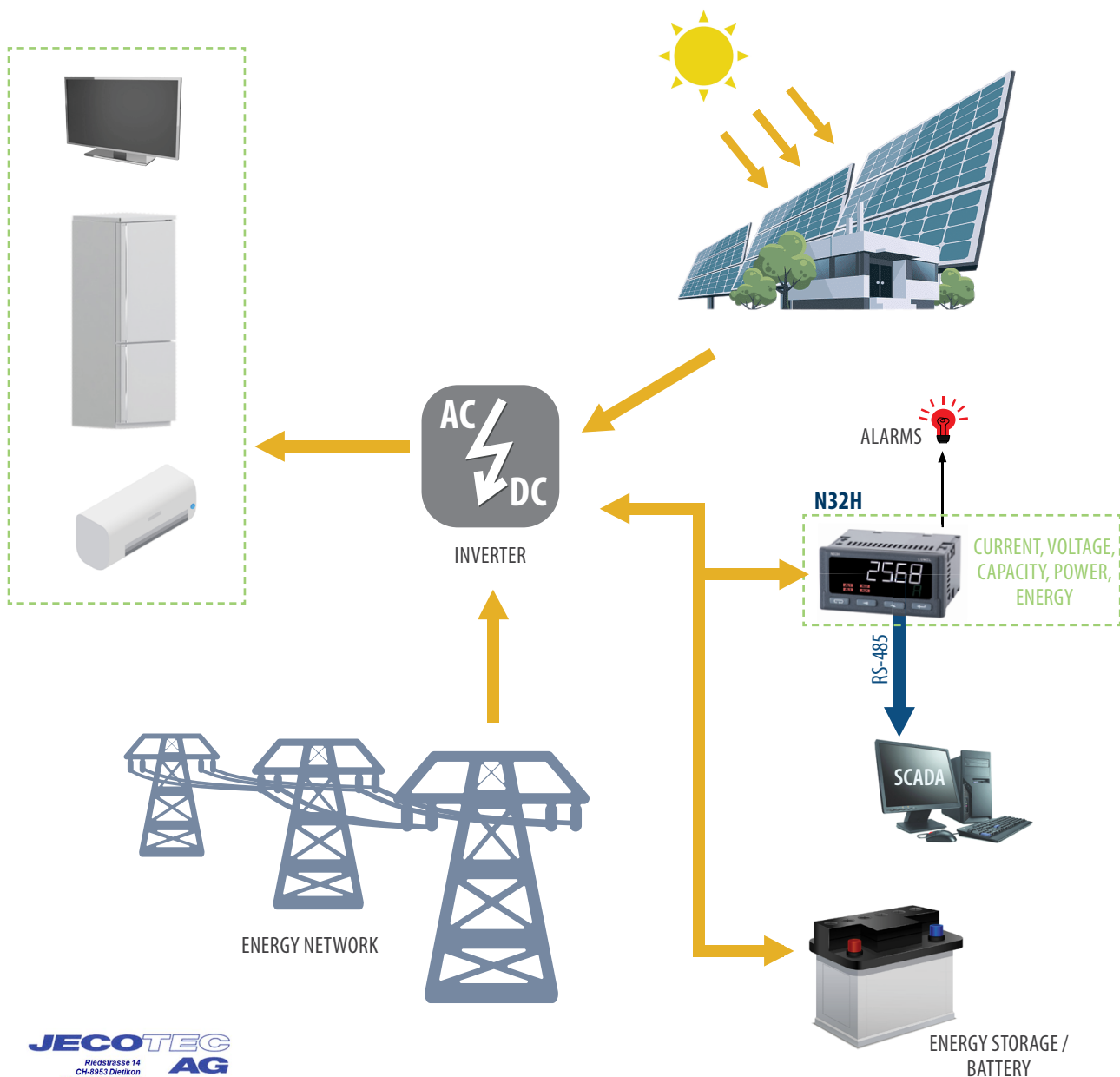
* only after agreeing with the manufacturer



N32H DIGITAL METER OF D.C. CIRCUIT PARAMETERS

- Voltage measurement $\pm 600V$ (maximum range display $\pm 1200 V$), current measurement via shunt, power, energy and capacity measurement of d.c. circuits.
- Two-line LCD display with high contrast and built-in backlighting.
- Possibility of displaying the measured value and time simultaneously or an second measured value or unit (automatically displayed unit of measured quantity).
- Wide range of voltage measurement at the shunt input up to 1500 mV.
- High sampling frequency of measured signals.
- Programming parameters via buttons or RS-485 interface and free e-con software.
- 4 alarm outputs with signaling on led diodes, working in 7 different modes (option).
- Pulse output to control energy consumption.
- Conversion of any measured value into an analog signal 0/4...20 mA or 0...10V (option).
- Memory of minimal and maximal values for all measured quantities.
- Automatic voltage measurement compensation function.

EXAMPLE OF APPLICATION



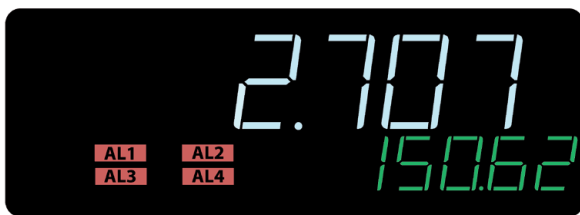
N32H - DIGITAL METER OF D.C. CIRCUIT PARAMETERS

FEATURES	INPUTS	OUTPUTS	GALVANIC ISOLATION

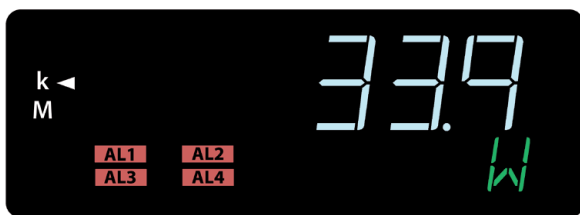
MEASURED QUANTITIES AND CALCULATED BY THE METER

- d.c. voltage U
- d.c. current I (indirectly through the shunt)
- d.c. power P
- averaged voltage in a given range U_{AV}
- averaged current in a given range I_{AV}
- power averaged in a given range P_{AV}
- capacity counter (accumulated current) CAP
- energy counter E
- maximum and minimum values in the given averaging period
- current time

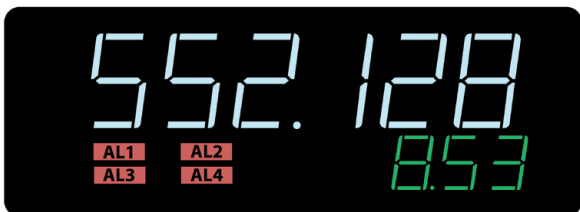
DATA VISUALISATION



or



or

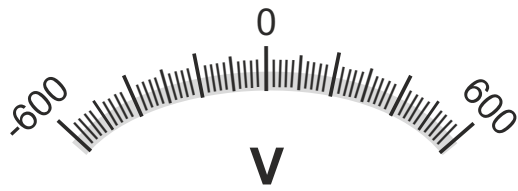


Two-line display.
Simultaneous preview of two measured values e.g. current and power.

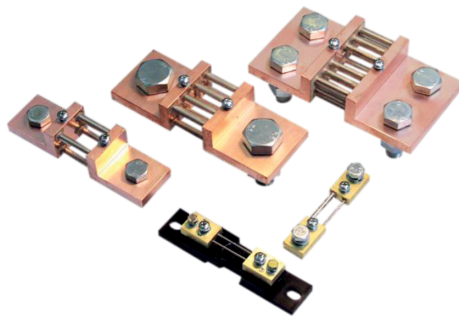
Automatically displayed unit of measured value and symbol of multiplier kilo, mega.

Preview of current time on the bottom line of the display.
Real-time clock with automatic winter/summer time change function.

BIDIRECTIONAL MEASURING INPUT



- 50 mV
- 60 mV
- 75 mV
- 100 mV
- 150 mV

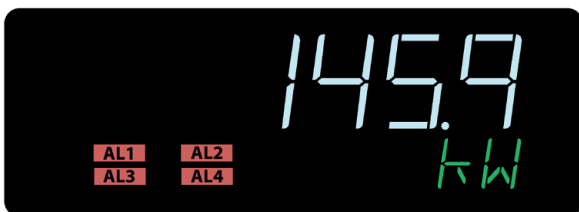


Bidirectional voltage measurement in a wide range of $\pm 600V$ (maximum indication range $\pm 1200V$) and bi-directional current measurement through a shunt. This function is useful, among others when monitoring the parameters of an energy storage system.

Universal input for measuring with any type of shunt with a wide voltage measurement range up to 1500 mV.

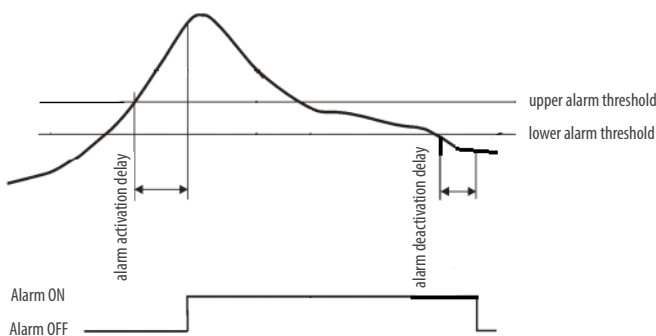
Automatic compensation of the voltage drop on the measuring shunt to support the correct measurements of voltage, power and energy in relation to the load.

ALARM FUNCTIONS



1 or 4 relay outputs with signaling on the display in the form of an active alarm number.

Each of the alarms can be configured to work in one of 7 modes, incl. REG mode for alarm control via RS-485 Modbus.

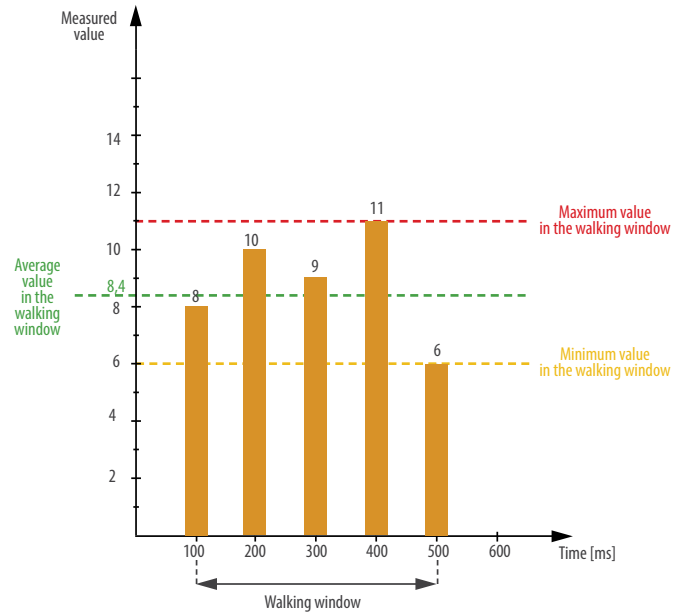
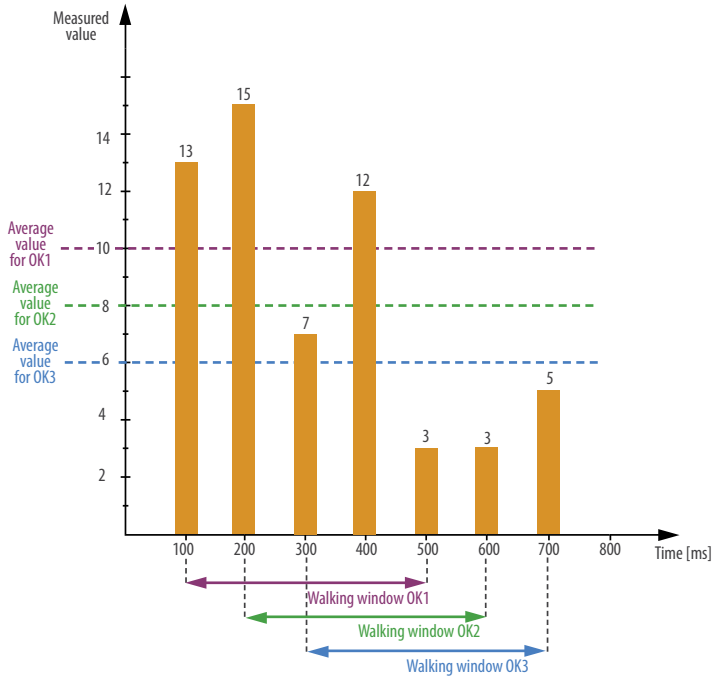


$t \geq$ time delay \rightarrow Alarm activated
For alarm operation both conditions (value and time delay) must be met

Programmable maintenance of alarm signaling. After the alarm event has ceased, the alarm status marker blinks on the display until it is deleted by the user.

Individually programmable parameters of switching on and switching off the alarm; this feature can be used to prevent „false“ alarms from occurring.

WALKING WINDOW ALGORITHM



Programmed averaging time according to the walking window algorithm with a given averaging time. This function is useful for measuring signals with high dynamics.

Possibility to measure the average, minimum or maximum value during the walking window.

TECHNICAL DATA

INPUTS AND MEASURING RANGES

Measured quantity	Nominal range	Maximum range of indications	Class
Voltages	50 V	-75...75 V	0.1
	100 V	-160...160 V	
	150 V	-300...300 V	
	300 V	-600...600 V	
	600 V	-1200...1200 V	
Currents (shunt voltage)		60000...60000 A (-1500...1500 mV)	
Capacity (accumulated current)		-99999...999999 MAh	±0.5 %
Power		all ranges	0.2 + shunt class
Energy		-99999...999999 MWh	±0.5 % + shunt class

OUTPUTS

Output type	Properties	Remarks
Relay output	<ul style="list-style-type: none"> 1 NO contact, load capacity 5A / 250V a.c.; 5A / 30V d.c. 3 relays with a changeover contact, load capacity 6A / 250V a.c.; 6A / 30V d.c.; 0,15A / 250V d.c. 	
Analog output	<ul style="list-style-type: none"> programmable current 0/4...20 mA, load resistant ≤ 500 Ω programmable voltage 0...10 V, load resistant ≥ 500 Ω 	Analog output error: 0.1% of the set range Additional error from temperature changes: 50% of class/10K
OC output	OC type, passive npn, 30 V d.c./30 mA	voltage free output

DIGITAL INTERFACE

Interface type	Transmission protocol	Mode	Baud rate
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	2.4, 4.8, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 115.2 kbit/s

EXTERNAL FEATURES

Readout field	1 row 6-digit; digits height 12.85 mm 2 rows: 5-digit; digits height 7.5 mm	high contrast LCD with backlight and programmable measuring unit
Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 93 mm	mounting hole: 92 ^{+0.6} x 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from terminal side: IP 10

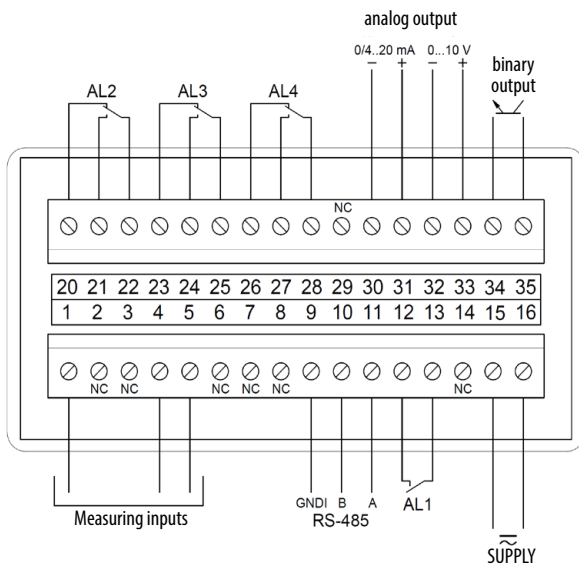
RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (40...400 Hz), 90...300 V d.c. 20...40 V a.c. (45...65 Hz) / 20...60 V d.c.	power consumption < 6 VA
Temperature	ambient: -25...23...55°C	storage: -30...70°C
Relative humidity	25...95%	without condensation
Operating position	any	
External magnetic field	0...400 A/m	

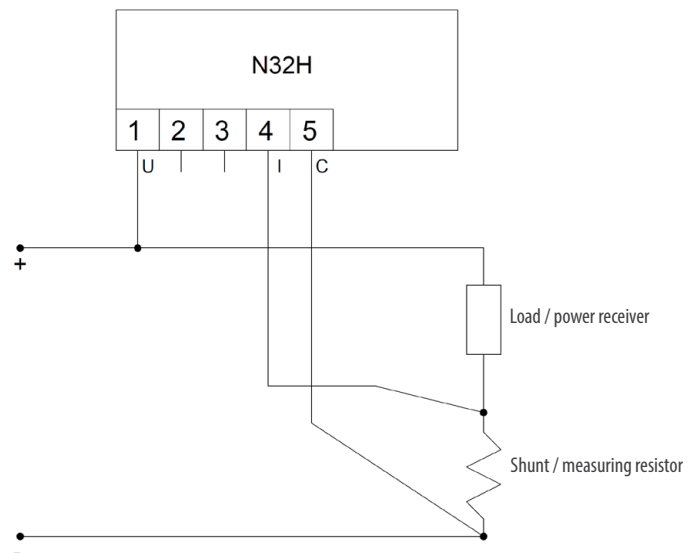
SAFETY AND COMPABILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	
Installation category	III	
Maximal phase-to-earth voltage	for supply circuits: 300 V	
	for other circuits: 50 V	
Altitude a.s.l.	< 2000 m	

CONNECTION DIAGRAMS



Description of signals on the connector strips



Meter connection

ORDERING CODE

N32H	X	X	XXXXXXX	X	X
Supply:					
85...253 V a.c., 90...300 V d.c.	1				
20..40 V a.c./ 20..60 V d.c.	2				
Dodatkové vyjścia:					
1 relay output, RS-485	1				
4 relay outputs, RS-485	2				
4 relay outputs, RS-485, 1 analog output	3				
Version:					
standard			000000		
custom-made*			XXXXXX		
Language:					
Polish/English					M
Acceptance tests:					
without additional quality requirements					0
with an extra quality inspection certificate					1
with an extra calibration certificate					2
acc. to customer's request					X

ORDERING EXAMPLE:

N32H130000000M0 means N32H meter with supply 85...253 V a.c., 90...300 V d.c. with 4 relay outputs, RS-485 interface and 1 analog output, in standard version, polish-english language version, without additional quality requirements.

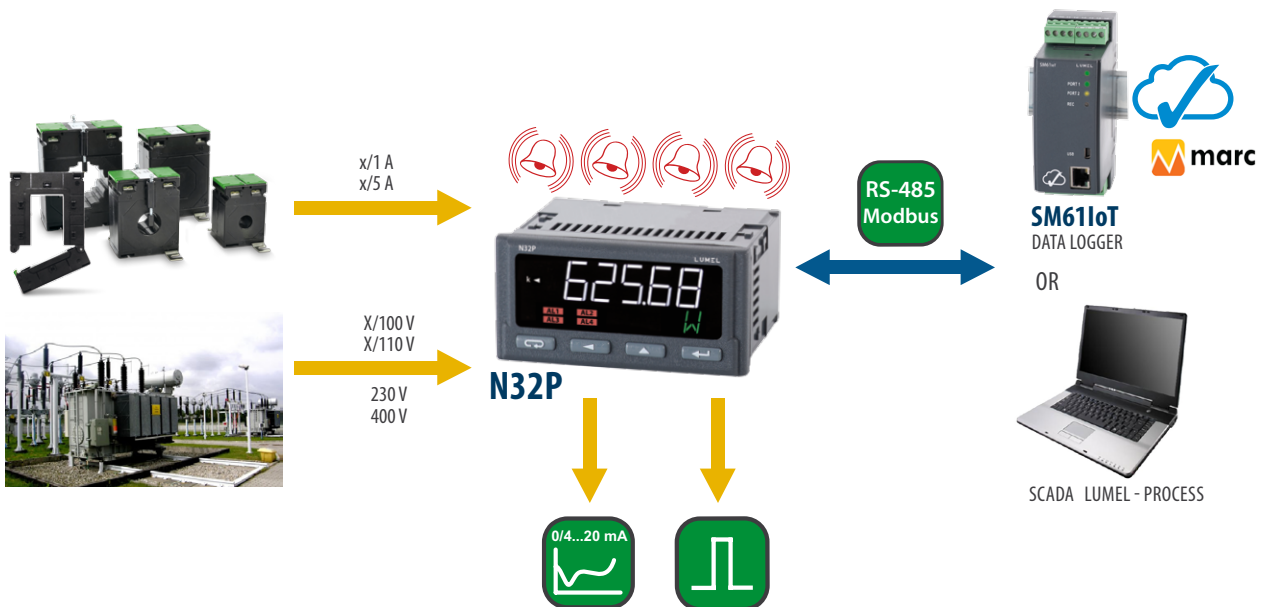
* only after agreeing with the manufacturer



N32P 1-PHASE POWER NETWORK METER

- Measurement of single-phase network parameters: voltage, current, active, reactive and apparent power, $\cos \phi$, $\tan \phi$, frequency, active, reactive and apparent energy, active power 15 minutes, voltage 10 minutes.
- Current and voltage harmonics analysis up to 51st (measurements available via RS-485).
- Two-line LCD display with high contrast and built-in backlighting.
- Possibility of displaying the measured value and time simultaneously or a second measured value or unit (automatically displayed unit of measured quantity).
- Programmable measuring range (current 1 A / 5 A and voltage 100 V / 230 V / 400 V).
- High sampling frequency of measured signals 8 kHz.
- Programming parameters via buttons or RS-485 interface and free eCon software.
- 4 alarm outputs with signaling on led diodes, working in 7 different modes (option).
- Possibility to program each of the alarms to react to a different measurements.
- The function of the switch-on delay and switch-off delay of the alarm with the alarm event memory.
- Pulse output to control energy consumption.
- Conversion of any measured value into an analog signal 0/4...20 mA or 0...10V (option).
- Memory of minimal and maximal values for all measured quantities.
- Choice of period and averaging method with the possibility of synchronizing the average value with the built-in real-time clock.

EXAMPLE OF APPLICATION

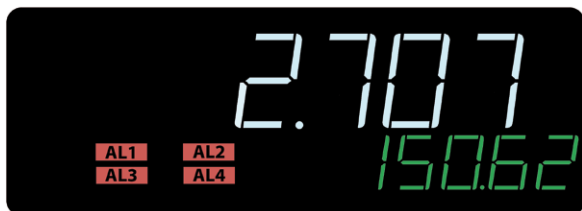


FEATURES	INPUTS	OUTPUTS	GALVANIC ISOLATION

MEASURED QUANTITIES AND CALCULATED BY THE METER

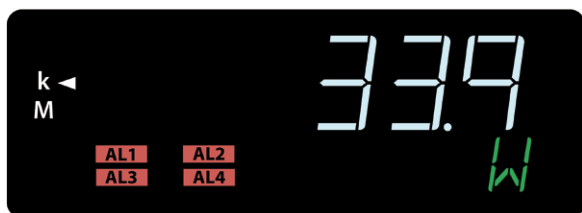
- effective voltage U
- effective current I
- frequency f
- power: active P , reactive Q , apparent S
- power factor $\cos \varphi$
- power tangent $\tan \varphi$
- active energy input/output E_p
- reactive energy input/output E_q
- total apparent energy E_s
- energy meter E
- maximum and minimum values in the given averaging period
- current time

DATA VISUALISATION



Two-line display.
Simultaneous preview of two measured values e.g. current and power.

or



Automatically displayed unit of measured value and symbol of multiplier kilo, mega.

or



Preview of current time on the bottom line of the display.
Real-time clock with automatic winter/summer time change function.

MULTI-PARAMETER MEASUREMENT



Up to 47 parameters can be viewed in one meter. The display can indicate two values simultaneously. All values are available via the RS-485 (Modbus) digital interface.

UNIVERSAL MEASURING INPUT

x/1 A
x/5 A



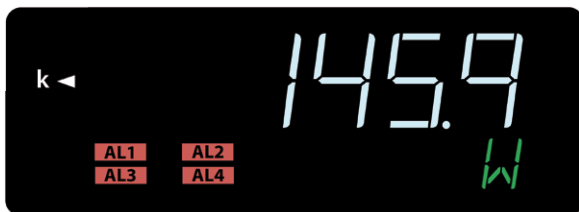
Universal input for current and voltage measurement directly or indirectly from a current or voltage transformer. The primary and secondary sides of the transformer are separately configurable, which will correspond to the actual values.

x/100 V
x/110 V



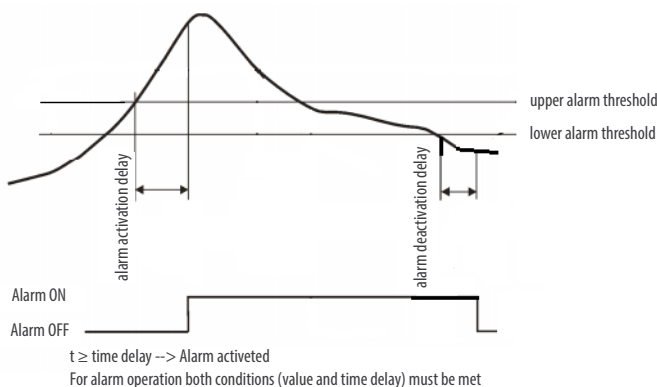
Only one parameter can be measured e. g. only the current, where the operation of the meter is synchronized with the current signal.

ALARM FUNCTIONS



1 or 4 relay outputs with signaling on the display in the form of an active alarm number.

Each of the alarms can be configured to work in one of 7 modes, incl. REG mode for alarm control via RS-485 Modbus.



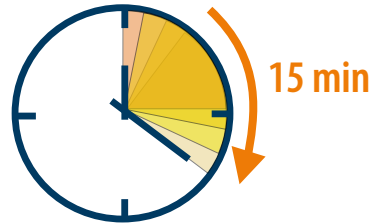
Programmable maintenance of alarm signaling. After the alarm event has ceased, the alarm status marker blinks on the display until it is deleted by the user.

Individually programmable parameters of switching on and switching off the alarm; this feature can be used to prevent „false“ alarms from occurring.

MEASUREMENT AVERAGING ALGORITHM

Average values of voltage, current and power calculated by the walking window method, i.e. continuously updated.

Programmable averaging period of measured parameters in minutes, e.g. active power.



MOVING WINDOW

The average value can be synchronized with the internal time clock, e.g. for the 15-minute setting, the value is updated every quarter of an hour.

Additional measurement of minimum and maximum values during the moving window.

TECHNICAL DATA

INPUTS AND MEASURING RANGES

Measured quantity	Measuring range (Ku=1; Ki=1)	Class
Voltage input 100 V 230 V 400 V	0.05...1.2 Un	0.1
Current input 1 A 5 A	0.05...1.2 In	
Frequency	35...65...100 Hz	
Active power	The actual measuring range for active and reactive power: -1.2Ur * 1.2Ir ... 1.2Ur * 1.2Ir. For apparent power: 0... 1.2Ur * 1.2Ir	0.2
Reactive power		
Apparent power		
cos φ	-1...0...1	0.5
tg φ	-999.99...-1.2...0...1.2...999.99	
THD of voltages and currents	0...100%	
Active energy	0...9 999 999.9 kWh	
Reactive power	0...9 999 999.9 kVarh	
Apparent power	0...9 999 999.9 kVA	
Current time	0.00...23.59	
Ku - voltage ratio; Ki - current ratio; Un - rated voltage; In - rated current; Ur - set voltage measurement range; Ir - set current measurement range;		± 20 ppm

OUTPUTS

Output type	Properties	Remarks
Relay output	<ul style="list-style-type: none"> 1 NO contact, load capacity 5A / 250 V a.c.; 5A / 30V d.c. 3 relays with a changeover contact, load capacity 6A / 250V a.c.; 6A / 30V d.c.; 0,15A / 250V d.c. 	
Analog output	<ul style="list-style-type: none"> programmable current 0/4...20 mA, load resistence ≤ 500 Ω programmable voltage 0...10 V, load resistence ≥ 500 Ω 	Analog output error: 0.1% of the set range Additional error from temperature changes: 50% of class/10K
OC output	OC type, passive npn, 30 V d.c./30 mA	voltage free output

DIGITAL INTERFACE

Interface type	Transmission protocol	Mode	Baud rate
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	2.4, 4.8, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 115.2 kbit/s

EXTERNAL FEATURES

Readout field	1 row 6-digit; digits height 12.85 mm 2 rows: 5-digit; digits height 7.5 mm	high contrast LCD with backlight and programmable measuring unit
Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 93 mm	mounting hole: 92 ^{+0.6} x 45 ^{+0.6} mm
Protection grade (acc. to EN 60529)	from frontal side: IP65	from terminal side: IP 10

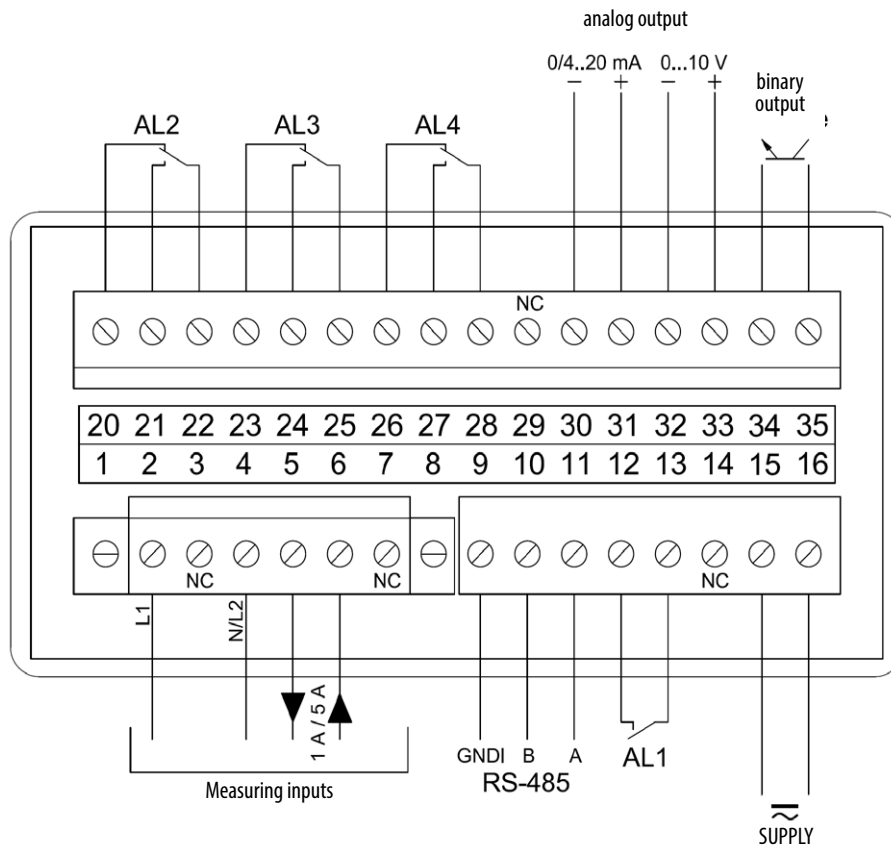
RATED OPERATING CONDITIONS

Supply voltage	85...253 V a.c. (40...400 Hz), 90...300 V d.c. 20...40 V a.c. (45...65 Hz) / 20...60 V d.c.	power consumption < 6 VA
Temperature	ambient: -25...23...55°C	storage: -30...70°C
Relative humidity	25...95%	without condensation
Operating position	any	

SAFETY AND COMPABILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	
Installation category	III	
Maximal phase-to-earth voltage	for measuring, power and alarm circuits: 300 V	
	for other circuits: 50 V	
Altitude a.s.l.	< 2000 m	

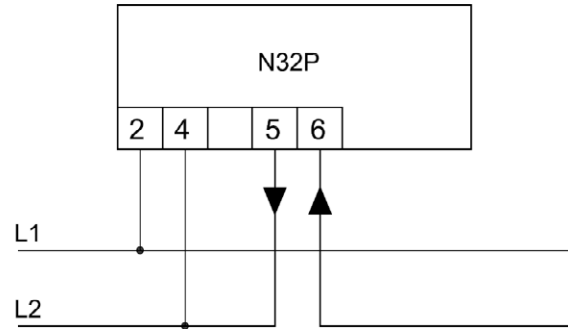
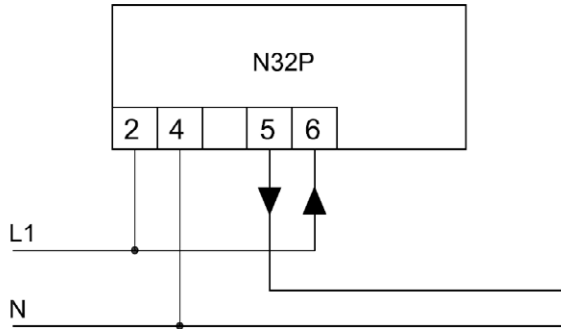
CONNECTION DIAGRAMS



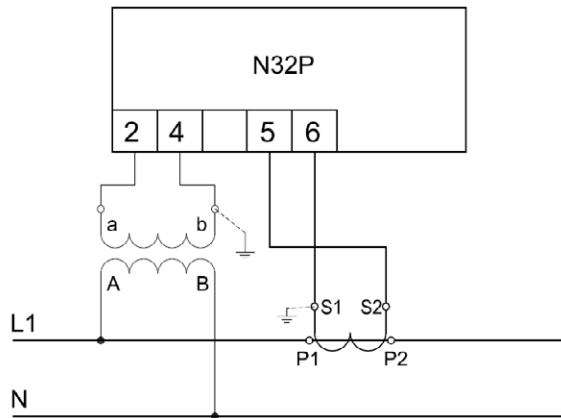
Description of signals on the connection strips

CONNECTION DIAGRAMS

Direct measurement



Indirect measurement



Meter connection

ORDERING CODE

N32P	X	X	XXXXXXX	X	X
Supply:					
85...253 V a.c., 90...300 V d.c.	1				
20..40 V a.c./ 20..60 V d.c.	2				
Dodatkowe wyjścia:					
1 relay output, RS-485	1				
4 relay outputs, RS-485	2				
4 relay outputs, RS-485, 1 analog output	3				
Version:					
standard			0000000		
custom-made*			XXXXXXX		
Language:					
Polish/English				M	
Acceptance tests:					
without additional quality requirements					0
with an extra quality inspection certificate					1
with an extra calibration certificate					2
acc. to customer's request					X

ORDERING EXAMPLE:

N32P13000000M0 means N32P meter with supply 85...253 V a.c., 90...300 V d.c. with 4 relay outputs, RS-485 interface and 1 analog output, in standard version, polish-english language version, without additional quality requirements.

* only after agreeing with the manufacturer

N27D MESSGERÄT DER NETZPARAMETER AUF HUTSCHIENE

NUTZEIGENSCHAFTEN:

63 A

EINGÄNGE:



GALVANISCHE TRENNUNG!



- Messung von:
 - Effektivwert von Wechselstrom und -Spannung,
 - Wirkleistung,
 - Frequenz.
- Direkte Messung (bis zu 63 A).
- Umschaltbare Messgröße.
- Hinterleuchtete Anzeigegröße.
- Modulares Gehäuse auf Hutschiene S nach DIN-EN 62208 (das Messgerät hat die Breite von 3 Modulen).
- 4-stelliges Display, gelb.

EINGANG

Eingang	Messbereich	Parameter	Grundfehler
Spannung U	0... <u>0,01</u> ... <u>1,2</u> Un	Eingangswiderstand: > 3 MΩ	± (0,5% des Bereiches) im Frequenzbereich 40...500 Hz
Strom I	0... <u>0,01</u> ... <u>1,2</u> In		± (0,5% des Bereiches) im Frequenzbereich 45...65 Hz
Spannungsfrequenz	0... <u>2,00</u> ... <u>500,0</u> Hz		± (0,02% des Bereiches)
Stromfrequenz	0... <u>45,00</u> ... <u>500,00</u> Hz		
Wirkleistung	-45,4 ... <u>31,5</u> ... <u>31,50</u> ... 45,36 kW bei Frequenz 45... 65 Hz		± (1% des Bereiches) im Frequenzbereich 45...65 Hz

EXTERNE EIGENSCHAFTEN

Anzeigefeld	4-stelliges LED-Display - Ziffernhöhe: 8,5 mm - gelb, Anzeigebereich: -1999...9999	
Gewicht	< 0,25 kg	
Abmessungen	53 x 110 x 60 mm	Displayrahmen: 45 x 53 mm
Schutzgrad	IP00	nach DIN-EN 60529
Montage	auf Hutschiene 35 mm	nach DIN-EN 60715

NOMINALE BETRIEBSBEDINGUNGEN

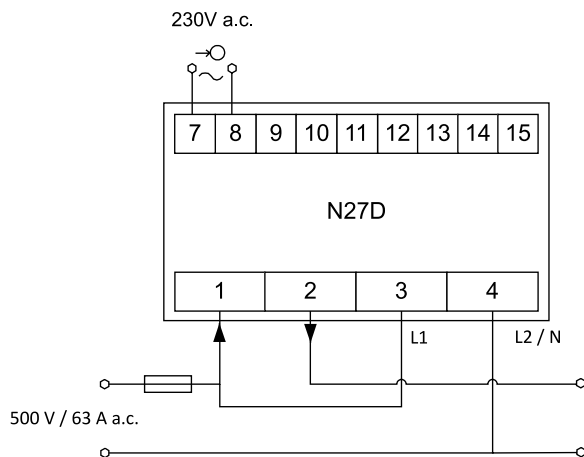
Versorgungsspannung	230 V ± 10% a.c. (45...65 Hz)	Leistungsaufnahme < 6 VA
Spannung Un	500 V a.c. 0... <u>2</u> ... <u>40,0</u> ... <u>500,0</u> Hz	
Strom In	63 A a.c. 0... <u>45,0</u> ... <u>500,0</u> Hz	
Temperatur	Umgebungstemperaturbereich: -10... <u>23</u> ...55°C	Lagertemperatur: -25...85°C
Luftfeuchte	< 95%	ohne Kondensation
Arbeitslage	beliebig	

N27D MESSGERÄT DER NETZPARAMETER AUF HUTSCHIENE

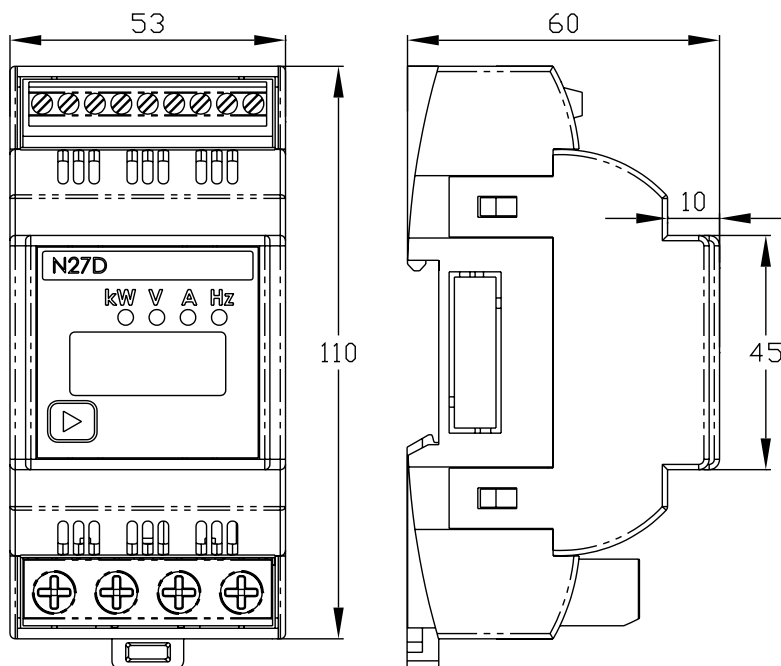
SICHERHEITS- UND EMV ANFORDERUNGEN

Elektromagnetische Verträglichkeit	Störfestigkeit	nach DIN-EN 61000-6-2
	Störaussendung	nach DIN-EN 61000-6-4
Überspannungskategorie	III bis zu 300 V (II für 300 ... 600 V)	nach DIN- EN 61010-1
Schmutzgrad	2	
Maximale Arbeitsspannung gegen Erde	- für Versorgungskreis: 300 V, - für Messeingang 600 V – Kategorie II (300 V – Kategorie III)	

ANSCHLUSSPLAN



ABMESSUNGEN



BESTELLANGABEN

N27D -	XX	X	X
Ausführung:			
standard	00		
kundenspezifisch*	XX		
Sprache der Betriebsanleitung:			
polnisch		P	
englisch		E	
andere*		X	
Abnahmeproben:			
ohne Attest der Qualitätskontrolle			0
mit Attest der Qualitätskontrolle			1
nach Vereinbarung mit dem Kunden*			X

* - nur nach Vereinbarung mit dem Hersteller

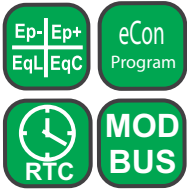
BESTELLUNGSBEISPIEL:

Der Kode: **N27D - 00 E 0** bedeutet:

- N27D** - digitales Messgerät N27D auf Hutschiene
- 00** - Standardausführung,
- E** - Betriebsanleitung auf Englisch,
- 0** - ohne Attest der Qualitätskontrolle.

N27P METER OF NETWORK PARAMETERS

FEATURES:

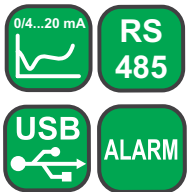


- Measurement of 1-phase network parameters:
U, I, f, P, Q, S, PF, tg φ, φ, Ep, Eq.
- Universal measuring input:
- 1/5 A, 100/ 400 V or
- 32/63 A, 100/400 V.
- Programmable analog output 0/4...20 mA.
- RS485 Modbus RTU Slave interface.
- Programmable current and voltage transformer ratios.
- Meter configuration using button or eCon software (through USB).
- Modern graphical display in OLED technology.

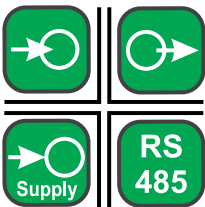
INPUT:



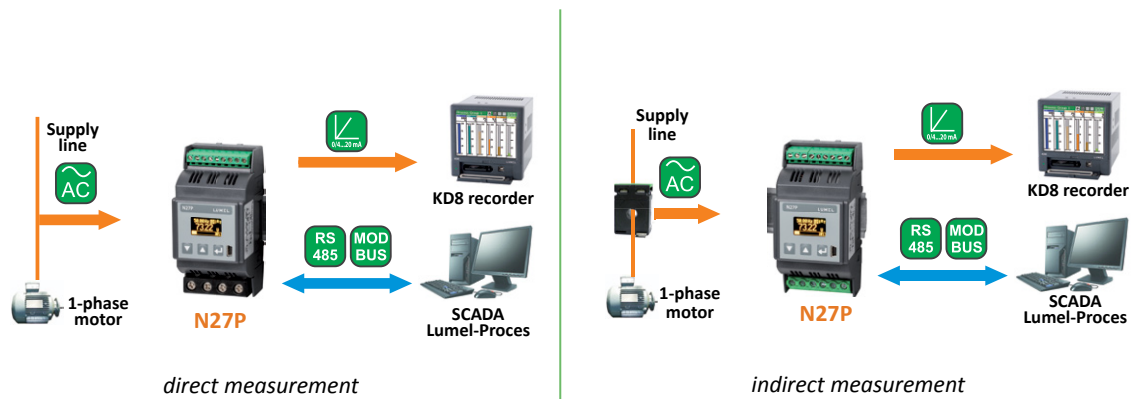
OUTPUTS:



GALVANIC ISOLATION:



EXAMPLE OF APPLICATION



Conversion and recording of current engine load and energy consumption.
Monitoring of single-phase network parameters.

MEASURED VALUES AND RANGES

Measured value	Range	Basic error
Current In 1 A 5 A 32 A* 63 A*	0.005 ... 1.200 A~ 0.025 ... 6.000 A~ 0.160 ... 38.40 A~ 0.315 ... 75.60 A~	±0.2%
Voltage L-N 100 V 400 V	5 ... 120 V 20 ... 480 V	±0.2%
Frequency (f)	45.0...66.0...100 Hz	±0.2%
Active power (P) version 1/5 A version 32/63 A	-2.88 kW ... 1.00 W ... 2.88 kW -32.29 kW ... 1.00 W ... 32.29 kW	±0.5%
Reactive power (Q) version 1/5 A version 32/63 A	-2.88 kvar ... 1.00 var ... 2.88 kvar -32.29 kvar ... 1.00 var ... 32.29 kvar	±0.5%
Apparent power (S) version 1/5 A version 32/63 A	1.40 VA ... 2.88 kVA 1.40 VA ... 32.29 kVA	±0.5%
PF	-1...0...1	±0.5%
Tangens φ	-1.2...0...1.2	±1%
φ	0...359	±1%
Active energy (Ep)	0 ... 999 999.9 kWh or 9 999.999 MWh	±0.5%
Reactive energy (Eq)	0 ... 999 999.9 kvarh or 9 999.999 Mvarh	±0.5%

* - concerns the version for direct measurement

OUTPUTS

Output type	Properties
Relay	1-2 x (depending on the meter version) programmable relay output, NOC, load capacity 250 V~/0.5 A~, number of cycles 1 x 10 ⁵
Analog	lack or 1 x (depending on the meter version) programmable analog output 0/4..20 mA, R _{load} = 0...250 Ω

N27P METER OF NETWORK PARAMETERS

DIGITAL INTERFACE

Interface type	Transmission protocol	Mode	Baud rate
RS-485	MODBUS RTU	8N2, 8E1, 8O1, 8N1	4.8; 9.6; 19.2; 38.4; 57.6; 115.2 kbit/s
USB 1.1/ 2.0 (for meter configuration)	MODBUS RTU	8N2	9.6 kbit/s

EXTERNAL FEATURES

Readout field	OLED display	
Overall dimensions	53 × 110 × 60 mm	mounting on a 35mm DIN rail
Weight	0.2 kg	
Protection grade	for housing: IP40	for terminals: IP00

RATED OPERATING CONDITIONS

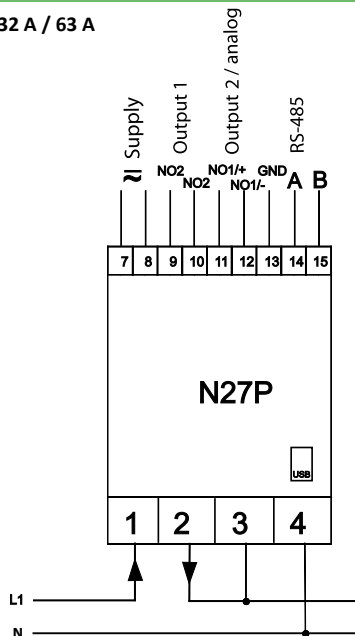
Power supply	85...253 V a.c. 40...400 Hz; / 90...300 V d.c.	Power consumption: in supply circuit ≤ 5 VA in voltage circuit ≤ 0.2 VA in current circuit: for undirect meas. ≤ 0.05 VA, for direct meas. ≤ 2.5 VA
Temperature	ambient: -10...23...55°C	storage: -30...70°C
Relative humidity	25 ... 95%	inadmissible condensation
Working position	vertical	
Standard conversion time	1.2 s	
Maximal conversion time	2.2 s	
Preheating time	15 min	
External magnetic field	0...40... 400 A/m	
Short duration overload (1 s)	voltage input: 2 U _N (max. 1000 V)	current input: 10 I _N
Sustained overload	voltage: 1,2 U _N	current: 1,2 I _N

SAFETY AND COMPATIBILITY REQUIREMENTS

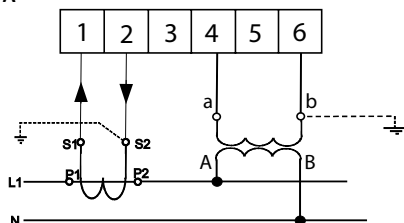
Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution level	2	
Installation category	III (for voltages above 300 V – category II)	
Maximal phase-to-earth working voltage	- for supply circuits 300 V - for measuring input 600 V – cat. II (300 V – cat. III) - for other circuits 50 V	
Altitude above sea level	< 2000 m	

CONNECTION DIAGRAM

range 32 A / 63 A



range 1 A / 5 A



ORDERING

	N27P -	X	X	XX	X	X
Current measuring range:						
1 A / 5 A a.c.		1				
32 A / 63 A a.c.		2				
Outputs:						
2 relays			1			
1 relay and 1 analog 0/4...20mA			2			
Version:						
standard				00		
custom-made*				XX		
Language:						
Polish					P	
English						E
other*						X
Acceptance tests:						
without extra quality requirements						0
with an extra quality inspection certificate						1
acc. to customer's requirements*						X

* after agreeing with the manufacturer

Example of order:

The code: **N27P - 1 1 00 E 0** means:

- N27P** - meter of network parameters N27P type
- 1** - version for indirect measurement for the range 1A/5A
- 1** - with 2 relay outputs
- 00** - standard version
- E** - user's manual in English
- 0** - without extra quality requirements.

NA3 DIGITAL METER WITH BARGRAPH

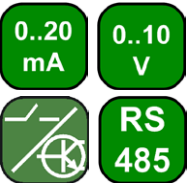
FEATURES:



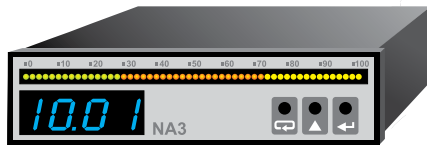
INPUT:



OUTPUTS:

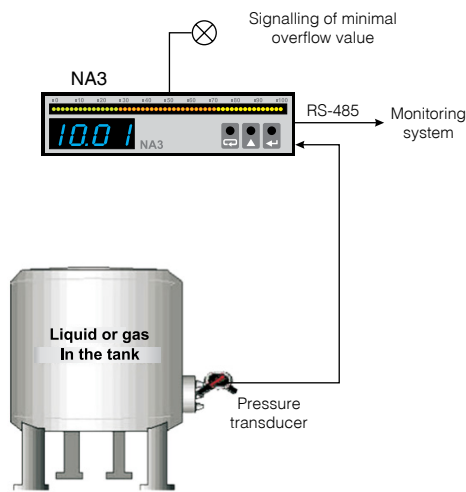


GALVANIC ISOLATION:



- Universal input for the measurement of d.c. current, d.c. voltage and temperature,
- 3 or 7-colour bargraph,
- Programming of bargraph colour depending on the measured quantity value,
- Signalling of set alarm value overflow,
- Storage of measured signal in programmed time segments (750 samples),
- Current or voltage analog output,
- Communication in SCADA systems (RS485/Modbus interface RTU and ASCII).

EXAMPLE OF APPLICATION



INPUTS

Kind of input	Measuring range
Pt100	-200...850°C
Pt500	-200...850°C
Pt1000	-200...850°C
J (Fe-CuNi)	-30...1100°C
K (NiCr-NiAl)	-50...1370°C
N (NiCrSi-NiSi)	-100...1300°C
E (NiCr-CuNi)	-20...850°C
R (PtRh13-Pt)	0...1760°C
S (PtRh10-Pt)	0...1760°C
T (Cu-CuNi)	-50...400°C
Resistance	0...400 Ω, 0...4000 Ω
Voltage	0...60 mV, Rinp. > 9 MΩ
	0...3 V, Rinp. > 4 MΩ
	0...10 V, Rinp. > 4 MΩ
	0...200 V, Rinp. > 4 MΩ
Current	0...5 mA, Rinp. = 4 Ω
	0...20 mA, Rinp. = 4 Ω
	0...2 A, Rinp. = 10 mΩ ± 10%
	0...5 A, Rinp. = 10 mΩ ± 10%

OUTPUTS

Kind of output	Features
Analog output	• galvanic isolation with resolution 0.025% of range; current programmable 0/4...20 mA, load resistance ≤ 500 Ω or voltage programmable 0...10 V, load resistance ≥ 500 Ω, output response time: 100 ms.
Relay output	• 1 or 2 relays; NOC voltageless contacts, maximal load-carrying 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
Open collector (OC) type	• voltageless of OC type with npn transistor, maximal load: 25 mA, range of appended voltages: 5...24 V d.c.
Digital	• interface type: RS-485; transmission protocol: MODBUS ASCII (8N1, 7E1, 7O1), RTU (8N2, 8E1, 8O1, 8N1); baud rate: 2400, 4800, 9600 bit/s.

EXTERNAL FEATURES

	NA3-F	
Readout field		4 LED displays with 7 segments, digits of 7 mm high, indication range -1999...9999 multicoloured bargraph of 82 mm long, 45 segments in a 3-colour version or with 25 segments in 7-colour version
Weight	< 0.3 kg	
Overall dimensions	96 × 24 × 125 mm	panel cut-out: 92 ^{+0.5} × 22.2 ^{+0.5} mm
Protection grade (acc. to EN 60529)	IP40 from frontal side	IP20 from terminal side

NA3 DIGITAL METER WITH BARGRAPH

RATED OPERATING CONDITIONS

Supply voltage	95...253 V a.c./d.c., 20...40 V a.c./d.c.	Power consumption < 8 VA
Temperature	ambient: -10...23...55°C	Storage: -25...85°C
Relative humidity	< 95%	Condensation inadmissible

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Safety requirements		acc. to EN 61010-1

TABLE 1. EXECUTION CODE:

	NA3 -	X	X	X	X	X	X	X	X	XX	X								
Meter version: with a bargraph and digital display		F																	
Bargraph colour: 3-colour bargraph (R, G, R+G) 7-colour bargraph (R, G, B, R+G, R+B, G+B, R+G+B)										T	M								
Display colour: red green											R	G							
Input signal: universal input												U							
Analog output signal: lack current programmable 0/4...20 mA voltage programmable 0...10 V											0	1	2						
Additional output: lack RS-485 digital output + 1 relay RS-485 digital output + 1 output of OC type 2 relays * 2 outputs of OC type											0	1	2	3	4				
Supply: 95...253 V a.c./d.c. 20...40 V a.c./d.c. on order *												1	2		X				
Kind of terminals: socket-screw plug															0				
Version: standard custom-made*																00	XX		
Acceptance tests: without an extra quality inspection certificate with an extra quality inspection certificate acc. to customers' request*																	8	7	X

CONNECTION DIAGRAMS

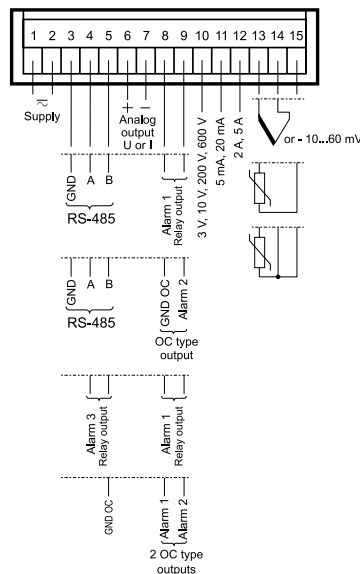


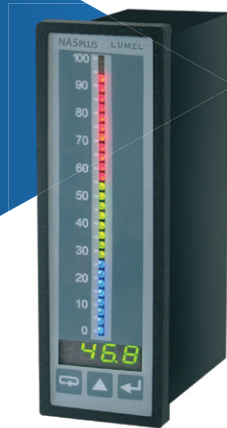
Fig. 1 External connections of the NA3 meter.

* - after agreeing with the manufacturer

Ordering Example:

The code: **NA3 - F T R U 0 1 1 0 00 8** means:

- NA3** - digital meter with bargraph of NA3 type,
- F** - with a bargraph and digital display,
- T** - with a 3-colour display,
- R** - red display colour,
- U** - universal input,
- 0** - lack of analog output signal,
- 1** - additional output: RS-485 digital output + 1 relay,
- 1** - supply voltage: 95...253 V a.c./d.c.,
- 0** - socket-screw plug,
- 00** - standard version,
- 8** - without extra quality requirements.



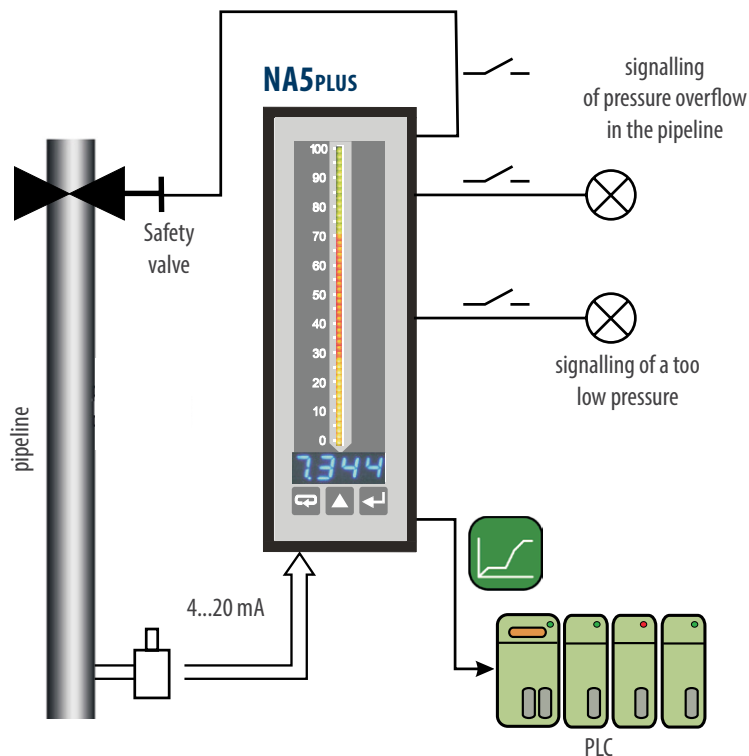
NA5PLUS - DIGITAL METER WITH BARGRAPH

- 3 or 7-colour bargraph with programmable colour switching over.
- Logging of the measured signal in programmed time intervals (800 samples).
- Universal measuring input.
- Programmable indication characteristic (21-point rescaling) and bargraph magnifier.
- Up to 8 programmable alarm outputs.
- Alarm triggered by the rate of change of the measured signal over time.
- Arithmetical functions x^2 , \sqrt{x} .
- Communication in SCADA systems (RS485/Modbus interfaces).
- Conversion of any measured value into a current or voltage analog signal.



EXAMPLE OF APPLICATION

Measurement of pressure in a pipeline.



FEATURES	INPUTS	OUTPUTS	GALVANIC ISOLATION

TECHNICAL DATA

Input type	Measurement range	Basic error	Additional error
Pt100	-200...850°C	0.1%	compensation of temperature changes of reference welds $\leq \pm 1^\circ\text{C}$ compensation of cable resistance changes - when changing the resistance of wires $< 10\Omega$ the error is $\leq \pm 0.5^\circ\text{C}$
Pt500	-200...850°C		
Pt1000	-200...850°C		
J (Fe-CuNi)	-100...1100°C		
K (NiCr-NiAl)	-100...1370°C		
N (NiCrSi-NiSi)	-100...1300°C	0.2%	- when changing the resistance of wires $< 20\Omega$ the error is $\leq \pm 1^\circ\text{C}$
E (NiCr-CuNi)	-100...850°C		
R (PtRh13-Pt)	0...1760°C	0.1%	change in ambient temperature $\leq \pm 0.1\%$ of the range
S (PtRh10-Pt)	0...1760°C		
T (Cu-CuNi)	-50...400°C		
Resistance	0...5 kΩ	0.1%	change in ambient temperature $\leq \pm 0.1\%$ of the range
Voltage	$\pm 75\text{ mV}$, $R_{\text{imp.}} > 100\text{ k}\Omega$ $\pm 300\text{ mV}$, $R_{\text{imp.}} > 100\text{ k}\Omega$ $\pm 0...600\text{ V}$, $R_{\text{imp.}} > 3.5\text{ M}\Omega$		
Current	$\pm 40\text{ mA}$, $R_{\text{imp.}} < 4\Omega$ $\pm 5\text{ A}$, $R_{\text{imp.}} = 10\text{ m}\Omega \pm 10\%$		

Output type	Features
Current analog output	1 or 2 programmable 0/4...20 mA; load resistance $\leq 500\Omega$
Voltage analog output	1 or 2 programmable 0-10 V; load resistance $\geq 500\Omega$
Relay output	4 relays; NOC voltageless contacts, maximal load: - voltage: 250 V a.c., 150 V d.c. - current: 5 A 30 V d.c., 250 V a.c. - resistive load: 1250 VA, 150 W
Open collector (OC) type	8 outputs of OC type: maximal load: - voltage: 5...30V d.c. - current: 25mA d.c.
Digital interface	interface type: RS-485; transmission protocol: MODBUS, RTU (8N2, 8E1, 8O1, 8N1) baud rate: 2400, 4800, 9600, 19200, 57600, 115200 b/s
Additional supply output	24 V d.c., maximal load 30 mA

Intensity of current flowing through the resistance thermometer: $< 400\text{ }\mu\text{A}$
 Resistance of wires connecting the resistance thermometer with the meter: $< 20\Omega/1\text{ wire}$

EXTERNAL FEATURE

Readout field	4 - digits LED display	7-segment digits of 7 mm high, measuring range -1999...9999
	bargraph	bargraph of 100 mm length: - 55 segments in three-colour version - 28 segments in seven-colour version Bargraph resolution: programmable
Overall dimensions	48 x 144 x 100 mm	
Weight	$< 0.4\text{ kg}$	panel cut-out: 44+0.5 x 137.5+0.5 mm
Protection grade (acc. to EN 60529)	from frontal side: IP50	from terminal side: IP20

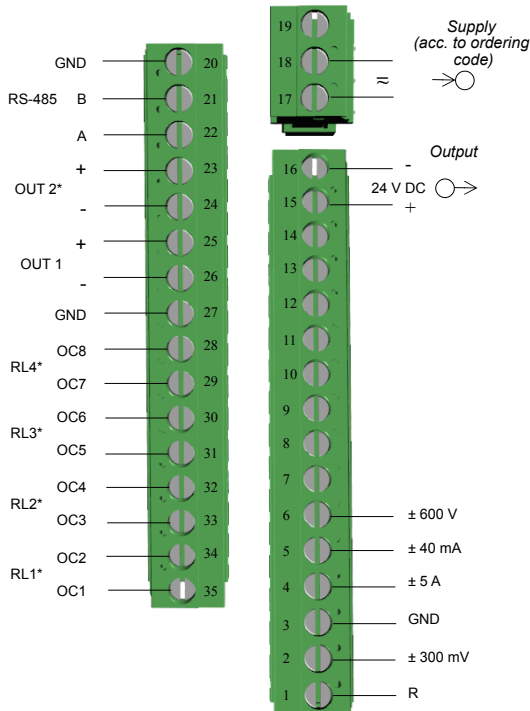
RATED OPERATING CONDITIONS

Supply voltage	95...253 V a.c. 40...400 Hz; 90...300 V d.c. 20...40 V a.c. 40...400 Hz, 20...60 V d.c.	power consumption $\leq 13\text{ VA}$
Temperature	ambient: -10...23...55°C	storage: -25...85°C
Relative humidity	$< 95\%$	Condensation inadmissible

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity noise emissions	acc. to EN 61000-6-2 acc. to EN 61000-6-4
Pollution grade	2	acc. to EN 61010-1
Installation category	III	
Maximal phase-to-earth operating voltage	• for input circuit: 600 V • for supply circuit: 300 V • for other circuits: 50 V	
Altitude above sea level	$< 2000\text{ m}$	

ELECTRICAL CONNECTIONS



*-optional elements depend on the meter's version

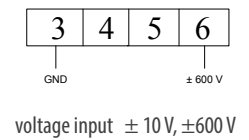
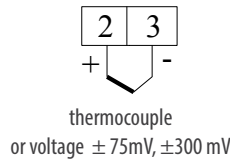
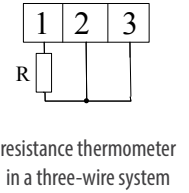
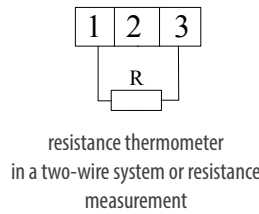


Fig. 1 Description of the terminal strip.

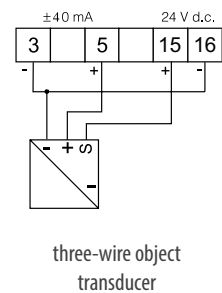
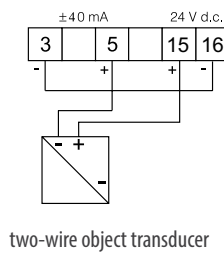
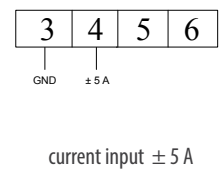
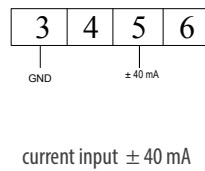
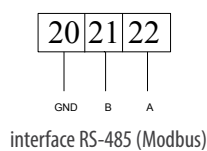
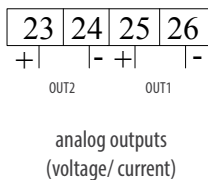
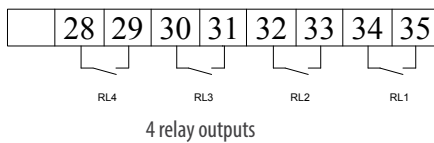
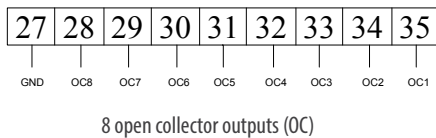


Fig. 3. Connection way of output signals depending on the execution code.

Fig. 2 Connection way of input signals.

ORDERING

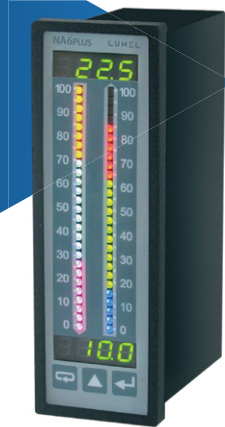
NA5PLUS -	X	X	X	X	X	X	XX	X	X
Bargraph colour:									
3-colour (R, G, R+G)	T								
7-colour (R, G, B, R+G, R+B, G+B, R+G+B)	M								
Display colour:									
red	R								
green	G								
custom-made*	X								
Input signal:									
universal input		U							
custom-made*		X							
Analog output:									
lack			0						
0/4...20mA			1						
0...10 V			2						
2 x 0/4...20 mA			3						
2 x 0...10 V			4						
1 x 0/4...20 mA, 1 x 0...10 V			5						
Additional output:									
lack			0						
4 relays			4						
8 outputs of OC type			8						
Supply voltage:									
95...253 V a.c./d.c.			2						
20...40 V a.c., 20...60 V d.c.			4						
Version:									
standard			00						
custom-made*			XX						
Language:									
Polish				P					
English				E					
other*				X					
Acceptance tests:									
without extra requirements								0	
with an extra quality inspection certificate								1	
acc. to customer's request								X	

Ordering example:

The code **NA5PLUS-TGU18200E0** means:

- NA5PLUS** - NA5PLUS meter
- T** - bargraph RG
- G** - green display colour
- U** - universal inputs
- 1** - current output 0/4...20 mA
- 8** - 8 outputs of OC type
- 2** - supply 95...253V a.c./ 90...300V d.c.
- 00** - standard version
- E** - english version
- 0** - without extra requirements

* - after agreeing with the manufacturer



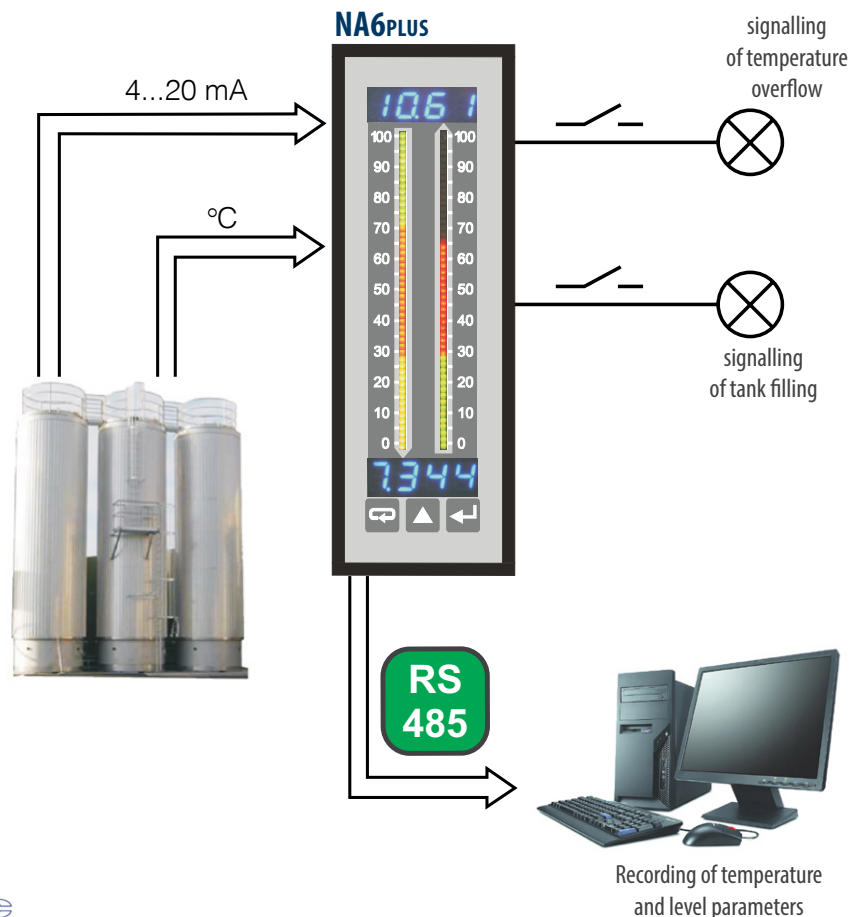
NA6PLUS - DIGITAL METER WITH BARGRAPH

- 3 or 7-colour bargraph with programmable colour switching over.
- Logging of the measured signal in programmed time intervals (800 samples).
- 2 independent measuring channels with universal input.
- Programmable indication characteristic (21-point rescaling) and bargraph magnifier.
- Up to 8 programmable alarm outputs.
- Alarm triggered by the rate of change of the measured signal over time.
- Mathematical operations on channels.
- Communication in SCADA systems (RS485/Modbus interfaces).
- Conversion of any measured value into a current or voltage analog signal.



EXAMPLE OF APPLICATION

Level and temperature measurement in the tank.



FEATURES	INPUTS	OUTPUTS	GALVANIC ISOLATION

TECHNICAL DATA

INPUTS				OUTPUTS			
Input type	Measurement range	Basic error	Additional error	Output type	Features		
Pt100	-200...850°C	0.1%	compensation of temperature changes of reference welds $\leq \pm 1^\circ\text{C}$	Current analog output	1 or 2 programmable 0/4...20 mA; load resistance $\leq 500 \Omega$		
Pt500	-200...850°C			Voltage analog output	1 or 2 programmable 0-10 V; load resistance $\geq 500 \Omega$		
Pt1000	-200...850°C			Relay output	4 relays; NOC voltageless contacts, maximal load: - voltage: 250 V a.c., 150 V d.c. - current: 5 A 30 V d.c., 250 V a.c. - resistive load: 1250 VA, 150 W		
J (Fe-CuNi)	-100...1100°C			0.2%	compensation of cable resistance changes - when changing the resistance of wires $< 10 \Omega$ the error is $\leq \pm 0.5^\circ\text{C}$ - when changing the resistance of wires $< 20 \Omega$ the error is $\leq \pm 1^\circ\text{C}$	Open collector (OC) type	8 outputs of OC type: maximal load: - voltage: 5...30V d.c. - current: 25mA d.c.
K (NiCr-NiAl)	-100...1370°C					Digital interface	interface type: RS-485; transmission protocol: MODBUS, RTU (8N2, 8E1, 8O1, 8N1) baud rate: 2400, 4800, 9600, 19200, 57600, 115200 b/s
N (NiCrSi-NiSi)	-100...1300°C					Additional supply output	24 V d.c., maximal load 30 mA
E (NiCr-CuNi)	-100...850°C	0.1%	change in ambient temperature $\leq \pm 0.1\%$ of the range				
R (PtRh13-Pt)	0...1760°C						
S (PtRh10-Pt)	0...1760°C						
T (Cu-CuNi)	-50...400°C						
Resistance	0...5 k Ω						
Voltage	$\pm 75 \text{ mV}$, $R_{\text{inp.}} > 100 \text{ k}\Omega$ $\pm 300 \text{ mV}$, $R_{\text{inp.}} > 100 \text{ k}\Omega$ $\pm 0...600 \text{ V}$, $R_{\text{inp.}} > 3.5 \text{ M}\Omega$						
Current	$\pm 40 \text{ mA}$, $R_{\text{inp.}} < 4 \Omega$ $\pm 5 \text{ A}$, $R_{\text{inp.}} = 10 \text{ m}\Omega \pm 10\%$						

Intensity of current flowing through the resistance thermometer: $< 400 \mu\text{A}$
Resistance of wires connecting the resistance thermometer with the meter: $< 20 \Omega/1 \text{ wire}$

EXTERNAL FEATURE

Readout field	2 x 4 - digits LED display	7-segment digits of 7 mm high, measuring range -1999...9999
	bargraph	bargraph of 100 mm length: - 55 segments in three-colour version - 28 segments in seven-colour version Bargraph resolution: programmable
Overall dimensions	48 x 144 x 100 mm	
Weight	$< 0.4 \text{ kg}$	panel cut-out: 44+0.5 x 137.5+0.5 mm
Protection grade (acc. to EN 60529)	from frontal side: IP50	from terminal side: IP20

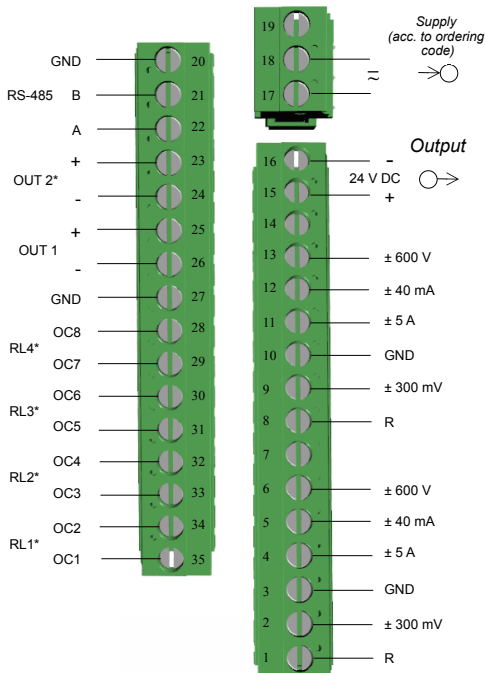
RATED OPERATING CONDITIONS

Supply voltage	95...253 V a.c. 40...400 Hz; 90...300 V d.c. 20...40 V a.c. 40...400 Hz, 20...60 V d.c.	power consumption $\leq 13 \text{ VA}$
Temperature	ambient: -10...23...55°C	storage: -25...85°C
Relative humidity	$< 95\%$	Condensation inadmissible

SAFETY AND COMPATIBILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Pollution grade	2	acc. to EN 61010-1
Installation category	III	
Maximal phase-to-earth operating voltage	<ul style="list-style-type: none"> for input circuit: 600 V for supply circuit: 300 V for other circuits: 50 V 	
Altitude above sea level	$< 2000 \text{ m}$	

ELECTRICAL CONNECTIONS



*-optional elements depend on the meter's version

Fig. 1 Description of the terminal strip.

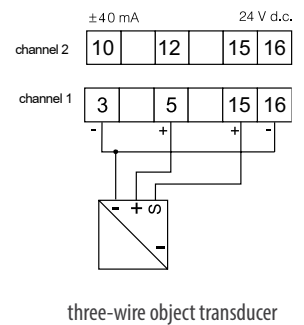
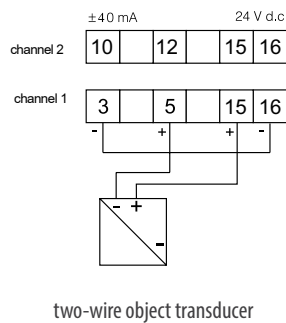
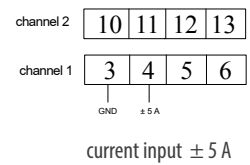
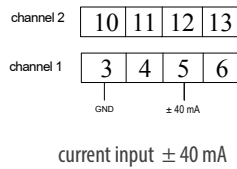
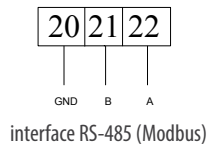
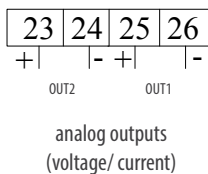
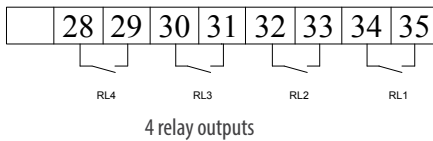
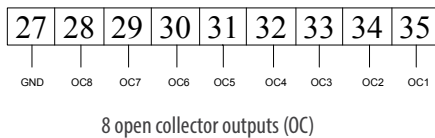
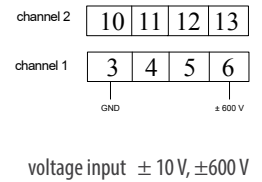
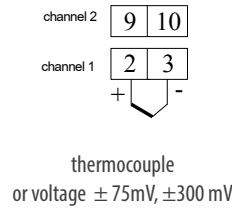
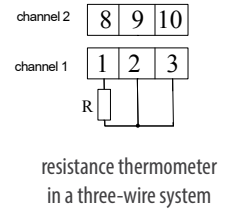
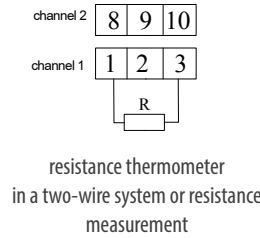


Fig.3. Connection way of output signals depending on the execution code.

Fig. 2 Connection way of input signals.

ORDERING

NA6PLUS -	X	XX	X	X	X	X	XX	X	X
Bargraph colour:									
3-colour(R, G, R+G)	T								
7-colour (R, G, B, R+G, R+B, G+B, R+G+B)	M								
Display colour on channels 1 and 2:									
red-red	RR								
red-green	RG								
green-red	GR								
green-green	GG								
Input signal:									
universal input	U								
custom-made*	X								
Analog output:									
lack		0							
0/4...20mA		1							
0...10 V		2							
2 x 0/4...20 mA		3							
2 x 0...10 V		4							
1 x 0/4...20 mA, 1 x 0...10 V		5							
Additional output:									
lack		0							
4 relays		4							
8 outputs of OC type		8							
Supply voltage:									
95...253 V a.c./d.c.			1						
20...40 V a.c., 20...60 V d.c.				3					
Version:									
standard						00			
custom-made**							XX		
Language:									
Polish								P	
English									E
other*									X
Acceptance tests:									
without extra requirements									0
with an extra quality inspection certificate									1
acc. to customer's request**									X

* - after agreeing with the manufacturer

Ordering example:

The code **NA6PLUS- TRRU18100E0** means:

- NA6PLUS** - NA6PLUS meter
- T** - bargraph RG
- RR** - red display colour
- U** - universal inputs
- 1** - current output 0/4...20 mA
- 8** - 8 outputs of OC type
- 1** - supply 95...253V a.c./ 90...300V d.c.
- 00** - standard version
- E** - english version
- 0** - without extra requirements