

PRODUCTS & SERVICES CATALOG

measuring & control
instruments



automation
systems

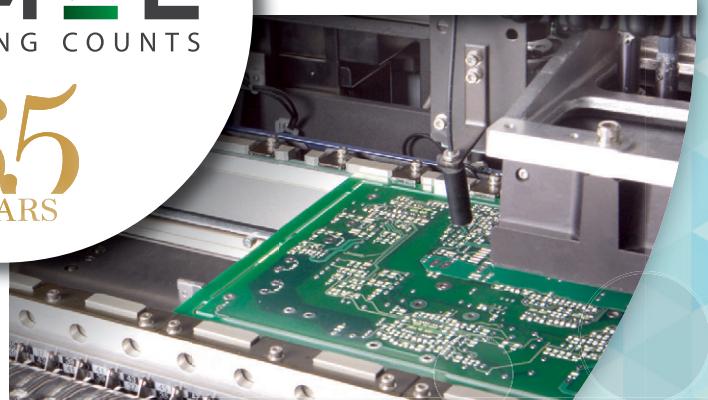


laboratory
services & equipment

LUMEL
EVERYTHING COUNTS

65
YEARS

electronic
manufacturing services





LUMEL

For over sixty years we have been providing you with all what you need, working in accordance with the highest standards. Every day thousands of our clients all over the world get our safe and user-friendly products. It wouldn't be possible without power and skills of our best specialists. We remember about every single detail because.....

E V E R Y T H I N G C O U N T S



GUARANTEE OF THE HIGHEST QUALITY OF PRODUCTION AND SERVICES

To meet the expectations of our customers **we continuously improve the quality management system**. It takes place at every activity level, from the identification of the customer's needs, through the production process, to the research of the recipients satisfaction.

To guarantee the highest quality we continuously supervise the production processes, we aim at the permanent parameter improving and we use materials from suppliers, who meet the highest global standards.

We work in accordance with:

- Certificate **ISO 9001:2008**,
- Certificate **ISO 14001:2004**,
- Technical specification **ISO/TS 16949:2009**.

We fulfill all requirements of 2002/95/EC Directive (**RoHS**) about limiting Hazardous Substances in our products.

Our products fulfill requirements:

- **Electromagnetic compatibility acc. to:**
 - immunity against electromagnetic interference EN 61000-6-2,
 - emission of electromagnetic interference EN 61000-6-4.
- **Safety acc. to:** EN 61010.
- **Category III instalation acc. to:** safety requirements for electrical equipment for measurement, control and laboratory use EN 61010.

We declare with full responsibility that all products manufactured by LUMEL S.A. fulfil all requirements of Regulation (WE) of the European Parliament and the European Council no 1907/2006 dated December 18, 2006 regarding registration, rating, permits and limitations regarding chemicals (**REACH**).



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METERS AND ANALYZERS OF POWER NETWORK PARAMETERS



	N43	N14	ND10	ND20LITE	ND20CT	ND20	ND30	ND30PNET
Measured parameters (detailed information in user's manual)								
U_{LN}/U_{LL}					✓/✓			
average U_{LN}/U_{LL}		✓/✓			@/@		✓/✓	
$I_L/\text{average } I_L/I_N$	✓/✓/ @	✓/✓/-			✓/✓/✓			
P / Q / S					✓/✓/✓			
$E_p/E_Q/E_S$	✓/✓/✓			✓/✓/-			✓/✓/✓	
4-quadrant measurement	@				✓			
PF / tgφ / cosφ / φ	✓/✓/-/-	✓/✓/@/ @			✓/✓/✓/ @		✓/✓/-/-	
f / THD U / THD I	✓/✓/✓	✓/-/-			✓/✓/✓			
Harmonics	-	-		-		✓ 21		✓ 51
P (15/30/60 min.)	✓/✓/✓	✓/-/-			✓/✓/✓			
S (15/30/60 min.)	✓/✓/✓		-		-		✓/✓/✓	
I (15/30/60 min.)	✓/✓/✓						✓/✓/✓	
Time / Date / Temp.	✓/@/-	-	✓/✓/-		✓/-/-		✓/✓/-	✓/✓/✓
Memory of min. and max. values	-				✓			
Inputs	1 A / 5 A or 63 A 57.7/100 V or 230/400 V or 290/500 V	1 A or 5 A 57.7/100 V or 230/400 V or 400/690 V	1 A or 5 A 57.7/100 V or 230/400 V or 290/500 V	1 A or 5 A 57.7/100 V or 230/400 V	0.1 A and 0.25 A 57.7/100 V or 230/400 V	1 A or 5 A 57.7/100 V or 230/400 V or 290/500 V or 63.5/110 V or 69.3/120 V	1 A / 5 A 57.7/100 V 230/400 V or 110/190 V 400/690 V	2 x Pt100 - option
Outputs	3 x relay 1 x pulse	1 x relay 1 x pulse	2 x relays 1 x pulse	1 x relay 1 x pulse	1 x 0/4...20 mA (option) 1 x relay 1 x pulse		1 x 0/4...20 mA (option); 2 x relay	
Interface	RS-485 Modbus Slave		RS-485 Modbus Slave - option		RS-485 Modbus Slave		RS-485 Modbus Slave	
Display	LCD 4x3 digits + 1x7 digits	LED 3x3 digits (14 mm)	3.5" LCD 3x4 digits (16 mm)		3.5" LCD 3x4 (11 mm) + 1x5 digits (9 mm)		3.5" colour TFT LCD 320x240 pixel	
Supply voltage	85...253 V a.c./ 90...300 V d.c. or 20...40 V a.c./ 20...60 V d.c.	85...253 V a.c./d.c.	50...64 V a.c. or 195...253 V a.c. or 246...300 V a.c.			85...253 V a.c./90...300 V d.c. or 20...40 V a.c./20...60 V d.c.		
Protection IP	IP50	IP40				IP65		
Ext. dimensions	105 x 110 x 60 mm	96 x 96 x 70.5 mm				96 x 96 x 77 mm		
Programming	free eCon software (using miniUSB) or using buttons			free eCon software (using RS-485) or using buttons			free eCon software, (using RS-485 or Ethernet) or using buttons	
Additional functions	<ul style="list-style-type: none"> connection with S4AO module (module of 4 analog outputs) 			<ul style="list-style-type: none"> easy installation of meter and current transformer only to cooperation with dedicated current transformers L3XX and LJXX 	<ul style="list-style-type: none"> memory 9000 samples for mean power 	<ul style="list-style-type: none"> selection of displayed quantities on each of the 12 programmable pages temperature measurement - 2 x input Pt100, galvanic isolation between input/output, supply and interface 	<ul style="list-style-type: none"> data archiving in the internal memory 8 GB 	-
				• galvanic isolation of current inputs				

@ - parameter available only through digital interface RS-485 and/or Ethernet

METERS AND ANALYZERS OF POWER NETWORK PARAMETERS



NEW

NEW

NEW

NEW



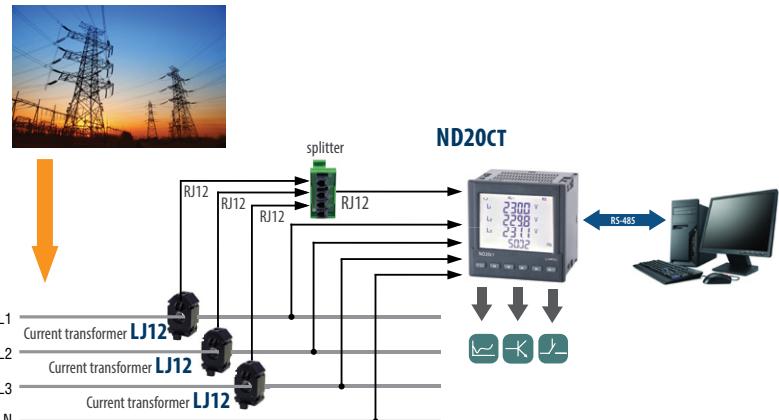
	N100	ND40
Measured parameters (detailed information in user's manuals)		
U_{LN}/U_{LL}	✓/✓	
average U_{LN}/U_{LL}	@/✓	✓/✓
$I_L/\text{average } I_L/I_N$	✓/✓/✓	
P/Q/S	✓/✓/✓	
$E_P/E_Q/E_S$	✓/✓/✓	
4-quadrant measurement	✓	
PF/tgφ/cosφ/φ	✓/✓/-/-	✓/✓/-/-
f/THD U/THD I	✓/✓/✓	
Harmonics	✓ 51	
P(15/30/60 min.)	✓/✓/✓	
Q(15/30/60 min.)	-	✓/✓/✓
S(15/30/60 min.)	✓/✓/✓	
I(15/30/60 min.)	✓/✓/✓	
Time/Date/Temp.	✓/✓/-	✓/✓/✓
Dips / Swells/ Overvoltages	-	✓/✓/✓
Tariffs / Voltage asymmetry	-	-/✓
Memory of min. and max. values	✓	-
Inputs	1 A/5 A 57.7/100 V or 230/400 V or 400/690 V	1 A/5 A 230/400 V
Outputs	pulse 0/12...36 V	2 x Pt100/Pt1000/5kΩ 6 x logic - option
Interface	1 x pulse, 1 x 0/4...20 mA + 3 x relay or 3 x -20...0...20 mA + 1 x relay	3 x 0/4...20 mA; or 8 x relay
Display	RS-485 Modbus Slave	RS-485 Modbus Slave, USB Device & Host
Supply voltage	Ethernet 10/100 Base-T Modbus TCP, www, FTP - option	Ethernet 10/100 Base-T Modbus TCP, www, FTP, NTP
Protection IP	IP40	IP65
Ext. dimensions	144 x 144 x 77 mm	144 x 144 x 104 mm
Programming	free eCon software (using RS-485 or Ethernet) or using buttons	dedicated software or using touch screen
Additional functions	<ul style="list-style-type: none"> selection of displayed quantities on each of the 20 programmable pages galvanic isolation of current and voltage inputs data archiving in the internal memory 8 GB available special version with input frequency up to 500 Hz (see ordering code, page 8) 	<ul style="list-style-type: none"> measurement class A/S measurement and logging of energy quality acc. to EN 50160, EN 61000-4-30, EN 61000-4-7 <ul style="list-style-type: none"> oscilloscope galvanic isolation of measuring current and voltage inputs data archiving on SD card

Current transformers dedicated to ND20CT		
Version	LJ12	LJ25, LJ35, LJ45
Range	1-phase	3-phase
Class	50-250 A*	60-600 A*
Connection way to ND20CT	RJ12 connector	screw terminals

* - more detailed informations in data sheet

ND20CT APPLICATION EXAMPLE

Measurements, monitoring, recording of network parameters and energy using three single-phase transformers with RJ12 slot.

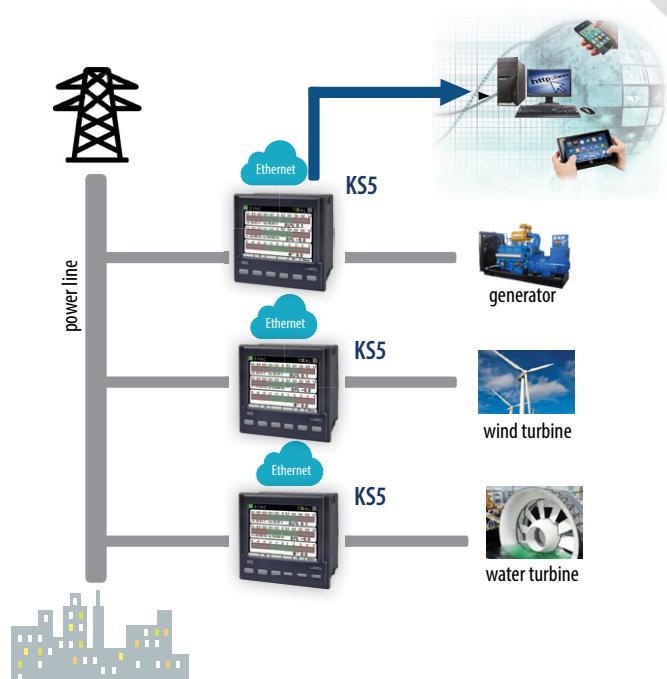


SYNCHRONIZATION METERS

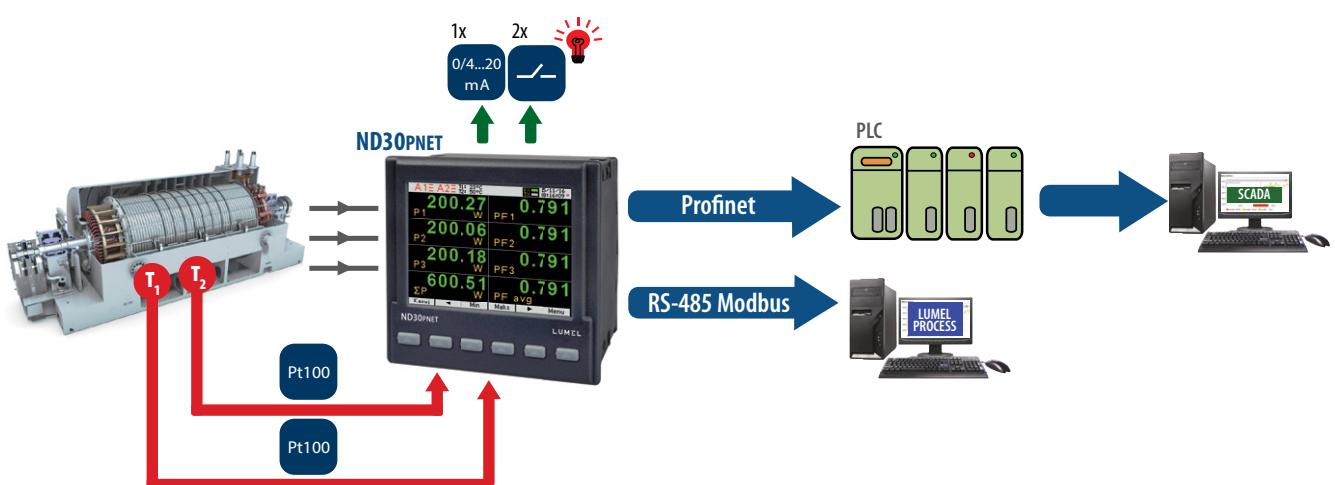


KS5	
Input	50...150 V 150...400 V
Output	2 x relays
Interface	RS-485 Modbus Ethernet 10/100 Base-T Modbus TCP, www - option
Display	3.5" colour TFT LCD 320x240 pixel
Supply voltage	85..253 V a.c., 90..300 V d.c. or 20..40 V a.c., 20..60 V d.c.
Protection rating	IP65
External dimensions	96 x 96 x 77 mm
Programming	free eCon software, (using RS-485 or Ethernet) or using buttons
Additional functions	<ul style="list-style-type: none"> memory of min. and max. values many forms of data presentation bargraph, digital <ul style="list-style-type: none"> additional control inputs

KS5 APPLICATION EXAMPLE



ND30PNET APPLICATION EXAMPLE



N43 ordering code:						
	N43-	X	X	X	XX	X
Input current In:						
1 A/5 A (X/1; X/5)	1					
63 A	2					
Input voltage (phase/phase-to-phase) Un:						
3 x 57.7/100 V	1					
3 x 230/400 V	2					
3 x 290/500 V	3					
Supply voltage:						
85...253 V a.c., 90...300 V d.c.	1					
20...40 V a.c., 20...60 V d.c.	2					
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

N14 ordering code:						
	N14-	X	X	XX	X	
Current input In:						
1 A (X/1)	1					
5 A (X/5)	2					
Voltage input (phase/phase-to-phase) Un:						
3 x 57.7/100 V	1					
3 x 230/400 V	2					
3 x 400/690 V**	3					
Version:						
standard	00					
input voltage 3 x 110/190 V	01					
custom-made*	XX					
Acceptance tests:						
without extra requirements	8					
with an extra quality inspection certificate	7					
acc. to customer's request	X					

** - version only for direct measurement

* - after agreeing with the manufacturer

ND10 ordering code:						
	ND10-	X	X	X	XX	X
Current input In:						
1 A (X/1)	1					
5 A (X/5)	2					
Voltage input (phase/phase-to-phase) Un:						
3 x 57.7/100 V	1					
3 x 230/400 V	2					
3 x 290/500 V	3					
Digital output:						
without RS-485 interface	0					
with RS-485 interface	1					
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					

ND20LITE ordering code:						
	ND20LITE-	X	X	XX	X	X
Current input In:						
1 A	1					
5 A	2					
Voltage input (phase/phase-to-phase) Un:						
3 x 57.7/100 V	1					
3 x 230/400 V	2					
Supply voltage:						
85...253 V a.c., 90...300 V d.c.	1					
20...40 V a.c., 20...60 V d.c.	2					
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					

ND20CT ordering code:						
	ND20CT-	X	X	XX	X	X
Voltage input (phase/phase-to-phase) Un:						
3 x 57.7 / 100 V	1					
3 x 230 / 400 V	2					
Analog current output:						
without analog output	0					
with programmable output 0(4)...20 mA	1					
Supply voltage:						
85...253 V a.c., 90...300 V d.c.	1					
20...40 V a.c., 20...60 V d.c.	2					
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					

LJ12 ordering code: Single-phase transformer with RJ12 - hole diameter 21 mm						
Code	Current ratio	Power/class				
LJ12-132235S 000000 *	50A/100mA	0.25VA/1				
LJ12-142235S 000000	60A/100mA	0.25VA/1				
LJ12-182235S 000000	100A/100mA	0.25VA/0.5; 0.35VA/1				
LJ12-202235S 000000	125A/100mA	0.25VA/0.5; 0.35VA/1				
LJ12-222235S 000000	150A/100mA	0.25VA/0.5; 0.35VA/1				
LJ12-232235S 000000	160A/100mA	0.25VA/0.5; 0.35VA/1				
LJ12-242235S 000000	200A/100mA	0.25VA/0.5; 0.5VA/1				
LJ12-272235S 000000	250A/100mA	0.25VA/0.5; 0.5VA/1				

* - item available from our stock

LJ25 ordering code: Three-phase transformer with RJ12 - busbar 15 x 15 mm						
	Code	Current ratio	Power/class			
LJ25-142231S 000000	60A/100mA	0.25VA/1				
LJ25-182235S 000000 *	100A/100mA	0.25VA/0.5; 0.35VA/1				
LJ25-202235S 000000	125A/100mA	0.25VA/0.5; 0.35VA/1				
LJ25-222235S 000000	150A/100mA	0.25VA/0.5; 0.35VA/1				
LJ25-232235S 000000	160A/100mA	0.25VA/0.5; 0.35VA/1				
LJ25-242235S 000000	200A/100mA	0.25VA/0.5; 0.35VA/1				

* - item available from our stock

LJ35 ordering code: Three-phase transformer with RJ12 - busbar 22 x 21 mm						
	Code	Current ratio	Power/class			
LJ35-142231S 000000	60A/100mA	0.25VA/1				
LJ35-182235S 000000 *	100A/100mA	0.25VA/0.5; 0.35VA/1				
LJ35-202235S 000000	125A/100mA	0.25VA/0.5; 0.35VA/1				
LJ35-222235S 000000 *	150A/100mA	0.25VA/0.5; 0.5VA/1				
LJ35-232235S 000000	160A/100mA	0.25VA/0.5; 0.5VA/1				
LJ35-242235S 000000 *	200A/100mA	0.25VA/0.5; 0.5VA/1				
LJ35-272235S 000000	250A/100mA	0.25VA/0.5; 0.5VA/1				

* - item available from our stock

LJ45 ordering code: Three-phase transformer with RJ12 - busbar 32 x 27 mm						
	Code	Current ratio	Power/class			
LJ45-272235S 000000 *	250A/100mA	0.25VA/0.5; 0.5VA/1				
LJ45-312235S 000000	400A/100mA	0.25VA/0.5; 0.5VA/1				
LJ45-332235S 000000	600A/100mA	0.25VA/0.5; 0.5VA/1				

* - item available from our stock

ORDERING CODES

ND20 ordering code:								
ND20 -	X	X	X	X	XX	X	X	X
Current input In:								
1 A	1							
5 A	2							
Voltage input (phase/phase-to-phase) Un:								
3 x 57.7/100 V	1							
3 x 230/400 V	2							
3 x 290/500 V	3							
3 x 63.5/110 V	4							
3 x 69.3/120 V	5							
Analog current output:								
without analog output	0							
with programmable output 0(4)...20 mA	1							
Supply voltage:								
85...253 V a.c., 90...300 V d.c.	1							
20...40 V a.c., 20...60 V d.c.	2							
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							

ND30 ordering code:								
ND30 -	X	X	X	X	XX	X	X	X
Input voltage (phase/phase-to-phase) Un:								
3 x 57.7/100 V, 3x 230/400 V	1							
3 x 110/190 V, 3 x 400/690 V	2							
Additional outputs/inputs:								
2 relays	1							
2 relays, 1 analog output, 2 PT100 inputs	2							
Interfaces:								
RS-485	1							
RS-485 and Ethernet, internal memory	2							
Supply:								
85...253 V a.c., 90...300 V d.c.	1							
20...40 V a.c., 20...60 V d.c.	2							
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							

ND30NET ordering code:								
ND30PNET -	X	X	X	XX	X	X	X	X
Input voltage (phase/phase-to-phase) Un:								
3 x 57.7/100 V, 3x 230/400 V	1							
3 x 110/190 V, 3 x 400/690 V	2							
Additional outputs/inputs:								
2 relays	1							
2 relays, 1 analog output, 2 PT100 inputs	2							
Interfaces:								
RS-485	1							
RS-485 and Ethernet, internal memory	2							
Supply:								
85...253 V a.c., 90...300 V d.c.	1							
20...40 V a.c., 20...60 V d.c.	2							
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							

N100 ordering code:								
N100 -	X	X	X	XX	X	X	X	X
Input voltage (phase/phase-to-phase) Un:								
3 x 57.7/100 V	1							
3 x 230/400 V	2							
3 x 400/690 V	3							
Outputs:								
3 x relay, 1 x analog, 1x pulse input, 1 x pulse output	1							
3 x analog, 1 x relay	2							
Additional equipment:								
without Ethernet interface	0							
with Ethernet interface, internal memory	1							
Version:								
standard	00							
input frequency up to 500 Hz (custom version G189)*	02							
custom-made**	XX							
Language:								
Polish	P							
English	E							
other**	X							
Acceptance tests:								
without additional quality requirements	0							
with an extra quality inspection certificate	1							
acc. to customer's request	X							

ND40 ordering code:								
ND40 -	X	X	XX	X	X	X	X	X
Measuring class:								
class S	0							
class A/S	1							
Input/Outputs:								
none	0							
8 relay outputs	1							
6 logic inputs, 4 relay outputs	2							
6 logic inputs, 3 analog outputs	3							
Version:								
standard	00							
custom-made*	XX							
Language:								
Polish	P							
English	E							
German	G							
Russian	R							
other*	X							
Acceptance tests:								
without extra requirements	0							
with an extra quality inspection certificate	1							
acc. to customer's request	X							

Synchronization meter								
KSS -	X	X	X	XX	X	X	X	X
Input voltage (phase/phase-to-phase) Un*:								
50...150 V	1							
150...400 V	2							
Interfaces:								
RS-485	1							
RS-485 and Ethernet	2							
Supply:								
85...253 V a.c., 90...300 V d.c.	1							
20...40 V a.c., 20...60 V d.c.	2							
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							

* - measurement of harmonics and THD aren't available for custom version G189 of N100 meters.

Measurement of the other network parameters (without harmonics and THD) respectively:

- 1) for frequency 65...400 Hz – phase voltages required are greater than 45 % Un;
- 2) for frequency 400...500 Hz – phase voltages required are greater than 85 % Un;

Additional error of measured quantity < 1



	N24	N25	N20	N20Z	N21	N27D
Input	fixed 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	Pt100, J, K 0/4...20 mA, ±20 mA 0...60 mV, 0...10 V, ±10 V	fixed 1 A, 5 A a.c. 100 V, 250 V, 400 V a.c. 20...500 Hz	fixed 1 A, 5 A a.c. 100 V, 250 V, 400 V a.c. 20...500 Hz	programmable Pt100 J, K ±20 mA, ±10 V, ±60 mV	fixed 0...500 V a.c. 0...63 A a.c. -31.5...31.5 kW 45...500 Hz
Output	supplying output (24 V/ 30 mA) for S and T versions (option)	• 2 x OC • supplying output (24 V/ 30 mA)	2 x OC	• 1 x relay NO, 250 V~/0.5 A~, • supplying output 24 V d.c. ± 5%, 30 mA	-	-
Display	red LED 4 digits (20 mm)	red LED 5 digits (14 mm)	3-colour programmable LED 5 digits (14 mm)	OLED 128 x 32 pixels in amber colour	yellow LED 4 digits (8.5 mm)	
Supply voltage	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 or 20...40 V a.c./d.c.		universal 22...60 V a.c. / 20...60 V d.c. (terminals 12-13) 60...253 V a.c. / 60...300 V d.c. (terminals 13-14)	230 V a.c.	
Protection rating		IP65			IP00	
External dimensions		96 x 48 x 64 mm			110 x 53 x 60 mm	
Programming		free eCon software (using PD14 programmer)		free eCon software (using miniUSB)	-	
Additional functions		rescaling		• rescaling • coming soon - - vertical display	selection of displayed quantities (kW, V, A, Hz)	



	N30U	N30H	N30o	N30P	N27P
Input	programmable Pt100/500/1000 J, K, N, E, R, S ± 20 mA 0...10 V, -10...60 mV 400, 4000 Ω	programmable 1/5 A d.c., 100/500 V d.c.	programmable pulse input (pulses, frequency, rotational speed, period, operating time counter, encoder)	programmable 1/5 A 100/400 V 1-phase power network parameters	programmable 1/5 A or direct measurement 32/63 A 100 V/400 V a.c. 1-phase power network parameters
Output	4 x relays (2 NO + optional 2 NOC), 1 x analog 0/4...20 mA or 0...10 V - option, 1 x pulse in N30P meter - option, supplying output (24 V/ 30 mA) in N30U and N300 (for supply 85...253 V)				2 relays (2 NO) or 1 x relay (NO) + 1 x output 0/4...20 mA
Interface		RS-485 Modbus Slave - option			RS-485 Modbus Slave
Display		3-colour programmable LED 5 digits (14 mm)			OLED 0.96" yellow
Supply voltage	85...253 V a.c./d.c. or 20...40 V a.c., 20...60 V d.c.		85...253 V a.c./d.c. or 20...40 V a.c./d.c.		85...253 V a.c. 90...300 V d.c.
Protection rating		IP65			IP50 (1/5 A) or IP00 (32/63 A)
External dimensions		96 x 48 x 93 mm			110 x 53 x 60 mm
Programming		free eCon software (using RS-485) or using buttons			free eCon software (using miniUSB, RS-485 or buttons)
Additional functions	• Conversion of any measured value into a current or voltage analog signal. • Storage of minimal and maximal values for all measured quantities. • 21-point rescaling for the measured value (does not apply to N30P and N27P).		• Password protection. • Programmable current and voltage transformer ratio (applies to N27P and N30P).		



COMING
SOON



COMING
SOON



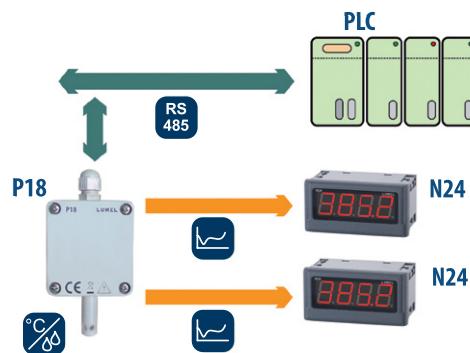
	NA3	NA5PLUS	NA6PLUS
Input	programmable Pt100/500/1000, J, K, N, E, R, S, T 0...5/20 mA d.c., 0...2/5 A d.c., 0...60 mV d.c., 0...10/600 V d.c., 0...3/10/600 V d.c. 0...4 kΩ		programmable Pt100/500/1000, J, K, N, E, R, S, T ± 40 mA d.c., ± 5 A d.c., ± 75 mV d.c., ± 300 mV d.c., ±10 V d.c., ±0...600 V d.c., 0...10 kΩ
Output	1 x relay or 2 x OC (option); 1 x analog (option)		4 x relay or 8 x OC (option); 1 x analog (option)
Interface		RS-485 Modbus Slave	
Bargraph	3- or 7-colour programmable horizontal	3- or 7-colour programmable vertical	2 x 3- or 2 x 7-colour programmable vertical
Display	LED 4 digits (7 mm) or 4 digits (14 mm)	LED 4 digits (7 mm)	2 x LED 4 digits (7 mm)
Supply voltage		95...253 V a.c./d.c. or 20...40 V a.c./ 20...60 V d.c.	
Protection rating	IP40		IP50
External dimensions	96 x 24 x 125 mm		48 x 144 x 100 mm
Programming		free eCon software (using RS-485) or using buttons	
Additional functions	<ul style="list-style-type: none"> • 21-point rescaling • arithmetical functions x^2, \sqrt{x}, $(+/-)$, $*$, $/$ - only in NA6PLUS • logging of the measured signal in programmed time intervals (800 samples) 	<ul style="list-style-type: none"> • memory of minimal and maximal values for all measured parameters • password protection • conversion of any measured value into a current or voltage analog signal 	

APPLICATION EXAMPLES

Temperature and flow measurement in a pipeline



Air temperature and humidity measurement



Current measurement in an electroplating plant



Measurement, alarming and logging of load current for a 1-phase engine



ORDERING CODES

N24 and N25 meters										
N24 ordering code:							N25 ordering code:			
N24 -	X	X	XX	XX	X	X	N25 -	X	X	XX
Kind of input signal:							Kind of input signal:			
standard: voltage, current	S						standard: voltage, current	S		
temperature: thermocouples, resistance	T						temperature: thermocouples, resistance	T		
thermometers							thermometers			
a.c. signals	Z						a.c. signals	Z		
d.c. signals: high voltage/current	H						d.c. signals: high voltage/current	H		
Input signal:							Input signal:			
see table 1		X					see table 1		X	
Supply voltage:							Supply voltage:			
230 V a.c.	1						230 V a.c.	1		
110 V a.c.	2						110 V a.c.	2		
24 V a.c.	3						24 V a.c.	3		
85...253 V a.c./d.c. with supply output 24 V/30 mA**	4						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						20...40 V a.c./d.c. with supply output 24 V/30 mA**	5		
Unit:							Unit:			
see table 2		XX					see table 2		XX	
Version:							Version:			
standard	00						standard	00		
non-standard settings	NS						non-standard settings	NS		
custom-made*	XX						custom-made*	XX		
Language:							Language:			
Polish	P						Polish	P		
English	E						English	E		
other*	X						other*	X		
Acceptance tests:							Acceptance tests:			
without extra requirements	0						without extra requirements	0		
with an extra quality inspection certificate	1						with an extra quality inspection certificate	1		
acc. to customer's request*	X						acc. to customer's request*	X		

N20 and N20Z meters										
N20 ordering code:							N20Z ordering code:			
N20 -	X	X	XX	XX	X	X	N20Z -	X	X	XX
Input:							Input:			
Pt100: -50...400°C	1						100V	1		
Thermocouple J: -50...1200°C	2						250V	2		
Thermocouple K: -50...1370°C	3						400V	3		
0...20 mA	4						1 A	4		
4...20 mA	5						5 A	5		
± 20 mA	6						frequency: 20...500 Hz	6		
0...60 mV	7									
0...10 V	8									
± 10 V	9									
Supply voltage:							Supply voltage:			
85...253 V a.c./d.c.	1						85...253 V a.c./d.c.	1		
20...40 V a.c./d.c.	2						20...40 V a.c./d.c.	2		
Unit:							Unit:			
unit code acc. to the table 3		XX					unit code acc. to the table 3		XX	
Version:							Version:			
standard	00						standard	00		
custom-made*	XX						custom-made*	XX		
non-standard settings	99						non-standard settings	99		
Acceptance tests:							Acceptance tests:			
without extra requirements	8						without extra requirements	8		
with an extra quality inspection certificate	7						with an extra quality inspection certificate	7		
acc. to customer's request*	X						acc. to customer's request*	X		

Table 3. Codes of highlighted unit:										
Code	Unit	Code	Unit							
00	without unit	24	l/h							
01	V	25	ms							
02	A	26	s							
03	mV	27	h							
04	kV	28	N							
05	MV	29	kN							
06	mA	30	Pa							
07	kA	31	hPa							
08	MA	32	kPa							
09	°C	33	MPa							
10	°F	34	bar							
11	K	35	rad							
12	Hz	36	Ω							
13	kHz	37	kΩ							
14	Ah	38	%							
15	kAh	39	°							
16	m/s	40	obr							
17	μm	41	rps							
18	mm	42	rpm							
19	cm	43	rph							
20	m	44	m/h							
21	km	45	km/h							
22	l	46	imp							
23	l/s	XX	on rod़er*							

N21 ordering code:				
N21 -	XX	X	X	X
Version:				
standard	00			
custom-made*	XX			
Language:				
Polish		P		
English		E		
other*		X		
Acceptance tests:				
without extra quality requirements	0			
with quality inspection certificate	1			
acc. to customer's request*	X			

N21 meter has in standard:										
- universal input										
- relay output										
- power output 24 V d.c.										
- supply voltage 24 V a.c./d.c., 230 V a.c./d.c.										
- miniUSB port for programming										

* - after agreeing with the manufacturer

ORDERING CODES

N27D and N27P meters						
N27D ordering code:				N27P ordering code:		
N27D -	XX	X	X	N27P -	X	X
Version:				Current measuring range:		
standard	00			1 A/5 A a.c.	1	
custom-made*	XX			32 A/63 A a.c.	2	
Language:				Outputs:		
Polish	P			2 relays	1	
English	E			1 relay and 1 analog 0/4...20 mA	2	
other*	X					
Acceptance tests:				Version:		
without extra requirements	0			standard	00	
with an extra quality inspection certificate	1			custom-made*	XX	
acc. to customer's request*	X					

N30 meter series						
N30U ordering code:				N30H ordering code:		
N30U -	X	X	XX	XX	X	X
Supply voltage:				Supply voltage:		
85...253 V a.c./d.c.	1			85...253 V a.c./d.c.	1	
20...40 V a.c., 20...60 V d.c.	2			20...40 V a.c., 20...60 V d.c.	2	
Additional outputs:				Additional outputs:		
lack	0			lack	0	
OC output, RS-485, analog outputs	1			OC output, RS-485, analog outputs	1	
OC output, RS-485, analog outputs and change-over relay outputs	2			OC output, RS-485, analog outputs and change-over relay outputs	2	
Unit:				Unit:		
unit code acc. to the table 4	XX			unit code acc. to the table 4	XX	
Version:				Version:		
standard	00			standard	00	
custom-made*	XX			custom-made*	XX	
Language:				Language:		
Polish	P			Polish	P	
English	E			English	E	
other*	X			other*	X	
Acceptance tests:				Acceptance tests:		
without extra requirements	0			without extra requirements	0	
with an extra quality inspection certificate	1			with an extra quality inspection certificate	1	
acc. to customer's request*	X			acc. to customer's request*	X	
N30P ordering code:						
N30P -	X	X	XX	XX	X	X
Supply voltage:				Supply voltage:		
85...253 V a.c./d.c.	1			85...253 V a.c./d.c.	1	
20...40 V a.c./d.c.	2			20...40 V a.c./d.c.	2	
Additional outputs:				Additional outputs:		
lack	0			lack	0	
OC output, RS-485, analog outputs	1			OC output, RS-485, analog outputs	1	
OC output, RS-485, analog outputs and change-over relay outputs	2			OC output, RS-485, analog outputs and change-over relay outputs	2	
Unit:				Unit:		
unit code acc. to the table 26	XX			unit code acc. to the table 26	XX	
Version:				Version:		
standard	00			standard	00	
custom-made*	XX			custom-made*	XX	
Language:				Language:		
Polish	P			Polish	P	
English	E			English	E	
other*	X			other*	X	
Acceptance tests:				Acceptance tests:		
without extra requirements	0			without extra requirements	0	
with an extra quality inspection certificate	1			with an extra quality inspection certificate	1	
acc. to customer's request*	X			acc. to customer's request*	X	
N30o ordering code:						
N30o -	X	X	XX	XX	X	X
Supply voltage:				Supply voltage:		
85...253 V a.c./d.c.	1			85...253 V a.c./d.c.	1	
20...40 V a.c./d.c.	2			20...40 V a.c./d.c.	2	
Additional outputs:				Additional outputs:		
lack	0			lack	0	
OC output, RS-485, analog outputs	1			OC output, RS-485, analog outputs	1	
OC output, RS-485, analog outputs and change-over relay outputs	2			OC output, RS-485, analog outputs and change-over relay outputs	2	
Unit:				Unit:		
unit code acc. to the table 26	XX			unit code acc. to the table 26	XX	
Version:				Version:		
standard	00			standard	00	
custom-made*	XX			custom-made*	XX	
Language:				Language:		
Polish	P			Polish	P	
English	E			English	E	
other*	X			other*	X	
Acceptance tests:				Acceptance tests:		
without extra requirements	0			without extra requirements	0	
with an extra quality inspection certificate	1			with an extra quality inspection certificate	1	
acc. to customer's request*	X			acc. to customer's request*	X	

Table 4. Codes of highlighted unit:

Code	Unit	Code	Unit
00	without unit	29	%
01	V	30	%RH
02	A	31	pH
03	mV	32	kg
04	kV	33	bar
05	mA	34	m
06	kA	35	l
07	W	36	s
08	kW	37	h
09	MW	38	m³
10	var	39	obr
11	kvar	40	pcs
12	Mvar	41	imp
13	VA	42	rps
14	kVA	43	m/s
15	MVA	44	l/s
16	kWh	45	obr/min
17	MWh	46	rpm
18	kvarh	47	mm/min
19	Mvarh	48	m/min
20	kVAh	49	l/min
21	MVAh	50	m³/min
22	Hz	51	szt./h
23	kHz	52	m/h
24	Ω	53	km/h
25	kΩ	54	m³/h
26	°C	55	kg/h
27	°F	56	l/h
28	K	XX	on order*

* - after agreeing with the manufacturer

NA3, NA5PLUS and NA6PLUS meters												
NA3 ordering code:												
NA3 -	X	X	X	X	X	X	X	XX	X	X		
Meter version:												
with a bargraph and digital display	F											
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											
blue	B											
Input signal:												
universal input	U											
custom-made*	X											
Analog output:												
lack	0											
0/4...20 mA	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											
RS-485 digital output + 1 relay	1											
RS-485 digital output + 1 output of OC type	2											
2 relays	3											
2 outputs of OC type	4											
Supply voltage:												
95...253 V a.c./d.c.	1											
20...40 V a.c./d.c.	2											
on order*	X											
Kind of terminals:												
screwed plug-in sockets	0											
Version:												
standard	00											
custom-made*	XX											
Acceptance tests:												
without extra requirements	8											
with an extra quality inspection certificate	7											
acc. to customer's request	X											

NA5PLUS ordering code:												
NA5PLUS -	X	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...20 mA	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											
Kind of terminals:												
screwed plug-in sockets	0											
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											

NA6PLUS ordering code:												
NA6PLUS -	X	XX	X	X	X	X	X	X	X	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...20 mA	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

* - after agreeing with the manufacturer

TRANSDUCERS, SEPARATORS



	P20 and P17 transducers					Separators	
	P20	P20Z	P21Z	P20H	P17	P20G	P17G
Input	programmable Pt100/250/500/1000, J, K, S, N 0/4...20, ±20 mA 0...5/10, ±5, ±10 V ±60, ±150 mV 0...400/4000 Ω	fixed 0..60/100/150/250/ 400/500/ 600 V a.c. 0.1/5 A a.c.	fixed 0...100/250/ /400 V a.c. 0...1/5 A a.c. 20...500 Hz	fixed 100, 250, 400 V d.c. ±100, ±250, ±400 V d.c. ±1, ±5 A d.c.	fixed Pt100 J, K, N, E, 0...10 V 0...60 mV	programmable 0/4...20 mA ±20 mA 0...5/10 V ±5V, ±10 V	0/4...20 mA
Output	0/4...20 mA or 0...10 V			0/4...20 mA or 0...10 V or RS-485 Modbus Slave	passive 0/4...20 mA	programmable -20...20 mA -10...10 V	active output 0/4...20 mA
Supply voltage	85...253 V a.c./d.c. or 20...85 V d.c., 20...65 V a.c.	85...253 V a.c./d.c. or 20...40 V a.c./d.c.		85...253 V a.c. / 90...300 V d.c. or 20...40 V a.c. / 20...60 V d.c.	supplied from output current loop	85...253 V a.c./d.c. or 20...85 V d.c., 20...65 V a.c.	supplied from input current loop
Protection rating	IP40				IP50	IP40	IP50
External dimensions	22.5 x 120 x 100 mm				6.2 x 77.5 x 100 mm	22.5 x 120 x 100 mm	6.2 x 77.5 x 100 mm
Additional functions	free eCon software (using PD14 programmer)	-		free eCon software (using PD14 programmer)	-	free eCon software (using PD14 programmer)	-



	P30 transducers					
	P30U	P300	P30H	P30P		
Input	programmable Pt100/250/500/1000, Cu100, Ni100, Ni1000 J, K, N, E, R, S, T, B 0...4/20, ±20 mA -5...20, ±75, ±200 mV, ±10 V, ±24 V 400, 2000, 5500 Ω, RS-485 Master or Slave	2 programmable inputs: pulse counter, frequency, rotational speed, period, operating time counter, pulse differential counter on inputs or encoder	d.c. network parameters programmable current using shunt ± 200 mV voltage 0...12/48/100/250 V voltage 0...600/1000 V in set with additional D5 resistor	1-phase power network parameters fixed 1A (X/1A), 5A (X/5A) 100V(x/100V) or 250V		
Output	1 x analog 0/4...20 mA or 0...10 V 1 x relay NO 1 x additional NO relay optionally exchangeable with 24 V, 30 mA supplying output		1 x analog 0/4...20 mA or 0...10 V 1 x relay NO optionally exchangeable with additional analog output 0/4...20 mA or 0...10 V 1 x additional NO relay optionally exchangeable with 24 V, 30 mA supplying output			
Interface	RS-485 Modbus (Slave or Master) - standard Ethernet 10/100 Base-T - option					
Display	LCD 2x8 characters with LED backlight					
Supply voltage	85...253 V a.c./d.c. or 20...40 V a.c./20...60 V d.c.		85...253 V a.c., 85...300 V d.c. or 20...40 V a.c., 20...60 V d.c.			
Protection rating	IP40					
External dimensions	45 x 120 x 100 mm					
Programming	using buttons or free eCon software using RS-485 Modbus, Ethernet (option)					
Additional functions	<ul style="list-style-type: none"> • alarms indicated on the display • internal memory 534336 samples • WWW server, FTP, Modbus TCP/IP Slave (optionally) • data logging in internal memory or on SD card (optionally) 		<ul style="list-style-type: none"> • rescaling (up to 21 points) • memory of min. and max. values (with time stamp) • mathematic functions independent for both inputs • filtration of periodic signals (only P300) 			
	<ul style="list-style-type: none"> • memory of min. and max. values 					



Power transducers

	P41	P30P	P43
Input	programmable 1/5 A, 100/400 V 1-phase power network parameters	fixed 1/5 A, 100 or 250 V 1-phase power network parameters	fixed 1 or 5 A, 100 or 400 V 3-phase power network parameters
Output	1 x analog programmable ±20 mA	1 x analog 0/4...20 mA or 0...10 V 1 x NO relay optionally exchangeable with additional analog output 0/4...20 mA or 0...10 V 1 x additional NO relay optionally exchangeable with 24 V, 30 mA supplying output	4 x relays or 2 x relay + 2 x analog programmable ±20 mA or 4 x analog programmable ±20 mA
Interface	RS-485 Modbus Slave	RS-485 Modbus (Slave or Master) - standard Ethernet 10/100 Base-T - option	RS-485 Modbus Slave
Display	-	LCD 2x8 characters with LED backlight	-
Supply voltage	85...253 V a.c./90...300 V d.c. or 20...40 V a.c./20...60 V d.c.	85...253 V a.c., 85...300 V d.c. or 20...40 V a.c., 20...60 V d.c.	85...253 V a.c./90...300 V d.c. or 20...40 V a.c./20...60 V d.c.
Protection rating		IP40	
External dimensions	45 x 120 x 100mm		90 x 120 x 100 mm
Programming	free eCon software using USB or RS-485	using buttons or free eCon software using RS-485 Modbus, HTTP (option)	free eCon software using USB or RS-485
Additional functions	<ul style="list-style-type: none"> • memory for selected measured value – 9 000 samples <ul style="list-style-type: none"> • memory of minimal and maximal values • programmable current and voltage transformer ratios 	<ul style="list-style-type: none"> • alarms indicated on the display • internal memory 534336 samples • programmable current and voltage transformer ratios <ul style="list-style-type: none"> • WWW server, FTP, Modbus TCP/IP Slave (optionally) • data logging in internal memory or on SD card (optionally) 	<ul style="list-style-type: none"> • memory for average power – 9 000 samples • memory of minimal and maximal values • programmable current and voltage transformer ratios <ul style="list-style-type: none"> • pulse output



P18 and P19 temperature and humidity transducers

	P18L	P18	P18D	P18S	P19
Measurement range	-30 ... -20 ... 60 ... 85°C or 0...100% RH		-30 ... -20 ... 60 ... 85°C, 0...100% RH		-20 ... 60 °C, 0...100% RH
Output	passive 4...20 mA	2 x 4...20 mA or 0...10 V (option)			-
Interface	-		RS-485 Modbus		
Galvanic isolation	-	supply/ RS-485 (for version without analog outputs)		supply/ RS-485	
Supply voltage	19...30 V d.c. (supplied by a current loop)	9 ... 24 V d.c./a.c		9 ... 28 V d.c./a.c	9 ... 24 V d.c./a.c
Protection rating		IP65			IP20
External dimensions		38 x 58 x 118 mm		(sensor case) 86 x 12.5 mm	120 x 80 x 25 mm
Additional functions		<ul style="list-style-type: none"> • calculation of other quantities (dew-point temp.; absolute humidity) • available version with sensor mounted on the wire 0.5 m 	<ul style="list-style-type: none"> • memory of measured and calculated min. and max. values • wire to connect RS-485 and supply 		
			<ul style="list-style-type: none"> • data presentation on a LCD display • configuration of transmission parameters using the capacitive button 		

MONITORS, DATA LOGGERS

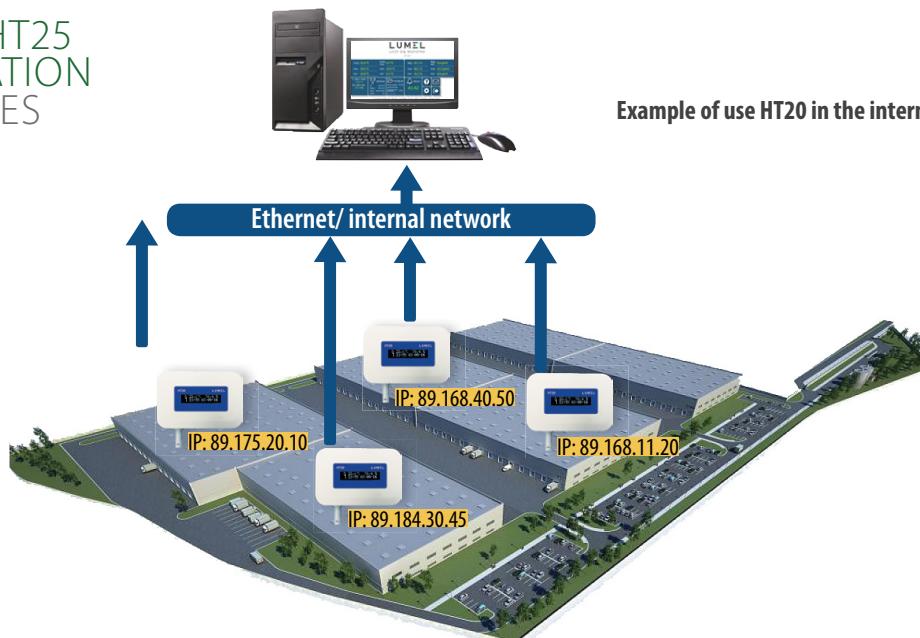


	Humidity and temperature monitor HT20	Data logger HT25
Number of channels	up to 4 channels (T [°C], RH [%], a [g/m³], Td [°C])	up to 16 channels (4 channels reserved for data logging from P18S/P18/P18D)
Input	built-in temperature and humidity sensor	Modbus RTU Master
Output		Modbus TCP/IP
Measurement range	-20...60 °C, 0...100% RH	-
Interface	Ethernet (WWW, FTP, SMTP, DHCP)	1 x RS-485 (Modbus Slave or Master) Ethernet (WWW, FTP, SMTP, DHCP)
Memory		internal - 8GB
Display	LCD, 2 x 16 characters	LCD, 2 x 16 characters and LED, 4 characters
Supply voltage	6 V d.c. or PoE IEEE 802.3af - option	12 V d.c. or PoE IEEE 802.3af - option
Protecting rating		IP20
External dimensions		150 x 100 x 30 mm
Additional functions	<ul style="list-style-type: none"> data presentation on a LCD display and on website parameter configuration through a web browser 	<ul style="list-style-type: none"> email messages in case of alarm occurs acoustic signaling of alarm events <ul style="list-style-type: none"> up to 90 monitored parameters (10 groups 9 register each) via web browser up to 100 monitored parameters (10 group 10 register each) via Modbus TCP/IP logging of 16 parameters (4 parameters reserved for P18S/P18/P18D)

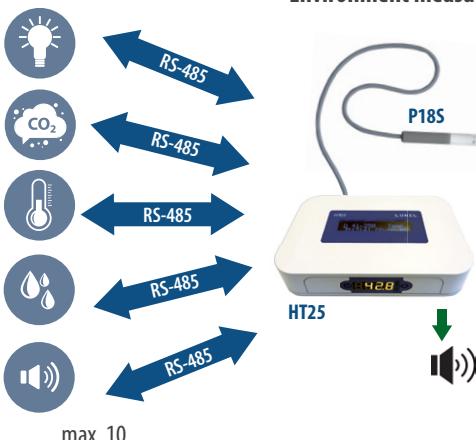
HT20 & HT25 APPLICATION EXAMPLES



Example of use HT20 in the internal company network.



Environment measurements and access to data with built-in web server.



ULTRASONIC LEVEL METER



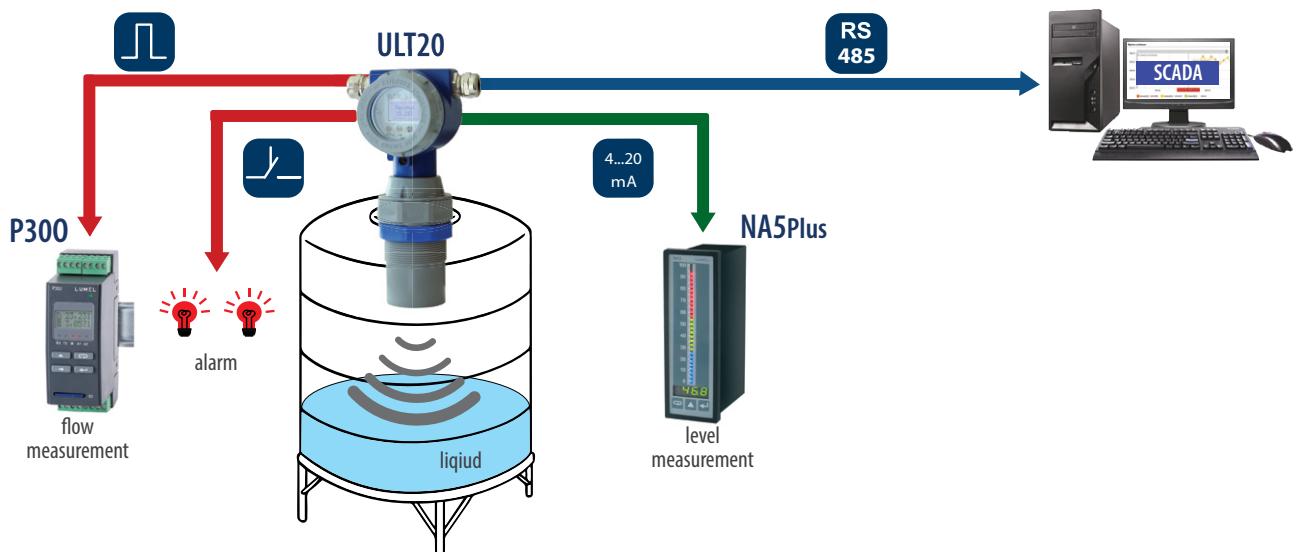
Ultrasonic level meter

ULT20

Range of distance measurement	0.5...8 m
Measurement resolution	0.001 m
Output	1x analog 0/4...20 mA 1 x relay (2 NO outputs) 1 x pulse
Interface	RS-485 Modbus Slave USB Device, v.2.0.
Supply voltage	12...24...40 V d.c.
Protection rating	IP65
Programming	free eCon software
Additional functions	<ul style="list-style-type: none"> • two 32-points individual characteristic (recalculate functions) • memory of min. and max. values (with time stamp) • internal data and setup memory

ULT20 APPLICATION EXAMPLE

Level measurement with visualisation and recording.



ORDERING CODES

P20 ordering code:						
P20 -	X	X	XX	XX	X	
Analog output:						
current 0...20 mA	1					
current 4...20 mA	2					
voltage 0...10 V	3					
Supply:						
85...253 V a.c./d.c.	1					
20...85 V d.c., 20...65 V a.c.	2					
Kind of input:						
write the code from table 5	XX					
Version:						
standard	00					
custom-made*	XX					
Acceptance tests:						
without extra requirements	8					
with an extra quality inspection certificate	7					
acc. to customer's request*	X					

P20H ordering code:						
P20H -	X	X	X	XX	X	
Input signal:						
+/- 100 V	1					
+/- 250 V	2					
+/- 400 V	3					
+/- 1 A	4					
+/- 5 A	5					
0..100 V	6					
0..250 V	7					
0..400 V	8					
Output:						
0...20 mA	1					
4...20 mA	2					
0...10 V	3					
RS-485	4					
Supply voltage:						
85..253 V a.c. 40..400 Hz; 90..300 V d.c.	1					
20..85 V d.c., 20..60 V a.c.	2					
Version:						
standard	00					
non-standard settings	NS					
custom-made*	XX					
Acceptance tests:						
without extra requirements	8					
with an extra quality inspection certificate	7					
acc. to customer's request*	X					

* - after agreeing with the manufacturer

P20 and P17 transducer series						
Table 5. Input signals P20						
Type of sensor/input [Unit]	Range	Code	Type of sensor/input [Unit]	Range	Code	
Pt100 [°C]	-200..850	01	TC of K type [°C]	-200..1370	36	
	0..850	02		0..1200	37	
	0..600	03		0..1000	38	
	0..400	04		0..800	39	
	0..200	05		0..600	40	
	-200..200	06		0..400 ¹	41	
	-100..100 ¹	07		-200..200 ¹	42	
	-200..850	08		0..1760	43	
Pt250 [°C]	0..850	09		0..1600	44	
	0..600	10		0..1400 ¹	45	
	0..400	11		0..1200 ¹	46	
	0..200	12		0..1000 ¹	47	
	-200..200	13		-200..1200	48	
	-100..100	14		0..1200	49	
	-200..850	15		0..1000	50	
	0..850	16		0..800	51	
Pt500 [°C]	0..600	17		0..600 ¹	52	
	0..400	18		0..400 ¹	53	
	0..200	19		-200..200 ¹	54	
	-200..200	20		0..10	55	
	-100..100	21		0..5	56	
	-200..850	22		-10..10	57	
	0..850	23		-5..5	58	
	0..600	24		0..60	59	
Pt1000 [°C]	0..400	25	Voltage d.c. [mV]	-60..60	60	
	0..200	26		0..150	61	
	-200..200	27		-150..150	62	
	-100..100	28		0..20	63	
	-200..1200	29		4..20	64	
	0..1200	30		0..5	65	
	0..1000	31		-20..20	66	
	0..800	32		0..400	67	
TC of J type [°C]	0..600	33		0..4000	68	
	0..400 ¹	34		Custom-made	XX	
	-200..200 ¹	35				

P17 ordering code:				
P17 -	XX	XX	X	
Input signal:				
voltage (0...10 V)	00			
thermocouple J (-100...1200°C)	01			
thermocouple K (-100...1370°C)	02			
thermocouple N (-100...1300°C)	03			
thermocouple E (-100...900°C)	04			
Pt100 (-50...100°C)	05			
Pt100 (-50...400°C)	06			
voltage (0...60 mV)	09			
Version:				
standard	00			
on order*	XX			
Acceptance tests:				
without extra requirements	8			
with an extra quality inspection certificate	7			
acc. to customer's request*	X			

P20G and P17G transducer series						
Table 6. Coding of the P20G separator kind of input and output						
Range	Input code	Output code				
0..1V	01	01**				
0..5V	02	02				
0..10V	03	03				
±1V	04	04**				
±5V	05	05				
±10V	06	06				
0..5 mA	07	07**				
0..20 mA	08	08				
±5 mA	09	09**				
±20 mA	10	10				
4..20 mA	11	11				
custom-made version*	XX	XX				

* - after agreeing with the manufacturer

** - conversion class > 0.2

ORDERING CODES

P30o ordering code:							
P30o -	X	X	X	X	XX	X	X
Analog output:							
current (0...20 mA)	1						
voltage (0...10 V)	2						
Additional equipment:							
without any	0						
with external SD/SDHC slot	1						
with Ethernet interface and internal file system memory	2						
Additional output:							
relay (NO), 5 A 30 V d.c., 250 V a.c.	1						
supply 24 V d.c. / 30 mA	2						
Supply:							
85...253 V a.c./d.c.	1						
20...40 V a.c., 20...60 d.c.	2						
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						

P30P ordering code:							
P30P -	X	X	X	X	XX	X	X
Inputs:							
voltage 0V, current 1/5 A	1						
voltage 250 V, current 1/5 A	2						
Analog outputs OUT1:							
current (0...20 mA)	1						
voltage (0...10 V)	2						
Additional equipment:							
without	0						
with external SD/SDHC slot	1						
with Ethernet interface and internal file system memory	2						
Output OUT2:							
relay A1, 5 A 30 V d.c., 250 V a.c.	1						
analog current output (0/4...20 mA)	2						
analog voltage output (0...10 V)	3						
Output OUT3:							
relay A2 NO, 5 A 30 V d.c., 250 V a.c.	1						
power output 24 V d.c. / 30 mA	2						
Supply:							
85...253 V a.c., 85...300 V d.c.	1						
20...40 V a.c., 20...60 d.c.	2						
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						

P30H ordering code:							
P30H -	X	X	X	X	XX	X	X
Analog outputs OUT1:							
current (0/4...20 mA)	1						
voltage (0...10 V)	2						
Additional equipment:							
without	0						
with external SD/SDHC slot	1						
with Ethernet interface and internal file system memory	2						
Output OUT2:							
relay A1 NO, 5 A 30 V d.c., 250 V a.c.	1						
analog current output (0/4...20 mA)	2						
analog voltage output (0...10 V)	3						
Output OUT3:							
relay A2 NO, 5 A 30 V d.c., 250 V a.c.	1						
power output 24 V d.c. / 30 mA	2						
Supply:							
85...253 V a.c., 85...300 V d.c.	1						
20...40 V a.c., 20...60 d.c.	2						
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

P41 and P43 power transducers							
P43 ordering code:							
P43 -	X	X	X	X	XX	X	X
Current input In:							
1A (X/1)	1						
5A (X/5)	2						
Voltage input (phase/phase-to-phase) Un:							
3 x 57.7/100 V	1						
3 x 230/400 V	2						
Supply voltage:							
85...253 V a.c.; 90...300 V d.c.	1						
20...40 V a.c.; 20...60 V d.c.	2						
Kind of outputs:							
without analog outputs, 4 relays	1						
2 analog outputs, 2 relays	2						
4 analog outputs, without relays	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						

P18, P18D, P18S and P18L temperature and humidity transducers							
P18 and P18D ordering code:							
P18(D) -	X	XX	X	X	X	X	X
Analog outputs - sensors:							
without outputs, with sensor mounted on the housing	0						
current 4...20 mA, with sensor mounted on the housing	1						
voltage 0...10 V, with sensor mounted on the housing	2						
without outputs, with probe on the wire 0.5 m	3						
current 4...20 mA, with probe on the wire 0.5 m	4						
voltage 0...10 V, with probe on the wire 0.5 m	5						
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						

HT20 ordering code:							
HT25 ordering code:							
HT20 -	X	X	XX	X	X	X	X
Supply*:							
6 V d.c.	1						
6 V d.c., PoE IEEE 802.3af	2						
Accessories:							
none	0						
adapter 6 V d.c.	1						
Version:							
standard	00						
custom-made**	XX						
Language:							
Polish	P						
English	E						
other**	X						
Acceptance tests:							
without additional quality requirements	0						
with an extra quality inspection certificate	1						
acc. to customer's request	X						

* - Monitors in version HT20 1XXXX require an external power supply 6 V d.c., in version HT20 2XXXX they can be powered either from Ethernet PoE (Power over Ethernet), as well as from the external power supply 6 V, D.C.
** - after agreeing with the manufacturer

ULT20 ordering code:							
P18S ordering code:							
P18S -	XX	X	XX	X	X	X	X
Connection way:							
socket-plug M8, wire 2 m	00						
wire 2 m	02						
wire 5 m	05						
wire 10 m	10						
other*	XX						
Accessories:							
none	0						
socket-plug cord M12	1						
Version:							
standard	00						
custom-made*	XX						
Language:							
Polish	P						
English	E						
other*	X						
Acceptance tests:							
without additional quality requirements	0						
with an extra quality inspection certificate	1						
acc. to customer's request*	X						

* - after agreeing with the manufacturer

TEMPERATURE CONTROLLERS



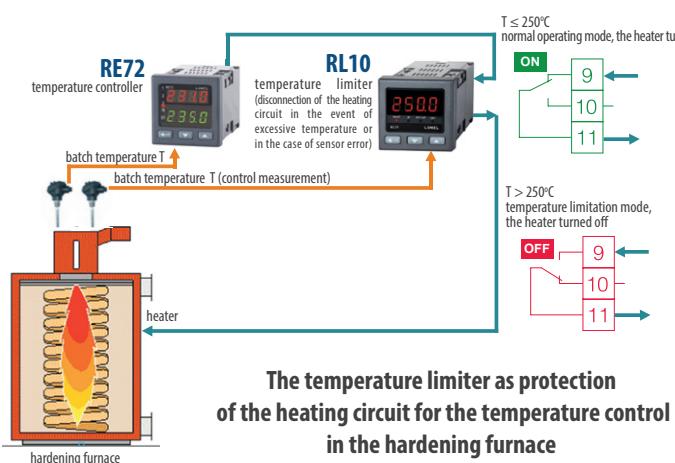
Industrial process controllers

	RE22	RE70	RE71	RE81	RE72	RE82	RE92
Number of channels	1	1	1	1	1	1	2
Input	programmable Pt100/1000 J,T,K,S,R, B,E,N,L or 0/4...20 mA, 0...5/10 V	programmable Pt100/1000 J,T,K,S,R, B,N	fixed Pt100 J, K, S		programmable Pt100/1000 J,T,K,S,R,B,E,N,L 0/4...20 mA 0...5/10 V		programmable 2 x Pt100/500/1000, Ni100, Cu100 J,T,K,S,R,B,E,N,L 0/4...20 mA 0...5/10 V 2 x digital input (RS-485 Modbus Master)
Additional input	-	-	-	-	logic/ current transformer input/ 0/4...20 mA (option)	2 x logic/ current transformer input/ 0/4...20 mA	3x logic and 0/4...20 mA / 0...5/10 V / potentiometer (100)1000 Ω (option) 3 x binary input interface
Output	relay or logic 0/5 V	relay	relays or logic 0/6 V	2 x relays or 1 x relay + 1 x logic 0/6 V	2 x relays / logic 0/5V / analog 0/4...20mA / 0...10V / supplying output 24V d.c. 30 mA - option	2 x relays and 2 x relays / logic 0/5V / analog 0/4...20 mA / 0...10 V (option) supplying output 24V d.c. 30 mA - option	max. 6 x relays / 2 x logic / 2 x analog 0(4)...20 mA / 0...10 V (option) supplying output 24 V d.c. 30 mA - option
Interface	-	RS-485 Modbus (only for configuration)	-	-	RS-485 Modbus		2 x RS-485 (Modbus Slave & Master), Ethernet - option
Alarm	-	-	-	1	max. 2	max. 3	max. 6
on/off or PID with self-tuning, heating or cooling							
Control	-	-	-		step-by-step		
	-	-	-	-	programmed		
Display	red LED 4 digits (9,2 mm)	red LED 4 digits (7,6 mm)		red and green LED 2 x 4 digits (7,6 mm)	red and green LED 2 x 4 digits (7,6 mm) + 2 bargraphs		colour LCD 3.5" TFT 320 x 240 pixels
Supply voltage	230 or 110 or 24 V a.c.		230 V a.c.		85...253 V a.c./d.c. or 20...40 V a.c./d.c.		85...253 V a.c./d.c.
Protection rating	IP40				IP65		
External dimensions		48 x 48 x 93 mm		48x96x93 mm	48 x 48 x 93 mm	48 x 96 x 93 mm	96 x 96 x 99 mm
Additional functions	• soft start				• soft start	• 6 types of alarms	• alarm LATCH function
					• profile control (15 programs with 15 segments in each)		• parameter logging on SD card • FTP and WEB server - option • profile control (20 programs with 15 segments in each)

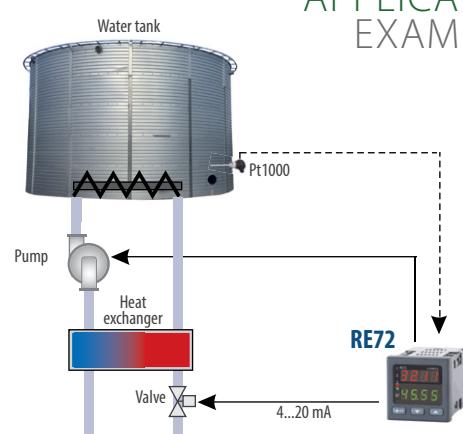
TEMPERATURE CONTROLLERS & LIMITERS



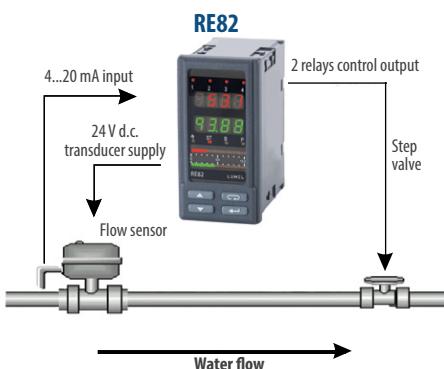
	Industrial process controllers				Temperature limiter
	RE55	RE60	RE62	RE01	RL10
Number of channels	1	1	1	1	1
Input	fixed Pt100 J, K, S		programmable Pt100 J, K $\pm 20 \text{ mA}, \pm 10 \text{ V}, \pm 60 \text{ mV}$	fixed Pt100, Pt1000 NTC	programmable Pt100/1000 J, T, K, S, R, B, N
Additional input	-		-	logic	-
Output	2 x relay or 1 x logic 0/5 V + 1 x relay	1 x relay or 1 x logic 0/5 V 1 or 2 x relay - option	max 3 x relay or 2 x relay and 1 x analog supply 24 V d.c. - option	2 x relay (1 x NOC 10 A/230 V, 1 x NO 5 A/230 V)	relay
Interface	-	-	RS-485 (option)	-	RS-485
Alarm	1	max 2 - option	max 3	max 2	-
Control	on/off, PID, heating or cooling				on/off
Display	green LED 4 digits (10 mm)	LCD (2 x 8 characters)	OLED 128 x 64 pixel, amber color	red LED 4 digits (14 mm)	red LED 4 digits (9.2 mm)
Supply voltage	85...253 V d.c./a.c.	24 or 110 or 230 V a.c. or 18...72 V d.c.	22...60 V a.c. / 20...60 V d.c. or 60...253 V a.c. / 60...300 V d.c.	230 V a.c.	230 V a.c.
Protection rating	IP40		IP30		IP65
External dimensions	96 x 96 x 65 mm	45 x 100 x 120 mm	53 x 110 x 60.5 mm	76 x 34 x 80 mm	48 x 48 x 93 mm
Remarks	-				meets the requirements of EN 60519-2 for class 2 (Safety in electroheat installations)



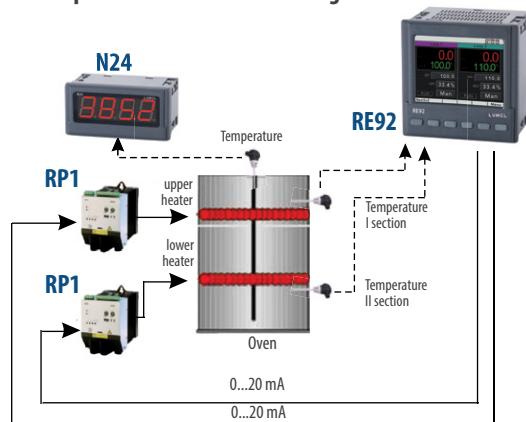
APPLICATION EXAMPLES



Water flow measurement and 3-stage valve control



Batch temperature measurement with a smooth heater power control in a hardening furnace



ORDERING CODES

Industrial process controllers

RE22 ordering code:						
	RE22 -	X	X	X	XX	X
Input:						
universal for RTD and TC sensors	1					
universal linear:						
- current: 0/4...20 mA	2					
- voltage: 0...5/10V						
on order*	X					
Output:						
relay	1					
logic 0/5 V for SSR control	2					
on order*	X					
Supply:						
230 V 50/ 60 Hz	1					
110 V 50/ 60 Hz	2					
24 V 50/ 60 Hz	3					
on order*	X					
Version:						
standard	00					
custom-made*	XX					
Acceptance tests:						
without extra requirements	8					
with an extra quality inspection certificate	7					
acc. to customer's request*	X					

RE71 ordering code:						
	RE71 -	XX	X	X	X	X
Input:						
Pt100 (-50..100 °C)	01					
Pt100 (0..250 °C)	02					
Pt100 (0..600 °C)	03					
thermocouple J (Fe-CuNi)(0...250°C)	04					
thermocouple J (Fe-CuNi)(0...600°C)	05					
thermocouple J (Fe-CuNi)(0...900°C)	06					
thermocouple K (NiCr-NiAl)(0...600°C)	07					
thermocouple K (NiCr-NiAl)(0...900°C)	08					
thermocouple K (NiCr-NiAl)(0...1300°C)	09					
thermocouple S (PtRh10-Pt)(0...1600°C)	10					
Output:						
relay	1					
logic 0/6 V to SSR control	2					
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					

RE81 ordering code:						
	RE81 -	XX	X	X	X	X
Input:						
Pt100 (-50..100 °C)	01					
Pt100 (0..250 °C)	02					
Pt100 (0..600 °C)	03					
thermocouple J (Fe-CuNi)(0...250°C)	04					
thermocouple J (Fe-CuNi)(0...600°C)	05					
thermocouple J (Fe-CuNi)(0...900°C)	06					
thermocouple K (NiCr-NiAl)(0...600°C)	07					
thermocouple K (NiCr-NiAl)(0...900°C)	08					
thermocouple K (NiCr-NiAl)(0...1300°C)	09					
thermocouple S (PtRh10-Pt)(0...1600°C)	10					
Output 1**:						
relay	1					
logic 0/6 V to SSR control	2					
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

** - output 2: relay

RE70 ordering code:						
	RE70 -	X	X			
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

RE72 ordering code:						
	RE72 -	X	X	X	X	X
Output 1:						
relay	1					
voltage 0/5 V	2					
continuous current 0/4 ... 20 mA	3					
continuous voltage 0 ... 10 V	4					
Output 2:						
relay ¹⁾	1					
voltage 0/5 V	2					
continuous current 0/4 ... 20 mA	3					
continuous voltage 0 ... 10 V	4					
Options:						
none	0					
output 3 - relay	1					
logic input	2					
current transformer input ¹⁾	3					
additional current input 0/4 .. 20 mA	4					
transducer supply 24 V d.c. / 30 mA	5					
Supply:						
85 ... 253 V a.c./ d.c.	1					
20 ... 40 V a.c./ d.c.	2					
Version:						
standard	00					
custom-made ²⁾	XX					
Language:						
Polish	P					
English	E					
other ²⁾	X					
Acceptance tests:						
without extra requirements	0					
with an extra quality inspection certificate	1					
acc. to customer's request ²⁾	X					

1) only, when on the output 1, a relay or voltage 0/5 V is also selected

2) after agreeing with the manufacturer

1) - only, when a relay or voltage output 0/5 V is also selected
2) - after agreeing with the manufacturer

RE92 ordering code:								
	RE92 -	X	X	X	X	XX	X	X
Additional input:								
lack	0							
current: 0/4...20 mA	1							
voltage: 0...5/10 V	2							
potentiometric transmitter: 100/1000 Ω	3							
Output 1 and 2:								
2 relays	1							
2 logic outputs 0/5 V	2							
Analog output:								
lack	0							
2 continuous 0/4...20 mA and 0...10 V	1							
Ethernet:								
lack	0							
with Ethernet	1							
Transducer supply:								
lack	0							
24 V d.c.	1							
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
in standard version: 2 universal inputs, 3 logic inputs, 6 relay outputs, RS-485 Modbus Slave,
supply 85...253 V d.c.

RE55 ordering code:				
	RE55 -	XX	X	XX
Input:				
Pt100 (-50...100 °C)	01			
Pt100 (0...250 °C)	02			
Pt100 (0...600 °C)	03			
thermocouple J - Fe-CuNi (0...250 °C)	04			
thermocouple J - Fe-CuNi (0...600 °C)	05			
thermocouple J - Fe-CuNi (0...900 °C)	06			
thermocouple K - NiCr-NiAl (0...600 °C)	07			
thermocouple K - NiCr-NiAl (0...900 °C)	08			
thermocouple K - NiCr-NiAl (0...1300 °C)	09			
thermocouple S - PtRh10-Pr (0...1600 °C)	10			
on order	XX			
Version:				
on-off controller	1			
PID controller	2			
PID controller configurable by buttons and with alarm output	3			
Control output:				
relay	1			
voltage 0/5 V	2			
Version:				
standard	00			
custom-made*	XX			
Acceptance tests:				
without extra requirements	8			
with an extra quality inspection certificate	7			
acc. to customer's request*	X			

RE60 ordering code:				
	RE60 -	XX	X	X
Input:				
Pt100 (-50...100 °C)	01			
Pt100 (0...250 °C)	02			
Pt100 (0...600 °C)	03			
thermocouple J - Fe-CuNi (0...250 °C)	04			
thermocouple J - Fe-CuNi (0...600 °C)	05			
thermocouple J - Fe-CuNi (0...900 °C)	06			
thermocouple K - NiCr-NiAl (0...600 °C)	07			
thermocouple K - NiCr-NiAl (0...900 °C)	08			
thermocouple K - NiCr-NiAl (0...1300 °C)	09			
thermocouple S - PtRh10-Pr (0...1600 °C)	10			
on order	XX			
Main output:				
relay	1			
logic 0/5 V to SSR control	2			
on order	X			
Alarm outputs:				
without outputs	0			
1 relay	1			
2 relays	2			
on order	X			
Supply:				
230 V a.c. 50/60 Hz	1			
110 V a.c. 50/60 Hz	2			
24 V a.c. 50/60 Hz	3			
18...72 V d.c.	4			
on order	X			
Acceptance tests:				
without extra requirements	8			
with an extra quality inspection certificate	7			
acc. to customer's request*	X			

* - after agreeing with the manufacturer

RE62 ordering code:				
	RE62 -	X	X	X
Additional output OUT1:				
without additional output	0			
relay 5 A 230 V	1			
0/4...20 mA (galvanic isolated)	2			
0...10 V (galvanic isolated)	3			
0/5 V 30 mA (for SSR, galvanic isolated)	4			
Additional output OUT3:				
without additional output	0			
relay 5 A 230 V	1			
supply output 24 V d.c./ 40 mA (galvanic isolated)	2			
Interface RS-485:				
without Interface	0			
with RS-485 (galvanic isolated)	1			
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			

RE01 ordering code:			
	RE01 -	X	XX
Input:			
Pt100	1		
Pt1000	2		
NTC 2.7k	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		
RL10 ordering code:			
	RL10 -	X	X
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

CONTROLLER FOR INJECTION MOULDS



System for injection moulds with heated channels

SR11

Number of channels	1...8
Input	fixed Fe-CuNi (J) logic 24 V d.c.
Output	1 output per control zone (15 A)
Control	Fuzzy Logic, PID with self-tuning
Interface	RS-485 with Modbus protocol (option)
Display	LED 14 mm 2 x 3 digits
Supply voltage	230 V a.c. (for system with 1 control zone) 3 x 230/ 400 V a.c. (for system with 2...8 control zones)
Protection rating	IP30
External dimensions	77.5 x 200 x 355 mm (1 control zone) 215 x 197 x 355 mm (2 or 3 control zones) 365 x 197 x 355 mm (4, 5 or 6 control zones) 465 x 197 x 355 mm (7 or 8 control zones)
Additional functions	<ul style="list-style-type: none"> • Fuzzy Logic algorythm ensures a high accuracy temperature control and optimal energy consumption • soft-start function and leakage current monitoring ensure prolonged heaters reliability and operation safety for users • during a break in system operation, a decreased temperature is maintained, what ensures a fast restart of the system <ul style="list-style-type: none"> • damage detection: - too high heater leakage current, - damage of the load circuit, - short-circuit, break or inverse polarization in the sensor circuit.

SR11 APPLICATION EXAMPLE



SR11 system



Injection mould

Temperature control in an injection mould

ORDERING CODES

System for injection moulds with heated channels

SR11 ordering code:

SR11-	X	X	X	X	X
Housing dimensions:					
housing width: 77.5 mm, number of controllers: 1	1				
housing width: 215 mm, number of controllers: 2, 3	3				
housing width: 365 mm, number of controllers: 4, 5, 6	6				
housing width: 465 mm, number of controllers: 7, 8	8				
Number of controllers:					
1 controller	1				
2 controllers	2				
3 controllers	3				
4 controllers	4				
5 controllers	5				
6 controllers	6				
7 controllers	7				
8 controllers	8				
Interface RS-485:					
without interface	0				
with interface	1				
Mould connectors:					
common connectors for thermocouples and heaters	1				
separate connectors for thermocouples and heaters ¹⁾	2				
Acceptance tests:					
without extra requirements	8				
with an extra quality inspection certificate	7				
acc. to customer's request ²⁾	X				

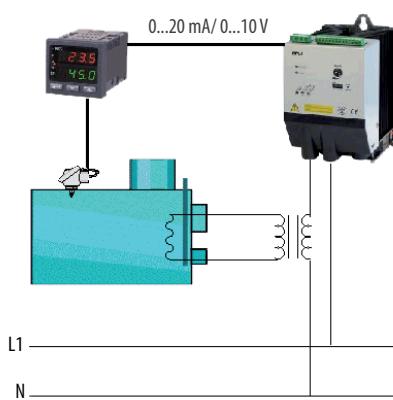
¹⁾ concerns only versions with 365 mm and 465 mm housing width mm

²⁾ after agreeing with the manufacturer

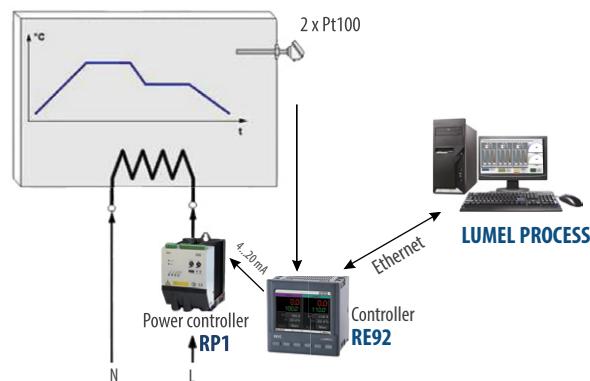


	RP7	RP1	RPL1	RP3
Version		1-phase		3-phase
Control	phase		phase, pulse, on/off	
Input signal		0.5/10V, 0/4..20mA potentiometer		
Output	-		2 x relays	
Output current	5-15 A		25-125 A	3 x 40-450 A
Load supply voltage	230 V	230 V, 400 V a.c.	230, 400, 500 V a.c.	400 V a.c.
Load configuration	2-wire		2 or 3-wire	3, 4 or 6-wire
External dimensions	50 x 105 x 105 mm	135 x 201 x 199 mm 135 x 231 x 199 mm	135 x 201 x 199 mm 135 x 231 x 199 mm - RPL1-x4xx (version with fan)	212 x 318 x 177 mm (40, 70, 125 A versions) 383 x 433 x 281 mm (200, 300, 450 A versions)

Continuous temperature control in furnace



Program following temperature control in a high power oven with electrical heaters



APPLICATION EXAMPLES

ORDERING CODES

Power controllers									
RP7 ordering code:		RP1 ordering code:				RPL1 ordering code:			
RP7 -	X X					RP1 -	X X X		
Maximal current output:						Control:			
5 A	1	25 A	1	phase	1	phase	1	X	X
10 A	2	40 A	2	pulse/ on/off	2	40 A	2	X	X
15 A	3	70 A	3	load voltage: 24...400 V a.c. 50/60 Hz	3	maximal current output 70 A	3	XX	XX
Acceptance tests:		125 A	4	maximal current output 125 A*	4	maximal current output 125 A	4	X	X
without extra requirements	8	supply voltage 85...115...135 V a.c.	1	maximal current output 40 A	2	maximal current output 40 A	2		
with an extra quality inspection certificate	7	supply voltage 195...230...253 V a.c.	2	maximal current output 70 A	3	maximal current output 70 A	3		
acc. to customer's request*	X			maximal current output 125 A	4	maximal current output 125 A	4		
RP3 ordering code:						Current range:			
RP3 -	X X					maximal current output 25 A	1		
Maximal current output:						maximal current output 40 A	2		
40 A	1	25 A	1			maximal current output 70 A	3		
70 A	2	40 A	2			maximal current output 125 A	4		
125 A	3	70 A	3	load voltage: 3 - 400 V a.c. 50 Hz	3				
200 A	4	125 A	4						
300 A	5								
450 A	6								
Acceptance tests:									
without extra requirements	8								
with an extra quality inspection certificate	7								
acc. to customer's request*	X								

* the version RPL1-x4xx has a fixed fan

** after agreeing with the manufacturer

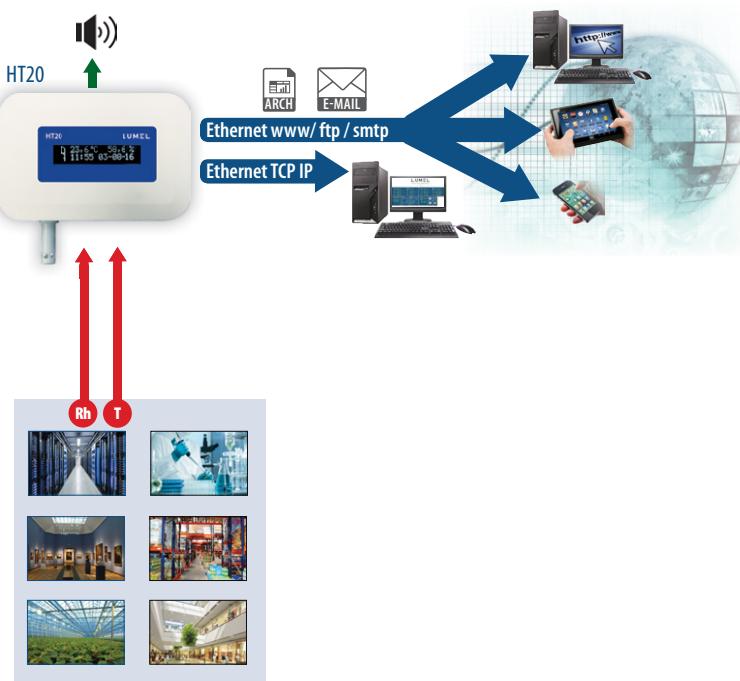


	HT20	HT25	KD7	KD8	SM61
Number of channels	up to 4 channels (T [°C], RH [%], a [g/m³], Td [°C])	up to 16 channels (4 channels reserved for data logging from P18S/P18/P18D)	up to 24 channels (max. 12 analog channels and/or max. 24 digital channels)	up to 6	up to 2500
Input	built-in temperature and humidity sensor	Modbus RTU Master	programmable (3, 6, 9 or 12 inputs) Pt100/500/1000, Ni100, Cu100, J, K, N, E, R, S, T, B, L, ± 20mA ± 9999mV 50...2000 Ω 0...2000 Ω logic input 0/5...24 V d.c. (8 or 16 pcs.) Modbus RTU Master (24 registers)	programmable (3 or 6 inputs) Pt100/500/1000 Ni100, Cu100, J, K, N, E, R, S, T, B, L, ± 20mA ± 9999mV 50...2000 Ω 0...2000 Ω logic 0/5...24 V d.c. (4 or 8 pcs.)	Port II: Modbus RTU Master, (100 groups 25 registers each) 2 x logic (option)
Output	Modbus TCP/IP		relays (8 or 16) relays OptoMOS (8 or 16) analog (4 or 8) 0...5, 0/4...20 mA 0...5 V, 1...5 V, 0...10 V supplying output (2 x 24 V d.c. 30 mA)	relays (6 or 12)	Port I: Modbus RTU/TCP Slave, 2 x relays (option)
Measurement range	-20...60 °C, 0...100% RH	-	-	-	-
Interface	Ethernet (WWW, FTP, SMTP, DHCP)	1 x RS-485 (Modbus Slave or Master) Ethernet (WWW, FTP, SMTP, DHCP)	2 x RS-485 (Modbus Slave and Master) 1 x RS-232 (Modbus Slave) USB Device 1.1. Ethernet 10 Base-T	RS-485 (Modbus Slave) USB Device 1.1.	2 x RS-485 (Modbus Slave and Master) 1 x RS-232 (Modbus Slave) USB Device 1.1. Ethernet 10/100 Base-T
Memory	internal - 8GB		internal – up to 6 MB external – CF card up to 4 GB		1 GB
Display	LCD, 2 x 16 characters	LCD, 2 x 16 characters LED, 4 characters	LCD 5,7" TFT type 320 x 240 pixels with touch panel		-
Supply voltage	6V d.c. or PoE IEEE 802.3af - option	12V d.c. or PoE IEEE 802.3af - option	90...253 V a.c., 90...300 V d.c. or 18...30 V d.c.		85...253 V a.c., 90...300 V d.c. or 20...40 V a.c., 20...60 V d.c. or 10...16 V a.c., 10...20 V d.c.
Protecting rating	IP20		IP65		IP40/IP20
External dimensions	150 x 100 x 30 mm		144 x 144 x 171 mm	144 x 144 x 171 mm	45 x 120 x 100 mm
Additional functions	<ul style="list-style-type: none"> • data presentation on a LCD display and on website <ul style="list-style-type: none"> • email messages in case of alarm occurs • parameter configuration through a web browser <ul style="list-style-type: none"> • acoustic signaling of alarm events 	<ul style="list-style-type: none"> • up to 90 monitored parameters (10 groups 9 register each) via web browser • up to 100 monitored parameters (10 group 10 register each) via Modbus TCP/IP • logging of 16 parameters (4 parameters reserved for P18S/P18/P18D) 	<ul style="list-style-type: none"> • many forms of data presentation: linear, bargraph, chart, digital and analog indicators, • WWW and FTP Server (KD7) • Windows® CE operating system • PC software: KD SETUP, KD CHECK, KD CONNECT, KD ARCHIVE <ul style="list-style-type: none"> • user access levels • menu available in 8 language versions 	<ul style="list-style-type: none"> • HTTP (WEB server -visualization in format of synoptic maps), • DHCP • FTP Server, • RTC 	

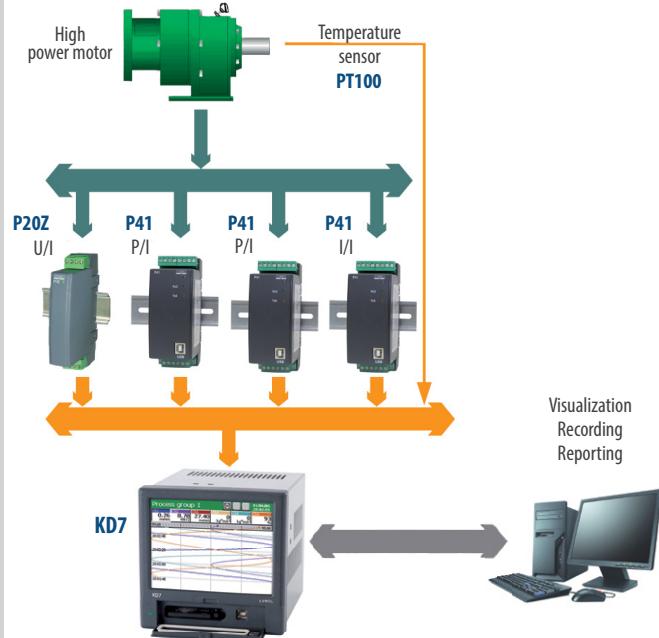


APPLICATION EXAMPLES

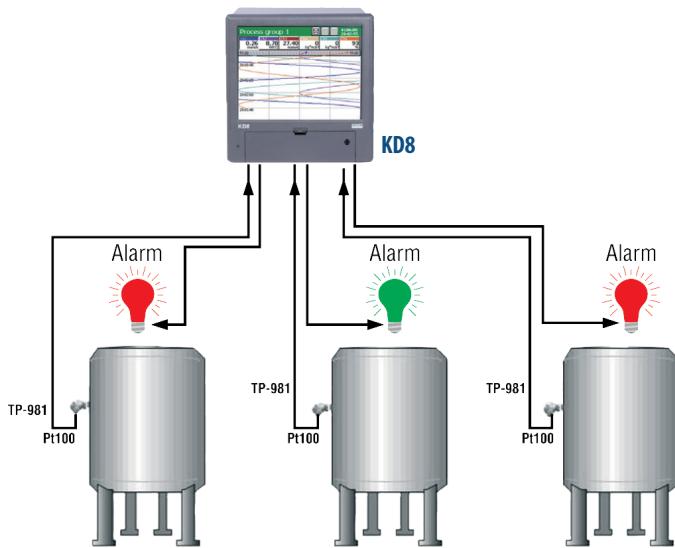
Access to the device from anywhere in the world thanks to the built-in web server.



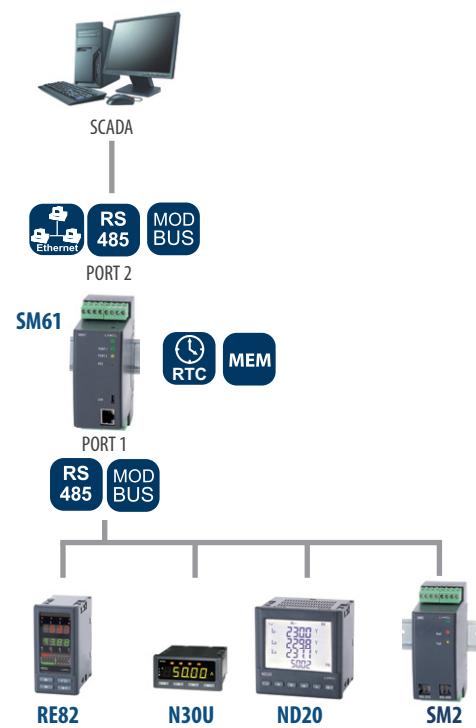
Measurement and visualization of motor working parameters (temperature and motor load)



Temperature measurement, logging and alarming



Archiving of process data



ORDERING CODES

HT20 ordering code:					
HT20 -	X	X	XX	X	X
Supply*:					
6 V d.c.	1				
6 V d.c., PoE IEEE 802.3af	2				
Accessories:					
none	0				
adapter 6 V d.c.	1				
Version:					
standard	00				
custom-made**	XX				
Language:					
Polish	P				
English	E				
other**	X				
Acceptance tests:					
without additional quality requirements	0				
with an extra quality inspection certificate	1				
acc.to customer's request	X				

* - Monitors in version HT20 1XXXX require an external power supply 6 V d.c., in version HT20 2XXXX they can be powered either from Ethernet PoE (Power over Ethernet), as well as from the external power supply 6 V, D.C.

** - after agreeing with the manufacturer

HT25 ordering code:					
HT25 -	X	X	XX	X	X
Supply*:					
12V d.c.	1				
12V d.c., PoE IEEE 802.3af	2				
Accessories:					
none	0				
adapter 12V d.c.	1				
Version:					
standard	00				
custom-made**	XX				
Language:					
Polish	P				
English	E				
other**	X				
Acceptance tests:					
without additional quality requirements	0				
with an extra quality inspection certificate	1				
acc.to customer's request	X				

* - Monitors in version HT25 1XXXX require an external power supply 12V d.c., in version HT25 2XXXX they can be powered either from Ethernet PoE (Power over Ethernet), as well as from the external power supply 12V, D.C.

** - after agreeing with the manufacturer

KD8 ordering code:					
KD8 -	X	X	X	X	X
Measuring inputs:					
3 programmable measuring inputs	1				
6 programmable measuring inputs	2				
Alarms and logic inputs:					
without alarms and logic inputs	0				
alarms (NO relays) + logic inputs ¹⁾	1				
Supply:					
90...253 V a.c.	1				
Softwares servicing the recorder from PC:					
KD Connect, KD Check	1				
KD Connect, KD Check, KD Archive, KD8 Setup	2				
Version:					
standard	00				
custom-made ²⁾	XX				
Acceptance tests:					
without extra quality inspection requirements	8				
with an extra quality inspection certificate	7				
with calibration certificate	4				
acc. to customer's request	X				

1) for each 3 measuring inputs a package with 6 alarms and 4 logic inputs is installed

2) after agreeing with the manufacturer

KD7 ordering code:											
KD7 -	X	X	X	X	X	X	X	X	X	X	X
Measuring input (slot 1):											
without measuring inputs	0										
6 programmable measuring inputs	1										
6 standard measuring inputs: 0...10 V	2										
6 standard measuring inputs: 0...20 mA	3										
6 standard measuring inputs: 4...20 mA	4										
6 standard measuring inputs: 3 x 0..10V + 3 x 0..20 mA	5										
6 standard measuring inputs: 3 x 0..10V + 3 x 4..20 mA	6										
3 programmable measuring inputs	7										
Measuring inputs (slot 2):											
without measuring inputs	0										
6 programmable measuring inputs	1										
6 standard measuring inputs ¹⁾	2..6										
3 programmable measuring inputs	7										
Interface input:											
RS-485 (1) for measuring inputs	1										
Digital signals/analog outputs (slot 3):											
without digital signals and analog outputs	0										
8 alarms (NO relays) + 8 alarms (OptoMos)	1										
8 alarms (NC relays) + 8 alarms (OptoMos)	2										
8 digital inputs + 4 analog outputs: 0...5 mA	3										
8 digital inputs + 4 analog outputs: 0...20 mA	4										
8 digital inputs + 4 analog outputs: 4...20 mA	5										
8 digital inputs + 4 analog outputs: 0...5 V	6										
8 digital inputs + 4 analog outputs: 0...10 V	7										
Digital signals/analog outputs (slot 4):											
without digital signals and analog outputs	0										
8 alarms (NO relays) + 8 alarms (OptoMos)	1										
8 alarms (NC relays) + 8 alarms (OptoMos)	2										
8 digital inputs + 4 analog output ²⁾	3..7										
Interface:											
USB	1										
USB + Ethernet + RS-485 (2)	2										
USB + Ethernet + RS-232	3										
Memory for measuring data:											
with a 4 GB CF card ³⁾	6										
as per order ⁴⁾	X										
Supply:											
90...253 V a.c.	1										
Recorder firmware:											
without mathematical functions ⁵⁾	0										
with mathematical functions	1										
Softwares servicing the recorder from PC:											
KD Connect, KD Check	1										
KD Connect, KD Check, KD Archive, KD7 Setup	2										
Acceptance tests:											
without extra quality inspection requirements	8										
with an extra quality inspection certificate	7										
with calibration certificate	4										
acc. to customer's request	X										

1) - write the range code from the item 2...6 as above: (Slot 1)

2) - write the range code from the item 3...7 as above: (Slot 3)

3) - CF card with the lowest capacity from currently accessible cards on the market

4) - after agreeing with the manufacturer (it is recommended to use a 4 GB CompactFlash card from ScanDisk company)

5) - a key for the activation of mathematical functions can be ordered separately

SM61 ordering code:					
SM61 -	X	X	XX	X	X
Supply voltage:					
85...253 V a.c., 90...300 V d.c.	1				
20...40 V a.c., 20...60 V d.c.	2				
10...16 V a.c., 10...20 V d.c.	3				
Input/output:					
2 relays	1				
2 logic inputs	2				
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

I/O MODULES, COMMUNICATION MODULES



	Input/Output modules						
	SM1	SM2	SM3	SM5	SM4	S4AI	S4AO
Number of channels	2	4	2	8	4 or 8	4	4
Inputs/outputs	fixed inputs: Pt100(-200...850°C), 0...400 Ω or 0/4...20 mA or 0...10 V	programmable inputs: logic on/off or pulse counter up to 1 kHz 0...4294 967 295 pulses	fixed inputs: logic on/off	fixed outputs: 4 x relay or 8 x OC	programmable inputs: 4 x ± 10 V, ± 20mA or 4 x Pt100, Pt500, Pt1000 J, k, S, ± 150 mV	fixed outputs: 4 x 0/4...20 mA or 4 x 0...10 V or 2 x 0/4...20 mA + 2 x 0...10 V	
Interface	RS-485 Modbus Slave, RS-232 for configuration				RS-485 Modbus (Slave), USB for configuration		2 x RS-485 Modbus (Slave, Master) USB for configuration
Baud rate	2400; 4800; 9600; 19.2 k; 38.4 k; 57.6 k; 115 k bit/s				1200; 2400; 4800; 9600; 19.2 k, 38.4 k, 57.6 k, 115.2 k bit/s		
Supply voltage	85...253 V a.c./d.c.; 20...50 V a.c./d.c.				85...253 V a.c./ 90...300 V d.c. 20...40 V a.c./ 20...60 V d.c.		
Protection rating	IP40						
External dimensions	22.5 x 120 x 100 mm	45 x 120 x 100 mm	22.5 x 120 x 100 mm	45 x 120 x 100 mm	45 x 120 x 100 mm	53 x 110 x 60 mm	



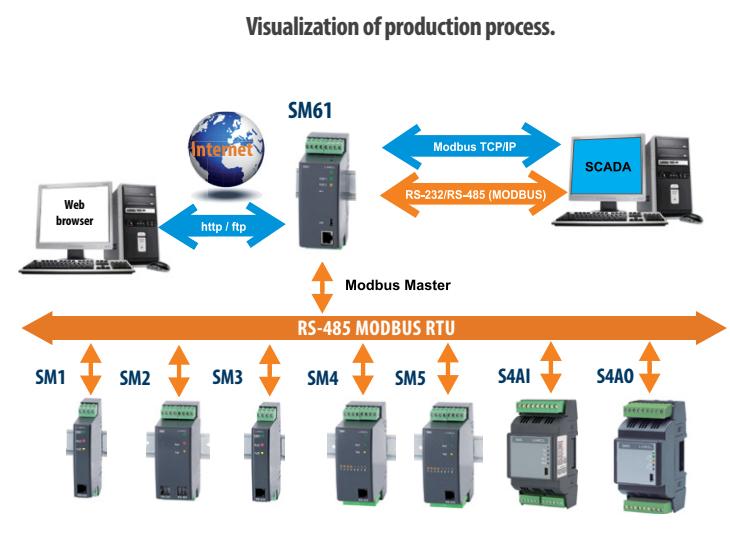
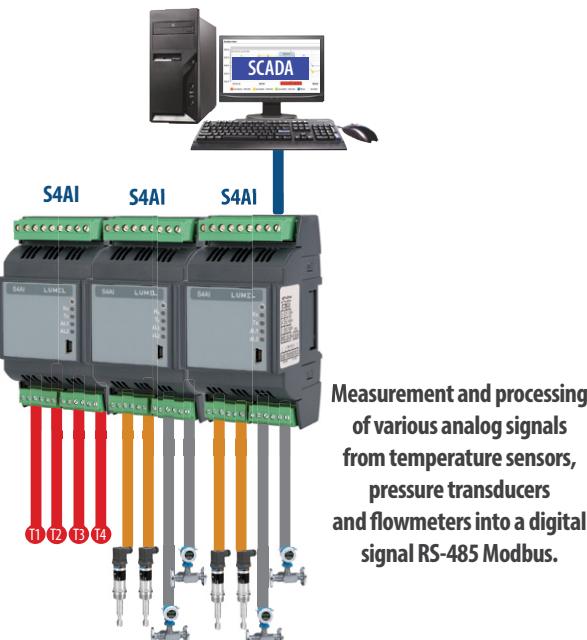
	Data loggers		
	PD22	SM61	HT25
Number of channels	up to 1000 digital channels	up 2500 digital channels	up to 16 channels (4 channels reserved for data logging from P18S/P18/P18D)
Input	Port I: Modbus RTU Master (50 groups 20 register each)	Port II: Modbus RTU Master (100 groups 25 registers each), 2 x logic	Modbus RTU Master
Output	Port II: Modbus RTU Slave	Port I: Modbus RTU/TCP Slave, 2 x relay	Modbus TCP/IP
Interface	3 x RS-485 (Modbus Slave and Master) 1 x RS-232 (Modbus Slave) USB Device 1.1.	2 x RS-485 (Modbus Slave and Master) 1 x RS-232 (Modbus Slave) USB Device 1.1. Ethernet 10/100 Base-T	1 x RS-485 (Modbus Slave or Master) Ethernet (WWW, FTP, SMTP, DHCP)
Memory	512 kB, 390.000 samples, 44.000 events	1 GB	8 GB
Supply voltage	85...253 V a.c./d.c. or 20...50 V a.c./d.c.	85...253 V a.c./ 90...300 V d.c. or 20...40 V a.c./ 20...60 V d.c. or 10...16 V a.c./ 10...20 V d.c.	12 V d.c. or PoE IEEE 802.3af - option
Protection rating	IP40		IP20
External dimensions	45 x 120 x 100 mm		150 x 100 x 30 mm
Additional functions	• RTC	<ul style="list-style-type: none"> • HTTP (web server - visualization in format of synoptic maps), • DHCP, • FTP server, • RTC 	<ul style="list-style-type: none"> • data presentation on a LCD display and on website • email messages in case of alarm occurs • acoustic signaling of alarm events • parameter configuration through a web browser • up to 90 monitored parameters (10 groups 9 register each) via web browser • up to 100 monitored parameters (10 group 10 register each) via Modbus TCP/IP • logging of 16 parameters (4 parameters reserved for P18S/P18/P18D)

I/O MODULES, COMMUNICATION MODULES



	Interface/protocol converters			Radio transmission module
	PD51	PD8	PD10	MR03
Interface 1	RS-232	RS-485, RS-232	RS-485	RS-232; RS-485
Interface 2	RS-485	Ethernet RJ45	USB	radio frequency 869.4 – 869.65 MHz
Interface 3	-	USB	-	-
Power output	-	-	-	500 mW
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 [bit/s]	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 56000 bit/s (RS-485) 10, 100 Mbit/s (Ethernet)	to 1 Mb/s	Port 1 - RS-232 1200...115200 bit/s Port 2 - RS-485 1200...115200 bit/s radio band 4800 bit/s
Distance	-	-	-	up to 1.5 km
Supply voltage	7...35 V d.c. or 20...24...40 V a.c./d.c. or 85...230...253 V a.c./d.c.	85...230...253 V a.c./d.c. 20...24...50 V a.c./d.c.	supplied from USB port	8...30 V a.c./d.c.
Protection rating frontal	IP40			IP54
Ambient temperature	0...23...55°C	-20...23...45°C	0...55°C	0...23...50°C
External dimensions	22.5 x 120 x 100 mm	45 x 120x 100 mm	52x44x24 mm	115x65x40 mm
Additional functions	• converter/repeater • galvanic isolation	• galvanic isolation • Digi RealPort®, TCP/IP, HTTP, ICMP, DHCP, ARP • Modbus TCP	• galvanic isolation	-

S4AI & S4AO APPLICATION EXAMPLE



Input/output modules							
SM1 ordering code:			SM2 ordering code:		SM3 ordering code:		
SM1 -	XX	X	X	XX	X	XX	X
Input:							
2 voltage inputs: 0...10V	00						
2 current inputs: 0/4...20mA	01						
1 voltage input + 1 current input: 0...10V + 0/4...20 mA	02						
2 resistance 0...400 Ω or Pt100 inputs	03						
custom-made*	XX						
Supply:							
85...253 V a.c./d.c.	1						
20...50 V a.c./d.c.	2						
Acceptance tests:							
without extra requirements	8						
with an extra quality inspection certificate	7						
acc. to customer's request*	X						
SM4 ordering code:							
SM4 -	X	X	XX	X			
Supply:							
85...253 V a.c./d.c.	1						
20...50 V a.c./d.c.	2						
Outputs:							
8 outputs of OC type	1						
4 relays	2						
Version:							
standard	00						
custom-made*	XX						
Acceptance tests:							
without extra requirements	8						
with an extra quality inspection certificate	7						
acc. to customer's request*	X						
SM5 ordering code:							
SM5 -	X	XX	X				
Supply:							
85...230...253 V a.c./d.c.	1						
20...24...50 V a.c./d.c.	2						
Version:							
standard	00						
custom-made*	XX						
Acceptance tests:							
without extra requirements	8						
with an extra quality inspection certificate	7						
acc. to customer's request*	X						

S4AI ordering code:					
S4AI -	X	X	XX	X	X
Inputs:					
4 programmable analog inputs: ±10 V - ±20 mA	1				
4 programmable analog inputs: Pt100, Pt500, Pt1000, J, K, S, ±150 mV	2				
acc. to customer's request*	X				
Supply voltage:					
85...253 V a.c., 90...300 V d.c.	1				
20...40 V a.c., 20...60 V d.c.	2				
Version:					
standard	00				
custom-made*	XX				
Language:					
Polish	P				
English	E				
other*	X				
Acceptance tests:					
without additional quality requirements	0				
with an extra quality inspection certificate	1				
acc. to customer's request	X				

S4AI AVAILABLE ACCESSORIES:
Accessories: the following accessories can be ordered together with input module S4AI:

- USB cable A/miniUSB-B - 1m black; order code: 20-069-00-00150
- modular connector of internal RS485 bus; order code: 24-171-01-0016,
- transition connector from internal RS485 bus to cable connector; order code 24-171-01-00017.

* - after agreeing with the manufacturer

S4AO ordering code:					
S4AO -	X	X	XX	X	X
Outputs:					
4 current outputs, 0...20 mA	1				
4 voltage outputs, 0...10 V	2				
2 sets of 1 voltage + 1 current output: 0...10 V / 0...20 mA	3				
acc. to customer's requirements*	X				
Supply voltage:					
85...253 V a.c., 90...300 d.c.	1				
20...40 V a.c., 20...60 V d.c.	2				
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 requirements*	X				

* - after agreeing with the manufacturer

Data logger				
PD22 ordering code:		SM61 ordering code:		
PD22 -	XX	X	XX	X
Version:				
standard	00			
custom-made*	XX			
Acceptance tests:				
without extra requirements	8			
with an extra quality inspection certificate	7			
acc. to customer's request*	X			
HT25 ordering code:				
HT25 -	X	X	XX	X
Supply*:				
12V d.c.	1			
12V d.c., PoE IEEE 802.3af	2			
Accessories:				
none	0			
adapter 12 V d.c.	1			
Version:				
standard	00			
custom-made**	XX			
Language:				
Polish	P			
English	E			
other**	X			
Acceptance tests:				
without additional quality requirements	0			
with an extra quality inspection certificate	1			
acc. to customer's request	X			

SM61 ordering code:					
SM61 -	X	X	XX	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				
10...16 V a.c., 10...20 V d.c.	3				
Input/output:					
2 relays	1				
2 logic inputs	2				
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

Interface/protocol converters				
PD51 ordering code:		PD8 ordering code:		
PD51 -	XX	XX	X	
Supply voltage:				
on-rail version: 85...230...253 V a.c./d.c.	A1			
20...24...40 V a.c./d.c.	A2			
7...24...35 V d.c.	A3			
portable version 9 V d.c.	B1			
Version:				
standard	00			
custom-made*	XX			
Acceptance tests:				
without extra requirements	8			
with an extra quality inspection certificate	7			
acc. to customer's request*	X			
PD10 ordering code:				
PD10 -	X	XX	X	
Galvanic isolation:				
with isolation	1			
Version:				
standard	00			
custom-made*	XX			
Acceptance tests:				
without extra requirements	8			
with an extra quality inspection certificate	7			
acc. to customer's request*	X			
Radio transmission modules				
MR03 ordering code:				
MR03 -	XX	X		
Version:				
standard	00			
custom-made*	XX			
Acceptance tests:				
without extra requirements	8			
with an extra quality inspection certificate	7			
acc. to customer's request*	X			

* - after agreeing with the manufacturer

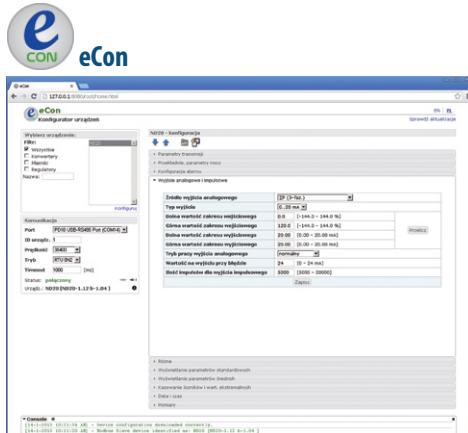
MR03 ordering code:			
MR03 -	XX	X	
Version:			
standard	00		
custom-made*	XX		
Acceptance tests:			
without extra requirements	8		
with an extra quality inspection certificate	7		
acc. to customer's request*	X		

* - after agreeing with the manufacturer

SOFTWARE TOOLS

eCon - Free Software for Configuration of Lumel Products

- Easy configuration of Lumel products
- Upload / download full configuration of a device connected to a PC computer using RS-485, Ethernet, USB or PD14 programmer (USB)
- Full device configuration can be saved to a file and stored on a PC computer for later use
- Firmware update for Lumel products
- Work over the web browser



PD10 – RS-485 to USB converter that can be used to configure using eCon a device equipped with RS-485

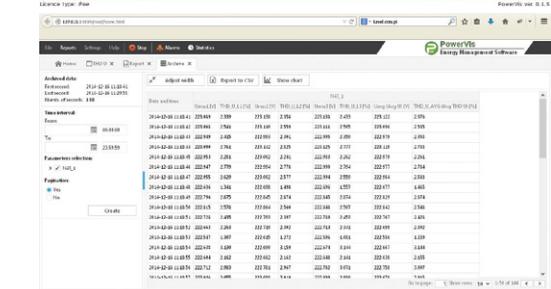
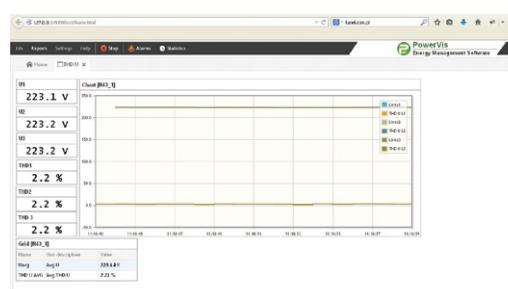
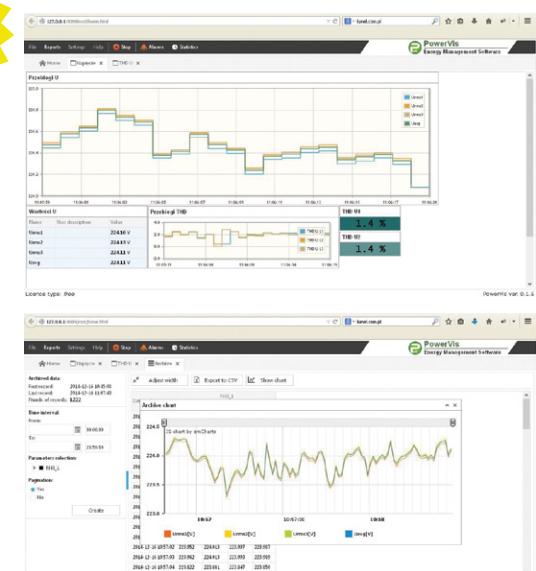
PD14 – programmer to configure non RS-485 devices using eCon

PROCESS VISUALIZATION SOFTWARE

PowerVis Software



- **NEW FUNCTION**: multiple user access with varying levels of authorization
 - meant for monitoring of power network parameters
 - works on all web browsers
 - simple and user-friendly configuration (specialist knowledge is not required)
 - user-friendly interface
 - dedicated for LUMEL meters and transducers
 - dedicated for other producers devices with Modbus or Modbus TCP protocols
 - visualization of parameters through: digital indications, trends and tables
 - data archiving
 - presentation of archived data through: tables and trends
 - export of archived data to CSV files
- **NEW FUNCTION**: signalling of alarm events (directly on computer screen or remotely via e-mail)
- remote access to PowerVis software through a web browser



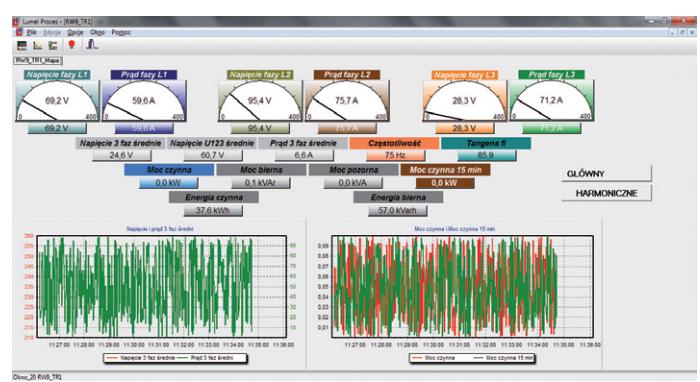
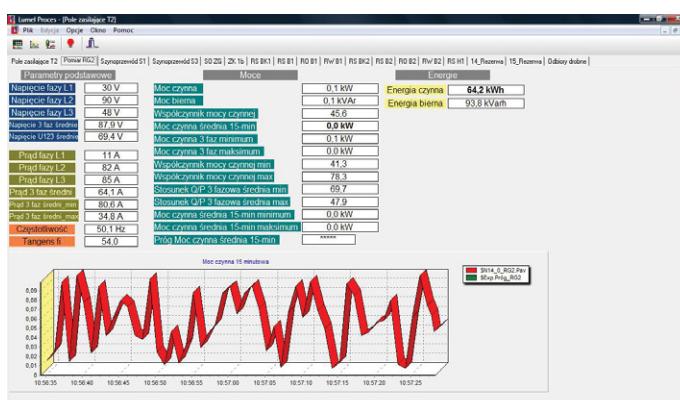
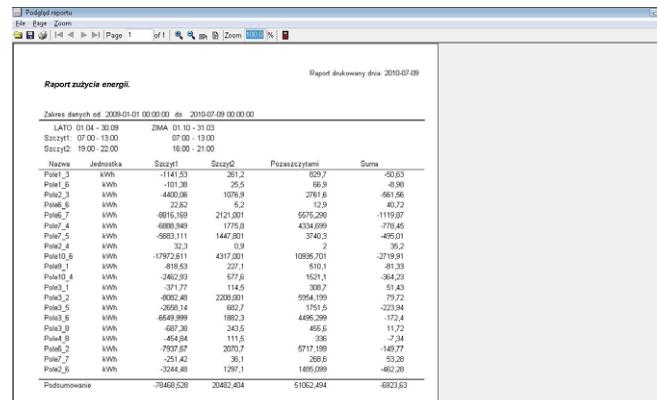
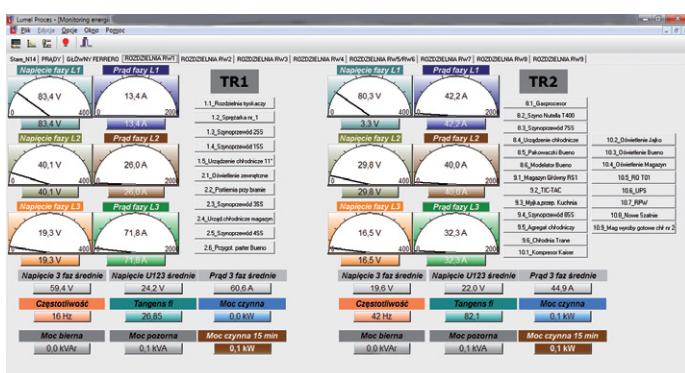
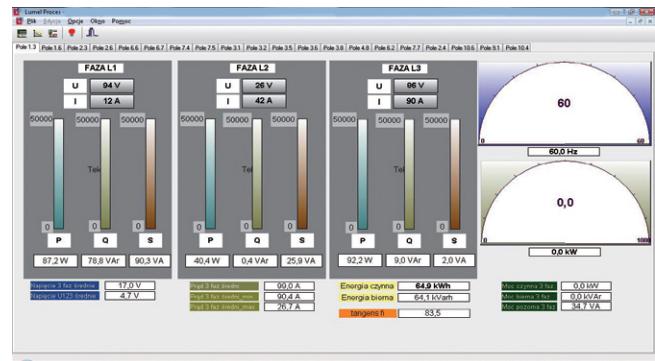


LUMEL-PROCESS Software

- modern integration and data presentation system,
- control and measurement applications for industrial installations, intelligent buildings, heat engineering, gas engineering, power engineering and laboratories,
- for systems built with the application of LUMEL's instruments, compatible with devices from other manufacturers,
- data exchange using Modbus transmission protocol,
- visualization of process parameters in form of mimic maps, tables, bargraphs and trends,
- remote configuration and control of devices,
- data logging,
- recording of alarm events in the system,
- data sharing with other applications using DDE data exchange protocol (DDE client),
- sharing data with other computers with a LUMEL Process software in the local computer network with the TCP/IP protocol,
- report templates,
- report monitoring on the base of archived data,
- report printing and export to pdf, txt, html formats,
- view of synoptic map via web browser!**

process
visualization

LUMEL-PROCESS
software



ANALOG PANEL METERS / SCALE: 90°



Moving-iron meters

	EB16	EA16	EA17	EA19	EA12
Type of scale			90°		
External dimensions	45 x 85 mm	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	-	✓ *	✓ *	✓ *	-
Measuring ranges:					
- current:	· direct · through a transformer*	100 mA ... 25 A xA x/5 A; xA/1 A		100 mA ... 100 A xA x/5 A; xA x/1 A	
(on request, with twice or six-times overload)					
- voltage:	· direct · through a transformer	6 V ... 600 V xV/100 V; xV/110 V		6 V ... 1000 V xV/100 V; xV/110 V	
Proof voltage	3 kV	2 kV			3 kV
Frequency of measured value			40...45...55...72 Hz		
Protection rating	IP52		IP52 (on request IP65)		IP52
Climate version	normal or tropical			normal, tropical or similar to marine	
Class			1.5		

* for current measurement up to ranges: 1 A, 1/2 A, 5 A, 5/10A), for voltage measurement - all ranges

** see our current transformers (page 40)



Moving-iron meters

	MA17(P)	MA19(P)	MA12(P)
Type of scale		90°	
External dimensions	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	✓	✓
Measuring ranges			
(direct):			
- current:	400 µA...1 A (30...1000...10 000 Hz) 1 A...6 A (49...50...51 Hz)		400 µA...1 A (30...1000...10 000 Hz)
- voltage:	60 mV...1.5 V (49...50...51 Hz) 2.5...600 V (30...1000...10 000 Hz)		2.5 V...600 V (30...1000...10 000 Hz)
Proof voltage	2 kV		2 kV
Protection rating	IP52 (on request IP65)		IP52
Climate version		normal, tropical or similar to marine	
Class		1.5	



3-phase voltmeters

	EP27	EP29
Type of scale		90°
External dimensions	72 x 72 mm	96 x 96 mm
Interchangeable scale	✓	✓
Voltage measuring ranges:		
- direct phase-to-phase:		
- through a transformer:	500 V xV/100 V; xV/110 V	
Frequency	40...45...55...72 Hz	
Proof voltage	3 kV	
Protection rating	IP52	
Climate version	normal	
Class	1.5	

Type of scale

External dimensions

Interchangeable scale

Power measuring ranges

Frequency

Proof voltage

Protection rating

Climate version

Class

Power meter

PA39

90°

96 x 96 mm

✓

50W...1000 MW
or 50 var...1000 Mvar

50 Hz, 60 Hz or 400 Hz

2 kV

IP52 (on request IP65)

normal, tropical or similar to marine

1.5

ANALOG PANEL METERS / SCALE: 90°



Moving-coil meters

	MB16	MA16	MA17	MA19	MA12
Type of scale			90°		
External dimensions	45 x 85 mm	48 x 48 mm	72 x 72 mm	96 x 96 mm	144x 144 mm
Interchangeable scale	-	✓	✓	✓	-
Measuring ranges:					
- current:					
· direct measurement					
· indirect measurement (through the shunt*)					
- voltage:					
· direct measurement					
· indirect measurement (through the shunt*)					
Proof voltage	3 kV			2 kV	
Protection rating	IP52		IP52 (on request IP65)		IP52
Climate version	normal or tropical			normal, tropical or similar to marine	
Rated operational conditions:					
- ambient temperature			5...23...55°C		
- relative air humidity			25...85%		
Class			1.5		

* see our shunts (page 42)



Max demand ammeters - Bimetalic or Bimetalic and moving-iron

	BA27	BA39	BE27	BE39
Type of scale		90°		
External dimensions	72 x 72 mm	96 x 96 mm	72 x 72 mm	96 x 96 mm
Interchangeable scale	✓	✓	✓	✓
Measuring ranges:				
- bimetalic element:				
· direct measurement				
· indirect measurement (through a transformer*)				
- moving-iron element:				
· direct measurement				
· indirect (through a transformer*)				
Proof voltage		3 kV		
Protection rating		IP40 (on request IP65)		
Climate version		normal or tropical		
Class	3			3 (1.5)

* see our current transformers (page 40)



Power factor and frequency meters

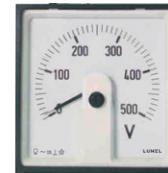
	FA39	FA32	CA37	CA39	CA32
Type of scale			90°		
External dimensions	96 x 96 mm	144 x 144 mm	72 x 72 mm	96 x 96 mm	144x 144 mm
Interchangeable scale	✓	✓	✓	✓	✓
Measuring ranges					
0.5 _{Cap} ...1...0.5 _{IND} .					
0.8 _{Cap} ...1...0.2 _{IND} .					
0.85 _{Cap} ...1...0.85 _{IND} .					
0 _{IND} ...1					
45...50...65 Hz					
Frequency					
Proof voltage			2 kV		
Protection rating	IP52 (IP65 on request)	IP52		IP52 (IP65 on request)	
Climate version				normal, tropical or similar to marine	
Class	1.5			0.5	

ANALOG PANEL METERS / SCALE: 240°



Moving-coil meters

	MA16L	MA17L	MA19L	MA12L
Type of scale			240°	
External dimensions	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	✓	✓	✓
Measuring ranges:				
- current:			40 µA...60 A	
- voltage:			60 mV...600 V	
Proof voltage	2 kV		3 kV	
Protection rating		IP52 (IP65 on request)		IP52
Climate version			normal	
Rated operational conditions:				
- ambient temperature			5...23...55°C	
- relative air humidity			25...85%	
Class			1.5	



Moving-iron meters

	MA16L(P)	MA17L(P)	MA19L(P)	MA12L(P)
Type of scale			240°	
External dimensions	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	-	-	-	-
Measuring ranges				
- current:			100 mA, 1 A 5 A, 10 A	
- voltage:			6 V...600 V	
Proof voltage			2 kV	
Protection rating		IP52 (IP65 on request)		IP52
Climate version			normal	
Class			1.5	



Power factor and frequency meters

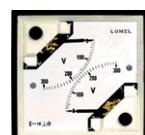
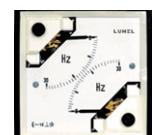
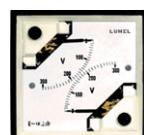
	FA39L	FA32L	CA39L	CA32L
Type of scale			240°	
External dimensions	96 x 96 mm	144 x 144 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	✓	✓	✓
Measuring ranges				
	0.5 _{Cap}1...0.5 _{IND} .		45....50....55Hz	
	0.8 _{Cap}1...0.3 _{IND} .		45....55....65Hz	
	0.8 _{Cap}1...0.8 _{IND} .		55....60....65Hz	
Frequency	49...51 Hz (1-phase) 45...65 Hz (3-phase)		360...400...440Hz 380...400...420Hz	
Proof voltage		2 kV		
Protection rating	IP52 (IP65 on request)	IP52	IP52 (IP65 on request)	IP52
Climate version			normal	
Class			0.5	

ANALOG PANEL METERS / SCALE: 240°



	Power meter	
	PA39L	PA32L
Type of scale	240°	
External dimensions	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	
Power measuring ranges	50 W...1000 MW or 50 var...1000 Mvar	
Frequency	50 Hz, 60 Hz or 400 Hz	
Proof voltage	2 kV	
Protection rating	IP52 (on request IP65)	IP52
Climate version	normal	
Class	1.5	

DUAL ANALOG PANEL METERS / 2 IN 1 / SCALE: 90°



	Dual moving-iron meters	Dual frequency meters	Dual moving-coil meters
	EA19D	CA39D	MA19D
Type of scale	90°		
External dimensions	96 x 96 mm		
Interchangeable scale	✓	✓	✓
Measuring ranges	150...600 V; xV/100V ; xV/110V 4...60 A; xA x/5A; xA/1A	45....50....55 Hz 45....55....65 Hz 55....60....65 Hz 360...400...440 Hz 380...400...420 Hz	1000 μ A...30 A 60 mV...600 V 40 mV...1000 V
Proof voltage	3 kV	2 kV	3 kV
Parameters of measured signal	45...65 Hz	-	-
Protection rating		IP52 (on request IP65)	
Climate version		normal	
Class	1.5	0.5	1.5

ORDERING CODES

A.C. Ammeters and A.C. Voltmeters EA and EB

Please, specify in the order:

- name and meter type
- measuring range
- overload value – only for current ranges
- data of measuring transformers – if the meter is foreseen to co-operate with transformers
- working position
- meter climate version – only for tropical versions or similar to marine
- extra requirements if necessary.

Ordering example: voltmeter of EA17 type, 500 V range, direct measurement, vertical 90° working position, scale consistent to the range, without extra requirements.

D.C. and A.C. Ammeters and Voltmeters MA, MB

Please, specify in the order:

- name and meter type
- measuring range
- zero position or data of the shunt – if the meter is foreseen to co-operate with an interchangeable shunt
- working position
- meter climate version - only for tropical versions or similar to marine
- extra requirements if necessary

One must order the shunt separately.

When ordering meters for a.c. current or voltage, add „with rectifier” to the meter name.

Ordering example: ammeter of MA16 type, 40 A range, to co-operate with shunt of B2 40 A/60 mV type, vertical 90° working position, scale consistent to the range, without extra requirements. If the shunt has to be delivered with the meter, one must place it in the order as a separate item, e.g. shunt B2 40 A/60 mV.

A.C. VOLTMETERS EP

Please, specify in the order:

- name and meter type
- measuring range
- data of measuring transformers – if the meter is foreseen to co-operate with transformers
- working position
- meter climate version - only for tropical versions or similar to marine
- extra requirements if necessary.

Ordering example: voltmeter of EP27 type, 500 V range, direct measurement, vertical 90° working position, scale according to the range, without extra requirements.

DEFAULT PARAMETERS

- climate version: normal
- protection grade: IP52
- working position: 90°
- scale according to the measuring range
- without an inspection certificate and extra requirements

POWER METERS PA39

POWER METER PA39									
PA39 -	X	X	X	X	X	XX	X		
Kind of measured power and measuring element:									
measurement of active power in 1-phase network									
measurement of active power in a 3-phase network, 3-wire balanced network	A								
measurement of active power in a 3-phase network, 3-wire unbalanced network	B								
measurement of active power in a 3-phase network, 4-wire balanced network	C								
measurement of active power in a 3-phase network, 4-wire unbalanced network	D								
measurement of reactive power in a 3-phase network, 3-wire balanced network	E								
measurement of reactive power in a 3-phase network, 3-wire unbalanced network	F								
measurement of reactive power in a 3-phase network, 4-wire balanced network	G								
measurement of reactive power in a 3-phase network, 4-wire unbalanced network	H								
input voltage:									
write in the range code Un from the table 7									
frequency of the input voltage:									
50 Hz									
60 Hz									
400 Hz									
input current:									
write in the range code In from the table 7									
power flow direction:									
unidirectional, zero on the left side of the scale									
bidirectional, zero in the middle side of the scale									
work position:									
write in the position code from the table 9									
version:									
standard									
custom-made									
acceptance tests:									
without extra requirements									
with an extra quality inspection certificate									
other requirements									

TABLE 7																						
In/x	IN Code	Power unit	Un Code																			
			T	U	A	V	W	B	C	D	E	F	G	H	I	K	L	M	N	P	R	S
1	— A1		50	100	200	250	400	600	800	1,2	5	10	15	25	30	50	80	100	200	400	800	
5; 5/x	B5 B1	W	250	500	1	1,2	2	2	3	4	6	25	50	60	120	150	250	400	500	1	2	4
10/x	C5 C1		500	1	2	2,5	4	4	6	8	12	50	100	150	250	300	500	800	1	2	4	
15/x	D5 D1		800	1,5	3	4	6	8	10	12	15	80	150	250	400	500	800	1,2	1,5	2,5	5	
20/x	E5 E1		1,2	2	4	6	8	12	15	20	100	200	300	500	600	1	1,5	2	4	8		
30/x	F5 F1		1,5	3	6	8	12	12	20	25	30	150	300	500	800	1	2	3	5	10		
50/x	G5 G1																				20	
75/x	H5 H1																				40	
100/x	I5 I1																				80	
150/x	J5 J1																				120	
200/x	K5 K1																				150	
300/x	L5 L1																				200	
400/x	M5 M1																				300	
600/x	N5 N1																				400	
800/x	P5 P1																				600	
1000/x	R5 R1																				800	
1200/x	S5 S1																				1000	
1500/x	T5 T1																				1200	
2000/x	U5 U1																				1500	
3000/x	V5 V1																				2000	
4000/x	W5 W1																				3000	
6000/x	X5 X1																				4000	
10000/x	Y5 Y1																				6000	
20000/x	Z5 Z1	MW/Mvar																			10000	

MAX DEMAND AMMETERS BA AND BE									
BIMETALLIC METERS BA27, BE27, BA39, BE39									
BA27, BE27, BA39, BE39 -	X	X	XXXX	X	X	X	X		
Version:									
standard, to fix in a panel	1								
direct fixing on the transformer (only BA27)	2								
custom-made version ¹⁾	X								
Climatic categories:									
standard version	N								
tropical version	T								
custom-made version ²⁾	X								
Ranges:									
acc. to the table 8 (write the code, e.g.: F205)	XXXX								
Setting time of the bimetallic element:									
15 minutes	0								
8 minutes	2								
Working position:									
acc. to the table 9	X								
Signts on the dial and markings:									
dial with a standard scale (consistent to the range)	0								
dial execution acc. to the order ³⁾	X								
Acceptance tests:									
without extra requirements	8								
with an extra quality inspection certificate	7								
other requirements ³⁾	X								

1) - the code number is established by the manufacturer
2), 3) - all extra requirements must be agreed with the manufacturer

TABLE 8.									
CODE RANGE	RANGE DESCRIPTION (MEASURING RANGE)	CODE RANGE	RANGE DESCRIPTION (MEASURING RANGE)						
F201	1.2 A	F366	1920 A 1.6k/1						
F205	6 A	F4	1.2 XA X/5						
F3	1.2X A X/1	F405	6 A 5/5						
F301	1.2 A 1/1	F406	7.2 A 6/5						
F305	6 A 5/1	F407	12 A 10/5						
F306	7.2 A 6/1	F408	18 A 15/5						
F307	12 A 10/1	F409	24 A 20/5						
F308	18 A 15/1	F411	36 A 30/5						
F309	24 A 20/1	F412	48 A 40/5						
F311	36 A 30/1	F413	60 A 50/5						
F312	48 A 40/1	F414	72 A 60/5						
F313	60 A 50/1	F415	96 A 80/5						
F314	72 A 60/1	F416	120 A 100/5						
F315	96 A 80/1	F417	180 A 150/5						
F316	120 A 100/1	F418	240 A 200/5						
F317	180 A 150/1	F420	360 A 300/5						
F318	240 A 200/1	F421	480 A 400/5						
F320	360 A 300/1	F422	600 A 500/5						
F321	480 A 400/1	F423	720 A 600/5						
F322	600 A 500/1	F424	960 A 800/5						
F323	720 A 600/1	F450	1200 A 1k/5						
F324	960 A 800/1	F451	1800 A 1.5k/5						
F350	1200 A 1k/1	F452	2400 A 2k/5						
F351	1800 A 1.5k/1	F454	3600 A 3k/5						
F352	2400 A 2k/1	F455	4800 A 4k/5						
F354	3600 A 3k/1	F456	6000 A 5k/5						
F355	4800 A 4k/1	F457	7200 A 6k/5						
F356	6000 A 5k/1	F459	12000 A 10k/5						
F357	7200 A 6k/1	F465	1440 A 1.2k/5						
F359	12000 A 10k/1	F466	1920 A 1.6k/5						
F365	1440 A 1.2k/1								

TABLE 9.									
Work position	Code								
	EB16	MB16	MA16 EA16	other meters					
c3, α = 90°	A	A	A	0					
c1, α = 0°	B	B	B	A					
c2, α = 15°		C	C	B					
c2, α = 30°		D	D	C					
c2, α = 45°		E	E	D					
c2, α = 60°	F	F	E						
c2, α = 75°	G	G	F						
c4, α = 105°	H	H	H						
c4, α = 120°	I	I	I						

POWER FACTOR METERS FA									
POWER FACTOR METERS FA39 AND FA32									
FA39 and FA32 -	X	X	X	XX	X	XX	X		
Measurement of power factor:									
in 1-phase system	1								
in 3-phase system, in a 3-phase balanced network	3								
Measuring range:									
0.5 cap...1...0.5 ind	A								
0.8 cap ...1...0.2 ind	B								
0.85 cap ...1...0.85 ind	C								
0_cap ...1	D								
Input current:									
1 A	1								
5 A	5								
Input voltage:									
60 V (only for measurement in a 1-phase system)	01								
100 V	02								
110 V	03								
230 V	04								
400 V	05								
415 V (only for measurement in a 3-phase system)	06								
440 V (only for measurement in a 3-phase system)	07								
500 V (only for measurement in a 3-phase system)	08								
on request - after agreeing with the manufacturer	XX								
Working position:									
acc. to the table 9	X								
Version:									
standard	00								
custom-made*	XX								
Acceptance tests:									
without extra requirements	8								
with an extra quality inspection certificate	7								
other requirements*	X								

FREQUENCY METERS CA									
FREQUENCY METERS CA32, CA37, CA39									
CA32, CA37, CA39 -	X	X	X	XX	X	XX	X		
Frequency range:									
45...55 Hz	1								
45...65 Hz	2								
48...52 Hz	3								
55...65 Hz	4								
58...62 Hz	5								
140...160 Hz	6								
180...220 Hz	7								
360...440 Hz	8								
380...420 Hz	9								
Range voltage:									
60 V	1								
100 V	2								
110 V	3								
230 V	4								
400 V	5								
415 V	6								
440 V	7								
500 V	8								
690 V	9								
Working position:									
acc. to the table 9	X								
Version:									
standard	00								
custom-made*	XX								
Acceptance tests:									
without extra requirements	8								
with an extra quality inspection certificate	7								
other requirements*	X								

* - after agreeing with the manufacturer

CURRENT TRANSFORMERS



LCTM series

LCTM current transformers with a primary winding		
	LCTM 62/W (40)	LCTM 74W (45)
Primary current [A]	1...30	1...60
External dimensions	40 x 62 mm	45 x 74 mm
Accuracy class		0.2; 0.5; 1



LCTR series

LCTR current transformers for a round conductor				
	LCTR 45/14(40)	LCTR 50/14 (30)	LCTR 50/14 (50)	LCTR 62/R
Primary current[A]	30..300	40...300	30...300	50...600
Hole diameter	Ø14	Ø14	Ø14	Ø22
Accuracy class		0.5; 1		0.2; 0.5; 0.5; 1



LCTB 45

LCTB current transformers for a bar conductor					
	LCTB 45/21 (40)	LCTB 50/21 (30)	LCTB 50/21 (50)	LCTB 62/20 (40)	LCTB 74/20 (45)
Primary current [A]	50...400	50...400	50...400	50...400	30...400
Hole diameter	Ø20	Ø21	Ø21	-	Ø20
Busbar (mm)	20 x 10	20x10	20x10	20 x 12 2 x 15 x 6	20 x 10
Accuracy class	0.5; 1	0.5; 1; 3	0.5; 1	0.2S; 0.2; 0.5S; 0.5; 1	0.2S; 0.2; 0.5S; 0.5; 1; 3
	LCTB 50/30 (30)	LCTB 50/30 (30)	LCTB 50/30 (30)	LCTB 50/30 (30)	LCTB 50/30 (30)



LCTB 74

LCTB 86

LCTB current transformers for a bar conductor					
	LCTB 50/30 (50)	LCTB 62/30 (40)	LCTB 62/30 (50)	LCTB 74/30 (45)	LCTB 62/40 (40)
Primary current [A]	75...600	50...800	40...800	30...800	100...800
Hole diameter	Ø26	Ø30	Ø28	Ø26	Ø31
Busbar (mm)	30x10; 20x15; 20x20; 2x20x10	30x10 2x25x10	30x10 2x25x10	30x15 2x20x10	40x10 2x30x10
Accuracy class	0.5; 1	0.2S; 0.2; 0.5S; 0.5; 1		0.2S; 0.2; 0.5S; 0.5; 1; 3	0.2S; 0.2; 0.5S; 0.5; 1
	LCTB 86/40 (45)				



LCTB 104

LCTB 86

LCTB current transformers for a bar conductor					
	LCTB 74/40 (45)	LCTB 74/50 (45)	LCTB 86/50 (45)	LCTB 86/60 (45)	LCTB 104/60 (45)
Primary current [A]	40...1000	100...1000	100...1250	100...1600	100...1600
Hole diameter	Ø35	Ø41	Ø46	Ø51	Ø54
Busbar (mm)	40x12 2x30x15	50x12 2x40x10	50x12 2x40x15	60x12 2x50x15	60x12 2x40x20 80x12 2x60x15 2x50x25
Accuracy class				0.2S; 0.2; 0.5S; 0.5; 1	



	LCTB current transformers for a bar conductor			
	LCTB 140/80 (45)	LCTB 140/100H (45)	LCTB 225/125 (50)	LCTB 225/167 (50)
Primary current [A]	200...2000	200...4000	600...6000	1000...7500
Hole diameter	Ø72	Ø86	-	-
Busbar (mm)	80x30 2x60x25	100x30 2x80x25 2x70x30	124x93	166x65
Accuracy class		0.2S; 0.2; 0.5S; 0.5; 1		

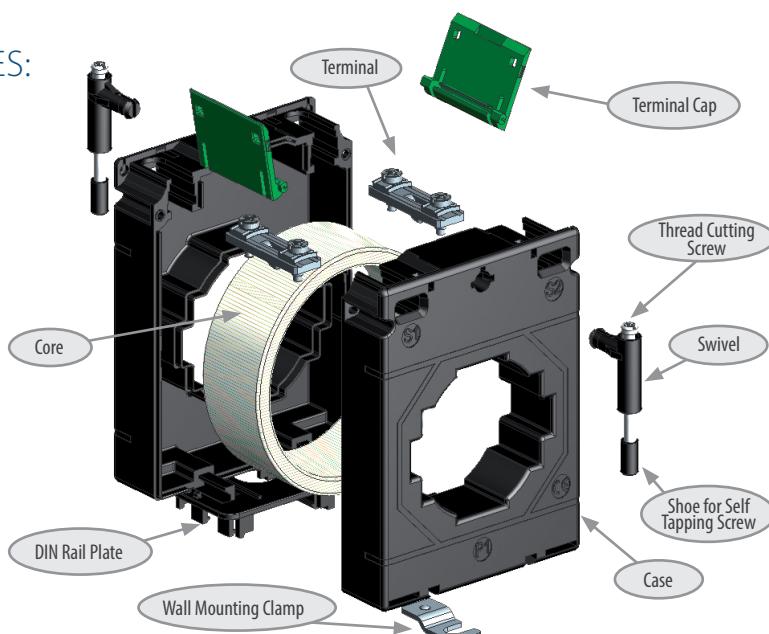
	LCTB current transformers for a bar conductor			
	LCTB 100/100V (45)	LCTB 140/100V (45)	LCTB 100/130V (45)	LCTB 140/130V (45)
Primary current [A]	400...2500	200...3000	400...3200	400...5000
Hole diameter	-	-	-	-
Busbar (mm)	41 x 103	100x30 2x80x25 2x70x30	38 x 128	70 x 130
Accuracy class	0.2S; 0.2; 0.5S; 0.5; 1	0.2; 0.5; 1	0.2; 0.5; 1	0.2; 0.5; 1

	LCTS split core current transformers			
	LCTS 93/30SC (40)	LCTS 125/50SC (40)	LCTS 155/80SC (40)	LCTS 195/80SC (64)
Primary current [A]	100...400	250...1000	250...3000	500...5000
Hole dimensions (depth x width) [mm]	23 x 33	85 x 54	85 x 125	82 x 162
Accuracy class		0.5; 1		

	LCTP 3-phase current transformers				
	LCTP 75/15(60)	LCTP 105/21(40)	LCTP 140/31(40)	LCTP 185/27(45)	LCTP 185/37(45)
Primary current [A]	100...160	100...250	250...630	100...500	300...800
Hole diameter [mm]	-	-	-	Ø27	Ø37
Busbar (mm)	14 x 24	20 x 24	31 x 36	-	-
Accuracy class	0.5; 1			1	

We offer: On customers request we offer transformer calibration certificates.

ACCESSORIES:



MORE INFORMATION IN OUR CATALOG:



SHUNTS / CLASS 0.2, 0.5



	B1	B2	B3	B4	B5	B6
Voltage drop	30 mV	60 mV	150 mV	50 mV	75 mV	100 mV
Rated current	1 A...15 kA (1; 1.5; 2.5; 4; 6 and their decimal multiples)					
Accuracy class	0.2 or 0.5 for ranges 1...2.5 kA 0.5 for ranges > 2.5 kA					

- all shunts from 1...25 A are fixed on insulating basis with the possibility to be mounted on a DIN rail
- shunts of other ranges are fixed directly on the DC rail or cable
 - dimensions acc. DIN 43703
- shunts 40...150 A - insulating base as a option for B2, B4, B5 types
- on request additional chemical coating available: lacquering, silver or nickel plating



plate
shunts

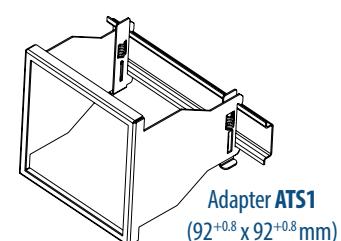
	BP4
Voltage drop	50 mV
Rated current	5 A...500 A
Accuracy class	0.5

- Custom-made executions are available on request (voltage drop, current).

ADAPTER FOR DIN RAIL TS35

- Designed for mounting of panel instruments on the DIN rail TS35.

	Adapter ATS				
	ATS1	ATS2	ATS3	ATS4	ATS5
Hole dimensions (width x height) [mm]	92 ^{+0.8} x 92 ^{+0.8}	92 ^{+0.8} x 45 ^{+0.6}	68 ^{+0.7} x 68 ^{+0.7}	45 ^{+0.6} x 92 ^{+0.8}	45 ^{+0.6} x 45 ^{+0.6}
Panel instruments dimensions (width x height) [mm]	96 x 96	96 x 48	72 x 72	48 x 96	48 x 48



ENLARGING FRAME

- Designed to reduce the mounting hole from 96 x 96 mm to 48 x 96 mm or 96 x 48 mm.

Ordering code: CZ/996-001





PKT1 - changeover



PKT2 - multi-step



PKT3 - isolator



PKT4 - selector switch

PKT1, PKT2, PKT3, PKT4

PARAMETERS	UNIT	6 A	10 A	16 A	20 A
Rated operational voltage (Ue)	V	440	440	690	690
Rated insulation voltage (Ui)	V	440	440	690	690
Rated uninterrupted current (Ith)	A	8	12	20	25
Rated short time withstand current (Icw)	A	72	120	192*	240*
Rated impulse withstand voltage (Uimp)	kV	4	4	4	4
Rated Fuse short circuit current	kA	3	3	5	5

* Rated short time withstand current (0.5s- current)

RATED OPERATING CONDITIONS

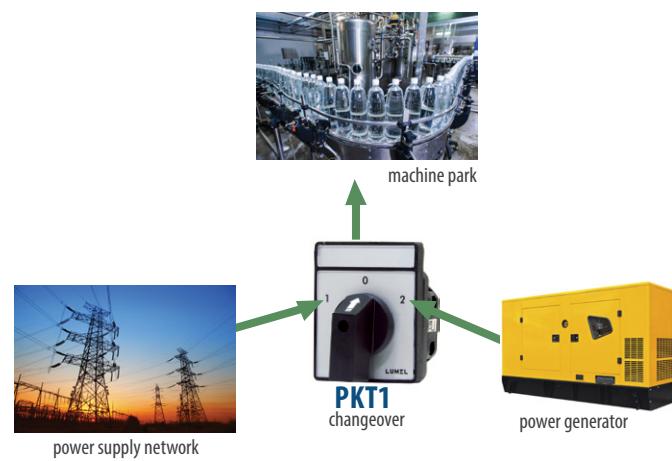
Frequency	50/60 Hz		
Operating temperature	-25°C...60°C		
Installation category	III		
Protection grade	IP50 from frontal side IP20 from terminal side		
Standards	IEC 60947-1, IEC 60947-3, IEC 60947-5		
SWITCH LIFE			
Mechanical Life	100 000 operations at 300 cycles/hr		
Electrical Life	10 000 operations at 100% rated duty at 120 cycles/hr		



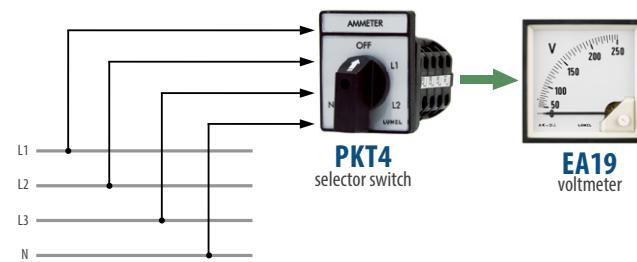
- all cam switches available in yellow-red version
(colour of background and knob can be selected in the ordering code and additional one can order separately the background-knob-combination as accessories- see data sheet)

PKT APPLICATION EXAMPLES

Switching on the (emergency) power supply.



Measurement of phase-to-phase voltage using only one voltmeter.





NP40

Portable power quality analyzer

- half cycle RMS measurement (voltage and current);
- measurement of TRMS currents up to 3000 A (with standard sensor);
- measurement in 1-phase and 3-phase systems (3 - and 4-wire);
- measurement of voltage, current, harmonics, power, energy, inrush current, flicker and other;
- graphical presentation of data in a waveform and vector diagram;
- record of events: dips, swells, over voltages;
- power quality according to EN-50160 standard or user-defined limit;
- internal memory for data logging needs (continuous registration from 2 hours to 7 days), the registration frequency from 1 second up to 60 minutes;
- built-in 8G memory card;
- Ethernet interface for remote operation of the analyzer;
- USB Host to move archive data and screenshots to an external USB memory;
- safety standards: EN 61010-1, CAT III 1000V / CAT IV 600V;
- 5,6" TFT color screen, 320 x 240 pixel;
- waveform real-time display (4 voltages/4 currents).



NP15

TRUE RMS digital multimeter
with data logger & view function

- voltage measurement of AC, DC and AC / DC up to 1000V;
- current measurement of AC, DC and AC / DC up to 10A;
- low input impedance;
- measurement of TRMS effective;
- data logging & view function (up to 32000 readings);
- 100 kHz bandwidth for voltage measurement;
- resistance measurement;
- frequency and duty cycle measurement;
- temperature measurement with J, K, Pt100 & Pt1000 sensors;
- capacitance measurement;
- automatic / Manual measuring range selection;
- low-pass filter mode with a cutoff frequency of 1kHz;
- voltage noise measurement and suppression (dB);
- square wave signal generator;
- continuity test and diode test;
- function: Backlight, Relative / Zero, Auto Hold, Min / Max / Avg;
- acoustic signal indicating the overrange (Go / NoGo);
- information on dangerous voltage at the terminals;
- external power supply;
- fuse 16 A for all current measurement ranges to protect the device.



NP10

Digital multimeter

- capacitance from 1pF...40.00 mF with zero correction;
- direct and alternating voltages from 100 µV ... 1000 V;
- direct and alternating currents from 10 µA ... 10.00 A;
- resistance from 100 mΩ... 60.00 MΩ;
- frequencies from 10.00 Hz ... 10 MHz;
- diode measurement and continuity testing;
- hold measurement- the value can be held and display simultaneously;
- relative measurement by pressing and holding PEAK and then pressing AUTO/MAN key;
- duty cycle (%) measurement;
- temperature measurement with 'K' type Thermocouple (NiCr – Ni) in the range from 0°C to 1300°C acc. to EN 60584;
- peak value measurement.



MORE INFORMATION
IN OUR CATALOG:





NC14

Power clamp-on meter

- AC & DC voltage measurement up to 1000 V;
- AC & DC current measurement in the range of 1000 A / 400 A;
- inrush/peak value measurement;
- active, reactive and apparent power measurement;
- power measurement in KM;
- energy consumption measurement in kWh;
- measurement up to 49th harmonics;
- phase angle measurement;
- THD measurement;
- DF measurement;
- crest factor /CF/ measurement;
- power factor /PF/ measurement;
- LPF mode.



NC12

Clamp-on meter

- current measurement up to 300 and 1000 A AC;
- measuring voltage up to 1000 V AC / DC;
- measuring temperature from -200°C to 800°C (Pt100 and Pt1000);
- the diameter of measured cable 50 mm (the meter up to 1000A);
- the diameter of measured cable 40 mm (the meter to 300A);
- illuminated digital display with analog indicator;
- a number of features:
- HOLD - Stop function currently displayed measured value,
- MIN, MAX - recording the minimum and maximum values measured;
- auto power off;
- an adjustment of the resistance or capacitance - for low measuring low resistance or capacitance, resistance wire or stray capacitance for a range of nF can be compensated by pressing the Shift;
- automatic and manual mode;
- available measuring function diodes and transistors;
- degree of protection IP20.



NT10

Insulation meter



- insulation resistance measurement up to 3 GΩ;
- measurement of DC and AC voltage in the range of 30 mV...1000 V;
- measurement of DC and AC current in the range of 300 µA...300 mA;
- resistance measurement 30 Ω...30 MΩ;
- capacity measurement 30 nF...30 µF;
- frequency measurement 300 Hz...100 kHz;
- measuring the fill factor (%);
- HOLD Function;
- temperature measurement in the range of -200...800°C / Pt100/ Pt1000;
- analog scale.

ORDERING CODES

NP40 ordering code:					
NP40-	X	XX	X	X	
Additional equipment:					
lack	0				
4 pcs. Rogowski coils PY 3000 A	1				
4 pcs. Rogowski coils PY 5000 A	2				
4 pcs. current clamps KLC8C 5 A	3				
4 pcs. current clamps CTC0080 50 A	4				
4 pcs. current clamps CTC0130 100 A	5				
4 pcs. current clamps CTC1535 1000 A	6				
Version:					
standard	00				
custom-made*	XX				
Language:					
Multilanguage (Polish/ English)	M				
other*	X				
Acceptance tests:					
without extra requirements	0				
with an extra quality inspection certificate	1				
acc. to customer's request	X				

NP15 ordering code:					
NP15-	X	XX	X	X	
Type:					
NP15-2	2				
NP15-3	3				
NP15-5	5				
NP15-6	6				
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				
with test certificate	2				
acc. to customer's request	X				

NP10 ordering code:					
NP10-	X	XX	X	X	
Type:					
NP10-2	2				
NP10-3	3				
NP10-5	5				
NP10-6	6				
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				
with test certificate	2				
acc. to customer's request	X				

NC14 ordering code:					
NC14-	X	XX	X	X	
Maximal range of current measurement a.c./d.c.:					
400 A	1				
1000 A	2				
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				
with test certificate	2				
acc. to customer's request	X				

NC12 ordering code:					
NC12-	X	XX	X	X	
Maximal range of current measurement a.c./d.c.:					
300 A	1				
1000 A	2				
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				
with test certificate	2				
acc. to customer's request	X				

NT10 ordering code:					
NT10-	XX	X	X		
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				
with test certificate	2				
acc. to customer's request	X				

* - after agreeing with the manufacturer

HIGH ACCURACY SERIES

HIGH ACCURACY LABORATORY EQUIPMENT



Digital Multimeter

	HA-DMA512	HA-DMA612
Measuring quantity	d.c. voltage and current, a.c. voltage and current, resistance, capacity, frequency, temperature	
Additional measuring functions	reading range, auto range, diode test, continuity, null, tigger, save/read, math	
Safety	IEC61010-1: 2010, CAT I 1000V/CAT II 600V, Pollution level: 2	
Interface	USB, RS-232	
Power supply	115 V/230 V (1±10%), 50 Hz/60 Hz, 15 VA	
Dimensions & weight	260 × 106 × 375 mm, 3.0 kg	
Additional functions	<ul style="list-style-type: none"> • VFD display with high-brightness • True digits 5½ (HA-DMA512) and 6½ (HA-DMA612). • Reading rates up to 1000 readings per second. • True RMS measurement of AC voltage and current. • Built-in math operations. • Full measuring functions to meet user's test need. 	



Programmable DC power supply

HA-PSA3515

Output range	35 V / 15 A
Output power	500 W
Resolution	1 mV/ 1 mA
Accuracy	voltage: ≤± (0.05% + 10 mV) current: ≤± (0.2% + 50 mA) OVP: ≤± (0.5% + 0.5 V)
Interface	RS-232
Power supply	AC 115-230 V (1±10%)V, 50 (1±5%) Hz
Dimensions & weight	425 × 150 × 465 mm, 20 kg
Additional functions	<ul style="list-style-type: none"> • All digital controlled, output 1mV/1mA step. • High stability, low drift. • LED display the voltage/current and working status visually. • Intelligent temperature controlled fun with low noise. <ul style="list-style-type: none"> • Storage and recall function. • OVP (Over Voltage Protection) function. • Keypad locked function to avoid the misoperation.

HIGH ACCURACY SERIES

HIGH ACCURACY LABORATORY EQUIPMENT



Synthesized Signal Generator HA-GFA005

CHA	
Frequency range	sine: 1 µHz ... 500 MHz square: 1 µHz ... 80 MHz
Sine output level	≤ 500 MHz
	≤ 1000 MHz
	≤ 1500 MHz
Modulation type	AM, FM, FSK, PSK
CHB	
Frequency range	1 µHz ... 10 MHz
Waveform type	Sine, Square, Ramp, Pulse, Sinc, Exp, Noise, DC
Output amplitude	1 mVpp ... 10 Vpp(50 Ω), 2 mVpp ... 20 Vpp (High Z)
GENERAL CHARACTERISTICS	
Interface	USB, RS-232
Power supply	100 V a.c. ... 240 V, 50(1±10%)Hz, <40 VA
Dimensions & weight	254 × 103 × 374 mm; 4.2 kg
Additional functions	<ul style="list-style-type: none"> • Perfect combination of DDS and PLL techniques. • Frequency upper limits to 500 MHz. • Higher level of frequency accuracy, up to 1 ppm. • Communication interfaces: USB, RS-232. • 4 built-in fixed arbitrary waveforms: Exp, Sinc, Noise, DC. • Sweep and Burst function.

ORDERING CODES

HA-DMA512/612 ordering code:			
HA-DMA512-	XX	X	X
HA-DMA612-			
Version:			
standard	00		
custom-made*	XX		
Language:			
polish	P		
english	E		
other*	X		
Acceptance test:			
with an quality inspection certificate	1		
with test certificate	2		
acc. to customers request	X		

HA-GFA005 ordering code:			
HA-GFA005-	XX	X	X
Version:			
standard	00		
custom-made*	XX		
Language:			
polish	P		
english	E		
other*	X		
Acceptance test:			
with an quality inspection certificate	1		
with test certificate	2		
acc. to customers request	X		

HA-PSA3515 ordering code:			
HA-PSA3515-	XX	X	X
Version:			
standard	00		
custom-made*	XX		
Language:			
polish	P		
english	E		
other*	X		
Acceptance test:			
with an quality inspection certificate	1		
with test certificate	2		
acc. to customers request	X		

* - after agreeing with the manufacturer



Demand power	10.0 MW
Consumed power	5.0 MW
Ratio power	500 %

DN

H-K Device 1	141	Bath temperature	134
H-K Device 2	149	Cycle time	8.85
Shot	8.85	Contract	8.8.8.13

DL

Outdoor or indoor large displays

DN1, DN2, DN3

Display	numerical
Digit height	100/200/300 mm
Number of rows	1 or 2
Characters per row	3,4 or 5
Display colour	red, yellow or green
Displayed values	value measured by external device, transmitted through RS-485 interface
Interface (Master)	RS-485 for value download
Protection rating	IP54 (IP65 option)
Additional functions	<ul style="list-style-type: none"> good visibility in range up to 120 m brightness sensor installed (display brightness changes depending on outside conditions)

Indoor large displays

	DL11, DL12, DL13	DL21	DNL
Display		numerical	
Digit height	100 mm		230 mm (DNL2), 305 mm (DNL3)
Number of rows	1, 2 or 3	1	1 or 2
Characters per row	3	3	4
Display colour	red, yellow or green	red/orange/green (programmable)	red, yellow
Displayed values	value measured by external device, transmitted through RS-485 interface		value measured by external device, transmitted through RS-485 interface
Interface (Master)		Modbus RTU RS-485 for value transmission	
Interface (Slave)	RS-485 for configuration		RS-485 for configuration
Programming	using dedicated software		using LPCon software
Additional functions	<ul style="list-style-type: none"> unit field can be printed in each row 15 V d.c. supply for P18 transducer 	<ul style="list-style-type: none"> 3-colour, display colour changes on value change. Ranges of colour changes can be programmed 	<ul style="list-style-type: none"> visibility up to 120 m brightness sensor (digital brightness changes depending on outside conditions) analog input 4...20 mA

DL12 APPLICATION EXAMPLES



ORDERING CODES

OUTDOOR DISPLAY											
TABLE 96. DN1, DN2, DN3 ORDERING CODE:											
DN -	X	X	X	X	X	XX	XX	X	XX	X	X
Digit height:											
100 mm	1										
200 mm	2										
300 mm	3										
Kind of display:											
Code acc to the table 10 (version 8 concerns DN3)		X									
on order*		9									
Digit colour of the first display field:											
red	R										
yellow	Y										
green	G										
blue** (concerns version 1...4 and 6 acc. to the tab.11)	B										
Digit colour of the second display field:											
lack of second field	0										
red	R										
yellow	Y										
green	G										
Way of fixing:											
on the wall	1										
suspended	2										
on order*	9										
Unit of the first display field:											
code number of the unit acc. to the table 11		XX									
on order*		99									
Unit of the second display field:											
code number of the unit acc. to the table 11		XX									
on order*		99									
Quantity displayed and measuring device:											
acc. to the table 12		X									
on order*		9									
Version:											
standard	00										
custom-made*		XX									
Acceptance tests:											
without extra quality requirements	8										
with an extra quality inspection certificate	7										
acc. to customer's request*	X										

TABLE 10.						
Code	Kind of display	Number of digits	Display overall dimensions [mm]			Assembly dimensions [mm]
			DN1	DN2	DN3	
1		2 digits	a = 415 b = 77 h = 160	a = 560 b = 77 h = 264	a = 820 b = 100 h = 264	c = 220 d = 50 L = 250
2		3 digits	a = 415 b = 77 h = 160	a = 560 b = 77 h = 264	a = 820 b = 100 h = 370	c = 220 d = 50 L = 350
3		4 digits	a = 593 b = 77 h = 160	a = 810 b = 77 h = 264	a = 1200 b = 100 h = 370	c = 320 d = 50 L = 420
4		5 digits	a = 593 b = 77 h = 160	a = 810 b = 77 h = 264	a = 1200 b = 100 h = 370	c = 320 d = 50 L = 480
5		2x 2 digits	a = 593 b = 77 h = 160	a = 810 b = 77 h = 264	a = 1200 b = 100 h = 370	c = 320 d = 50 L = 480
6		clock	a = 415 b = 77 h = 160	a = 810 b = 77 h = 264	a = 1200 b = 100 h = 370	c = 320 d = 50 L = 480
7		2x 3 digits 2 rows	a = 415 b = 77 h = 270	a = 560 b = 77 h = 478	a = 820 b = 100 h = 680	c = 320 d = 50 L = 350
8*		clock + temperature			A = 1200 B = 100 H = 370	C = 850 D = 80 L = 450

* concerns DN3

* after agreeing with the manufacturer
** concerns DN1

TABLE 11. CODES OF HIGHLIGHTED UNIT:					
Code	Unit	Code	Unit	Code	Unit
00	without unit	22	°F	44	m³/h
01	mV	23	K	45	obr
02	V	24	% H₂O	46	obr/min
03	kV	25	mbar	47	rad
04	mA	26	Bar	48	szt.
05	A	27	mmH₂O	49	szt/h
06	KA	28	mmHg	50	O₂
07	kW	29	Pa	51	CO
08	MW	30	hPa	52	CO₂
09	var	31	kPa	53	I
10	kvar	32	MPa	54	l/min
11	Mvar	33	pH	55	l/h
12	kWh	34	s	56	mg
13	Ω	35	min	57	kg
14	kΩ	36	h	58	Mg
15	μ S	37	mm	59	k/h
16	mS	38	cm	60	Mg/h
17	Hz	39	m	61	N
18	kHz	40	m³	62	kN
19	MHz	41	m/s	63	mg/l
20	%	42	m/h		
21	°C	43	km/h		

TABLE 12. CODE OF BACKLIGHTED UNIT AND MEASURING DEVICES	
Displayed quantities	Code
Without measuring quantity	0
Temperature measurement	1
* Measuring range	
Humidity measurement	2
* Measuring range	
Temperature and humidity measurement	3
* Measuring range	
Pressure measurement	4
* Measuring range	
Measurement of the real time	5
* Measuring range	
Measurement of pulses, revolutions, working time	6
* Measuring range	
Measurement of power network parameters	7
* Measuring range	
measurement of current and voltage standard signals	8
* Measuring range	



INDOOR DISPLAYS

DL11 ORDERING CODE:			
DL11 -	X	XX	X
Colour of display field:			
red	R		
yellow	Y		
green	G		
Version:			
standard	00		
custom-made*	XX		
Acceptance tests:			
without extra requirements	8		
with an extra quality inspection certificate	7		
acc. to customer's request*	X		

DL12 ORDERING CODE:			
DL12 -	X	XX	X
Colour of first display field:			
red	R		
yellow	Y		
green	G		
Colour of second display field:			
red	R		
yellow	Y		
green	G		
Version:			
standard	00		
custom-made*	XX		
Acceptance tests:			
without extra requirements	8		
with an extra quality inspection certificate	7		
acc. to customer's request*	X		

DL13 ORDERING CODE:			
DL13 -	X	XX	X
Colour of first display field:			
red	R		
yellow	Y		
green	G		
Colour of second display field:			
red	R		
yellow	Y		
green	G		
Colour of third display field:			
red	R		
yellow	Y		
green	G		
Version:			
standard	00		
custom-made*	XX		
Acceptance tests:			
without extra requirements	8		
with an extra quality inspection certificate	7		
acc. to customer's request*	X		

DL21 ORDERING CODE:		
DL21 -	XX	X
Version:		
standard	00	
custom-made*	XX	
Acceptance tests:		
without extra requirements	8	
with an extra quality inspection certificate	7	
acc. to customer's request*	X	

DNL ORDERING CODE:							
DNL -	X	XX	X	XX	XX	X	X
Digit height:							
230 mm (9")	2						
305 mm (12")	3						
Colour of digits in first row:							
red	R						
yellow	Y						
Unit of the first row:							
lack	00						
acc. to the table 13	XX						
Colour of digits in the second row:							
lack of row	0						
red	R						
yellow	Y						
Unit of the second row:							
lack	00						
acc. to the table 13	XX						
Version:							
standard	00						
first row with input 4...20 mA and output +15 V	01						
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 requirements	X						

TABLE 13. CODES OF HIGHLIGHTED UNIT:	
Code	Unit
00	lack
01	%
02	°C
03	szt.
04	imp.
05	kg
06	m/s
07	szt./h
08	m³
09	obr
XX	on order

* after agreeing with the manufacturer

Only **BENEFITS!**



For many years we have known that automation users appreciate a comprehensive offer. Therefore, in addition to the supply of equipment, we offer design and implementation of automation systems, which:

- will be time and cost effective,
- will raise productivity,
- will improve work quality and safety.



Who ARE WE?

- A team of engineers (designers, constructors, developers, integrators)
- We have over 50 years of experience in project implementation in Poland and abroad.
- We have modern development laboratory facilities where we test our solutions.



How DO WE WORK?

We offer a comprehensive approach to the project, starting with a thorough analysis of the needs, providing custom made solutions for system implementation in facilities, throughout training and warranty and after-warranty service.



WE CAN DO THIS FOR YOU:

- Design and implement a dedicated control system for industrial processes.
- Design and implement a control and transmission system in industrial environments.
- Create applications to visualize and control in SCADA programs.
- Design and manufacture power and control cabinets and laboratory work stations.

And everything:

- at competitive prices,
- based on certified and modern product and communication solutions,
- with guarantee of reliability and post-implementation service.



Energy Monitoring Systems - OUR SPECIALTY!



Facts and figures LIGHTING MONITORING IN LUMEL S.A.

COMPLEXITY OUR RANGE OF DEVICES AND SOFTWARE

Because of the possibility of large savings and environmental protection, the systems which currently are the most popular ones are our systems for energy consumption monitoring and for the control of power supply network parameters. These systems can be easily extended with additional measuring points or other utilities. What is important, the license for the software to manage these utilities is indefinite and unlimited in terms of the number of parameters read out from the devices.

- power bills are lower by 18%
- monitoring of costs in many departments at the same time
- effective sector management of lighting
- a thorough analysis of the most costly places

18%
of savings

We have a comprehensive offer of hardware and software to implement monitoring and control systems:

- devices to measure object signals (sensors, current transformers, shunts, transducers)
- devices for measurement and control such as meters, analyzers, controllers
- devices to ensure adequate communication (converters, I/O modules, hubs)
- our own software of Scada type to visualize, archive and process control

APPLICATION EXAMPLES



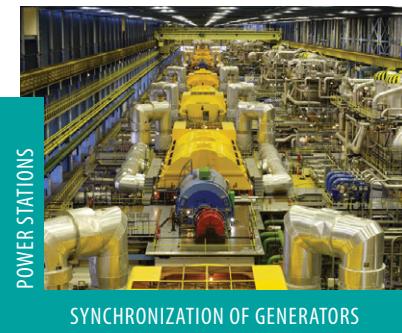
FURNITURE INDUSTRY

TEMPERATURE AND HUMIDITY MONITORING



FOOD INDUSTRY

ENERGY MANAGEMENT



POWER STATIONS

SYNCHRONIZATION OF GENERATORS



AIR INDUSTRY

ENGINE TEMPERATURE MONITORING



TELECOMMUNICATION

MONITORING OF ENERGY CONSUMPTION IN GSM SYSTEMS



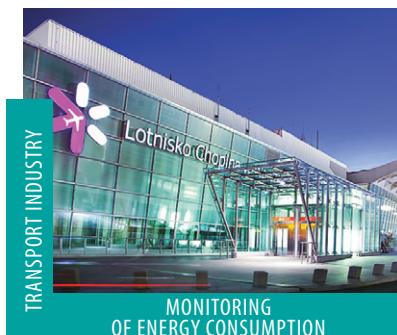
PUMPING STATION

ENERGY MONITORING



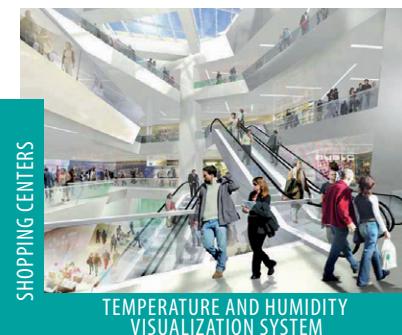
TRANSPORT INDUSTRY

CONTROL STATION OF BRAKE SYSTEMS



TRANSPORT INDUSTRY

MONITORING OF ENERGY CONSUMPTION



SHOPPING CENTERS

TEMPERATURE AND HUMIDITY VISUALIZATION SYSTEM

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e-mail: automatyka@lumel.com.pl



CHECK YOUR INSTRUMENTS AT OUR LABORATORY

/ Checking should be carried out regularly in all places where precise measurements significantly influence human life and health. /



Our services for you

If you want to have a **GUARANTEE**, that your instruments work properly - **USE OUR LABORATORY!**

We provide services related to calibration of analogue and digital devices, including:

- ammeters,
- voltmeters,
- wattmeters,
- multimeters
- shunts,
- temperature meters,
- temperature sensors,
- multi channel recorders and controllers,
- 3-Phase power network meters
- humidity meters and transducers.

CHECK YOUR INSTRUMENTS

AT OUR LABORATORY

The laboratory also performs tests of devices in the scope of:

- electromagnetic compatibility,
 - electromagnetic noise immunity according to EN 61000-6-2,
 - emission of electromagnetic interference according to EN 61000-6-4,
- safety (including safety according to EN 61010-1)
- ambient conditions,
- environmental conditions,
- vibrations and impacts,
- transport conditions,
- measurement accuracy,
- checking class of current transformer.

We guarantee competitive prices and delivery dates!

We are looking forward to doing business with you and working together!

CONTACT:

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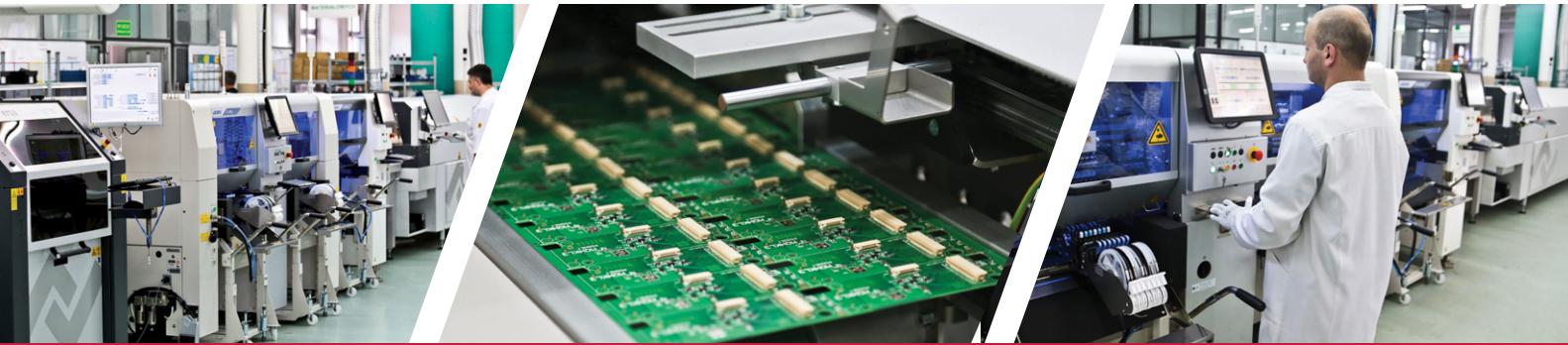




We offer:

- one-sided and double-sided assembling of SMD elements in the technology of reflow soldering, in accordance with European Directive for RoHS,
- assembly of THT elements by wave soldering,
- complementary assembly of THT elements and mechanical parts,
- mixed assembly,
- optical inspection of assembled PCB.

Assembly can be carried out on the base of own or committed elements.



Taking advantage of the acquired experience in design and testing of our apparatus we also offer:

- designing of PCB;
- completion of elements to assembly, ensuring PCB and stencils for soldering paste or glue in compliance with the provided documentation
- testing of assembled systems acc. to the customer's instructions,
- testing in the climatic chamber;
- testing of vibration resistance.

Our machine park

Our machine park consists of 2 complete assembly lines.

- silk screen printer ERSA (equipped in stencils cleaning system, inspection of bridging, clogging of the openings, inspection of smearing and paste level on the stencil. Additionally it is equipped in complete record of statistical data of the processes)
- two automatic machines JUKI (flexible KE-3020VA and high-speed chip shooter: FX-3RA).
- 7- zones reflow soldering oven ERSA HOTFLOW 3/14E.
- The whole line is completed by handling system, loader, conveyors and unloader of the circuit boards manufactured by ASYS - Germany.

The second assembly line is composed of:

- silks creen printer JUKI K1760,
- placement machine JUKI KE-2060,
- reflow oven ERSA HOTFLOW 2/14,
- magazine loader and line unloader – JOT,
- conveyors and in-line workstation – JOT.

Additionally our machine park is equipped with:

- two soldering aggregates of KIERSTEN company,
- optical control stands,
- stand for thread assembly with Weller soldering stations,
- tester Flying Probe Takaya.

All stands and devices are equipped with the protection against static electricity in compliance with EN 61340 5-1 and 5-2 standards.

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We are one of leading European manufacturers of electrical devices for automation and high pressure aluminium castings. We have been on the market since 1953. We have achieved our high position on the market due to continuous development policy, competence of our employees and modern equipment for research, design and production.

LUMEL is focused on 4 main activity fields:

- production of automatic devices for measurement, conversion, control and recording, transmission and visualization of various industrial processes;
- production and machining of high pressure castings and manufacturing of moulds and tools;
- design and manufacturing of control and measuring systems,
- SMT assembly, precision engineering and production of plastics parts.

We provide comprehensive solutions for various branches of industry: power industry, chemical industry, metallurgy, food industry, light industry, automotive industry, white industry and mining.

We have been working according to: ISO 9001:2008, ISO 14001:2004 and ISO/TS 16949.

october 2017

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