

# PRODUCTS & SERVICES FOR INDUSTRIAL AUTOMATION

CATALOG



LUMEL



A W A R D S  
2024/2025



**Forbes**  
Diamond Award



**BUSINESS  
GAZELLE**



**ECONOMIC  
INNOVATION  
A W A R D**



## YOUR TRUSTED PARTNER IN INDUSTRIAL AUTOMATION

LUMEL is a brand with over 70 years of experience, recognized worldwide as a manufacturer of reliable and modern industrial automation devices. Since 1953, we have been delivering measuring, controlling, and monitoring solutions that support the development of many industries.

Our knowledge, innovation, and consistent raising of standards make us a leader in our field.

Our achievements have been recognized with prestigious awards:

- Forbes Diamonds,
- Business Gazelle,
- Most Innovative Company in the Lubusz Voivodeship, Poland.

## LUMEL – A PROUD MEMBER OF THE RISHABH CAPITAL GROUP

LUMEL is a member of the Rishabh Capital Group – a global organization that brings together companies specializing in state-of-the-art measurement technologies, industrial automation, as well as energy and electronics solutions. The synergy within the Group allows us to provide our customers with a broader product portfolio, enhanced quality, and access to worldwide know-how.

The Rishabh Capital Group comprises, among others:

- **Rishabh Instruments Pvt. Ltd.** | India
- **LUMEL S.A.** | Poland
- **LUMEL ALUCAST Sp. z o.o.** | Poland
- **Shanghai VA Instrument Co. Ltd.** | China
- **Sifam Tinsley US** | USA
- **Sifam Tinsley UK** | United Kingdom
- **Microsys, spol. s r.o.** | Czech Republic

**RISHABH**  
GROUP OF COMPANIES



**LUMEL**

**LUMEL**  
ALUCAST



# INNOVATIVE SOLUTIONS FOR INDUSTRIAL APPLICATIONS

LUMEL offers a comprehensive range of **low-voltage** and **medium-voltage** products:

## Low Voltage Solutions:

- **Network Parameter Meters & Analyzers,**
- **Electrical & Non-Electrical Quantity Transducers,**
- **Digital Meters,**
- **Recorders & Data Loggers,**
- **Controllers,**
- **Analog Meters,**
- **Current Transformers,**
- **Shunts.**

Our products support a variety of **data communication protocols** (MODBUS, ETHERNET, PROFINET, BACNET, MQTT), ensuring **seamless integration** with industrial automation systems.

## Medium Voltage Solutions:

- **Protection Relays.**

## ADVANCED SYSTEMS FOR PROCESS MONITORING AND OPTIMIZATION – SCADA IN PRACTICE

LUMEL provides **comprehensive solutions** for monitoring, analysis, and management of industrial processes using advanced SCADA systems. Our technologies support efficiency, safety, and sustainable development in manufacturing plants.

### Areas of application:

- **Energy and utilities management** – full control and optimization of electricity, water, gas, and compressed air consumption.
- **Environmental parameter monitoring** – measurement and analysis of temperature, humidity, light intensity, CO<sub>2</sub> levels, and volatile gases.
- **Renewable energy management** – improving the efficiency of photovoltaic installations and other renewable sources through integration with SCADA systems.

Our solutions enable ongoing supervision, rapid response to irregularities, and informed decision-making based on real-time data.

# COMPREHENSIVE SERVICES – ELECTRONICS ASSEMBLY PHOTOVOLTAIC SYSTEMS DEVICE TESTING AND CALIBRATION

At LUMEL, we combine a broad product portfolio with a full range of engineering, manufacturing, and implementation services – all delivered in-house

## Services in electronic design and manufacturing:

- **OEM (Original Equipment Manufacturer)** - design and production of electronic devices according to customer specifications, covering electronics, mechanics, software, and enclosures.
- **EMS (Electronics Manufacturing Services)** – comprehensive support for the electronics assembly process: SMT, THT, testing, final assembly, and quality control.
- **ODM (Original Design Manufacturer)** – development and implementation of proprietary solutions – from concept to finished product, ready for rebranding.
- **Design and implementation of photovoltaic systems – comprehensive solutions** for solar energy projects.

## Design and production services for electronics:

- **Design and implementation of PV installations** – comprehensive support for photovoltaic projects: audits, technical design, component supply, installation, and integration with energy supervision and management systems (EMS/BMS/SCADA).

## Laboratory services:

- **Research and testing** – a comprehensive range of laboratory services in the field of electromagnetic compatibility (EMC), safety, environmental, and mechanical testing. Support in the certification processes of electronic products in accordance with national and international standards.



# COMMITMENT TO QUALITY AND COMPLIANCE



At Lumel S.A., we are dedicated to meeting and exceeding customer expectations by continuously improving our quality management system.

This commitment extends across all levels of our operations - from understanding customer needs and optimizing production processes to ensuring customer satisfaction through rigorous research and feedback

To guarantee the highest standards of quality, we:

- Maintain strict supervision over our production processes,
- Focus on the continuous improvement of key parameters,
- Source materials exclusively from suppliers who meet the highest global standards.

We operate in full compliance with internationally recognized standards:

- **ISO 9001:2015**  
Quality Management System,
- **ISO 14001:2015**  
Environmental Management System,
- **IATF 16949:2016**  
Automotive Quality Management,
- **ISO 27001:2022**  
Information Security Management System.

Additionally, we fully adhere to the **RoHS II (2011/65/EU)** and **RoHS III (2015/863/EU)** Directives, ensuring the restriction of hazardous substances in our products.

Our products comply with all **electromagnetic compatibility (EMC) and safety regulations**, guaranteeing reliability and performance.

**Excellence, sustainability, and compliance -**  
these are the pillars of our production philosophy.

# DISCOVER THE ELECTRONIC WORLD OF LUMEL



WEBSITE



SCAN ME!

PRODUCT  
CONFIGURATOR



SCAN ME!

ONLINE  
SHOP



SCAN ME!

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# OPTIMIZE ENERGY COSTS AND INCREASE PROCESS EFFICIENCY

At LUMEL, we offer comprehensive energy management solutions – combining advanced measuring devices, dedicated SCADA software, and the know-how of our experienced team of engineers. We design and implement systems tailored to the individual needs of industrial plants.

If you are looking for a way to reduce energy costs while increasing production efficiency – we have proven solutions for you.

## OUR SYSTEMS AND PRODUCTS ENABLE YOU TO:

### Continuously monitor and optimize power usage:

- ▶ prevent **penalties** by keeping ordered power under control.
- ▶ **dynamically adjust ordered** power to match real demand.
- ▶ **flatten peak loads** by automatically managing energy-intensive equipment.

### Enhance energy monitoring & cost analysis:

- ▶ track **consumption at the level of machines, lines, and workstations** for accurate cost allocation.
- ▶ identify the **most energy-intensive devices** in your plant.
- ▶ monitor machine **load distribution across shifts**.

### Ensure power quality & reliability:

- ▶ Detect **voltage dips and electrical disturbances** to prevent unexpected downtimes.

- ▶ Allocate energy costs **by department, hall, or production unit**.
- ▶ Automatically **alert maintenance teams** in case of failures.
- ▶ Manage energy consumption during **emergency conditions**, such as power reduction requests due to grid overload.

## Expand Your Monitoring Capabilities:

- ▶ **switchgear temperature monitoring** - enhancing operational safety,
- ▶ **compressed air monitoring** - **leakage** detection and loss reduction,
- ▶ **media monitoring: water, gas, heat,**
- ▶ **environmental parameter monitoring** - temperature, humidity, CO<sub>2</sub>, TVOC, light intensity,
- ▶ **production quantity monitoring (pieces/details)** for efficiency and OEE analysis.

# OPTIMIZATION OF ENERGY COSTS METERS AND ANALYZERS OF POWER NETWORK PARAMETERS



		N43	NR30	ND30	ND31LITE	ND31	ND31PLUS
Measured parameters (detailed information in user's manuals)	$U_{LN} / U_{LL}$	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
	average $U_{LN} / U_{LL}$	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
	$I_L$ / 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/interharmonics	- / -	✓ 63 (NR30IoT) ✓ 51 (NR30PNET, NR30BAC) / -	✓ 63 (ND30IoT) ✓ 51 (ND30PNET, ND30BAC) / -	✓ 63 / -	✓ 63 / -	✓ 63 / -
	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 or 63 A 57.7/100 V or 230/ 400 V or 290/ 500 V	1 A / 5 A or 63 A 57.7/100 V and 100/ 170 V or 230/ 400 V and 400/ 690 V	1 A / 5 A 57.7/ 100 V 230/ 400 V or 110/190 V 400/690 V 2 x Pt100 - option 2 x binary - option	1 A / 5 A 57.7/ 100 V 230/ 400 V	1 A / 5 A 57.7/ 100 V 230/ 400 V 2 x Pt100		
Outputs	3 x relay 1 x pulse	2 x relay	1 x 0/4...20 mA (option) 2 x relay	2 x relay	1 x 0/4...20 mA 2 x relay		
Interface	RS-485 Modbus Slave	RS-485 Modbus Slave Ethernet 10/100 Base-T NR30PNET: Profinet NR30IoT: MQTT NR30BAC: BACnet IP	RS-485 Modbus Slave Ethernet 10/100 Base-T ND30PNET: Profinet ND30IoT: MQTT ND30BAC: BACnet IP	RS-485 Modbus Slave	RS-485 Modbus Slave Ethernet 10/100 Base-T Modbus TCP MQTT BACnet IP www,FTP,SNTP	RS-485 Modbus Slave Ethernet Daisy Chain 2x RJ45 Ethernet 10/100 Base-T Modbus TCP MQTT BACnet IP www,FTP,SNTP	
Display	LCD 4 x 3 digits + 1 x 7 digits	LCD 20 characters x 4 rows	3.5" colour TFT LCD 320x240 pixel		3.5" colour TFT LCD 640x480 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./90...300 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 IP	IP50			IP65			
Ext.dimensions	105 x 110 x 60 mm			96 x 96 x 77 mm			
Programming	free eCon software (using miniUSB) or using buttons			free eCon software - using RS-485 or Ethernet (ND31, ND31PLUS) or using buttons			
Additional functions	• connection with S440 module (module of 4 analog outputs)			• display fully configurable by user (10 screens, 8 parameters in each), • additional 2 screens with harmonic presentations & 1 screen with analog indication, • galvanic isolation between input,output, supply and interface			
	-	NR30IoT: • data archiving up to 32 parameters • supervisory relay	ND30IoT: • data archiving in the internal memory 8 GB • 2 x supervisory relay	-	-	• temperature measurement: 2 x input Pt100 • data archiving in the internal memory 8 GB • 2 x supervisory relay	

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



# OPTIMIZATION OF ENERGY COSTS METERS AND ANALYZERS OF POWER NETWORK PARAMETERS



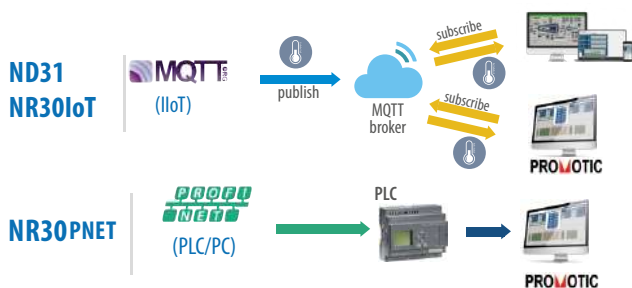
		N100	ND45	ND45PLUS
Measured parameters (detailed information in user's manuals)	$U_{LN} / U_{LL}$	✓/✓	✓/✓	✓/✓
	average $U_{LN} / U_{LL}$	@/✓	✓/✓	✓/✓
	$I_L$ / average $I_L / I_N$	✓/✓/✓	✓/✓/✓	✓/✓/✓
	P / Q / S	✓/✓/✓	✓/✓/✓	✓/✓/✓
	$E_p / E_Q / E_S$	✓/✓/✓	✓/✓/✓	✓/✓/✓
	4-quadrant measurement	✓	✓	✓
	PF / tgφ / cosφ / φ	✓/✓/-/-	✓/✓/-/✓	✓/✓/-/✓
	f / THD U / THD I	✓/✓/✓	✓/✓/✓	✓/✓/✓
	Harmonics / interharmonics	✓ 51 / -	✓ 51 / ✓ 51	✓ 51 / ✓ 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	-	✓ 4 / ✓	✓ 4 / ✓	
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 57.7/100 V or 230/400 V	1 A / 5 A 57.7/100 V or 230/400 V
		pulse 0/12...36 V	2 x Pt100/Pt1000/5k Ω	2 x Pt100/Pt1000/5k Ω 4 or 6 x logic - option
Outputs		1 x pulse, 1 x 0/4...20 mA + 3 x relay or 3 x -20...0...20 mA + 1 x relay	-	optionally: 3 or 6 x 0/4...20 mA; 4 or 8 x relay
Interface		RS-485 Modbus Slave  Ethernet 10/100 Base-T Modbus TCP, www, FTP - option	RS-485 Modbus Slave, USB Device & Host  Ethernet 10/100 Base-T Modbus TCP, www, FTP, NTP	
Display		LED 4 x 4 ½ digit, backlight unit, 2-colour display (red, green) (14 mm)	5.6" LCD TFT colour touch screen 640 x 480 pixel	
Supply voltage		85...253 V a.c. / 90...300 V d.c.	85...253 V a.c. / 90...300 V d.c.	85...253 V a.c. / 90...300 V d.c. or 24 V d.c.
Protection IP		IP40	IP54	
Ext. dimensions		144 x 144 x 77 mm	144 x 144 x 104 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"> <li>selection of displayed quantities on each of the 20 programmable screens</li> <li>galvanic isolation of current and voltage inputs</li> <li>data archiving in the internal memory 8 GB</li> <li>available special version with input frequency up to 500 Hz</li> </ul>	<ul style="list-style-type: none"> <li>measurement class A/S</li> <li>measurement and logging of energy quality acc. to EN 50160, EN 61000-4-30, EN 61000-4-7               <ul style="list-style-type: none"> <li>oscilloscope</li> </ul> </li> <li>galvanic isolation of measuring current and voltage inputs               <ul style="list-style-type: none"> <li>data archiving on SD card</li> </ul> </li> <li>programmable counter inputs (only ND45PLUS)               <ul style="list-style-type: none"> <li>dips and swells stored in registers</li> <li>flicker</li> </ul> </li> </ul>	

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

# OPTIMIZATION OF ENERGY COSTS METERS AND ANALYZERS OF POWER NETWORK PARAMETERS



		N14	ND10	ND20LITE	ND20	ND20CT	ND25
Measured parameters (detailed information in user's manuals)	$U_{LN} / U_{LL}$	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
	average $U_{LN} / U_{LL}$	✓✓	✓✓	@/@	@/@	@/@	✓/-
	$I_L$ / average $I_L / I_N$	✓✓/-	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
	P / Q / S	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
	$E_p / E_q / E_s$	✓✓/-	✓✓/-	✓✓/-	✓✓/-	✓✓/-	✓✓✓
	4-quadrant measurement	✓	✓	✓	✓	✓	✓
	PF / $\text{tg}\phi$ / $\cos\phi$ / $\phi$	✓/-/-/✓	✓✓/ / @	✓✓✓/ @	✓✓✓/ @	✓✓✓/ @	✓/-/-/✓
	f / THD U / THD I	✓/-/-	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
	Harmonics	-	-	-	✓ 21	-	✓ 31
	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 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 / 5 A 57.7/100 V 69.3/120 V 230/400 V	1 A / 5 A 57.7/100 V or 230/400 V or 290/500 V or 63.5/110 V or 69.3/ 120 V	0.1 A and 0.25 A 57.7/100 V or 230/400 V	1 A / 5 A 57.5...346.42 V/ 100...600 V	
Outputs	1 x relay 1 x pulse	2 x relays 1 x pulse	1 x relay 1 x pulse	1 x 0/4...20 mA 1 x relay 1 x pulse	1 x 0/4...20 mA (option) 1 x relay 1 x pulse	2 x relay (option)	
Interface	RS-485 Modbus Slave	RS-485 Modbus Slave	RS-485 Modbus Slave	RS-485 Modbus Slave	RS-485 Modbus Slave	RS-485 Modbus Slave (option) or <b>Ethernet</b> Modbus TCP (option) or <b>BACnet IP</b> (option)	
Display	LED 3 x 3 digits (14 mm)	3.5" LCD 3 x 4 digits (16 mm)	3.5" LCD 3 x 4 (11 mm) + 1 x 5 digits (9 mm)	3.5" LCD 3 x 4 (11 mm) + 1 x 5 digits (9 mm)	3.5" LCD 3 x 4 (11 mm) + 1 x 5 digits (9 mm)	3.5" LCD 3 x 4 (11 mm) + 1 x 5 digits (9 mm)	
Supply voltage	85...253 V a.c./d.c.	50...64 V a.c. or 195...253 V a.c. or 246...300 V a.c. from measuring circuit	85...253 V a.c./ 90...300 V d.c.	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./90...300 V d.c. or 20...40 V a.c./20...60 V d.c.	100...550 V a.c./d.c.	
Protection IP	IP40	IP65	IP65	IP65	IP65	IP54	
Ext. dimensions	96 x 96 x 70.5 mm	96 x 96 x 77 mm	96 x 96 x 77 mm	96 x 96 x 77 mm	96 x 96 x 77 mm	96 x 96 x 70 mm	
Programming	free eCon software (using RS-485) or using buttons	free eCon software (using RS-485) or using buttons	free eCon software (using RS-485) or using buttons	free eCon software (using RS-485) or using buttons	free eCon software (using RS-485) or using buttons	free eCon software	
Additional functions	<ul style="list-style-type: none"> <li>galvanic isolation of current inputs</li> </ul>	<ul style="list-style-type: none"> <li>galvanic isolation of current inputs</li> </ul>	<ul style="list-style-type: none"> <li>galvanic isolation of current inputs</li> </ul>	<ul style="list-style-type: none"> <li>memory of 9000 samples for mean power</li> <li>galvanic isolation of current inputs</li> </ul>	<ul style="list-style-type: none"> <li>easy installation of meter and current transformer</li> <li><b>only to cooperation with dedicated current transformers L3XX and LJXX (see page 45)</b></li> <li>galvanic isolation of current inputs</li> </ul>	<ul style="list-style-type: none"> <li>up to 28 programmable screens</li> <li>data archiving in the internal memory 8 MB</li> </ul>	



**ND31  
NR30BAC**

**BACnet  
(BMS)**



**ND31  
NR30**

**ETHERNET  
MODBUS TCP/IP  
Web Server  
Modbus TCP/IP  
Modbus RTU**



**APPLICATION**



OPTIMIZATION OF ENERGY COSTS  
**DIN RAIL ENERGY METERS**  
WITH MID CERTIFICATION



	NMID08LITE	NMID08	NMID08MBUS	NMID09LITE	NMID09	NMID09MBUS
Input	100 mA (RJ12) 230 V a.c. 1 x binary			1 A / 5 A 230 V a.c. 1 x binary		
Output	2 x pulse			2 x pulse		
Communication protocol	-	Modbus RTU (RS-485)	M-Bus	-	Modbus RTU (RS-485)	M-Bus
Power supply voltage	184...276 V a.c. (from the measuring circuit)			184...276 V a.c. (from the measuring circuit)		
Display	7 digits			7 digits		
IP rating	IP51			IP51		
External dimensions	35 x 90 x 65 mm			35 x 90 x 65 mm		
Additional functions	<ul style="list-style-type: none"> <li>password-protected menu</li> <li>active energy measurement, Class B (according to EN50470-3:2022)</li> <li>convenient connection of current transformers via RJ12 socket</li> <li>2 switchable tariffs via binary input</li> </ul>			<ul style="list-style-type: none"> <li>password-protected menu</li> <li>active energy measurement, Class B (according to EN50470-3:2022)</li> <li>2 switchable tariffs via binary input</li> </ul>		

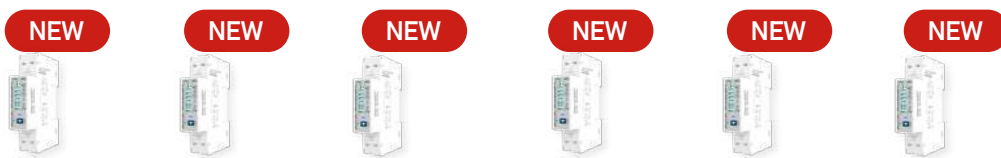


	NMID10LITE	NMID10	NMID10MBUS	NMID11LITE	NMID11	NMID11MBUS
Input	5 (100) A 230 V a.c. 1 x binary			100 mA (RJ12) 230 V a.c.		
Output	2 x pulse			2 x pulse		
Communication protocol	-	Modbus RTU (RS-485)	M-Bus	-	Modbus RTU (RS-485)	M-Bus
Power supply voltage	184...276 V a.c. (from the measuring circuit)			193...253 V a.c. (from the measuring circuit)		
Display	7 digits			7 digits		
IP rating	IP51			IP51		
External dimensions	35 x 90 x 65 mm			17.5 x 90 x 65 mm		
Additional functions	<ul style="list-style-type: none"> <li>password-protected menu</li> <li>active energy measurement, Class B (according to EN50470-3:2022)</li> <li>2 switchable tariffs via binary input</li> </ul>			<ul style="list-style-type: none"> <li>password-protected menu</li> <li>convenient connection of current transformers via RJ12 socket</li> <li>active energy measurement, Class B (according to EN50470-3:2022)</li> </ul>		
	2 switchable tariffs via binary input			2 tariffs switchable via RS-485		-

# OPTIMIZATION OF ENERGY COSTS DIN RAIL ENERGY METERS WITH MID CERTIFICATION



CERTYFIKAT  
**MID**



	NMID12LITE	NMID12	NMID12MBUS	NMID13LITE	NMID13	NMID13MBUS
Input	5 (45) A 230 V a.c.			1 A / 5 A 230 V a.c.		
	1 x binary	-	-	1 x binarne	-	-
Output	1 x pulse			1 x pulse		
Communication protocol	-	Modbus RTU (RS-485)	M-Bus	-	Modbus RTU (RS-485)	M-Bus
Power supply voltage	193...253 V a.c. (from the measuring circuit)			193...253 V a.c. (from the measuring circuit)		
Display	7 digits			7 digits		
IP rating	IP51			IP51		
External dimensions	17.5 x 90 x 65 mm			17.5 x 90 x 65 mm		
Additional functions	<ul style="list-style-type: none"> <li>password-protected menu</li> <li>active energy measurement, Class B (according to EN50470-3:2022)</li> </ul>			<ul style="list-style-type: none"> <li>password-protected menu</li> <li>active energy measurement, Class B (according to EN50470-3:2022)</li> </ul>		
	• 2 switchable tariffs via binary input	• 2 tariffs switchable via RS-485	-	• 2 switchable tariffs via binary input	• 2 tariffs switchable via RS-485	-



	NMID30-1 V1	NMID30-2 V2	NMID31LITE	NMID31	NMID31MBUS
Input	1 A / 5 A 3 x 230 / 400 V	10 (100)A 3 x 230 / 400 V	100 mA (RJ12) 3 x 230 / 400 V 1 x binary		
Output	<ul style="list-style-type: none"> <li>relay output</li> <li>pulse output (OC type), 3200 imp/kWh</li> </ul>		2 x pulse		
Communication protocol	Modbus RTU (RS-485)		-	Modbus RTU (RS-485)	M-Bus
Power supply voltage	85...275 V a.c. 120...380 V d.c.	230 V a.c. (from the measuring circuit)	100...550 V a.c./d.c.		
Display	3 x 4 digits		10 digits		
IP rating	IP51		IP54		
External dimensions	72 x 94.5 mm according to DIN 43880	76 x 100 mm according to DIN 43880	72 x 90 x 65 mm		
Additional functions	<ul style="list-style-type: none"> <li>16 measured parameters</li> <li>password-protected menu</li> <li>programmable averaging time for demand-type quantities</li> </ul>		<ul style="list-style-type: none"> <li>password-protected menu</li> <li>convenient CT connection via RJ12 socket</li> <li>active energy measurement, Class 0.5S (according to IEC 62053-22)</li> <li>2 tariffs switchable via binary input</li> </ul>		



## OPTIMIZATION OF ENERGY COSTS **DIN RAIL ENERGY METERS** WITH MID CERTIFICATION



	<b>NMID32LITE</b>	<b>NMID32</b>	<b>NMID32MBUS</b>	<b>NMID33LITE</b>	<b>NMID33</b>	<b>NMID33MBUS</b>
Input	1 A / 5 A 3 x 230 / 400 V 1 x binary			5 (100) A 3 x 230 / 400 V 2 x binary		
Output	2 x pulse			2 x pulse		
Communication protocol	-	Modbus RTU (RS-485)	M-Bus	-	Modbus RTU (RS-485)	M-Bus
Power supply voltage	100...550 V a.c./ d.c.			100...289 V a.c. (from the measuring circuit)		
Display	10 digits			10 digits		
IP rating	IP54			IP54		
External dimensions	72 x 90 x 65 mm			72 x 90 x 65 mm		
Additional functions	<ul style="list-style-type: none"> <li>password-protected menu</li> <li>active energy measurement, Class 0.2S (according to IEC 62053-22)</li> <li>2 tariffs switchable via binary input</li> </ul>			<ul style="list-style-type: none"> <li>password-protected menu</li> <li>active energy measurement, Class B (according to EN50470-3:2022)</li> <li>4 tariffs switchable via binary input</li> </ul>		



## OPTIMIZATION OF ENERGY COSTS **DIN RAIL ENERGY METERS** FOR APPLICATIONS NOT REQUIRING LEGAL METROLOGY



	<b>NR12</b>	<b>NR10PLUS</b>	<b>NR32</b>	<b>NR33</b>
Input	5(45)A 230 V	5 (100)A 230 V 1 x binary	1A / 5A 57,5...346,42 V/ 100...600 V 1/2 x binary (option)	5 (100) A 3 x 230/400 V 2 x binary
Output	1 x pulse	2 x pulse	<ul style="list-style-type: none"> <li>2 x relay (option)</li> <li>1 x pulse (option)</li> </ul>	2 x pulse
Communication protocol	Modbus RTU (RS-485)			
Power supply voltage	193...253 V a.c. (from the measuring circuit)	184...276 V a.c. (from the measuring circuit)	100...550 V a.c./d.c. lub 20...60 V a.c./d.c.	100...289 V a.c. (from the measuring circuit)
Display	7 digits		10 digits	
IP rating	IP51		IP54	
External dimensions	17.5 x 90 x 65 mm	35 x 90 x 65 mm	72 x 90 x 65 mm	
Additional functions	8	3	<ul style="list-style-type: none"> <li>2 / 4 tariffs (option) switchable via binary input</li> <li>active energy measurement, Class 0.2S (according to IEC 62053-22)</li> <li>programmable current and voltage transformer ratios</li> </ul>	<ul style="list-style-type: none"> <li>4 tariffs switchable via binary input</li> <li>direct current measurement up to 100 A</li> </ul>
	<ul style="list-style-type: none"> <li>2 tariffs</li> <li>password-protected parameter entry</li> <li>programming via RS-485 or push button</li> <li>active energy measurement in Class B</li> </ul>		<ul style="list-style-type: none"> <li>up to 10 user-configurable screens</li> </ul>	



**SYNCHRONIZATION METERS**



	<b>NS5</b>	<b>SA12/SA19</b>
Input	50...150 V 150...400 V	57.8...500 V
Output	2 x relays	-
Interface	RS-485 Modbus	-
	<b>Ethernet</b> 10/100 Base-T Modbus TCP, www - option	
Display	3.5" colour TFT LCD, 320x240 pixel	LED indicator
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	IP52
External dimensions	96 x 96 x 77 mm	96 x 96 x 111.5 mm (SA19), 144 x 144 x 111.5 mm (SA12)
Programming	free eCon software, (using RS-485 or Ethernet) or using buttons	-
Additional functions	<ul style="list-style-type: none"> <li>• memory of min. and max. values</li> <li>• many forms of data presentation bargraph, digital</li> <li>• additional control inputs</li> </ul>	<ul style="list-style-type: none"> <li>• one or two ranges of input voltage</li> </ul>



DIGITAL PROTECTION, AUTOMATION, MEASUREMENTS,  
CONTROL, RECORDING AND COMMUNICATION  
**MV PROTECTION RELAY**



**NEW**



**NEW**

	<b>ZIP CR2</b>	<b>extZIP®-PRO</b>	<b>extZIP®-2R PRO</b>	<b>extZIP®-PV PRO</b>
Description	Digital protection, automation, measurement, control, recording and communication for feeder and outgoing bays.	Digital protection relay for MV switchgears with additional inputs and outputs and communication ports	Automatic transfer switch (ATS) for MV switchgears	Integrated MV/LV protection and control relay for EPV switchgears and other renewable energy sources
External dimensions : - flush-mounted version - wall-mounted version	panel-mounted version - 300 x 180 x 150 mm	panel-mounted version - 283 x 190 x 155 mm surface-mounted version - 286 x 190 x 233 mm		<b>extZIP®-PV PRO</b> - panel-mounted version - 283 x 190 x 155 mm - surface-mounted version - 286 x 190 x 233 mm <b>extZIP®-PV PRO extZIP®-PV PRO with external panel</b> - central unit - 306 x 182 x 183 mm - external panel - 283 x 190 x 50 mm
Weight	5 kg	7 kg		<b>extZIP®-PV PRO</b> – 7 kg <b>extZIP®-PV PRO with external panel</b> – 7.3 kg - central unit – 5 kg - operator panel – 2.3 kg
Protection rating		IP50 from the front side IP20 from the terminal side		
Ambient temperature		-10...+55°C		
Storage temperature		-20°C ... +70°C		
Display		LCD TFT 7", 800x480, with colour touch panel		
Programmable diodes		14 programmable LEDs		
Programmable logics		Yes (50 logics line)		
Binary inputs	28		28 or 56	
Binary outputs	20		20 or 40	
Error log		Yes		
Event log		Yes		
Communications ports	USB, 2 x RS-485, Ethernet 10/100, BASE-TX	USB, 2 x RS-485, Ethernet 10/100, BASE-TX, fibre optic (option), CAN-BUS/RS-485(option)		USB, 2 x RS-485, Ethernet 10/100, BASE-TX, fibre optic (option)
Protocols	DNP 3.0, IEC 60870-5-103 and 104, IEC 61850, Modbus ASCII/RTU	DNP 3.0, IEC 60870-5-103 and 104, IEC 61850, Modbus ASCII/RTU, PPM2 protocol on CAN-BUS/RS-485 port		DNP 3.0, IEC 60870-5-103 and IEC 60870-5-104, IEC 61850, Modbus ASCII/RTU
<b>POWER</b>				
Rated supply voltage		24 V d.c., 220...230 V a.c./d.c.		
Power consumption		< 20 W		
<b>PHASE CURRENT INPUT CIRCUITS (for extZIP®-PV PRO: optionally two sets of inputs – for MV and LV sides)</b>				
<b>CURRENT TRANSFORMERS</b>				
Rated current $I_n$		5 A or 1 A	-	5 A or 1 A
Measurement range		0...200 A	-	0...200 A
Measurement error in measurement range		0.05 A ... 0.35 A < 10% 0.35 A ... 50 A < 1.5 % 50 A...200 A <10%	-	0.05 A ... 0.35 A < 10% 0.35 A ... 50 A < 1.5 % 50 A...200 A <10%
Rated frequency $f_n$		50 Hz	-	50 Hz
Power consumption at $I=I_n$		< 0.5 VA	-	< 0.5 VA
<b>LOW-POWER CURRENT TRANSFORMERS CR/CRR</b>				
Measurement range	-	-	-	0.1 A ... 150 kA
Measurement circuit resistance	-	-	-	50 kΩ



	<b>CZIP CR2</b>	<b>extCZIP®-PRO</b>	<b>extCZIP®-2R PRO</b>	<b>extCZIP®-PV PRO</b> <b>extCZIP®-PV PRO with a remote operator panel</b>
<b>PHASE VOLTAGE INPUT CIRCUITS</b>				
Rated voltage $U_n$			100 V	
Measurement range			0...130 V	
Measurement error in measurement range			< 1.5%	
Rated frequency $f_n$			50 Hz	
Power consumption at $U=U_n$			< 0.4 VA	
<b>ZERO SEQUENCE CURRENT INPUT CIRCUITS</b>				
Rated voltage $U_{0n}$	0.5 A		-	0.5 A
Measurement range	0...5 A		-	0...5 A
Measurement error in measurement range	3 A...0.02 A < 10% 0.02 A... 3.5 A < 1.5% 3.5 A... 5 A < 10%		-	3 A...0.02 A < 10% 0.02 A... 3.5 A < 1.5% 3.5 A... 5 A < 10%
Rated frequency $f_n$	50 Hz		-	50 Hz
Power consumption at $U=U_{0n}$	< 0.1 VA		-	< 0.1 VA
<b>ENERGIZING INPUTS (ZERO SEQUENCE VOLTAGE INPUT CIRCUITS)</b>				
Rated voltage $U_{0n}$	100 V		-	100 V
Measurement range	0...130 V		-	0...130 V
Measurement error in measurement range	< 1.5%		-	< 1.5%
Rated frequency $f_n$	50 Hz		-	50 Hz
Power consumption at $U=U_{0n}$	< 0.4 VA		-	< 0.4 VA
Intended use	<p><b>I</b> feeder and outgoing bays</p> <p>Preconfigured settings and configurations including protections, measurements, control, recording and communication for all types of MV switchgear bay in the same housing:</p> <ul style="list-style-type: none"> <li><b>L</b> feeder bay</li> <li><b>E</b> feeder bay with local power station (including wind farm)</li> <li><b>Z</b> incoming bay</li> <li><b>T</b> MV side of the 110 kV/MV transformer</li> <li><b>C</b> capacitor bay</li> <li><b>K</b> grounding transformer in compensated network</li> <li><b>P</b> grounding transformer in network with neutral earthing resistor</li> <li><b>X</b> grounding transformer in network with choke/resistor parallel system</li> <li><b>U</b> voltage measurement bay</li> <li><b>S</b> bus coupler bay</li> <li><b>H</b> 110 kV side of the 110 kV MV transformer</li> </ul>	<p>Preconfigured settings and configurations including protections, measurements, control, recording and communication for all types of MV switchgear bay in the same housing:</p> <ul style="list-style-type: none"> <li><b>L</b> feeder bay</li> <li><b>E</b> feeder bay with local power station (including wind farm)</li> <li><b>Z</b> incoming bay</li> <li><b>T</b> MV side of the 110 kV/MV transformer</li> <li><b>C</b> capacitor bay</li> <li><b>K</b> grounding transformer in compensated network</li> <li><b>P</b> grounding transformer in network with neutral earthing resistor</li> <li><b>X</b> grounding transformer in network with choke/resistor parallel system</li> <li><b>U</b> voltage measurement bay</li> <li><b>S</b> bus coupler bay</li> <li><b>H</b> 110 kV side of the 110 kV MV transformer</li> </ul>	<p><b>2R</b> automatic transfer switch (ATS) without recovery cycles</p> <p><b>2R1T</b> automatic transfer switch (ATS) without recovery cycles with one power transformer</p> <p><b>2R mini</b> automatic transfer switch (ATS) recovery cycles and two incoming lines</p> <p><b>2R3H</b> automatic transfer switch (ATS) with recovery cycles and three incoming lines</p>	<p><b>PV</b> service line MV/LV protection for PV farms (including applications specified for extCZIP-PRO)</p>
Unique protections and functionality		<p>Under-impedance protection against phase-to-phase short-circuits. Sensitive, adaptive protection for high resistance earth fault (up to 8 kΩ). Selective earth fault protection for grounding transformer bays.</p>		<p>Under-impedance protection against phase-to-phase short-circuits.</p>





# PHOTOVOLTAIC SYSTEMS

## Comprehensive design and implementation of photovoltaic systems:

LUMEL offers a full range of services in the design, installation, and commissioning of photovoltaic systems, tailored to the individual needs of industrial, municipal, commercial, and residential clients.

With our expertise in automation, energy, and system integration, we deliver projects that not only generate electricity but also support intelligent energy management and maximize self-consumption.

## Our services:



- ▶ **Energy audit and feasibility analysis** – assessment of PV investment potential, energy consumption analysis, and selection of optimal technical solutions,
- ▶ **Technical design of the photovoltaic installation** – comprehensive preparation of execution and as-built documentation,
- ▶ **Component supply** – photovoltaic panels, inverters, mounting structures, protection devices, switchgear, and automation components,
- ▶ **System installation and commissioning** – full turnkey implementation, in compliance with the highest quality and safety standards,
- ▶ **Integration with energy management systems (EMS, SCADA)** – providing supervision, reporting, and real-time optimization of energy consumption,
- ▶ **Implementation of telemechanics** – remote monitoring and control in line with distribution system operator (DSO) requirements,
- ▶ **Personnel training and service** – user training as well as long-term operational and maintenance support.



## The benefits of cooperation with LUMEL S.A.

- ▶ **Energy cost reduction** – lower grid energy consumption, reduced capacity charges and carbon-related taxes, as well as achieving energy independence
- ▶ **Increased energy efficiency of the plant** – enabled by integration with automation and real-time data analysis,
- ▶ **Optimal energy management** – intelligent control of energy flows between photovoltaics, energy storage, the external grid, and consumption points,
- ▶ **Compliance with formal and grid requirements** – full conformity with current standards, regulations, DSO guidelines, and insurance company requirements,



- ▶ **Safety and reliability** – use of components from reputable manufacturers combined with proven installation procedures,
- ▶ **Comprehensive service** – one partner responsible for the entire process: from concept and implementation to commissioning and post-implementation support,
- ▶ **Quality assurance and service support** – more than 70 years of Lumel's experience and the expertise of our engineering team ensure smooth execution and reliable after-sales care,
- ▶ **Building an ecological corporate image** – through real CO<sub>2</sub> emission reduction and a sustainable approach to energy.



### ANY QUESTIONS ABOUT A SYSTEM FOR YOUR BUSINESS?

CALL US:  
+48 730 630 533

WRITE TO US:  
fotovoltaika@lumel.com.pl

CHECK OUR OFFER:  
www.lumelpv.pl



SCAN ME!



# NEO

Photovoltaic string inverter



- LUMEL presents the new range of PV inverters. The NEO range of inverters conforms to the most advanced international standards and **meets the requirements of the industrial and civil solar plant installations.**
- **The higher energy yields, long term reliability, plant monitoring and high level professional service** are the cornerstones of our range of inverters.

### Available Inverter Power Ratings:

3 kW 4 kW 5 kW 6 kW 8 kW 10 kW 12 kW 15 kW 20 kW

### Key Electrical Parameters

- **Maximum DC input voltage:** up to **1100V**, ensuring broad compatibility with modern photovoltaic modules.
- **DC-side generator oversizing capability:** up to **150%**, allowing greater system design flexibility and maximizing energy yield.
- **MPPT voltage range per tracker:** **175V to 950V**, optimizing performance for various PV string configurations.
- **High conversion efficiency: European efficiency up to 98%**, minimizing losses and maximizing solar system output.

### Advanced Electrical Protection Features

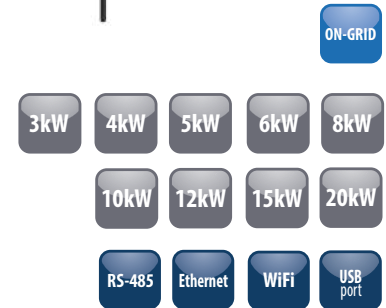
- **Intelligent fault detection** in PV circuits, enhancing safety and enabling faster diagnostics.
- **Built-in DC fuses** on both poles of the PV strings for short-circuit protection.
- **Integrated DC load-break switch**, ensuring safe disconnection of the inverter from the power source.
- **Automatic recording of operational parameters and system events**, supporting maintenance and diagnostics.
- **Comprehensive protection** against **current overloads, overheating, reverse DC polarity, AC/DC overvoltage**, ensuring stable and secure operation under all conditions.

### Compact Design & Ergonomic Dimensions

- **Housing dimensions:** 496 mm x 542 mm x 242 mm – a compact design that simplifies installation in both residential and commercial applications.
- **Lightweight construction** for easy transport and installation:
  - Models up to 6 kW: 20 kg
  - Models from 8 kW to 12 kW: 26 kg
  - Models from 15 kW to 20 kW: 30 kg

### Advanced Communication Interfaces

- **RS-485** – reliable and stable data transmission for monitoring systems.
- **WiFi** – wireless access for real-time inverter performance monitoring.
- **Ethernet** – fast and stable wired connection, ideal for commercial applications.
- **USB port** – quick and convenient storage of operational data and system performance reports.



<b>150%</b> DC OVERLOADING	<b>1100V</b> SYSTEM VOLTAGE	 UP TO 98.5% HIGHER YIELD	 INDOOR & OUTDOOR INSTALLATION
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<b>≤50°C</b> FULL POWER WITHOUT DERATING	 Google Play INTUITIVE NEW USER INTERFACE	 <b>TYPE II</b> SURGE PROTECTION DEVICES	 INTEGRATED DATALOGGER FOR FAULT ANALYSIS
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## MEASUREMENTS OF ELECTRICAL AND NON-ELECTRICAL QUANTITIES DIGITAL METERS



	N24	N25	N19Z	N20	N20PLUS	N20HPLUS	N20Z	N20ZPLUS	N21	N27D	LLM3	
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		fixed 1 A, 5 A a.c. 64 V, 110 V 240 V, 600 V a.c. 64/110 V, 133/ 230 V, 239.6/ 415 V a.c.	fixed Pt100, J, K 0/4...20 mA, ± 20 mA 0...60 mV, 0...75 mV (N20Plus), 0...10 V, ± 10 V		fixed ±100, ±400 V d.c.		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	3 x 230... ...400 V a.c.
Output	supplying output (24 V/ 30 mA) for S and T versions (option)		-	• 2 x OC • supplying output (24V/ 30 mA)			• 2 x OC		• 1 x relay NO, 250 V~/0.5 A~, • supplying output 24V d.c. ± 5%, 30 mA	-	-	
Display	red LED 4 digits (20 mm)	red LED 5 digits (14 mm)	red LED 4 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)	3 x dual red LEDs	
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)		80...300 V a.c., 40...300 V a.c./d.c. 20...60 V a.c./d.c.	85...253 V or 20...40 V a.c./d.c. (for N20, N20Z, N20ZPLUS) 85...253 V or 20...40 V a.c./ 20...60 V d.c. (N20PLUS, N20HPLUS)					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.	230 V a.c.	
Protection rating	IP65		IP50 or IP65-option	IP65						IP00	IP50	
External dimensions	96 x 48 x 64 mm		96 x 96 x 41 mm or 96 x 48 x 73 mm	96 x 48 x 64 mm						110 x 53 x 60 mm	57 x 110 x 60 mm	
Program- ming	free eCon software (using PD24 programmer)		-	free eCon software (using PD24 programmer - N20, N20Z or through RS-485 - N20PLUS, N20HPLUS and N20ZPLUS using PD20)					free eCon software (using miniUSB)	-	-	
Additional functions				• rescaling							selection of displayed quantities (kW, V, A, Hz)	external live line indicator LLI3
				• interface RS-485 Modbus Slave - only for N20PLUS, N20HPLUS and N20ZPLUS					• vertical display			

# MEASUREMENTS OF ELECTRICAL AND NON-ELECTRICAL QUANTITIES DIGITAL METERS



	N30U	N30H	N30o	N30P
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
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 N30O (for supply 85...253 V)			
Interface	RS-485 Modbus Slave - option			
Display	3-colour programmable LED 5 digits (14 mm)			
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.	
Protection rating	IP65			
External dimensions	96 x 48 x 93 mm			
Programming	free eCon software (using RS-485) or using buttons			
Additional functions	<ul style="list-style-type: none"> <li>Conversion of any measured value into a current or voltage analog signal.</li> <li>Storage of minimal and maximal values for all measured quantities.</li> <li>21-point rescaling for the measured value (does not apply to N30P and N27P)</li> </ul>		<ul style="list-style-type: none"> <li>Password protection.</li> <li>Programmable current and voltage transformer ratio (applies to N27P and N30P).</li> </ul>	



	N31U	N32U	N32o	N32H	N32P	N27P
Input	programmable Pt100/1000 J, K, N, E, R, S ± 20 mA, 4...20 mA ± 10 V ± 60, 150, 300 mV 400, 4000 Ω	programmable Pt100/500/1000 J, K, N, E, R, S ± 20 mA, 4...20 mA ± 10 V ± 60, 150, 300 mV 400, 4000 Ω	programmable 2 x pulse input (pulses, frequency, rotational speed, period, operating time counter, encoder)	programmable current from the shunt ± 75...1500 mV d.c. voltage ± 50... 600 V d.c. measurement of d.c. circuit parameters	programmable 1/5 A a.c. 100/230/400 V a.c. 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	1 x relay output (NO) 1 x supplying output 24 V d.c.	1 x NO contact 3 x relays with changeover contact - option 1 x analog 0/4...20 mA or 0...10 V - option 1 x OC output (only in N32P, N32H) 1 x supplying output 24 V d.c. 30 mA (only in N32U, N32o)			2 relays (2 NO) or 1 x relay (NO) + 1 x output 0/4...20 mA	
Interface	RS-485 Modbus Slave					
Display	high contrast LCD with backlight and programmable measuring unit row 1: 6-digit; digits height 12.85 mm row 2: 5-digit; digits height 7.5 mm					OLED 0.96" yellow
Supply voltage	40...253 V a.c., 20...300 V d.c.	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. 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	<ul style="list-style-type: none"> <li>second row of the display - displaying the unit, time or other measured value</li> <li>conversion of any measured value into an analog signal</li> <li>memory of min. and max. for measured values</li> <li>advanced functions of averaging measured quantities</li> <li>32-point individual characteristic (not applicable to N32H and N32P)</li> </ul>					<ul style="list-style-type: none"> <li>Password protection</li> <li>Programmable current and voltage transformer ratio</li> </ul>
	wide supply voltage range	-	-	-	-	



## MEASUREMENTS OF ELECTRICAL AND NON-ELECTRICAL QUANTITIES DIGITAL METERS



	NA5PLUS	NA6PLUS
Input	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...5 kΩ	
Output	4 x relay or 8 x OC (option); 1 x analog (option)	
Interface	RS-485 Modbus Slave	
Bargraph	3- or 7-colour programmable vertical	2 x 3- or 2 x 7-colour programmable vertical
Display	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	IP50	
External dimensions	48 x 144 x 100 mm	
Programming	free eCon software (using RS-485) or using buttons	
Additional functions	<ul style="list-style-type: none"> <li>• 21-point rescaling (NA5PLUS and NA6PLUS) parameters</li> <li>• arithmetical functions <math>x^2</math>, <math>\sqrt{x}</math>, (+, -, *, / - only in NA6PLUS)</li> <li>• logging of the measured signal in programmed time intervals (800 samples)</li> </ul>	<ul style="list-style-type: none"> <li>• memory of minimal and maximal values for all measured</li> <li>• password protection</li> <li>• conversion of any measured value into a current or voltage analog signal</li> </ul>

# MEASUREMENTS OF ELECTRICAL AND NON-ELECTRICAL QUANTITIES TRANSDUCERS, SEPARATORS



## BASIC TRANSDUCERS



	P10	P10Z	P20	P20Z	T22CT	T23CT	P21Z	P20H	P15	P17
Input	fixed 4...20 mA d.c. 0...1/5/20/ 100 mA d.c. 0...60/75/100/ 500 mV d.c. 0...1/5/10/150V d.c.	fixed 1/5 A a.c. 0...100/250/300V a.c.	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 50/100/150/ 200/250/ 300/400/ 500/600/ 750 A a.c.	fixed 50, 100, 150, 200, 300 A a.c./d.c.	fixed 0...100/250/ /400 V a.c. 0...1/5 A a.c. 20...500 Hz	fixed 100, 250, 400V d.c. ±100, ±250, ±400 V d.c. ±1, ±5 A d.c.	fixed 0/4...20 mA 1...5 mA	fixed Pt100 J, K, N, E, 0...10 V 0...60 mV
Output	0/4...20 mA or 0/2...10 V	0/2...10 mA or 0/4...20 mA or 0...10 V or 0...5 V	0/4...20 mA or 0...10 V	0...20 mA or 4...20 mA	0...20 mA or 4...20 mA	4...20 mA	0/4...20 mA or 0...10 V or RS-485 Modbus Slave	0/4...20 mA or 0...10 V or RS-485 Modbus Slave	2 x 0/4...20 mA	passive 0/4...20 mA
Supply voltage	24...60 V a.c./d.c. 60...300 V a.c./d.c.	24...60 V a.c./d.c. 40...300 V a.c./d.c.	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.	24 V d.c.	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. / 90...300 V d.c. or 20...40 V a.c. / 20...60 V d.c.	20...40 V a.c. 20...60 V d.c. 60...300 V a.c./d.c.	20...40 V a.c. 20...60 V d.c. 60...300 V a.c./d.c.	supplied from output current loop
Protection rating	IP40				IP20	IP65	IP40			IP50
External dimensions	22.5 x 65.5 x 106.5 mm		22.5 x 120 x 100 mm		70x92x44 mm (up to 300 A) or 90x115x58 mm (150 - 750 A)	70 x 92 x 47 mm	22.5 x 120 x 100 mm		22.5 x 65.5 x 106.5 mm	6.2 x 77.5 x 100 mm
Additional functions	-	-	free eCon software (using PD24 programmer)	-	hole diameter: 28 mm or 31 mm	hole diameter: 28mm busbar: 30 x 10 mm	free eCon software (using PD24 programmer)		-	-

## SEPARATORS



## ADVANCED TRANSDUCERS



	P20G	P17G	P30U	P300	P30H	P30P
Input	programmable 0/4...20 mA ±20 mA 0...5/10 V ±5V, ±10 V	0/4...20 mA	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 ± 150 mV voltage 0...12/48/100/250 V voltage 0...600/1000V in set with additional D5 resistor	1-phase power network parameters fixed 1A (X/1A), 5A (X/5A) 100 V(x/100 V) or 250 V
Output	programmable -20...20 mA -10...10 V	active output 0/4...20 mA	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   <b>Ethernet</b> 10/100 Base-T - option			
Display	-	-	LCD 2x8 characters with LED backlight			
Supply voltage	85...253 V a.c./d.c. or 20...85 V d.c., 20...65 V a.c.	supplied from input current loop	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	IP50	IP40			
External dimensions	22.5 x 120 x 100 mm	6.2 x 77.5 x 100 mm	45 x 120 x 100 mm			
Programming	-	-	using buttons or free eCon software using RS-485 Modbus, <b>Ethernet (option)</b>			
Additional functions	free eCon software (using PD24 programmer)	-	<ul style="list-style-type: none"> <li>alarms indicated on the display</li> <li>WWW server, FTP, Modbus TCP/IP Slave (optionally)</li> <li>memory of min. and max. values (with time stamp)</li> <li>mathematic functions independent for both inputs</li> <li>filtration of periodic signals (only P300)</li> </ul>		<ul style="list-style-type: none"> <li>internal memory 534336 samples</li> <li>data logging in internal memory or on SD card (optionally)</li> <li>memory of min. and max. values</li> </ul>	



# MEASUREMENTS OF ELECTRICAL AND NON-ELECTRICAL QUANTITIES TRANSDUCERS, SEPARATORS

## 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 $\pm 20$ 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 $\pm 20$ mA or 4 x analog programmable $\pm 20$ mA
Interface	RS-485 Modbus Slave	RS-485 Modbus (Slave or Master) - standard <b>Ethernet</b> 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 100 mm		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, <b>HTTP (option)</b>	free eCon software using USB or RS-485
Additional functions	<ul style="list-style-type: none"> <li>memory for selected measured value – 9 000 samples</li> <li>memory of minimal and maximal values</li> <li>programmable current and voltage transformer ratios</li> </ul>	<ul style="list-style-type: none"> <li>alarms indicated on the display</li> <li>internal memory 534336 samples</li> <li>programmable current and voltage transformer ratios</li> <li>WWW server, FTP, Modbus TCP/IP Slave (optionally)</li> <li>data logging in internal memory or on SD card (optionally)</li> </ul>	<ul style="list-style-type: none"> <li>memory for average power – 9 000 samples</li> <li>memory of minimal and maximal values</li> <li>programmable current and voltage transformer ratios</li> <li>pulse output</li> </ul>

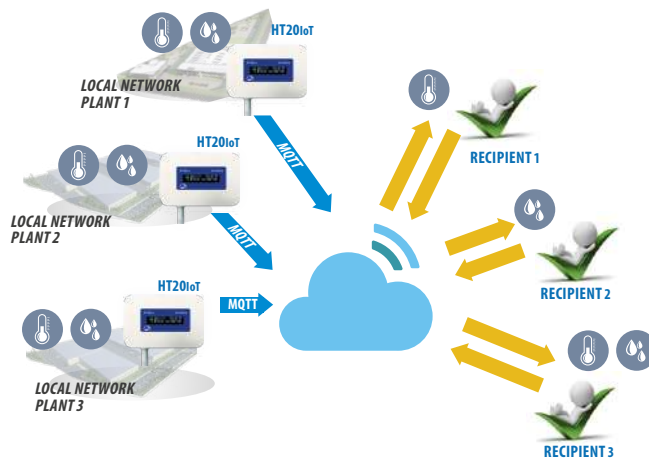


	P18L	P18	P18D	P18S
Measurement range	-30 ... -20 ... 60 ... 85°C or 0...100% RH	-30 ... -20 ... 60 ... 85°C, 0...100% RH		
Output	passive 4...20 mA	2 x 4...20 mA or 0...10 V (option)		-
Interface	-	RS-485 Modbus		
Galvanic isolation	-	supply/ RS-485 (for version without analog outputs)		supply/ RS-485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

# MEASUREMENTS OF ENVIRONMENTAL PARAMETERS MONITORS & DATA LOGGERS FOR MEASUREMENTS OF ENVIRONMENTAL PARAMETERS



	HT20	HT20IoT	HT22IoT
Number of channels	up to 4 channels ( temperature, humidity relative and absolute, dew point)		up to 12 channels (temperature, humidity relative and absolute, dew point, illuminance, total volatile organic compounds - TVOC, CO <sub>2</sub> concentration)
Input	built-in temperature and humidity sensor		built-in temperature and humidity sensor, illuminance, TVOC, CO <sub>2</sub> concentration sensor
Output	Modbus TCP/IP, Modbus RTU (only for HT22IoT)		
Measurement range	-20...60 °C, 0...100% RH		-20...60 °C, 10...90% RH, 0...60000 lx, 0...60000 ppb, 400...60000 ppm
Interface	Ethernet (WWW, FTP, SMTP, DHCP); RS-485 Modbus RTU (only for HT22IoT)		
	HT20IoT: MQTT		MQTT
Memory	internal - 8GB		
Display	LCD, 2 x 16 characters		
Supply voltage	6 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"> <li>data presentation on a LCD display and on website</li> <li>parameter configuration through a web browser</li> </ul>		<ul style="list-style-type: none"> <li>email messages in case of alarm occurs</li> <li>acoustic signaling of alarm events</li> </ul>



APPLICATION



# TEMPERATURE & PROCESS CONTROL

## TEMPERATURE CONTROLLERS

### INDUSTRIAL PROCESS CONTROLLERS



	RE11	RE12S	RE22	RE71	RE81	RE72	RE82	RE92
Number of channels	1	1	1	1	1	1	1	2
Input	programmable Pt100, J, T, K, S, R	programmable Pt100 J, K, T, R, S, C, E, B, N, L, U, W, Platine II, -5...56mV, 0...10V, 0...20mA	programmable Pt100/1000 J, T, K, S, R, B, E, N, L or 0/4...20 mA, 0...5/10V	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 <b>2 x digital input (RS-485 Modbus Master)</b>
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...5/10V /potentiometer (100)1000 Ω (option) <b>3 x binary input interface</b>
Output	1 x relay/ logic 0/12 V 1 x relay	3 x relay 1 x SSR relay 1 x analog 0/4...20mA	relay or logic 0/5 V	relays or logic 0/6 V	2 x relays or 1 x relay + 1 x logic 0/6 V	2 or 3 x relays / logic 0/5 V / analog 0/4...20mA / 0...10 V / supplying output 24 V d.c. 30 mA - option	2 x relays and 2 x relays / logic 0/5 V / 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 RTU	-	-	-	RS-485 Modbus		<b>2 x RS-485 (Modbus Slave &amp; Master), Ethernet</b> - option
Alarm	1	max. 3	-	-	1	max. 2	max. 3	max. 6
Control	on/ off or PID with self-tuning, heating or cooling							
	-	step-by-step	-	-	-	step-by-step		
	-	programmed	-	-	-	programmed		
Display	white and green LED 4+4 digits (15.3 mm / 8 mm)		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	85...270 V a.c./d.c.		230 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	IP50	IP65	IP65					
External dimensions	52x52x76 mm		48 x 48 x 93 mm		48x96x93 mm	48 x 48 x 93 mm	48x96x93 mm	96 x 96 x 91 mm
Programming	-	using buttons or RS-485	using buttons	using buttons or free eCon software (using PD24 programmer)		using buttons or free eCon software using RS-485		using buttons or free eCon software using RS-485 or Ethernet
Additional functions	-		• soft start	-		• soft start • 6 types of alarms • alarm LATCH function		• <b>parameter logging on SD card</b> • <b>FTP and WEB server - option</b> • profile control (20 programs with 15 segments in each)
	• soft start • 6 alarm types • profile control (8 programs with 16 segments in each)		-		• profile control (15 programs with 15 segments in each)			

# TEMPERATURE & PROCESS CONTROL

## TEMPERATURE CONTROLLERS & LIMITERS

### INDUSTRIAL PROCESS CONTROLLERS



	RE55	RE60	RE62	RE01	RL10
Number of channels	1	1	1	1	1
Input	fixed Pt100 J, K, S		programmable Pt100 J, K ± 20 mA, ± 10 V, ± 60 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. (terminals 11-12) or 60...253 V a.c. / 60...300 V d.c. (terminals 10-11)	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
Programming	using buttons		using buttons or free eCon software using RS-485	using buttons or free eCon software (using PD24 programmer)	using buttons or free eCon software using RS-485
Remarks				<b>defrost function with programmable automatic or manual mode</b>	meets the requirements of <b>EN 60519-2</b> for class 2 (Safety in electroheat instal- lations)



	RE41	RE42	RE43	RE44
Number of channels	1	1	1	1
Input		universal Pt100, J, K, T, E, B, R, S, N, L, 0...70 mV 0/4...20 mA 0...10 V		
Additional input	1 x binary input or current transformer input or 0...1/5/10 V	1 x binary input or current transformer input or 0/4...20 mA or 0...1/5/10 V (selectable)		
Output	2 x relay or binary 0/5 V or analog 0/4...20 mA or 0...10 V or triac (selectable) power supply 20 V 25 mA (option)			
Interface	RS-485 Modbus or analog retransmission 0/4...20 mA or 0...10 V (selectable)			
Alarm	2		1 or 2	
Control	on/off, PID + fuzzy logic, heating/cooling			
Display	red and green LED, 2 x 4-digit display, 14/10 mm	red and green LED, 2 x 4-digit display 10/8 mm	red and green LEDs, 2 x 4-digit display 10/8 mm	red LED, 4-digit display 10 mm
Supply voltage	90...264 V a.c., 47...63 Hz, 15 VA, 7 W max 11...26 V a.c./d.c., 15 VA, 7 W max			
Protection rating	IP65/IP20			
External dimensions	96 x 96 x 65 mm	48 x 96 x 80 mm	50.7 x 50.7 x 88.5 mm	50 x 26.5 x 110.5 mm
Remarks	soft start and heating timer, pump control, differential control			



## TEMPERATURE & PROCESS CONTROL 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"> <li>Fuzzy Logic algorithm ensures a high accuracy temperature control and optimal energy consumption</li> <li>soft-start function and leakage current monitoring ensure prolonged heaters reliability and operation safety for users</li> <li>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"> <li>damage detection:                   <ul style="list-style-type: none"> <li>- too high heater leakage current,</li> <li>- damage of the load circuit,</li> </ul> </li> <li>- short-circuit, break or inverse polarization in the sensor circuit.</li> </ul> </li> </ul>



## PROCESS CONTROL POWER CONTROLLERS



	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)



**NEW**

	SM61IoT	KD6	KD7	KD8	KD10
Number of channels	up to 2500	up to 60 logical channels (max. 8 universal analog channels)	up to 24 channels (max. 12 analog channels and/or max. 24 digital channels)	up to 6	up to 52 logical channels (max. 18 analog channels + 2 temperature channels and max. 32 digital channels)
Input	Port II: Modbus RTU Master, (100 groups 25 registers each) 2 x logic (option)	programmable (0, 4 or 8 inputs) Pt100/500/1000, J, K, N, E, R, S, T, B, ± 40 mA ± 300 mV 0...4000 Ω ± 10 V	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	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	programmable (6, 12 or 18 inputs) Pt100/1000, J, K, N, E, R, S, ± 20mA, 4...20mA, ± 10V, ± 60, 150, 300 mV, 0...400, 4000 Ω
		logic input 0/5...24 V d.c. (2, 6 or 10 pcs.)	logic input 0/5...24 V d.c. (8 or 16 pcs.)	logic 0/5...24 V d.c. (4 or 8 pcs.)	dedicated: 2x Pt100/1000/5k Ω 4 or 6 binary (option)
		Modbus RTU Master (10 x 10 registers)	Modbus RTU Master (24 registers)	-	-
Output	Port I: Modbus RTU/TCP Slave, 2 x relays (option)	relays (2, 6, 8, 10 or 14) analog 0/4...20 mA (0, 4 or 8) 1 x supplying output 24 V d.c. 30 mA	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)	optional: relays (4 or 8) analog 0/4...20 mA (3 or 6)
Interface	2 x RS-485 (Modbus Slave & Master) 1 x RS-232 (Modbus Slave) USB Device 1.1. Ethernet 10/100 Base-T Modbus TCP/IP 	2 x RS-485 (Modbus Slave & Master) 1 x USB Host 2.0 1 x Ethernet (Modbus TCP/IP, WWW, FTP, NTP, 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.	1x RS-485 Modbus Slave 1x RS-485 Modbus Master (option) USB Device & Host Ethernet 10/100 Base-T Modbus TCP (Master, Slave)
Memory	8 GB	internal 8 GB	internal – up to 6 MB external – CF card up to 4 GB		internal – 20 MB external – karta SD do 32 GB
Display	-	colour LCD 3.5" TFT type, 320 x 240 pixels	LCD 5.7" TFT type 320 x 240 pixels with touch panel		LCD 5.6" TFT type 640 x 480 pixels with touch panel
Supply voltage	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.	85...253 V a.c., 90...300 V d.c. or 20...60 V d.c.	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.
Protecting rating	IP40/IP20		IP65		IP54
External dimensions	45 x 120 x 100 mm	96 x 96 x 77 mm	144 x 144 x 171 mm	144 x 144 x 171 mm	144 x 144 x 104 mm
Additional functions	<ul style="list-style-type: none"> <li>• HTTP (WEB server -visualization in format of synoptic maps),</li> <li>• DHCP</li> <li>• FTP Server,</li> <li>• RTC</li> </ul>	<ul style="list-style-type: none"> <li>• many forms of data presentation: linear, bargraph, chart,</li> <li>• digital and analog indicators,</li> <li>• WWW and FTP Server (KD6, KD7)</li> </ul>	<ul style="list-style-type: none"> <li>• Windows® CE operating system</li> <li>• PC software: KD SETUP, KD CHECK, KD CONNECT, KD ARCHIVE                             <ul style="list-style-type: none"> <li>• user access levels</li> <li>• menu available in 8 language versions</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• WWW, FTP server</li> <li>• visualisation of measurements in the form of: digital, analogue meters, graphs, bargraphs                             <ul style="list-style-type: none"> <li>• PC software</li> <li>• user access levels</li> </ul> </li> </ul>	
		<ul style="list-style-type: none"> <li>• advanced mathematical operations on measured values</li> </ul>			



# TEMPERATURE SENSORS



	<b>RESISTANCE TEMPERATURE DETECTORS</b> Pt100, Pt500, Pt1000, Ni100, Ni1000 as well as NTC, PTC, KTY	<b>THERMOCOUPLES</b> J (Fe-CuNi), K (NiCr-Ni), N (NiCrSi-NiSi), T (Cu-CuNi), L (Fe-CuNi), E (NiCr-CuNi), S (PtRh10-Pt), R (PtRh13-Pt), B (PtRh30-PtRh6)
<b>Types</b>	head-mounted cable type connection box (enclosure) hygienic connection with GDM, GDS connectors with M12 connectors surface-mounted (strap-on) sensors measuring inserts	head-mounted cable type with compensation cables surface-mounted (strap-on) sensors measuring inserts
<b>Sensors used in the food, pharmaceutical and chemical industries, wherever sterile conditions are required in the technological process.</b>		

# I/O MODULES, COMMUNICATION MODULES

COMMUNICATION

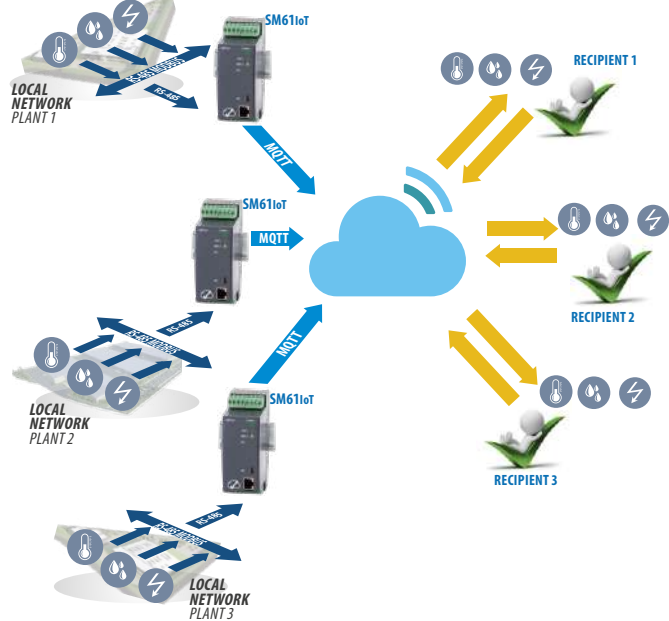


	SM1	SM2	SM3	SM5	SM4	S4AI	S4AO	
Number of channels	2	4	2	8	4 or 8	4	4	
Inputs/outputs	fixed inputs: Pt100(-200...850°C), 0...400 Ω or 0/4...20 mA or 0...10 V		programmable inputs: logic on/off or pulse counter up to 1 kHz 0...4 294 967 295 pulses		fixed inputs: logic on/off	fixed outputs: 4 x relay or 8 x OC	programmable inputs: 4 x ± 10 V, ± 20 mA 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		
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		



## SM61IoT

Number of channels	up 2500 digital channels
Input	Port II: Modbus RTU Master (100 groups 25 registers each), 2 x logic
Output	Port I: Modbus RTU/TCP Slave, 2 x relay
Interface	2 x RS-485 (Modbus Slave and Master) 1 x RS-232 (Modbus Slave) USB Device 1.1. <b>Ethernet</b> 10/100 Base-T Modbus TCP/IP, <b>MQTT</b>
Memory	8 GB
Supply voltage	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.
Protection rating	IP40
External dimensions	45 x 120 x 100 mm
Additional functions	<ul style="list-style-type: none"> <li>• HTTP (web server - visualization in format of synoptic maps),                             <ul style="list-style-type: none"> <li>• DHCP,</li> <li>• FTP server,</li> <li>• RTC</li> </ul> </li> </ul>



## COMMUNICATION PROTOCOL/ INTERFACE CONVERTERS



	PD51	PD9	PD9W	PD20
Interface 1	RS-232	RS-485, RS-232		RS-485
Interface 2	RS-485	<b>Ethernet</b> RJ45	<b>Wi-Fi, Ethernet</b>	USB
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 [bit/s]	600 ÷ 460800 bit/s	300 ÷ 230400 bit/s	up to 115.2 kbps
Supply voltage	7..35V d.c. or 20..24..40V a.c./d.c. or 85..230..253V a.c./d.c.	5 ÷ 36V d.c.		5V d.c., supplied from USB port
Protection rating frontal	IP40	IP30		IP40
External dimensions	22.5 x 120 x 100 mm	45 x 120 x 100 mm	86 x 82.5 x 25 mm	76 x 25 x 20 mm
Additional functions	<ul style="list-style-type: none"> <li>converter/repeater</li> <li>galvanic isolation</li> </ul>	<ul style="list-style-type: none"> <li>galvanic isolation</li> <li>Digi RealPort®, TCP/IP, HTTP, ICMP, DHCP, ARP</li> <li>Modbus TCP</li> </ul>	<ul style="list-style-type: none"> <li>Wi-Fi 2.4GHz 802.11 b/g/n</li> <li>programming through www</li> <li>TCP/IP, HTTP, ICMP, DHCP, ARP</li> <li>Modbus TCP, RTU</li> </ul>	<ul style="list-style-type: none"> <li>galvanic isolation</li> <li>compatible with industrial communication protocols</li> </ul>

## CONTROL TIME & PROTECTION RELAYS



	LTR10	LP10-V
Type	multifunctional - 10 time functions	voltage protection relay
Number and type of contact	2 x CO - changeover	1 x CO, 2 x CO (option)
Number of time ranges	10 time ranges	N/A
Resistive load	5A / 250 V AC	
Supply voltage	12...240 V AC/DC	= monitored voltage
External dimensions	91 x 17.5 x 65.4 mm	90 x 18 x 66.5 mm



## CONTROL POWER SUPPLIES

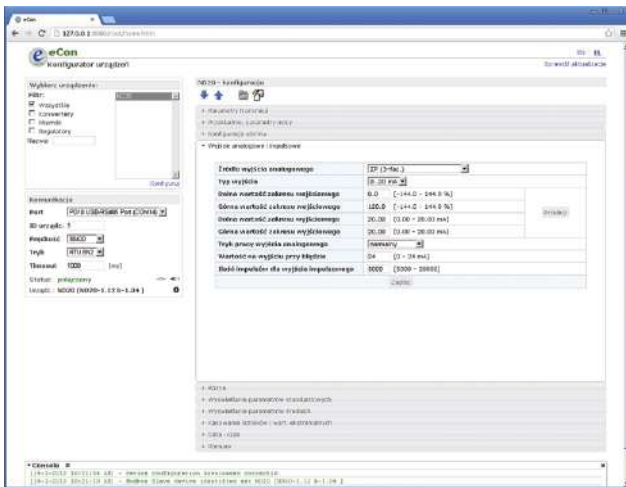


	ZS20-1P	ZS20-1K	ZS20-1L	ZS20-1A	ZS20-1B	ZS20-1C
Rating	24V / 0.63 A	24V / 1.5 A	24V / 1.75 A	24V / 2.5A	24V / 5A	24V / 7.5A
Power	15W	36W	45W	60W	95 ... 120 W	120 ... 180 W
Input voltage range AC	85 ... 264 VAC					
Input voltage range DC	120 ... 370 VDC			125 ... 350 VDC		
Protection rating	IP20					
External dimensions	18 x 90 x 62 mm	54 x 90 x 62 mm	54 x 90 x 62 mm	54 x 90 x 62 mm	55 x 110 x 105 mm	55 x 110 x 105 mm

SOFTWARE TOOL  
**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 PD24 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.



**PD20** – a portable converter designed for converting a signal using a USB bus to an RS-485 interface



**PD24** – converter is designed for data transmission between a computer and a device with an RS-232 interface operating at TTL voltage levels. Additionally, it serves as a programmer for LUMEL products, enabling parameter configuration via the free eCon software.





# ANALOG MEASUREMENT 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:	100 mA ... 25 A xA x/5 A; xA/1 A		100 mA ... 100 A xA x/5 A; xA x/1 A		
- current: · direct · through a transformer* (on request, with twice or six-times overload)	6 V ... 600 V xV/100 V; xV/110 V		6 V ... 1000 V xV/ 100 V; xV/110 V		
- voltage: · direct · through a transformer	3 kV	2 kV	3 kV		
Proof voltage					
Frequency of measured value	40...45...65...72 Hz				
Protection rating	IP52	IP52 (on request IP65)			IP52
Climate version	normal or tropical		normal, tropical or similar to marine		
Class	1				

\* 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 42)

## MOVING-IRON METERS



	MA16(P)	MA17(P)	MA19(P)	MA12(P)
Type of scale	90°			
External dimensions	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	-	✓	✓	✓
Measuring ranges (direct):	400 μA...1 A (30...1000...10 000 Hz)		400 μA...1 A (30...1000...10 000 Hz)	
- current:	1...750 mA (40...1000 Hz)	1 A...6 A (49...50...51 Hz)		
- voltage:	100...600 V (40...10 000 Hz)	60 mV...1.5 V (49...50...51 Hz)		2.5 V...600 V (30...1000...10 000 Hz)
		2.5 V...600 V (30...1000...10 000 Hz)		
Proof voltage	2 kV			
Protection rating	IP52	IP52 (on request IP65)		IP52
Climate version	normal	normal, tropical or similar to marine		
Class	1			

## 3-PHASE VOLTMETERS



	EP27	EP29
Type of scale	90°	
External dimensions	72 x 72 mm	96 x 96 mm
Interchangeable scale	✓	✓
Voltage measuring ranges:	500 V xV/100 V; xV/110 V	
- direct phase-to-phase: - through a transformer:	40...45...65...72 Hz	
Frequency	3 kV	
Proof voltage	IP40	
Protection rating	normal	
Climate version	1.5	
Class		

## POWER METER



	PA39
Type of scale	90°
External dimensions	96 x 96 mm
Interchangeable scale	✓
Power measuring ranges	50W...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)
Climate version	normal, tropical or similar to marine
Class	1.5

# ANALOG MEASUREMENT 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	144 x 144 mm
Interchangeable scale	-	✓	✓	✓	-
Measuring ranges:	<ul style="list-style-type: none"> <li>- current:                             <ul style="list-style-type: none"> <li>· direct measurement: 100 <math>\mu</math>A...6 A (MB16); 100 <math>\mu</math>A...25 A (MA16)</li> <li>· indirect measurement (through the shunt*): 1 A...15 kA</li> </ul> </li> <li>- voltage:                             <ul style="list-style-type: none"> <li>· direct measurement: 60 mV...600 V</li> </ul> </li> </ul>				
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:	<ul style="list-style-type: none"> <li>- ambient temperature: 5...23...55°C</li> <li>- relative air humidity: 25...85%</li> </ul>				
Class	1				

\* see our shunts (page 45)

## 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:	<ul style="list-style-type: none"> <li>- bimetalic element:                             <ul style="list-style-type: none"> <li>· direct measurement: 0...1.2 A or 0...6 A</li> <li>· indirect measurement (through a transformers*): 0...1.2(x) A x/1 A or 0...1.2(x) A x/5 A</li> </ul> </li> <li>- moving-iron element:                             <ul style="list-style-type: none"> <li>· direct measurement: 0...1/2 A or 0...5/10 A</li> <li>· indirect (through a transformer*): 0...2(x) A x/1 A or 0...2(x) A x/5 A</li> </ul> </li> </ul>			
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 42)

## POWER FACTOR AND FREQUENCY METERS







	FA39	FA32	CA36	CA37	CA39	CA32
Type of scale	90°					
External dimensions	96 x 96 mm	144 x 144 mm	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	✓	✓	✓	✓	✓
Measuring ranges	<ul style="list-style-type: none"> <li>0.5<sub>Cap</sub>...1...0.5<sub>IND</sub></li> <li>0.8<sub>Cap</sub>...1...0.2<sub>IND</sub></li> <li>0.85<sub>Cap</sub>...1...0.85<sub>IND</sub></li> <li>0<sub>IND</sub>...1</li> <li>45...50...60...65 Hz</li> </ul>					
Frequency	<ul style="list-style-type: none"> <li>45...55 Hz; 45...65 Hz; 48...52 Hz; 55...65 Hz; 360...440 Hz; 380...420 Hz</li> </ul>					
Proof voltage	2 kV					
Protection rating	IP52 (IP65 on request)	IP52	IP52	IP52 (IP65 on request)		IP52
Climate version	normal, tropical or similar to marine					
Class	1.5			0.5		






# ANALOG MEASUREMENT 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:	100 $\mu$ A...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			

## MOVING-IRON METERS

			
	MA17L(P)	MA19L(P)	MA12L(P)
Type of scale	240°		
External dimensions	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:	40 V...600 V		
Proof voltage	2 kV		
Protection rating	IP52 (IP65 on request)		IP52
Climate version	normal		
Class	1		

## 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 <sub>Cap</sub> ...1...0.5 <sub>IND</sub> 0.8 <sub>Cap</sub> ...1...0.3 <sub>IND</sub> 0.8 <sub>Cap</sub> ...1...0.8 <sub>IND</sub>		45...50...55Hz 45...55...65Hz 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 MEASUREMENT 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	

# ANALOG MEASUREMENT DUAL ANALOG PANEL METERS/ 2 IN 1 SCALE 90°



## DUAL MOVING-IRON METERS

## DUAL FREQUENCY METERS

## DUAL MOVING-COIL METERS



	EA19D	CA39D	CA32D	MA19D
Type of scale	90°			
External dimensions	96 x 96 mm	96 x 96 mm	144 x 144 mm	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 μA...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)	IP52 (on request IP65 - only for CA39D)		IP52 (on request IP65)
Climate version	normal			
Class	1	0.5		1



# ANALOG MEASUREMENT CURRENT TRANSFORMERS

## 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	



LCTM 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	∅14	∅14	∅14	∅22
Accuracy class	0.5; 1; 3			0.2; 0.55; 0.5; 1; 3



LCTR series

## LCTB CURRENT TRANSFORMERS FOR A BUSBAR CONDUCTOR

	LCTB 45/21 (40)	LCTB 50/21 (30)	LCTB 50/21 (50)	LCTB 62/20 (40)	LCTB 74/20 (45)	LCTB 50/30 (30)
Primary current [A]	50...400	50...400	50...400	50...400	30...400	75...600
Hole diameter	∅20	∅21	∅21	-	∅20	∅26
Busbar (mm)	20 x 10	20x10	20x10	20 x 12 2 x 15 x 6	20 x 10	30x10; 20x15 20x20 2x20x10
Accuracy class	0.5; 1; 3			0.25; 0.2; 0.55; 0.5; 1; 3		0.5; 1; 3



LCTB 45

LCTB 62

## LCTB CURRENT TRANSFORMERS FOR A BUSBAR CONDUCTOR

	LCTB 50/30 (50)	LCTB 62/30 (40)	LCTB 62/30 (50)	LCTB 74/30 (45)	LCTB 62/40 (40)	LCTB 86/40 (45)
Primary current [A]	75...600	50...800	40...800	30...800	100...800	50...1000
Hole diameter	∅26	∅30	∅28	∅26	∅31	∅36
Busbar (mm)	30x10; 20x15; 20x20; 2x20x10	30x10 2x25x10	30x10 2x25x10	30x15 2x20x10	40x10 2x30x10	40x10 2x30x15
Accuracy class	0.5; 1; 3		0.25; 0.2; 0.55; 0.5; 1; 3			



LCTB 74

LCTB 86

## LCTB CURRENT TRANSFORMERS FOR A BUSBAR CONDUCTOR

	LCTB 74/40 (45)	LCTB 74/50 (45)	LCTB 86/50 (45)	LCTB 86/60 (45)	LCTB 104/60 (45)	LCTB 104/80 (45)
Primary current [A]	40...1000	100...1000	100...1250	100...1600	100...1600	200...2000
Hole diameter	∅35	∅41	∅46	∅51	∅54	∅65
Busbar (mm)	40x12 2x30x15	50x12 2x40x10	50x12 2x40x15	60x12 2x50x15	60x12 2x50x15 2x40x20	80x12 2x60x15 2x50x25
Accuracy class	0.25; 0.2; 0.55; 0.5; 1; 3					



LCTB 104

LCTB 86

## LCTB CURRENT TRANSFORMERS FOR A BUSBAR 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	∅72	∅86	-	-
Busbar (mm)	80x30 2x60x25	100x30 2x80x25 2x70x30	124x93	166x65
Accuracy class	0.25; 0.2; 0.55; 0.5; 1; 3			



LCTB 140

LCTB 225



**LCTB CURRENT TRANSFORMERS FOR A BUSBAR 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
Busbar (mm)	41 x 103	100 x 30 2 x 80 x 25 2 x 70 x 30	38 x 128	70 x 130
Accuracy class	0.25; 0.2; 0.55; 0.5; 1; 3		0.2; 0.5; 1; 3	

**LCTS SPLIT CORE CURRENT TRANSFORMERS**



	LCTS 50/18SC	LCTS 50/32SC	LCTS 93/30SC (40)	LCTS 125/50SC (40)	LCTS 155/80SC (40)	LCTS 195/80SC (64)
Primary current [A]	150...250	250...500	100...400	250...1000	250...3000	500...5000
Hole dimensions (depth x width) [mm]	∅18.5	∅32.5	23 x 33	85 x 54	85 x 125	82 x 162
Accuracy class	1			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]	-	-	-	∅27	∅37
Busbar (mm)	14 x 24	20 x 24	31 x 36	-	-
Accuracy class	0.5; 1			1	

**LRC - RESIN CAST CURRENT TRANSFORMERS**



	LRC1 80/30(50)	LRC2 90/50(40)	LRC3 110/72(40)	LRC4 135/85(40)
Primary current [A]	60 A...160	200 A...320	400 A...630	800 A...1250
Hole diameter [mm]	∅ 30	∅ 50	∅ 72	∅ 85
Accuracy class	0.5, 1			

**LRC - RESIN CAST CURRENT TRANSFORMERS**



	LRC5 165/115(40)	LRC6 195/130(40)	LRC7 230/165(40)	LRC8 295/200(40)
Primary current [A]	1500 A...2000	2500 A...3200	3000 A...3200	4000 A...5000
Hole diameter [mm]	∅ 115	∅ 130	∅ 165	∅ 200
Accuracy class	0.5, 1			

**LU01 - SUMMATION CURRENT TRANSFORMERS**



	LU01 (75)	LU01 (150)
Inputs [A]	2 x 5A...4 x 5A	5 x 5A...8 x 5A
Secondary current	5 A	5 A
Dimensions [mm]	70 x 75	70 x 150
Accuracy class	0.5; 1	

**LW - ROUND CURRENT TRANSFORMERS**



	LW01	LW02	LW03	LW04	LW05	LW06
Primary current [A]	50...200	50...200	75...300	120...600	200...1000	600...3200
Hole diameter [mm]	∅30	∅30	∅43	∅58	∅72	∅113
Outer diameter [mm]	∅73	∅73	∅92	∅100	∅110	∅159
Accuracy class	0,5; 1		0.2; 0.55; 0.5; 1			



# ANALOG MEASUREMENT CURRENT TRANSFORMERS

## LE - ROUND CURRENT TRANSFORMERS

	LE01 73/30 (50)	LE03 92/43 (41)	LE04 95/50 (40)	LE05 100/58 (41)
Primary current [A]	50...200	200...400	200...300	400...600
Hole diameter [mm]	∅30	∅43	∅50	∅58
Outer diameter [mm]	∅73	∅92	∅95	∅100
Accuracy class	1;5	1		



## LE - ROUND CURRENT TRANSFORMERS

	LE06 110/72 (41)	LE07 135/85 (30)	LE08 159/113 (40)	LE09 165/130 (30)
Primary current [A]	800...1000	800...1200	1200...2000	2400...3000
Hole diameter [mm]	∅72	∅85	∅113	∅130
Outer diameter [mm]	∅110	∅135	∅159	∅165
Accuracy class	1			



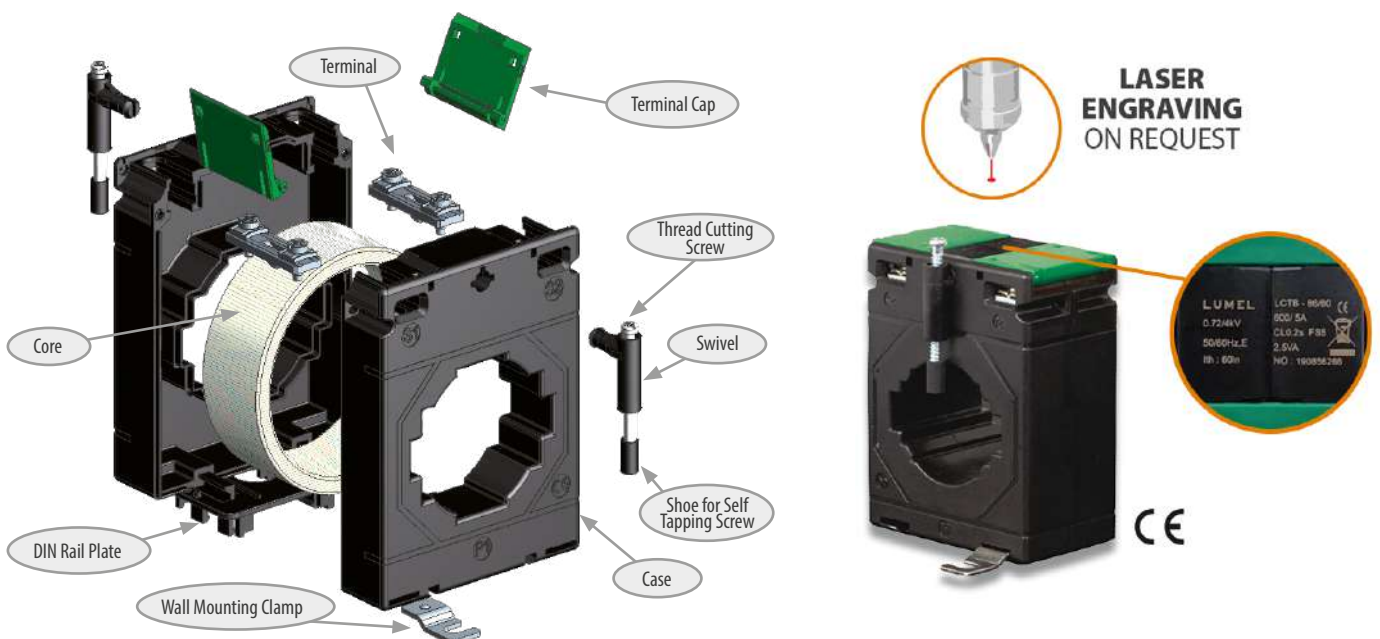
## CURRENT TRANSFORMERS DEDICATED TO ND20CT

	LJ12	LJ25, LJ35, LJ45	L306, L307, L308
Version	1-phase	3-phase	
Range	50-250 A*	60-600 A*	63-250 A*
Class	1 or 0.5*		
Connection way to ND20CT	RJ12 connector		screw terminals or RJ12 connector

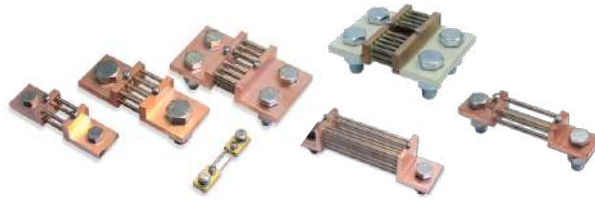
\* - more detailed informations in data sheet

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

## ACCESSORIES:



# ANALOG MEASUREMENT 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					
<ul style="list-style-type: none"> <li>shunts from 1...25 A are fixed on insulating basis with the possibility to be mounted on a DIN rail (except B1 type)                             <ul style="list-style-type: none"> <li>shunts of other ranges are fixed directly on the DC rail or cable                                     <ul style="list-style-type: none"> <li>dimensions acc. DIN 43703</li> </ul> </li> <li>shunts 40...150 A - insulating base as a option for B2 types</li> </ul> </li> <li>on request additional chemical coating are available: varnishing or silver</li> </ul>						



plate  
shunts

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

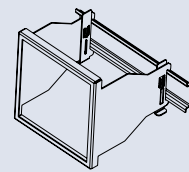
- Custom-made executions are available on request (voltage drop, current).

## ADAPTER

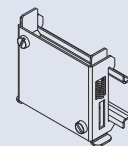


- Designed for mounting of panel instruments on the DIN rail TS35.

	ADAPTER ATS					
	ATS1	ATS2	ATS3	ATS4	ATS5	ATS6
Hole dimensions (width x height) [mm]	$92^{+0.8} \times 92^{+0.8}$	$92^{+0.8} \times 45^{+0.6}$	$68^{+0.7} \times 68^{+0.7}$	$45^{+0.6} \times 92^{+0.8}$	$45^{+0.6} \times 45^{+0.6}$	dedicated for transducers P18, P18D, P18L
Panel instruments dimensions (width x height) [mm]	96 x 96	96 x 48	72 x 72	48 x 96	48 x 48	



Adapter ATS1



Adapter ATS6

## 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/20-810-01-00004





## ANALOG MEASUREMENT CAM SWITCHES



**PKT1 / PKS1 / PKH1**  
changeover



**PKT2 / PKS2 / PKH2**  
multi-step



**PKT3 / PKS3 / PKH3**  
isolator



**PKT4**  
selector

PARAMETERS	UNIT	PKT1, PKT2, PKT3, PKT4				PKS1, PKS2, PKS3				PKH1, PKH2, PKH3	
		6 A	10 A	16 A	20 A	25 A	32 A	40 A	63 A	100 A	200A
Rated operational voltage (Ue)	V	440	440	690	690	690	690	690	690	690	690
Rated Insulation voltage (Ui)	V	440	440	690	690	690	690	690	690	690	690
Rated uninteruptd current (Ith)	A	8	12	20	25	32	40	50	80	125	225
Rated short time withstand current (Icw)	A	72	120	192*	240*	300	384	480	756	1200	2400
Rated Impulse withstand voltage (Uimp)	kV	4	4	4	4	6	6	6	6	6	6
Rated Fuse short circuit current	kA	3	3	5	5	10	10	10	10	15	15
Frontal frame dimensions	mm	48 x 48				64 x 64				88 x 88	

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



**PKR1 / PKR5**  
on-OFF spring return switches



**PKR2 / PKR6**  
double throw with OFF



**PKR3 / PKR7**  
spring return switches  
without OFF



**TKR1 / TKR2**  
spring return cam switches 1xNO 1xNC /  
spring return cam switches 2xNO 2xNC

PARAMETERS	UNIT	PKR1, PKR2 PKR3, PKR5, PKR6, PKR7			TKR1, TKR2	
		16 A	20 A	25 A	32 A	
Rated operational voltage (Ue)	V	690	690	690	690	
Rated Insulation voltage (Ui)	V	690	690	690	690	
Rated uninteruptd current (Ith)	A	20	25	32	40	
Rated short time withstand current (Icw)	A	192*	300	300	384	
Rated Impulse withstand voltage (Uimp)	kV	4	6	6	6	
Rated Fuse short circuit current	kA	5	10	10	10	
Frontal frame dimensions	mm	48 x 48	64 x 64	65 x 65		

\* 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
<b>SWITCH LIFE</b>	
Mechanical Life	100 000 operations at 300 cycles/hr
Electrical Life	10 000 operations at 100% rated duty at 120 cycles/hr

# PORTABLE MULTIMETERS & CLAMP METERS



## NP45

Portable power quality analyzer

- 5.6" TFT color screen. 640 x 480 pixel,
- waveform real-time display (4 voltages/4 currents),
- half cycle RMS measurement (voltage and current),
- measurement of TRMS currents up to 6000 A (with additional probes mode),
- 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, overvoltages,
- power quality according to EN-50160 standard or user-defined limit,
- registration of user-defined parameters in the 32GB internal memory (registration time from 2 h up to 1 year),
- Ethernet and WiFi interfaces 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



## 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.



## NP15B

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  $\mu$ V ... 1000 V;
- direct and alternating currents from 10  $\mu$ A ... 10.00 A;
- resistance from 100 m $\Omega$ ... 60.00 M $\Omega$ ;
- 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.





# PORTABLE MULTIMETERS & CLAMP METERS



## NP06

Digital multimeter

- direct and alternating voltages from 100 $\mu$ V ... 1000V,
- direct and alternating currents from 10 $\mu$ A ... 10.00A,
- resistance from 1 $\Omega$ ... 40.00M $\Omega$  with zero correction,
- resistance from 1pF... 200.00 $\mu$ A with zero correction,
- frequencies from 10.00 Hz ... 10MHz,
- diode measurement and continuity testing,
- duty cycle (%) measurement,
- hold measurement,
- relative measurement,
- non contact voltage detection.



## NP08

Digital multimeter

- direct and alternating voltages from 100 $\mu$ V ... 1000V,
- direct and alternating currents from 10 $\mu$ A ... 10.00A,
- resistance from 1 $\Omega$ ... 40.00M $\Omega$  with zero correction,
- resistance from 1pF... 200.00 $\mu$ A with zero correction,
- frequencies from 10.00 Hz ... 10MHz,
- diode measurement and continuity testing,
- hold measurement,
- relative measurement,
- duty cycle (%) measurement,
- temperature measurement with 'K' type Thermocouple,
- backlit facility.



## 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.



## NC11

Clamp-on meter

- the diameter of measured cable 50 mm (the meter up to 1000A)
- the diameter of measured cable 40 mm (the meter to 400A)
- current measurement up to 400 and 1000 A AC
- measuring voltage up to 1000 V AC
- measuring temperature from 0 to 1300°C (K type thermocouple)
- illuminated digital display with analog indicator,
- a number of features:
  - HOLD - Stop function currently displayed measured value,
  - Auto power off,
- for low ohm measurement, the lead resistance can be compensated by pressing the REL key,
- automatic and manual mode,
- available measuring function diodes and transistors,
- degree of protection IP20.
- an adjustment of the resistance - for low measuring low resistance or can be compensated by pressing the Shift button

# PORTABLE MULTIMETERS & CLAMP METERS



5 IN 1

## VA19

5 in 1 Digital multimeter

- Measurements of AC / DC voltage, AC / DC current, resistance, frequency, load, capacitance and continuity, diode test.
- Sound Level function.
- Illumination measurement function (the meter uses a stable, long-life silicon diode).
- Temperature measurement.
- Humidity measurement.
- Automatic and manual measuring range function.
- Automatic switch-off function.
- Hold function.
- Relative measurement function.
- Backlight.
- Measurement in CAT II 600V installations.



## MS8221A

Pocket size digital multimeter

- AC / DC current measurement max 10A.
- DC 1000VDC voltage measurement.
- 750VAC AC voltage measurement.
- Resistance measurement.
- Continuity test.
- Hold function.



## M266C

Clamp meter

- 3½ digit LCD, with automatic polarity indication
- Dual-slope integration A-D converter system.
- CAT II 600V installation category.
- Jaw opening 50mm.
- AC 20/200/600 / 1000A current measurement.
- AC 200 / 600V voltage measurement.
- DC voltage measurement 0.2 / 2 / 20 / 200 / 600V.
- Resistance measurement.
- Temperature measurement max. 750°C.

## VA503

Pen R/C meter for SMD

- measurement of resistance 400...40M Ohm
- capacity measurement 4nF...100µF
- diode test
- measurement of relative values



## VA8010

Temperature /humidity and dew point meter

- 4-digit LCD display;
- °C, °F, % RH (relative humidity); td (dew point temperature);
- Resolution: 0.1°C; 0.1 °F; 0.1% RH;
- Range:
  - -10 ~ +50 °C, +14 ~ +122°F;
  - 0 ~ +100% relative humidity;
- Accuracy: ± 1.0 °C; ± 1.8 °F; ± 3% RH (5 ~ 95% RH);
- Sampling rate: 1/s;
- Automatic power off: about 20 minutes;
- Protective case;
- Large, easy to read LCD display.



## VA8051

Luxmeter with sensor rotation

- 6 digits LCD Display
- Parameters: Lux (lm/m²), foot candle (lm/ft²)
- Resolution: 1 Lux (0...30000 Lux); 0.1 ftc (0...2788.0 ftc);
- Range: 0...30000 Lux, 0...2788.0 ftc
- Accuracy: ±(4% +50 digits) to reference
- Sample rate: 2 time /sec
- Auto power off: about 20 minutes



## VA8090

Infrared temperature and thermocouple meter

- 4 digits LCD Display;
- Resolution:
  - 0.1 °C / 0.1 °F
  - 1 °C / 1 °F (thermocouple above 1000 °C)
- Range:
  - infrared: -50 ~ 300 °C (-58°F ~ 572°F)
  - thermocouple: -200 ~ 1300 °C (-328 °F ~ 2372 °F)
- Accuracy:
  - infrared:
    - -50 ~ -20 °C / ± 5 °C / 9 °F
    - -20 ~ 300 °C / ± (1.5% odczytu + 2 °C / 4 °F)
  - thermocouple: -200 ~ -100 °C / ± (0.2% odczytu + 1 °C / 2 °F)
  - -100 ~ 1300 °C / ± (0.1% reading + 0.7 °C / 1.4 °F)
- Emissivity: 0.95
- Field of view: 2:1
- Laser power: Less than 1 mW
- Response time: 0.5 second
- Auto power off: 25 seconds (infrared) or 20 minutes (thermocouple)
- Low battery indicat



## VA8060

Dual ways thermocouple meter

- 4 digits LCD Display
- Resolution:
  - 0.1 °C / 0.1 °F (below 1000 °C)
  - 1 °C / 1 °F (above 1000 °C)
- Range:
  - K - type: -200 °C ~ 1300 °C (-328 °F ~ 2372 °F)
  - J - type: -200 °C ~ 1200 °C (-328 °F ~ 2192 °F)
- Accuracy:
  - (-200 ~ -100 °C) ± (0.2% reading + 1 °C)
  - (-100 ~ 1300 °C) ± (0.1% reading + 0.7 °C)
  - (-328 ~ -148 °F) ± (0.2% reading + 2)
  - (-148 ~ 2372 °F) ± (0.1% reading + 1.4)
- Sample rate: 1 time /sec
- Auto power off: about 20 minutes
- Low battery indicator



# PORTABLE MULTIMETERS & CLAMP METERS

NEW



## VA90B Digital multimeter

- Base accuracy 0.2%
- IP67
- AC/DC Voltage measurement 0..1000 V,
- AC/DC Current measurement  $\mu$ A/mA/10 A,
- Resistance measurement 0... 60 M $\Omega$ ,
- Capacitance measurement 0... 60 mF,
- Frequency measurement, TTL
- Diode test
- Temperature measurement -200... 1000°C,
- Auto Scan (SMART), REL, Duty
- Automatic measuring range selection
- HOLD function

NEW



## VA28B Digital multimeter

- CAT III 600V
- TRMS
- AC/DC Voltage measurement 400mV... 400 V,
- AC/DC Current measurement 40mA... 10 A,
- Resistance measurement 400m $\Omega$ ... 40 M $\Omega$ ,
- Capacitance measurement 4 nF... 4 mF,
- Frequency measurement
- Temperature measurement -200... 1200°C,
- Auto Scan function (SMART)
- HOLD function
- Continuity test and Diode test
- Dimensions: 130 x 62 x 27 mm.

NEW



## VA310 Digital Clamp Meter

- Jaw size: 40 mm
- DC Voltage: 1000 VDC  $\pm$
- AC Voltage: 750 VAC  $\pm$
- AC Current: 20/200A/1000 A  $\pm$
- Resistance: 200 $\Omega$ /2K $\Omega$
- Temperature (VA310C) : -40~750°C
- Diode test
- Continuity Buzzer
- Max. Display: 1999
- Data Hold
- Dimensions: 225 x 86 x 32 mm

NEW



## VA312 Digital Clamp Meter

- Class II: 1000mV
- Class III: 600 mV
- Max. jaw opening: 40 mm
- Max. Display: 5999
- Backlight display: 44x23 mm
- Voltage DC: 6V/60V/600V/1000V DC
- Voltage AC: 6V/60V/600V/700V AC
- Current AC: 600A/1000A AC
- Resistance: 600/6k/60k/600k/6M/60M $\Omega$
- Capacitance: 600nF/6 $\mu$ F/60 $\mu$ F/600 $\mu$ F/1000 $\mu$ F
- Low voltage measuring output up to 600mV
- Auto and auto/manual range
- Diode test
- Data Hold
- Max./min. value measurement
- Continuity test
- Dimensions: 225 x 86 x 32 mm

NEW



## VA333 Small size clamp-on meter

- The diameter of measured cable 32 mm
- AC/DC Current measurement 400A
- AC/DC Voltage up to 600V AC/DC
- Resistance measurement 400m $\Omega$ ... 40 M $\Omega$
- Capacitance measurement 50 nF... 100 $\mu$ F
- Frequency measurement 5..100kHz
- Continuity test and Diode test
- Hold, REL functions

NEW



## VA700 Volt/mA Calibrator

- Characteristic Documentation Certificates
- Maximum voltage: 30V (between any jack and earth ground or between any two jacks)
- Storage temperature: -40°C to 60°C
- Operating temperature: -10°C to 55°C
- Operating altitude: Up to 3000 meters
- Temperature coefficient:  $\pm$ 0.005% of range per  $^{\circ}$ C (for temperatures -10°C to 18°C and 28°C to 55°C)
- Relative humidity:
  - 95% up to 30°C
  - 75% up to 40°C
  - 45% up to 50°C
  - 35% up to 55°C
- Shock: Random 2g, 5Hz to 500Hz
- Safety: 1 meter drop test
- Power requirements: 6 x AAA batteries
- Size: 204mm (L) x 99mm (W) x 46mm (H)
- Weight: 460g (including battery)

NEW



## VA701 Voltage/Current Calibrator

- Maximum voltage: 30V (between any jack and earth ground or between any two jacks)
- Storage temperature: -40°C to 60°C
- Operating temperature: -10°C to 50°C
- Operating altitude: Up to 2000 meters
- Temperature coefficient:  $\pm$ 0.01% of range per  $^{\circ}$ C (for temperatures -10°C to 18°C and 28°C to 55°C)
- Relative humidity:
  - 95% up to 30°C
  - 75% up to 40°C
  - 45% up to 50°C
  - 35% up to 55°C
- Power requirements: 6 x AAA batteries
- Size: 204mm (L) x 99mm (W) x 46mm (H)
- Weight: 460g (including battery)

NEW



## VA702 Voltage/Current/TC Calibrator

- Maximum voltage: 30V (between any jack and earth ground or between any two jacks)
- Storage temperature: -40°C to 60°C
- Operating temperature: -10°C to 50°C
- Operating altitude: Up to 2000 meters
- Temperature coefficient:  $\pm$ 0.01% of range per  $^{\circ}$ C (for temperatures -10°C to 18°C and 28°C to 55°C)
- Relative humidity:
  - 95% up to 30°C
  - 75% up to 40°C
  - 45% up to 50°C
  - 35% up to 55°C
- Power requirements: 6 x AAA batteries
- Size: 204mm (L) x 99mm (W) x 46mm (H)
- Weight: 460g (including battery)

NEW



## VA710 Thermocouple Calibrator

- Measure or simulate: Millivolt and 8 types of thermocouples ( $^{\circ}$ C or  $^{\circ}$ F)
- Display: Large 5-digit LCD with full-angle visibility
- Accuracy: Max. up to 0.3°C and 0.025% for mV
- Power: Standard jack for external power supply
- Maximum voltage: 30V (between any jack and earth ground or between any two jacks)
- Storage temperature: -40°C to 60°C

- Operating temperature: 0°C to 50°C
- Operating altitude: Up to 3000 meters
- Temperature coefficient:  $\pm$ 0.02%/ $^{\circ}$ C (from 0°C to 18°C and 28°C to 50°C)
- Relative humidity:
  - 95% up to 30°C
  - 75% up to 40°C
  - 45% up to 50°C

- Shock: Random 2g, 5Hz to 500Hz
- Safety: 1 meter drop test
- Fuse: F 0.125A/250V
- Power requirements: 6 x AAA 1.5V batteries
- Size: 205mm (L) x 98mm (W) x 46mm (H)
- Weight: 472g (including battery)

# DETECTION GAMMA AND/OR NEUTRON RADIATION SMP RADIATION PORTAL MONITORS



Radiation Portal Monitor (SMP) of Lumel S.A. are designed to detect radiation from gamma and/or neutron emitters contained in objects, containers, or vehicles, or carried by a pedestrian.

SMP monitors may be equipped with one or several detection blocks and an operator panel with a touch screen and a printer.

Stationary Radiation Monitor Systems manufactured by Lumel S.A. are designed for three different areas:

- ▶ scrapyards, metalworks,
- ▶ incinerators, landfills,
- ▶ control points at border crossing points in airports, seaports, road border crossing, railway border crossing.

## GAMMA- NEUTRON RADIATION PORTAL MONITORS



## GAMMA RADIATION PORTAL MONITORS



## FEATURES:

- ▶ automatic radiometric control without interference on the traffic,
- ▶ high sensitivity,
- ▶ generation of reports and alarm signals,
- ▶ speed control,
- ▶ interactive control panel with a 8.3" touch screen,
- ▶ bi-directional communication which provides:
  - ▶ remote control of the smp,
  - ▶ remote change of selected parameter settings,
- ▶ operation in the dedicated Remote Management System SMP-Studio,
- ▶ video recording (supervised by the SMP-Studio),
- ▶ reliability,
- ▶ user-friendly.



# DETECTION GAMMA AND/OR NEUTRON RADIATION SMP RADIATION PORTAL MONITORS

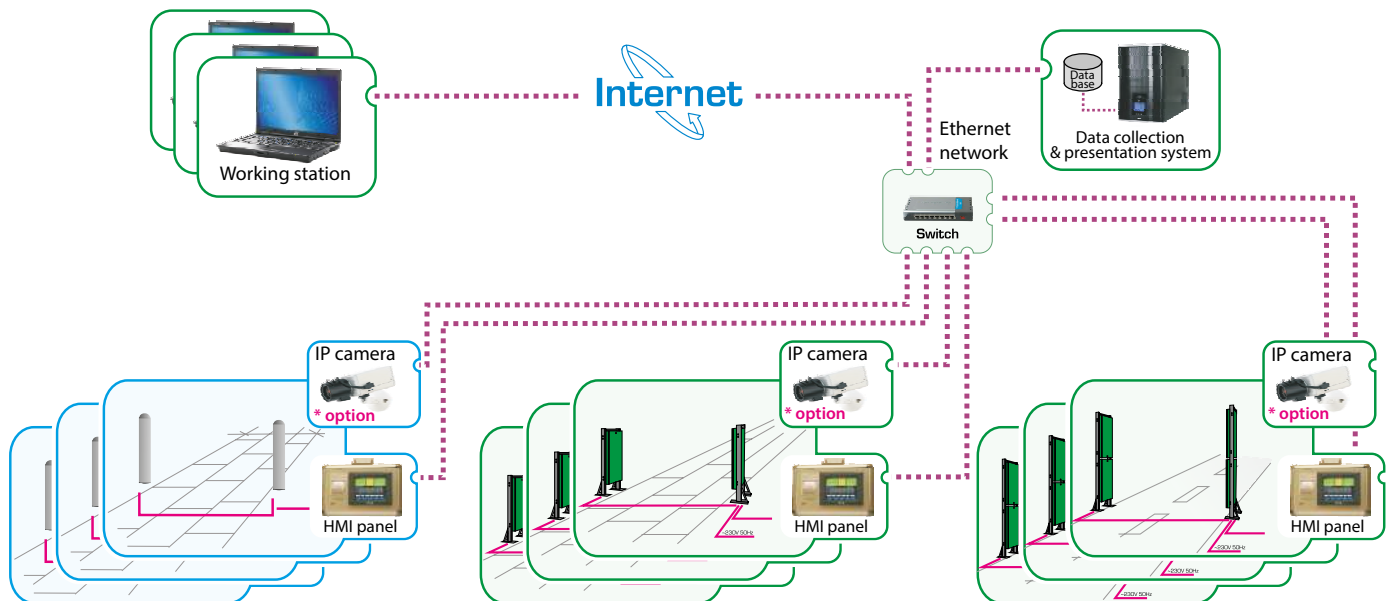
	GAMMA RADIATION PORTAL MONITORS		GAMMA- NEUTRON RADIATION PORTAL MONITORS					
	SMP-4/100	SMP-2/50	SMP-M11	SMP-M22	SMP-11	SMP-22	SMP-44	
Application	<ul style="list-style-type: none"> <li>scrap metal recycling facilities</li> <li>steel mills</li> </ul>	<ul style="list-style-type: none"> <li>landfills</li> <li>incineration plants</li> </ul>	Control points at border crossing points in airports, seaports, road border crossing, railway border crossing.					
Control zone [width/height]	6 m / 4 m permissible (4,5 m / 4 m optimal)		1.5 m / 2 m	3 m / 2 m	1.5 m / 2 m	3 m / 2 m	6 m / 2 m	6 m / 4 m
Speed	8 km / h permissible (5 km / h optimal)		5 km/h			5 km / h	8 km / h	8 km/h
Controlled object	trucks, containers, rail vehicles	trucks, containers	pedestrians with hand luggage (indoor use)		pedestrians, luggage, conveyor belt, trolleys, –outdoor use		vehicles, luggage, pedestrians – outdoor use	trucks, buses, rail vehicles

## SMP STUDIO | REMOTE SUPERVISION SYSTEM

**Remote Supervision System SMP Studio performs the function of visualization, collection and distribution of operation data detected by Radiation Portal Monitors installed on one or many locations.**

- Remote visualization of the status of SMP RPM's.
- Recording alarm and emergency data
- Recording changes in SMP device settings.
- The image preview of supervisory zone from video cameras.
- Saving image of supervisory zone from the course of alarm recorded by video cameras.

- Compilation and printing information about operation mode and registered events.
- Automatic backup of computer database.
- Automatic synchronization of the clock of SMP devices.
- Supervision of up to 32 supervisory zones.
- Communication with supervised SMP by LAN or WAN networks.





# ELECTRONICS CONTRACT MANUFACTURING SERVICES

For more than 70 years, LUMEL is well-known in the international market for the production of highest quality of electronic measuring devices. Precision has been the instilled in the roots of LUMEL, our proficient employees and cutting edge technologies permit us to offer:

- ▶ **Contract Electronics Manufacturing Services (EMS)** – including prototypes, as well as small, medium, and large production series.
- ▶ **Comprehensive project execution (OEM, ODM)** – from concept to finished product, including:
  - ▶ design and manufacturing of enclosures,
  - ▶ research and development (R&D),
  - ▶ procurement of components for production,
  - ▶ SMT and THT assembly,
  - ▶ device programming and calibration.

Knowing that your electronic products will be produced by a competent manufacturer, you can be free from responsibilities of manufacturing and can lay your focus on other sectors of your business such as marketing and sales while the goods are being prepared.

## RESEARCH & DEVELOPMENT LABORATORY SERVICES

The following tests are conducted:

- ▶ Electromagnetic Compatibility (EMC) testing,
- ▶ Environmental testing,
- ▶ Vibration and shock resistance testing,
- ▶ Functional testing,
- ▶ Software and hardware validation





## SURFACE MOUNT TECHNOLOGY (SMT) SERVICES

- ▶ One-sided and double-sided assembling of SMD elements in the technology of reflow soldering, in accordance with European Directive for RoHS.
- ▶ Assembly of thread elements by flow soldering.
- ▶ Assembly can be carried out on the base of own or committed elements.

### 4 high-performance assembly lines

#### The first assembly line is composed of:

- ▶ CO<sub>2</sub> Laser Marker ASYS INSIGNUM 4000,
- ▶ Screen Printer JUKI G-TITAN,
- ▶ SPI in-line Viscom S3088,
- ▶ Two pick-and-place machines JUKI (RS-1RTS; RS-1RTSC2),
- ▶ 10-zone Reflow Soldering Oven ERSA Hotflow Three 20,
- ▶ AOI in-line Viscom S3088,
- ▶ The entire system is interconnected with ASYS handling equipment.
- ▶ The production line operates with **full traceability**, leveraging a licensed solution from the Canadian company Cogiscan.

#### The second assembly line is composed of:

- ▶ Silk screen printer JUKI G-TITAN,
- ▶ Two automatic machines JUKI (RS-1RTS; RS-1RTSC2),
- ▶ 10-zones reflow oven JUKI RS1000N with the possibility of connecting nitrogen,
- ▶ The whole line is completed by handling system, loader, two conveyors, and is manufactured by JUKI.

#### The third assembly line is composed of:

- ▶ Silk screen printer ERSA,
- ▶ 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.

#### The fourth assembly line is composed of:

- ▶ Silk screen printer JUKI ERSA,
- ▶ Placement machine JUKI KE-2060,
- ▶ Reflow oven ERSA HOTFLOW 2/14,
- ▶ The whole line is completed by handling system, loader, conveyors and unloader of the circuit boards manufactured by JOT.



#### Additional Equipment:

- ▶ Automatic component loading station by ESEGI
- ▶ X-Ray component counter
- ▶ Climate-controlled cabinet for storing MSD components
- ▶ AOI Tester – PowerSpecter GTAz 350CE Dolphin – 2 units
- ▶ Optical inspection workstations
- ▶ Soldering robot with linear transport and vision system



The entire assembly process is carried out under the strict supervision of a team of technologists and is in accordance with the European directive IPC-A-610H.

## OUR SMT LINES CAN PLACE OVER **295,000** ELECTRONIC COMPONENTS PER HOUR.

PCB size **max. 410 x 360 mm / min. 50 x 30 mm / Optimum: 200 x 300 mm /**

The number of layers: **36**

Component sizes ranging from **0201 metric to 74 x 74 mm / 50 x 150 mm**

<b>Laminate thickness:</b> Maximum: 5.0mm Minimum: 0.5mm	<b>Materials:</b> FR4, CEM, Aluminium, flexibel	<b>Copper plating:</b> HAL RoHS, HAL Pb, OSP, chemical or galvanic gold plating, silver plating
<b>Copper thickness Material [µm]:</b> 12 / 18 / 35 / 70 / 105	<b>Final thickness after metallization [µm]:</b> 30 / 35 / 60 / 95 / 130	<b>Available soldermask colors:</b> green (standard), red, black, white, blue, other colors on customer's request
<b>Minimum path width:</b> Value [mm]: 0.1 / Recommended [mm]: 0.2	<b>The minimum hole diameter:</b> Value [mm]: <b>0.1</b> / Recommended [mm]: <b>0.3</b>	<b>The minimum distance copper – copper</b> Value [mm]: 0.1 / Recommended [mm]: 0.2
<b>Additionally:</b> carbon paste, UL peelable mask, marking		

## THROUGH HOLE TECHNOLOGY (THT) SERVICES



**In addition, we also provide services in the field of:**

- ▶ Programming.
- ▶ Coating finished products with varnishes or protective compounds.
- ▶ Performing functional tests.
- ▶ Final assembly of the product.
- ▶ Calibration of the devices.

**As part of the offered THT assembly service, we implement the following steps:**

- ▶ Preparation of elements, automatic processing - cutting and bending.
- ▶ Placement of elements - manual assembly and soldering.
- ▶ Assembly of elements on a solder wave.
- ▶ Cable processing.

**Machine park:**

- ▶ All stations are equipped with ESD protection measures in accordance with EN 61340 5-1 and 5-2.
- ▶ Solder wave - Nova Star 12D.
- ▶ Washing and drying station - Pbt Super Swash.
- ▶ Soldering Robot REECO RE-2100.





## ADDITIONAL SERVICES



### DESIGNING:

When customers come to us with ideas, we offer them our team of designers and programmers who prepare model, prototypes and perform necessary tests required which confirm that the product fulfills all the CE standards.

### ADDITIONAL TESTS:

Our products are tailor made keeping our customers demand in consideration, therefore we also offer different sample size and medium of test for a minimum cost in case the customers want customized test samples to comply to the needs of their products.

### PROTECTING COATS:

With high quality products, programmable selective coating on any part of the PCB with a protective varnish or resin is performed, according to the customers demand.

### LABELING:

After your product is mounted, we can place your logo and the details your require.

### PACKAGE DESIGNING:

Every PCB and electronic device manufactured in our facility is precisely protected and we pack them in accordance to the customers guidelines. We make sure that the packaging is done to the best of our abilities so that the product is safe and sound.

### SERVICING:

Servicing of any parts (assembly and disassembly) is offered as an extra service by our team.

## OEM | ODM | EMS SERVICES

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SCAN ME!



# LABORATORY of LUMEL S.A. CALIBRATION & ATTESTATION OF CONFORMITY

If you want to have a **GUARANTEE**, that your instruments work properly - **USE OUR LABORATORY!** The LUMEL S.A. Testing Laboratory is a stationary facility providing calibration services for instruments that measure electrical quantities, temperature, and relative humidity. The combination of our team's expert knowledge and experience, high-quality equipment, and low measurement uncertainty, made possible by high-accuracy reference standards, ensures the highest level of service quality.

## **We provide services related to calibration of analog and digital devices, including:**

- ▶ 3-phase power network meters,
- ▶ multi-channel controllers and recorders,
- ▶ ammeters, voltmeters, wattmeters,
- ▶ multimeters,
- ▶ shunts and current transformers,
- ▶ temperature meters and sensors (thermoresistive, semiconductor, thermocouples),
- ▶ humidity meters and transducers.

## **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 and environmental conditions,
- ▶ vibrations and impacts ( among others transport conditions),
- ▶ measurement accuracy.

We guarantee competitive prices and delivery dates!  
We are looking forward to doing business

## **CONTACT:**

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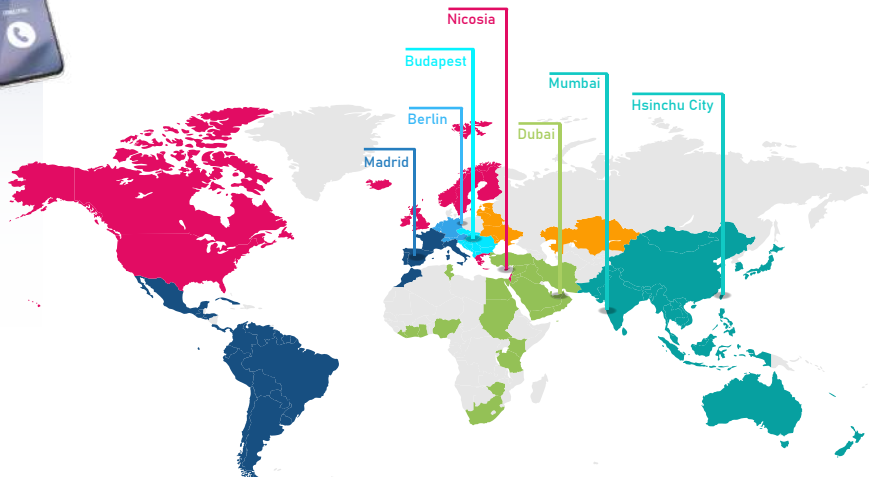
# CONTACT DATA

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## PROTECTION AUTOMATION & CONTROL

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ONLINE CATALOG



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