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CUSTOMER PRESENTATION

Energy Measurement

Power / power quality analyzer & accessories

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AGENDA

1 **DRIVERS & APPLICATIONS**
Efficiency, standards, reliability and use cases by industry

2 **VALUELINE PORTFOLIO**
New power analyzers, power quality analyzers and RCM

3 **BASICLINE & U-REMOTE**
Energy meters, MID energy counters and I/O modules

4 **ACCESSORIES & SYSTEM**
Current transformers, Rogowski coils, system architecture

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CHAPTER 1

Drivers & applications

Efficiency, standards, reliability and use cases



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WHY MEASURE?

ENERGY MANAGEMENT NEEDS ENERGY TRANSPARENCY NEEDS MEASURING

“If you can’t measure it, you can’t improve it.”

William Thomson, Lord Kelvin (1824–1907)

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OVERVIEW

DRIVERS FOR POWER ANALYSIS



EFFICIENCY & SAVINGS

Energy management systems

- → Measuring & monitoring
- → Energy data transparency
- → Energy savings, CO_2 reduction, cost savings



STANDARDS & COMPLIANCE

- Energy efficiency standards
- Power quality in public power transmission and distribution
- Power quality in industrial power networks



RELIABILITY & SAFETY

Power quality monitoring

- → Equipment protection
- → Overload avoidance
- → Trip and “hang-up” avoidance

Residual current monitoring

- → Fire avoidance

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DRIVERS FOR POWER ANALYSIS

EFFICIENCY & SAVINGS

Energy management system
→ Efficiency

- Energy savings
- CO_2 reduction
- Cost savings

Basis: **energy measuring & monitoring**

	 INDUSTRY	 BUILDINGS
BASE LOAD COSTS	up to **30%**	up to **25%**
OPERATING LOAD COSTS	up to **10%**	up to **15%**
PEAK LOAD COSTS	up to **10%**	up to **10%**

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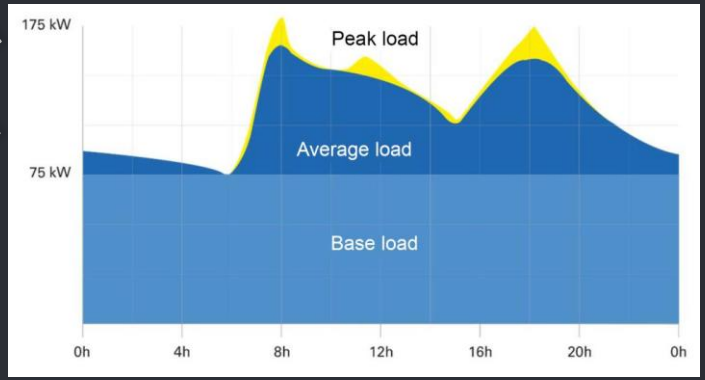
EFFICIENCY & SAVINGS: STUDY RESULTS

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Results from a study by PricewaterhouseCoopers (April 2015)

- A precondition for energy savings is the creation of data transparency.
- Investments in energy efficiency pay off.
- Companies with an energy management system (EnMS) save the most and are more successful in energy cost efficiency than companies without EnMS.
- The reduction of energy costs is an average of 17% with EnMS.

Source: PwC, “Energiewende im Mittelstand”



Example: annual energy savings

75 kW × 8,760 h × 17% × 17.8 ct/kWh = €19,881

AMORTISATION

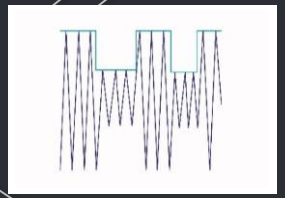
12–26 months

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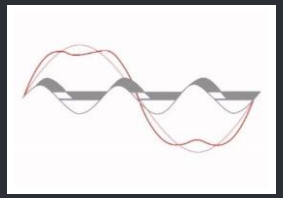
MORE THAN JUST ENERGY: POWER QUALITY

Possible problems due to a “contaminated” network:

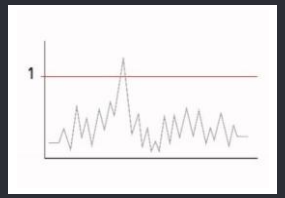
- PLC and CNC control systems “hang up”
- Computers stop
- Production interruptions, production failures
- Transformers, capacitors, motors … overheat
- Shortening of the service life of operating equipment
- Circuit breakers and fuses trip
- Increased energy costs, power loss
- Maintenance costs increase
- Fire protection and risk management



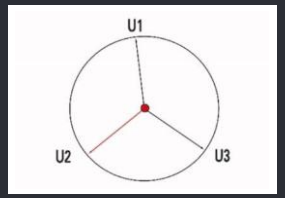
Voltage variations



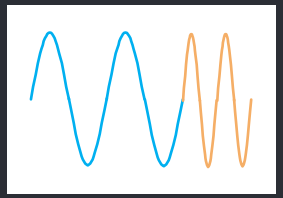
Harmonics



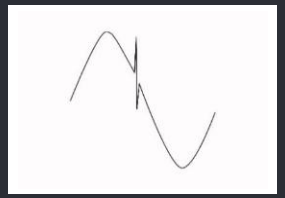
Flicker



Unbalance



Frequency variations



Transients and short-term interruptions

TYPES OF POWER QUALITY DISTURBANCES

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STANDARDS & COMPLIANCE

EN ISO 50001 Energy management systems

- Specifications for systematic energy management
- Precondition for the partial release of energy-intensive companies from the German law on renewable energy sources

DIN VDE 0100-801 Energy efficiency in low-voltage systems

- Directive for planning energy distribution, also applies for retrofits to older systems
- Prescribes the use of energy measurement technology in all energy distribution systems

EN 50160 Power quality standard for energy suppliers

- “Incoming goods inspection – current”
- Enforceable product liability standard

EN 61000-2-4 Power quality standard within companies

- Threshold values for the loads of electronic components through grid feedback
- Key phrase: warranty claims

EN 50600-2-2 Data centre facilities and infrastructures – power supply and distribution

- Including measurement & monitoring of power flows, power quality and residual currents

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DRIVERS FOR POWER ANALYSIS

RELIABILITY & SAFETY

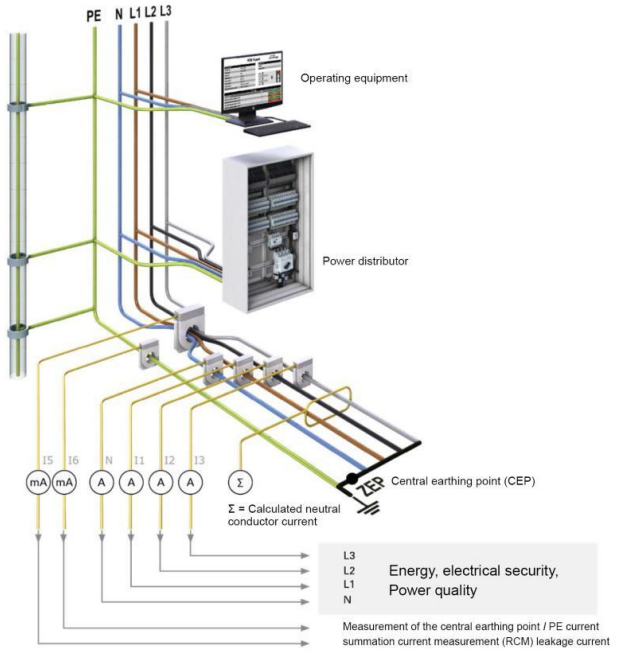
Power quality monitoring

- Avoid IT, PLC and machinery “hang-ups”
- Protect sensitive equipment
- Avoid overload of transformers, capacitors, motors …
- Avoid tripping of circuit breakers and fuses

Residual current monitoring

- Avoid power loss
- Avoid corrosion
- Avoid fire

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INDUSTRY SEGMENTS & USE CASES



DATA CENTER

- Power supply and distribution according to EN 50600-2-2, ISO/IEC 22237-3: energy measurement and monitoring
- Efficiency: power usage effectiveness (PUE) and other KPIs
- Reliability: power quality IEC/TS 62749, IEC 61000-2-4
- Safety: residual current monitoring (fire protection)



POWER TRANSMISSION & DISTRIBUTION

- Distribution grid management in complex prosumer scenarios (PV, electric heating and mobility)
- Power quality in public power networks EN 50160



MANUFACTURING / MACHINERY

- Energy management systems
- Efficiency: energy saving, CO_2 reduction, cost saving
- Reliability: power quality IEC 61000-2-4
- Safety: residual current monitoring

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INDUSTRY SEGMENTS & USE CASES



BUILDING

- Building efficiency
- Energy management system ISO 50001
- Energy billing, MID
- HVAC



NEW ENERGY

- PV, wind, storage facilities
- Feed-in controller
- Distribution grid management in complex prosumer scenarios (PV, electric heating and mobility)
- Power quality in public power networks EN 50160



PROCESS

- Oil & gas, chemistry, water, building material …
- Pumps, motors, heaters, reactors … with high energy consumption
- Energy management for efficiency

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CHAPTER 2

ValueLine portfolio

New power analyzers, power quality analyzers and RCM

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ENERGY MEASUREMENT PORTFOLIO

DEVICES

Power quality analyzer
ValueLine*



Power quality analyzer

Power analyzer
ValueLine*



Energy analyzer feat. RTU, PB, PN & Ethernet

Energy meter
BasicLine



Core functions (incl. MID) of energy data acquisition

Power analyzer
u-remote



Energy measurement modules for the u-remote I/O system

ACCESSORIES, TOOLS & APPLICATION SOFTWARE

Current transformers



Plug-on, split-core, low power & RCM, Rogowski coils

Accessories



Terminal blocks, DIN rail mounting accessory

Software*



Configuration, cloud services

ResMa



Process analysis & energy management

* New ValueLine, release Q1/2027ff

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VALUELINE

PORTFOLIO VALUELINE

	PANEL	RAIL
Power quality analyzer	 **PQA-8-P** PQA-8-P-CT-WES-M-230-6DI6DO2RO PQA-8-P-CT-WES-M-24-6DI6DO2RO	 **PQA-4-R** PQA-4-R-CT-WE-M-230-2DO PQA-4-R-CT-WE-M-24-2DO
Power analyzer with memory	 **PA-6-P** PA-6-P-RC-WE-M-4DI2DO2RO PA-6-P-CT-WE-M-4DI2DO2RO	 **PA-6-R** PA-6-R-MV-WES-M-4DO
Power analyzer	 **EM220-RTU-4DI2DO-GW** BasicLine  **EM220-RTU-4DI2DO** BasicLine	 **PA-2-R** PA-2-R-CT-S-2DO  **PA-4-R** PA-4-R-CT-WE
Residual current monitoring (RCM)		 **RCM-A-2-R** RCM-A-2-R-CT-S-2RO  **RCM-B-2-R** RCM-B-2-R-CT-S-1RO
RCM current transformer		 **RCM type A** CMA-RCM-A-35/80  **RCM type B** CMA-RCM-B-35/80

* New ValueLine, release Q1/2027ff

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POWER QUALITY ANALYZER · VALUELINE

PQA-8-P

TYPE	▪ Panel-mount power quality analyzer (145 × 201 mm form factor) ▪ Class A acc. IEC 61000-4-30
APPLICATION	▪ Power quality analyzer ▪ Analysis of electrical parameters and energy consumption ▪ Suitable for low-voltage and medium-voltage applications (up to 600 V Ph-N / 1000 V Ph-Ph)
MEASUREMENT	▪ Four-quadrant measurement for monitoring both energy consumption and generation ▪ Many parameters, harmonics up to the 63rd order
COMMUNICATION	▪ RS-485, 2× Ethernet, Wi-Fi | Modbus RTU, Modbus TCP
I/O	▪ 6 digital inputs, 6 digital outputs, 2 relay outputs
OTHERS	▪ Integrated memory (8 GB RAM, 2 GB Flash) for data and event recording ▪ Built-in web server for configuration and monitoring, no additional software required ▪ Current measurement via …/5 A, …/1 A or …/250 mA ▪ GPS-based timestamp accuracy ▪ SMTP for e-mail notification

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TYPE	ORDER NO.
PQA-8-P-CT-WES-M-24-6DI6DO2RO	3235310000
PQA-8-P-CT-WES-M-230-6DI6DO2RO	3235320000

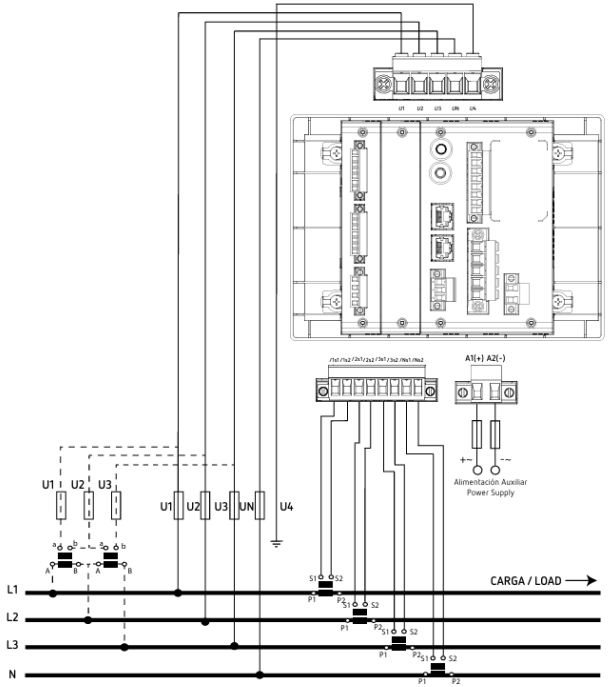
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PQA-8-P

MEASUREMENT ACCURACY	▪ Phase voltage measurement: 0.1% (10 … 150% Un) ▪ Phase current measurement: 0.1% (0.01 … 10 A) ▪ Active power measurement (kW): 0.2% ± 1 digit ▪ Apparent power measurement (kVA): 0.2% ± 10 mHz ▪ Reactive power measurement (kvar): 0.5% ± 1 digit
POWER SUPPLY	▪ AC: nominal voltage 100 … 300 V~, 47 … 63 Hz ▪ DC: nominal voltage 100 … 300 V DC
ENVIRONMENT	▪ Working temperature −20 … +70 °C ▪ IP30, front IP40
OTHERS	▪ Installation category CAT III 600 V

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EXAMPLE: 3-PHASE / 4-WIRE NETWORK



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POWER QUALITY ANALYZER · VALUELINE

PQA-4-R

TYPE	▪ DIN-rail-mount power quality analyzer (140 × 118 mm form factor) ▪ Class S
APPLICATION	▪ Analysis of electrical parameters and energy consumption ▪ Suitable for low-voltage and medium-voltage applications (up to 600 V Ph-N / 1000 V Ph-Ph)
MEASUREMENT	▪ Four-quadrant measurement for monitoring both energy consumption and generation ▪ Voltage and current THD (%) and harmonics (up to 50th order)
COMMUNICATION	▪ Ethernet, Wi-Fi | Modbus TCP/IP, MQTT, REST
I/O	▪ 2 digital outputs
OTHERS	▪ Built-in web server for configuration and monitoring (also e-mail notification), no additional software required ▪ Current measurement via …/5 A or …/1 A ▪ Up to 4 tariffs (time-controlled), 6 LEDs

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TYPE	ORDER NO.
PQA-4-R-CT-WE-M-24-2DO	3235290000
PQA-4-R-CT-WE-M-230-2DO	3235300000

Preliminary data (draft)

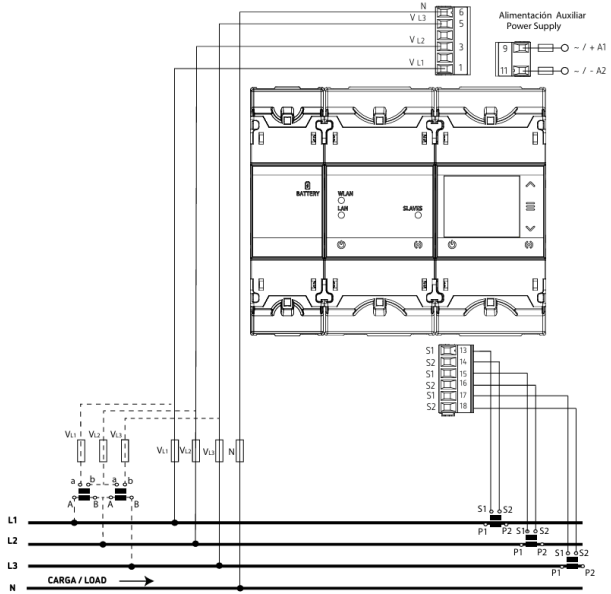
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PQA-4-R

MEASUREMENT ACCURACY	▪ Phase voltage measurement: 0.2% ▪ Phase current measurement: 0.2% ▪ Active power measurement (kW): 0.5% ▪ Apparent power measurement (kVA): 0.5% ▪ Reactive power measurement (kvar): 1%
POWER SUPPLY	▪ AC: nominal voltage 120 … 264 V~, 50 … 60 Hz ▪ DC: nominal voltage 190 … 300 V DC
ENVIRONMENT	▪ Working temperature −10 … +50 °C ▪ IP30, front IP40
OTHERS	▪ Installation category CAT III 300 V

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EXAMPLE: 3-PHASE / 4-WIRE NETWORK



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POWER ANALYZER · VALUELINE

PA-6-P

TYPE	▪ Panel-mount power analyzer (96 × 96 mm form factor)
APPLICATION	▪ Analysis of electrical parameters and energy consumption ▪ Suitable for low-voltage and medium-voltage applications
MEASUREMENT	▪ Four-quadrant measurement for monitoring both energy consumption and generation ▪ Voltage and current THD (%) and harmonics (up to 31st order)
COMMUNICATION	▪ Ethernet, Wi-Fi | Modbus TCP/IP, BACnet
I/O	▪ 4 inputs, 2 relay outputs and 2 digital outputs
OTHERS	▪ Integrated data logger with downloadable memory (40 days, CSV) ▪ Built-in web server for configuration and monitoring, no additional software required ▪ Automatic wiring error correction (autowiring) ▪ Neutral current measurement for detecting load imbalance and potential neutral conductor overload ▪ Current measurement via .../5 A, .../1 A or Rogowski coils ▪ Up to 3 tariffs, 2 LEDs

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TYPE	ORDER NO.
PA-6-P-CT-WE-M-4DI2DO2RO	3235270000
PA-6-P-RC-WE-M-4DI2DO2RO	3235280000

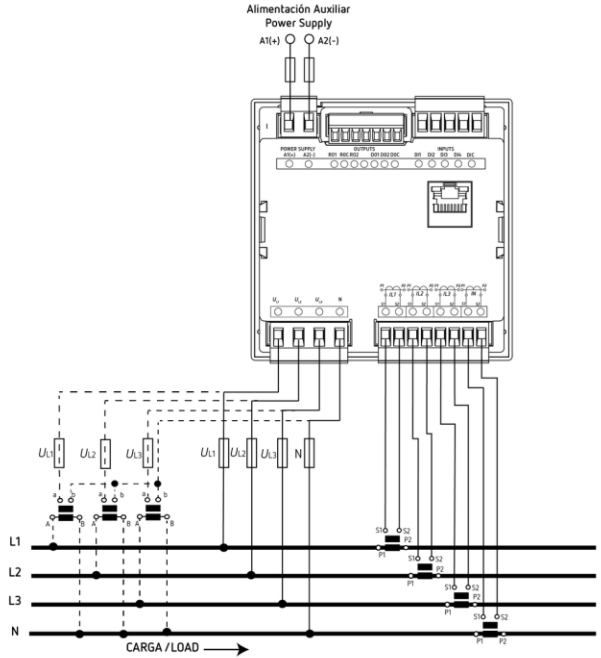
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PA-6-P

MEASUREMENT ACCURACY	▪ Phase voltage measurement: 0.2% (20 … 120% Un) ▪ Phase current measurement: 0.2% (10% In ≤ I ≤ 120% In) ▪ Active power measurement (kW): 0.5% ± 2 digits ▪ Apparent power measurement (kVA): 0.5% ± 2 digits ▪ Reactive power measurement (kvar): 1% ± 2 digits
POWER SUPPLY	▪ AC: nominal voltage 100 … 240 V~, 50 … 60 Hz ▪ DC: nominal voltage 100 … 240 V DC
ENVIRONMENT	▪ Working temperature −10 … +50 °C ▪ IP20, front IP54
OTHERS	▪ Installation category CAT III 300 V

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EXAMPLE: 3-PHASE / 4-WIRE NETWORK



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POWER ANALYZER · VALUELINE

PA-6-R

TYPE	▪ DIN-rail-mount power analyzer (105 × 104 mm form factor) ▪ Low-power current transformer 333 mV measurement
APPLICATION	▪ Analysis of electrical parameters and energy consumption ▪ Suitable for low-voltage applications
MEASUREMENT	▪ Four-quadrant measurement for monitoring both energy consumption and generation ▪ Voltage and current THD (%) and harmonics (up to 15th order)
COMMUNICATION	▪ RS-485, Ethernet, Wi-Fi | Modbus RTU, Modbus TCP/IP
I/O	▪ 4 digital outputs
OTHERS	▪ Integrated data logger with downloadable memory (at least 15 days) ▪ Built-in web server for configuration and monitoring, no additional software required ▪ Automatic wiring error correction (autowiring) ▪ Self-powered from voltage inputs, no auxiliary supply required

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TYPE	ORDER NO.
PA-6-R-MV-WES-M-4DO	3235260000

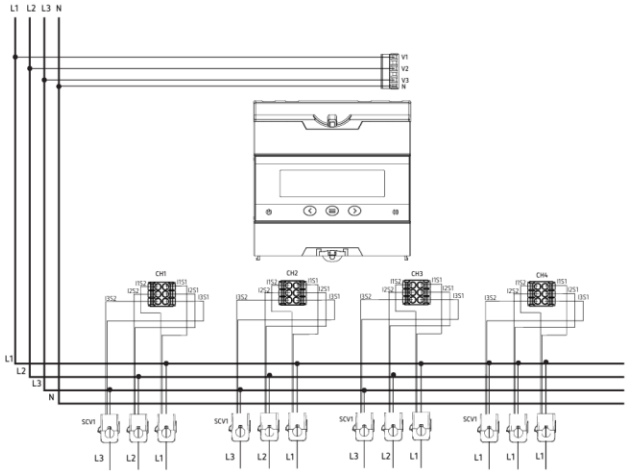
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PA-6-R

MEASUREMENT ACCURACY	▪ Phase voltage measurement: 0.5% ▪ Phase current measurement: 0.5% (10% In ≤ I ≤ 120% In) ▪ Power measurement (kVA): 1% ▪ Energy measurement: 1%
POWER SUPPLY	▪ AC: nominal voltage 120 … 300 V~ (Ph-N)
ENVIRONMENT	▪ Working temperature −10 … +60 °C ▪ IP30, front IP40
OTHERS	▪ Installation category CAT III 300 V

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EXAMPLE: 3-PHASE / 4-WIRE NETWORK



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POWER ANALYZER · VALUELINE

PA-4-R

TYPE	▪ DIN-rail-mount power analyzer (52.5 × 118 mm form factor)
APPLICATION	▪ Analysis of electrical parameters and energy consumption ▪ Suitable for low-voltage and medium-voltage applications
MEASUREMENT	▪ Four-quadrant measurement for monitoring both energy consumption and generation ▪ Voltage and current THD (%) and harmonics (up to 31st order)
COMMUNICATION	▪ RS-485, Ethernet, Wi-Fi | Modbus RTU, Modbus TCP/IP
I/O	▪ –
OTHERS	▪ Detection of incorrect wiring and wrong phase rotation ▪ Built-in web server for configuration and monitoring ▪ Current measurement via …/5 A or …/1 A ▪ Up to 2 tariffs, front LEDs for CPU & alarm

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PA-4-R-CT-WE	3235240000

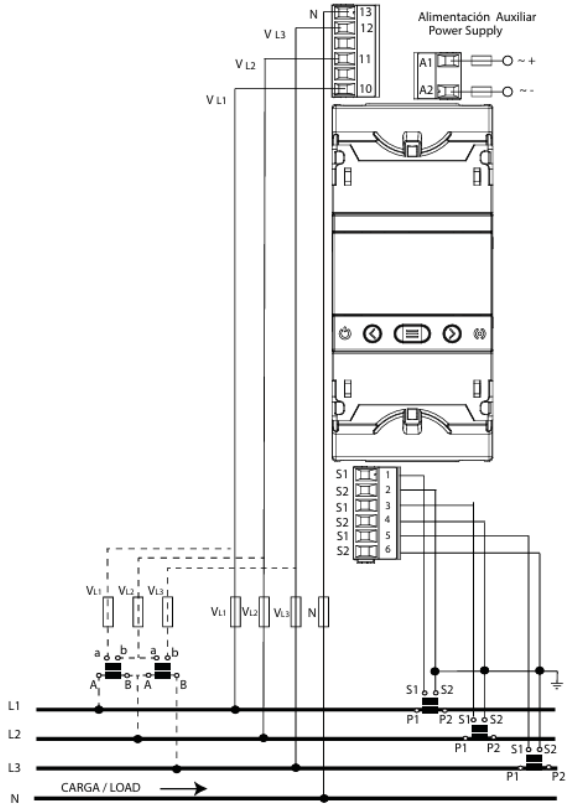
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PA-4-R

MEASUREMENT ACCURACY	▪ Phase voltage measurement: 0.5% ± 1 digit (5 … 120% Un) ▪ Phase current measurement: 0.5% ± 1 digit (2% In ≤ I ≤ 120% In) ▪ Active power measurement (kW): 0.5% ± 2 digits ▪ Apparent power measurement (kVA): 0.5% ± 2 digits ▪ Reactive power measurement (kvar): 1% ± 2 digits
POWER SUPPLY	▪ AC: nominal voltage 100 … 240 V~ ±10%, 50 … 60 Hz ▪ DC: nominal voltage 100 … 240 V DC ±10%
ENVIRONMENT	▪ Working temperature −10 … +50 °C ▪ IP30, front IP40
OTHERS	▪ Installation category CAT III 300 V

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EXAMPLE: 3-PHASE / 4-WIRE NETWORK



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POWER ANALYZER · VALUELINE

PA-2-R

TYPE	▪ DIN-rail-mount power analyzer (52.5 × 118 mm form factor)
APPLICATION	▪ Analysis of electrical parameters and energy consumption ▪ Suitable for low-voltage and medium-voltage applications
MEASUREMENT	▪ Four-quadrant measurement for monitoring both energy consumption and generation ▪ Voltage and current THD (%) and harmonics (up to 40th order)
COMMUNICATION	▪ RS-485 | Modbus RTU
I/O	▪ 2 digital outputs
OTHERS	▪ Detection of incorrect wiring and wrong phase rotation ▪ Current measurement via …/5 A or …/1 A ▪ Up to 4 tariffs

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TYPE	ORDER NO.
PA-2-R-CT-S-2DO	3235250000

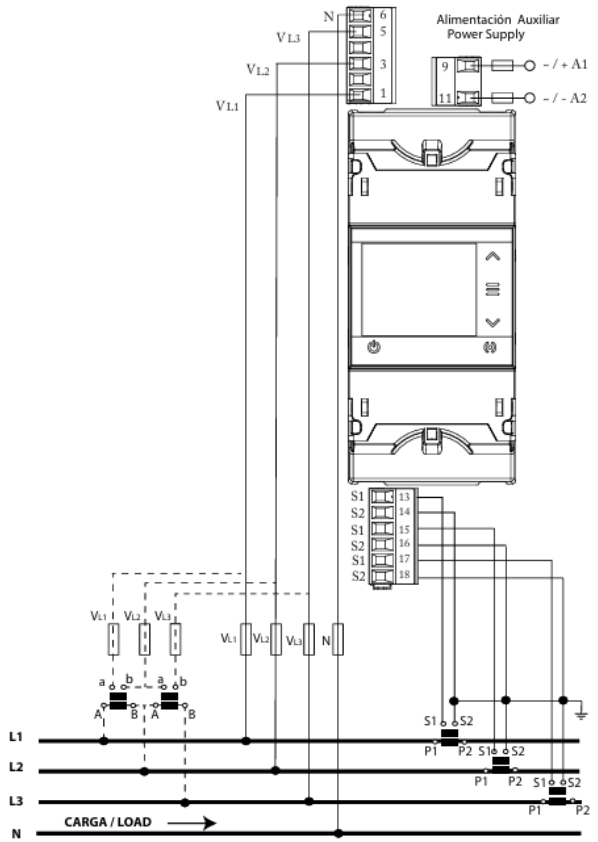
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PA-2-R

MEASUREMENT ACCURACY	▪ Phase voltage measurement: 0.2% ▪ Phase current measurement: 0.2% ▪ Active power measurement (kW): 0.5% ▪ Apparent power measurement (kVA): 0.5% ▪ Reactive power measurement (kvar): 1%
POWER SUPPLY	▪ AC: nominal voltage 80 … 264 V~, 50 … 60 Hz ▪ DC: nominal voltage 100 … 300 V DC
ENVIRONMENT	▪ Working temperature −10 … +50 °C ▪ IP30, front IP40
OTHERS	▪ Installation category CAT III 300 V

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EXAMPLE: 3-PHASE / 4-WIRE NETWORK



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RCM-A-2-R

TYPE	▪ DIN-rail-mount residual current monitoring relay (52.5 × 118 mm form factor), type A
APPLICATION	▪ Earth leakage protection and monitoring of low-voltage installations
PROTECTION	▪ Sensitivity adjustable from 30 mA to 30 A ▪ Trip delay: instantaneous, selective or 0.1 … 5 s ▪ Real-time display of the leakage current; the leakage current at the moment of tripping is stored
COMMUNICATION	▪ RS-485 | Modbus RTU
I/O	▪ 1 digital input, 2 relay outputs (trip and pre-alarm)
OTHERS	▪ True RMS measurement ▪ Color-coded display: white (normal), yellow (pre-alarm), red (trip or error) ▪ Relays configurable for positive safety (fail-safe); keypad lock ▪ Current measurement via external earth leakage transformers (up to 4000 A)

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TYPE	ORDER NO.
RCM-A-2-R-CT-S-2RO	3235330000

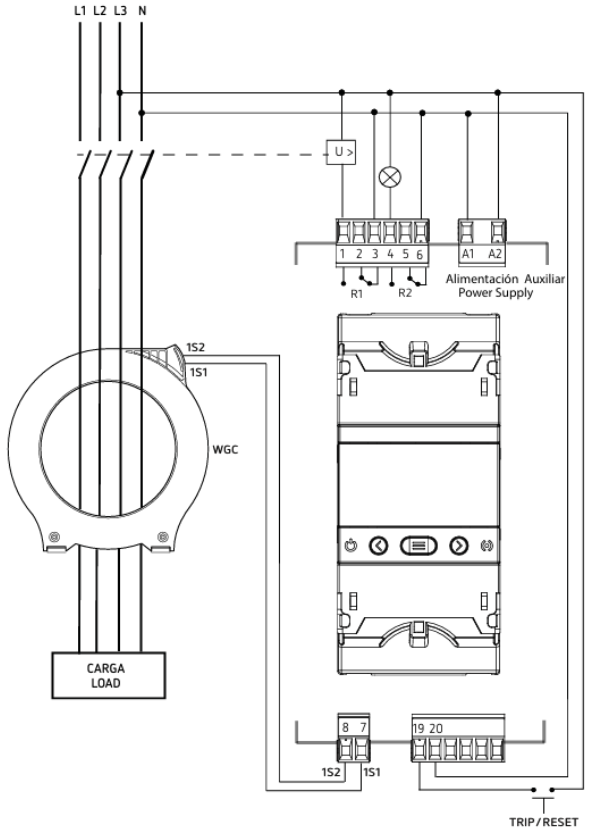
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RCM-A-2-R

PROTECTION SETTINGS	▪ Sensitivity IΔn: 0.03 – 0.1 – 0.2 – 0.3 – 0.5 – 0.75 – 1 – 1.5 – 2 – 3 – 5 – 10 – 30 A ▪ Trip delay tΔ: INS – SEL – 0.1 – 0.2 – 0.3 – 0.4 – 0.5 – 0.8 – 1 – 3 – 5 s ▪ Rated residual non-operating current: 0.8 IΔn ▪ Relay contacts: 6 A, 230 V~, 1500 VA
POWER SUPPLY	▪ AC: nominal voltage 110 … 230 V~, 50 … 60 Hz
ENVIRONMENT	▪ Working temperature −10 … +60 °C ▪ IP30, front IP40
OTHERS	▪ Installation category CAT III 300 V

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CONNECTION EXAMPLE



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RCM-B-2-R

TYPE	▪ DIN-rail-mount residual current monitoring relay (52.5 × 118 mm form factor), type B
APPLICATION	▪ Earth leakage protection and monitoring where smooth DC and high-frequency leakage currents can occur
PROTECTION	▪ Detects AC, pulsating DC and smooth DC leakage currents (DC and 50 Hz … 1 kHz) ▪ Sensitivity adjustable from 30 mA to 30 A ▪ Trip delay: instantaneous, selective or 0.1 … 5 s ▪ Real-time display of the leakage current ▪ Monitoring of the transformer connection and detection of transformer faults
COMMUNICATION	▪ RS-485 | Modbus RTU
I/O	▪ 1 digital input, 1 digital output (pre-alarm), 1 trip relay (NO)
OTHERS	▪ Event log of the last 20 events with date and time ▪ Color-coded display: white (normal), yellow (pre-alarm), red (trip or error) ▪ Relays configurable for positive safety (fail-safe); keypad lock

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TYPE	ORDER NO.
RCM-B-2-R-CT-S-1RO	3235340000

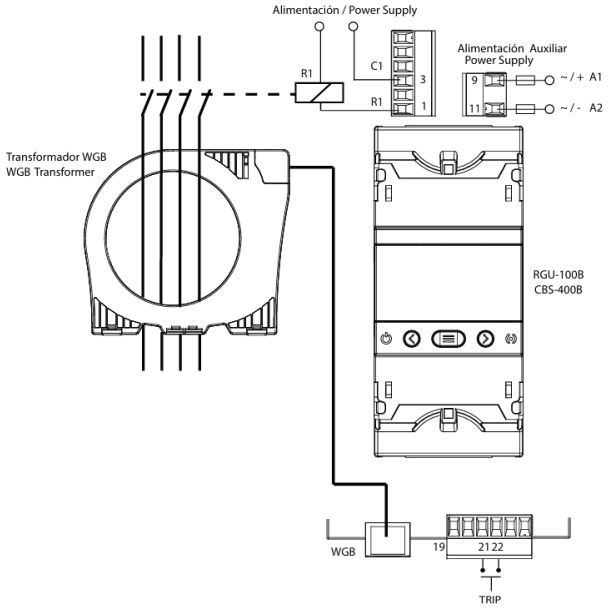
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RCM-B-2-R

PROTECTION SETTINGS	▪ Sensitivity IΔn: 0.03 – 0.1 – 0.3 – 0.5 – 1 – 3 A ▪ Trip delay tΔ: INS – SEL – 0.1 – 0.2 – 0.3 – 0.4 – 0.5 – 0.8 – 1 – 3 – 5 s ▪ Rated residual non-operating current: 0.8 IΔn ▪ Tripping accuracy: ±2 mA (30 mA), ±5 mA (100 mA), ±20 mA (300/500 mA) ▪ Relay contact: 6 A, 230 V~, 1500 VA
POWER SUPPLY	▪ AC: nominal voltage 230 V~ ±15%, 50 … 60 Hz
ENVIRONMENT	▪ Working temperature −10 … +50 °C ▪ IP30, front IP40
OTHERS	▪ Installation category CAT III 300 V

DRAFT

CONNECTION EXAMPLE



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VALUELINE

VALUELINE ORDER OVERVIEW

Available Q1/2027ff

SERIES	DESCRIPTION	TYPE	ORDER NO.
PA-4-R	Power analyzer, rail, Modbus TCP, CT	PA-4-R-CT-WE	3235240000
PA-2-R	Power analyzer, rail, Modbus RTU, CT	PA-2-R-CT-S-2DO	3235250000
PA-6-R	Power analyzer, rail, multichannel, Modbus TCP/RTU, memory, low-power CT	PA-6-R-MV-WES-M-4DO	3235260000
PA-6-P	Power analyzer, panel, Modbus TCP, memory, CT	PA-6-P-CT-WE-M-4DI2DO2RO	3235270000
PA-6-P	Power analyzer, panel, Modbus TCP, memory, Rogowski	PA-6-P-RC-WE-M-4DI2DO2RO	3235280000
PQA-4-R	Power quality analyzer, rail, class S, Modbus TCP, CT, 24 V	PQA-4-R-CT-WE-M-24-2DO	3235290000
PQA-4-R	Power quality analyzer, rail, class S, Modbus TCP, CT	PQA-4-R-CT-WE-M-230-2DO	3235300000
PQA-8-P	Power quality analyzer, panel, class A, Modbus TCP/RTU, CT, 24 V	PQA-8-P-CT-WES-M-24-6DI6DO2RO	3235310000
PQA-8-P	Power quality analyzer, panel, class A, Modbus TCP/RTU	PQA-8-P-CT-WES-M-230-6DI6DO2RO	3235320000
RCM-A-2-R	RCM type A	RCM-A-2-R-CT-S-2RO	3235330000
RCM-B-2-R	RCM type B	RCM-B-2-R-CT-S-1RO	3235340000
CMA-RCM-A-35	CT RCM type A	CMA-RCM-A-35	3235350000
CMA-RCM-A-80	CT RCM type A	CMA-RCM-A-80	3235360000
CMA-DRH-RCM-A	DIN rail adapter	CMA-DRH-RCM-A	3235370000
CMA-RCM-B-35	CT RCM type B	CMA-RCM-B-35	3235380000
CMA-RCM-B-80	CT RCM type B	CMA-RCM-B-80	3235390000
CMA-DRH-RCM-B	DIN rail adapter	CMA-DRH-RCM-B	3235400000

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MIGRATION

CROSSING TABLE OLD VALUELINE (JANITZA)

ENERGY METERS

OLD WEIDMÜLLER	JANITZA	NEW WEIDMÜLLER
Energy Meter D370-CBM	UMG 103-CBM	EM120, PA-2-R-CT-S-2DO (3235250000)
Energy Meter D650	UMG 104	EM120, PA-2-R-CT-S-2DO (3235250000)
Energy Meter 520-24	UMG 96RM	n/a
Energy Meter 520-230	UMG 96RM	EM220 RTU
Energy Meter 525-24	UMG 96RM-EL	n/a
Energy Meter 525-230	UMG 96RM-EL	EM220 RTU
Energy Meter 535-24 / 525-24	UMG 96RM-EL	n/a
Energy Meter 535-230 / 525-230	UMG 96RM-EL	EM220 GW, PA-6-P-CT-WE-M-4DI2DO2RO (3235270000)
Energy Meter 700-PN-24	UMG 96RM-PN	n/a
Energy Meter 700-PN-230	UMG 96RM-PN	n/a
Energy Meter 610-24-PB	UMG 96RM-P	n/a
Energy Meter 610-230-PB	UMG 96RM-P	n/a
Energy Meter 610-24	UMG 96RM-CBM	n/a
Energy Meter 610-230	UMG 96RM-CBM	PA-6-P-CT-WE-M-4DI2DO2RO (3235270000)
Energy Meter 750-24	UMG 96RM-E	n/a
Energy Meter 750-230	UMG 96RM-E	PA-6-P-CT-WE-M-4DI2DO2RO (3235270000)

ENERGY ANALYSERS & LOGGER

OLD WEIDMÜLLER	JANITZA	NEW WEIDMÜLLER
Energy Logger D550	ProData 2	n/a
Energy Analyser D550-24	UMG 604	PQA-4-R-CT-WE-M-24-2DO (3235290000)
Energy Analyser D550-230	UMG 604-24V	PQA-4-R-CT-WE-M-230-2DO (3235300000)
Energy Analyser 550-24	UMG 509	n/a
Energy Analyser 550-230	UMG 509	n/a
Energy Analyser 750-24	UMG 512	PQA-8-P-CT-WES-M-24-6DI6DO2RO (3235310000)
Energy Analyser 750-230	UMG 512	PQA-8-P-CT-WES-M-230-6DI6DO2RO (3235320000)

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CHAPTER 3

BasicLine & u-remote

Energy meters, MID energy counters and I/O modules



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BASICLINE

BASICLINE ENERGY METER

Accurate, reliable and cost-effective energy measurement

ENERGY MANAGEMENT

Extensive energy measurement data, high accuracy: 0.5S active energy

PRICE

Affordable energy analyzer for entry-level use

100 A

MAX. DIRECT CURRENT

Direct measurement up to 45 A (1P) or 100 A (3P)

TYPE	MOUNTING	PHASE(S)	CURRENT	CONNECTION
EM110-RTU-2P	Rail	1	CT	Modbus RTU
EM111-RTU-2P	Rail	1	Direct 45 A	Modbus RTU
EM120-RTU-2P	Rail	3	CT	Modbus RTU
EM122-RTU-2P	Rail	3	Direct 100 A	Modbus RTU
EM220-RTU-4DI2DO	Panel	3	CT	Modbus RTU
EM220-RTU-4DI2DO-GW	Panel	3	CT	Modbus TCP







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BASICLINE

BASICLINE MID ENERGY COUNTER

Measurable energy efficiency – full cost control

CERTIFICATION
MID certificate incl. SW modification

COMMUNICATION
Optional Modbus RTU, M-Bus or Modbus TCP

ENERGY MANAGEMENT
Legally compliant billing and recording for BesAR

TYPE	MOUNTING	PHASE(S)	CURRENT	CONNECTION
EM111-RTU-MID	Rail	1	Direct 45 A	Modbus RTU
EM120-RTU-MID	Rail	3	CT	Modbus RTU
EM122-RTU-MID	Rail	3	Direct 100 A	Modbus RTU
EM111-MBUS-MID	Rail	1	Direct 45 A	M-Bus
EM120-MBUS-MID	Rail	3	CT	M-Bus
EM122-MBUS-MID	Rail	3	Direct 100 A	M-Bus
EM120-TCP-MID	Rail	3	CT	Modbus TCP
EM122-TCP-MID	Rail	3	Direct 100 A	Modbus TCP







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BASICLINE

MID ENERGY COUNTER

Main features

COMMUNICATION
Modbus RTU · Modbus TCP · M-Bus · S0 pulse outputs

CERTIFICATION
MID certified (2014/32/EU)

ENERGY MANAGEMENT
For accounting purposes · Alarm function

ACCURACY
Class 1 for active energy

MEASURED VALUES
Active energy & reactive energy

TAMPER-PROOF
Sealed terminal cover



EM111 One-phase meter
- 1 phase (1 + N)
- Direct connection up to 45 A
- Width: 2 DIN modules

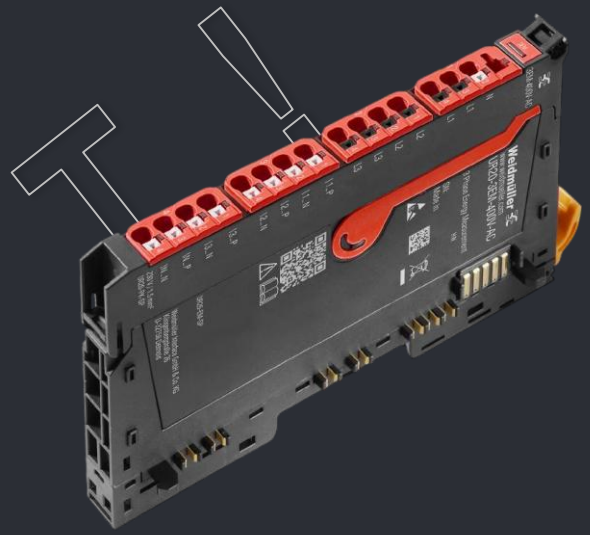
EM120 Three-phase meter
- 3 phases (3 + N)
- CT connection 1(6) A
- Transformer ratio freely adjustable
- For 3- and 4-wire connection
- Width: 4 DIN modules (3 + N)

EM122 Three-phase meter
- 3 phases
- Direct connection up to 100 A
- For 3- and 4-wire connection
- Width: 4 DIN modules

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U-REMOTE

New energy measurement modules for the u-remote I/O system



- Four new energy measurement modules
- Available in Q2 2025
- Preliminary manual information with technical data
- Test systems available

DRAFT!

ORDER DATA

PRODUCT DESCRIPTION	TYPE	PU	ORDER NO.
1 A current transformer measurement	**UR20-3EM-400V-AC-CT1A**	1	2920830000
5 A current transformer measurement	**UR20-3EM-400V-AC-CT5A**	1	2920840000
Rogowski coil measurement	**UR20-3EM-400V-AC-RC**	1	2920850000
333 mV measurement	**UR20-3EM-400V-AC-333MV**	1	2920860000

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TYPICAL USAGE IN INDUSTRY

ENERGY METER VS. UR20-3EM

Energy meter

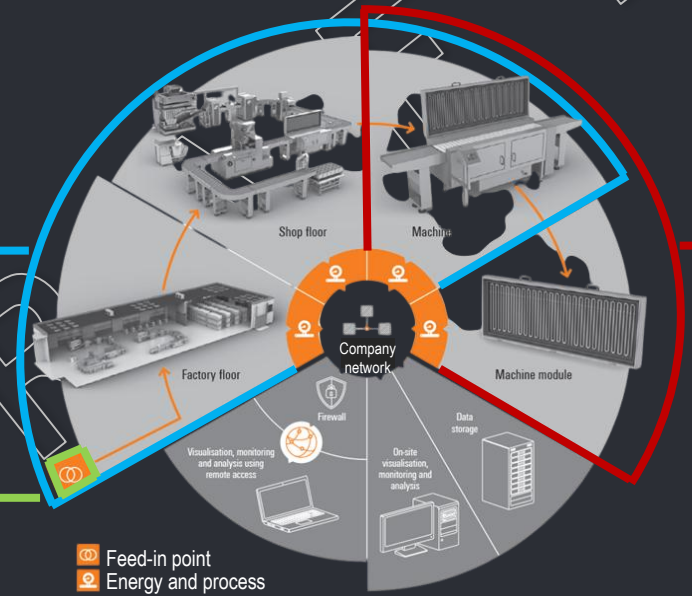
- Single device
- With display for front panel + rail mounted
- Complies with energy meter standard DIN EN 62053
- Mainly used on shop floor and line level
- Applications in many segments possible
- >23 types



Energy analyzer

- Verification of the delivered power quality in the feeder
- Additional features for energy data collection
- Detect central grounding point and other leakage currents





u-remote power measurement module

- Modular I/O system
- Flexible communication via fieldbus coupler
- Mainly used on machinery & module level
- Segment focus on machinery
- 4 types (1 A, 5 A, LP, RC)



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CHAPTER 4

Accessories & system

Current transformers, Rogowski coils, system architecture



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CURRENT TRANSFORMERS

UL certified and made in Europe

NAMING SYNTAX

CMA-31-125-5A-2,5VA-0,5

CMA	Type
31	Conductor in mm
125	Primary current
5A	Secondary current
2,5VA	Burden
0,5	Accuracy

ACCURACY CLASS 0.5

ORDER NO.	TYPE
2680200000	CMA-31-125-5A-2,5VA-0,5
2421030000	CMA-31-150-5A-2,5VA-0,5
2421020000	CMA-31-200-5A-2,5VA-0,5
1482050000	CMA-31-250-5A-5VA-0,5
2420990000	CMA-31-300-5A-5VA-0,5
2420980000	CMA-31-400-5A-5VA-0,5
1482070000	CMA-31-500-5A-5VA-0,5
2420970000	CMA-31-600-5A-5VA-0,5
1482080000	CMA-31-750-5A-5VA-0,5
2680210000	CMA-41-1000-5A-5VA-0,5
2680220000	CMA-51-1250-5A-5VA-0,5
2680230000	CMA-61-1500-5A-5VA-0,5
2680240000	CMA-81-2000-5A-10VA-0,5
2680250000	CMA-101-2500-5A-10VA-0,5



ACCURACY CLASS 1

ORDER NO.	TYPE
2525150000	CMA-CTM-7-32-1A-0.2VA-1
2556030000	CMA-CTM-7-50-1A-0.4VA-1
2556010000	CMA-CTM-7-64-1A-0.5VA-1
2421380000	CMA-31-60-5A-1,25VA-1
1482040000	CMA-31-75-5A-2,5VA-1
1482030000	CMA-31-100-5A-2,5VA-1
2420960000	CMA-31-150-5A-5VA-1
2420950000	CMA-31-200-5A-5VA-1
2420940000	CMA-31-250-5A-5VA-1
2420920000	CMA-31-400-5A-5VA-1
2420910000	CMA-31-500-5A-5VA-1
2420900000	CMA-31-600-5A-5VA-1
2420890000	CMA-31-750-5A-5VA-1
2680150000	CMA-41-1000-5A-5VA-1
2680160000	CMA-51-1250-5A-5VA-1
2680170000	CMA-61-1500-5A-5VA-1
2680180000	CMA-81-2000-5A-10VA-1
2680190000	CMA-101-2500-5A-10VA-1





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ACCESSORIES

CURRENT TRANSFORMERS

Cable length and accuracy

- No measured values below 5%
- Up to 10 meters distance between CT and measuring device possible

Brief overview (power consumption copper line) for 5 A and 1 A:

With every temperature change of 10 °C the power consumed by the cables increases by 4 %.

Power consumption in VA at 5 A										
Nominal cross-section	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m
2.5 mm²	0.36	0.71	1.07	1.43	1.78	2.14	2.50	2.86	3.21	3.57
4.0 mm²	0.22	0.45	0.67	0.89	1.12	1.34	1.56	1.79	2.01	2.24
6.0 mm²	0.15	0.30	0.45	0.60	0.74	0.89	1.04	1.19	1.34	1.49
10.0 mm²	0.09	0.18	0.27	0.36	0.44	0.54	0.63	0.71	0.80	0.89

Power consumption in VA at 1 A										
Nominal cross-section	10 m	20 m	30 m	40 m	50 m	60 m	70 m	80 m	90 m	100 m
1.0 mm²	0.36	0.71	1.07	1.43	1.78	2.14	2.50	2.86	3.21	3.57
2.5 mm²	0.14	0.29	0.43	0.57	0.72	0.86	1.00	1.14	1.29	1.43
4.0 mm²	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.71	0.80	0.89
6.0 mm²	0.06	0.12	0.18	0.24	0.30	0.36	0.42	0.48	0.54	0.60
10.0 mm²	0.04	0.07	0.11	0.14	0.18	0.21	0.25	0.29	0.32	0.36

CURRENT ERROR IN % AT % OF RATED CURRENT

Class	5%	20%	50%	100%	120%
3			3		3
1	3	1.5		1	1
0.5	1.5	0.75		0.5	0.5

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ACCESSORIES

ROGOWSKI COILS

Portfolio

ORDER NO.	TYPE	
2593370000	RCMA-B22-D70-1.5	
2593380000	RCMA-B22-D125-1.5	
2593390000	RCMA-B22-D175-1.5	
2593340000	RCMA-B22-D70-4.5	
2593350000	RCMA-B22-D125-4.5	
2593360000	RCMA-B22-D175-4.5	
2831090000	RCMA-B22-D70-6.0	New
2831100000	RCMA-B22-D125-6.0	New
2831110000	RCMA-B22-D175-6.0	New
2865880000	RCMA-B22-D300-6.0	New
2593400000	RCMC-5000-1A-P	
2593410000	RCMC-5000-AO-P	

COILS



Cable length 1.5 m / 4.5 m / 6.0 m

6.0 m only

TRANSDUCERS



RCMC-5000-1A-P
Output: 1 A



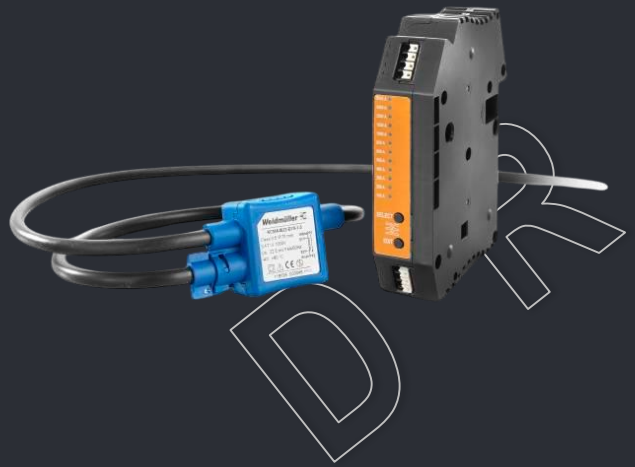
RCMC-5000-AO-P
Output: 0/4 … 20 mA
0 … 5/10 V DC
0 … 225/333 mV AC

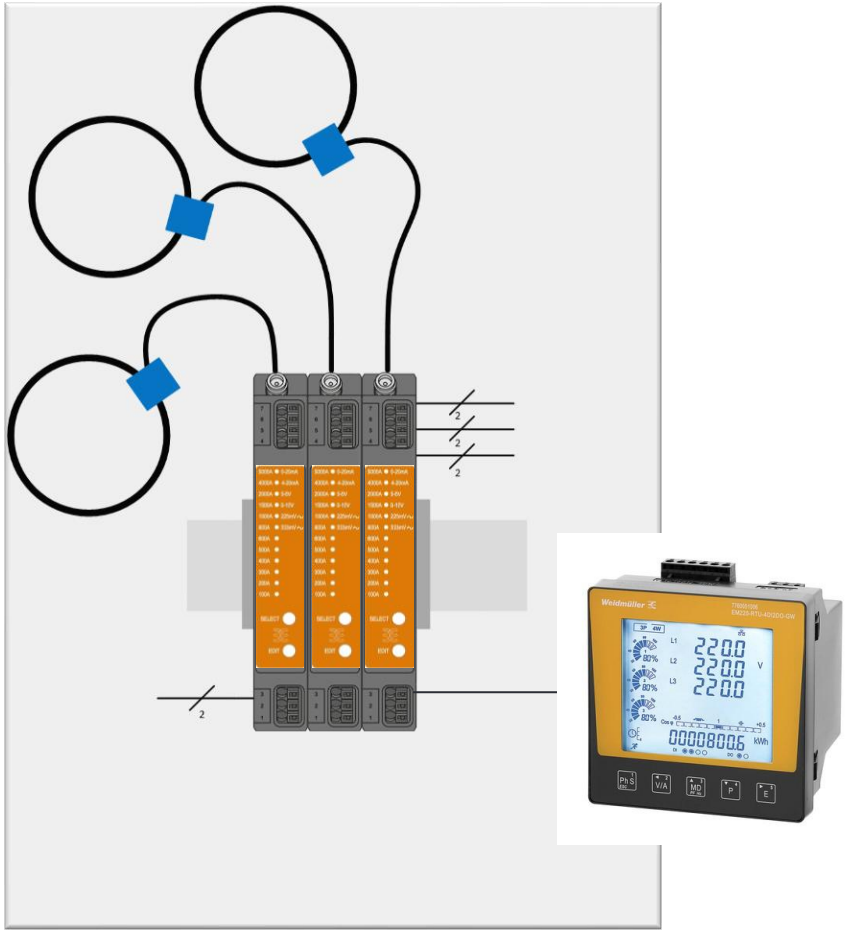
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ACCESSORIES

ROGOWSKI COILS

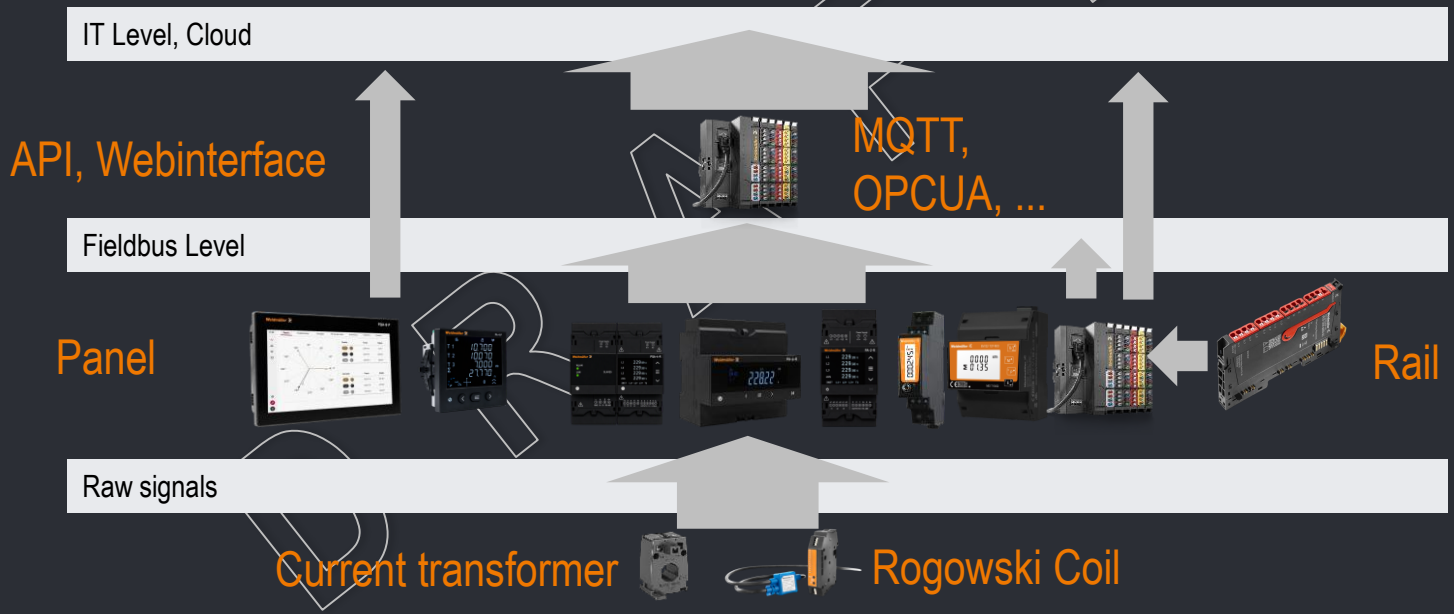
Measurement of 3 phases





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SYSTEM ARCHITECTURE – DATA LEVELS



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