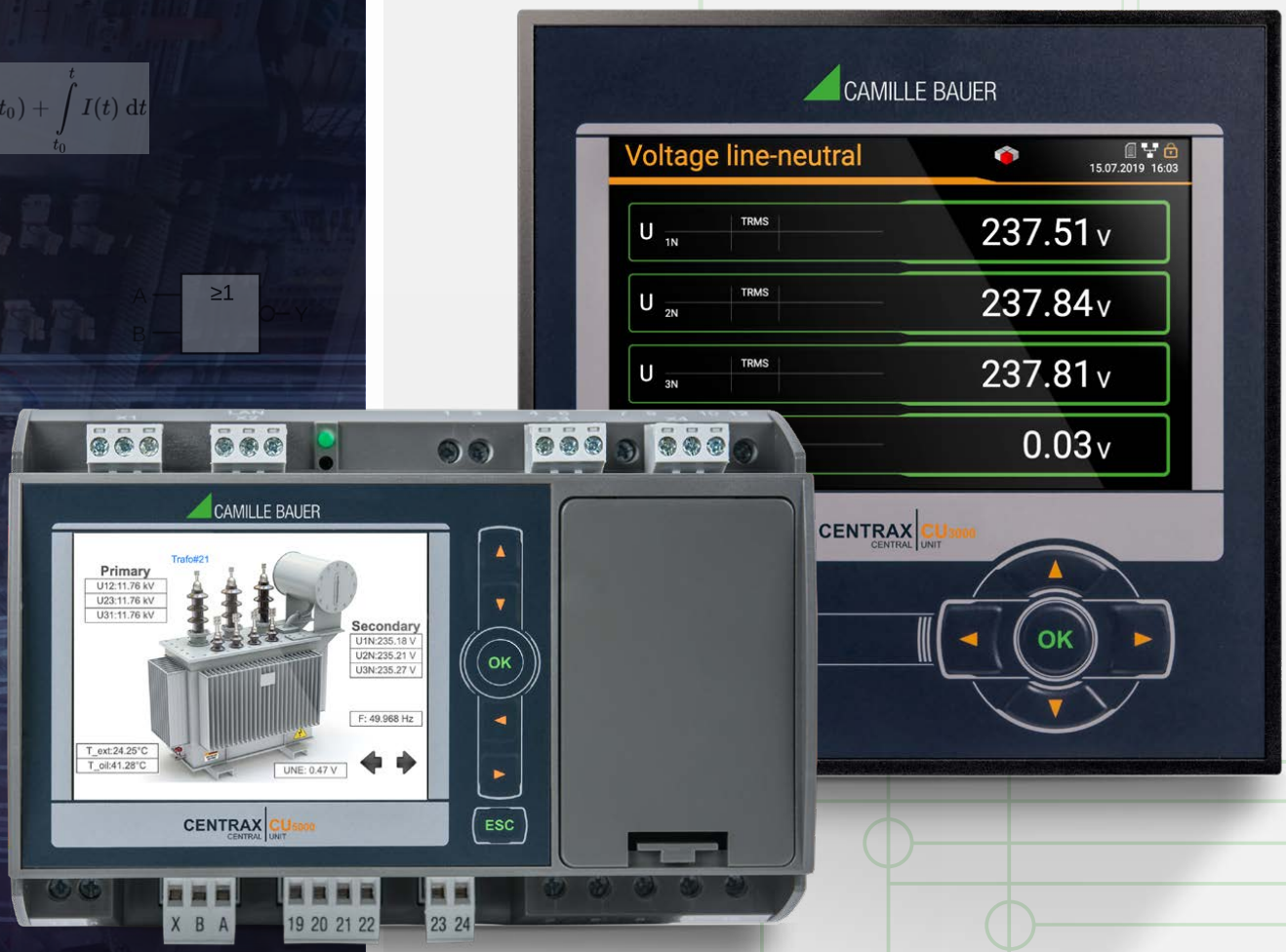
CAMILLE BAUER
GMC-INSTRUMENTS GROUP

MEASUREMENT AND CONTROL IN POWER SYSTEMS

MULTIFUNCTIONAL
TRANSDUCER + PLC CONTROL
IN ONE DEVICE

mesures PALMARES TECHNOLOGIQUE
INNOVATION AWARD

CODESYS
PLC CONTROL ACCORDING
TO IEC 61131-3



CENTRAX CU-SERIES

CENTRAX CU3000 ▪ CENTRAX CU5000

Comprehensive instrument for measurement and control of power systems

CENTRAX CU3000 / CU5000 combines the functionality of a highly accurate instrument for heavy current application with the possibilities of a freely programmable PLC in one housing. This makes the need of a separate control, a control system, a remote display or an additional data collector superfluous.
The measuring part of the instrument determines more than 1500 high-quality items of status, energy consumption and power quality. The control application is based on CODESYS and can now, depending on the application, process this data logically, use it in control algorithms or interact with energy generation or consumers as the situation demands. The instrument can communicate with the process environment via freely selectable I/Os and Modbus interfaces. The ADVANCED and PROFESSIONAL versions offer the additional possibility of importing measured data of other field instruments into the control application via Modbus interfaces for further processing.
CENTRAX CU3000 / CU5000 can thus be used for autarkic solutions in the areas of energy management, control and optimisation of the energy consumption, utility monitoring and other general automation and control tasks.
A connection to higher-ranking systems is possible at any time.

ADAPTABLE

Adaptable to the task at hand via control application

Possibility of providing own on-site and web visualizations

Horizontal and vertical extension possible

INTUITIVE

Easy device operation with language-specific plain text menu guidance

Topical arrangement of measured data information for quick access to desired data

Service area for maintenance and commissioning

MULTIFUNCTIONAL

Measurement and control in one instrument

Central acquisition of measured data and energy consumption

Monitoring of plant, process and utilities

FLEXIBLE

Universal measuring inputs for any type of grid

Freely selectable mean value and meter measuring variables

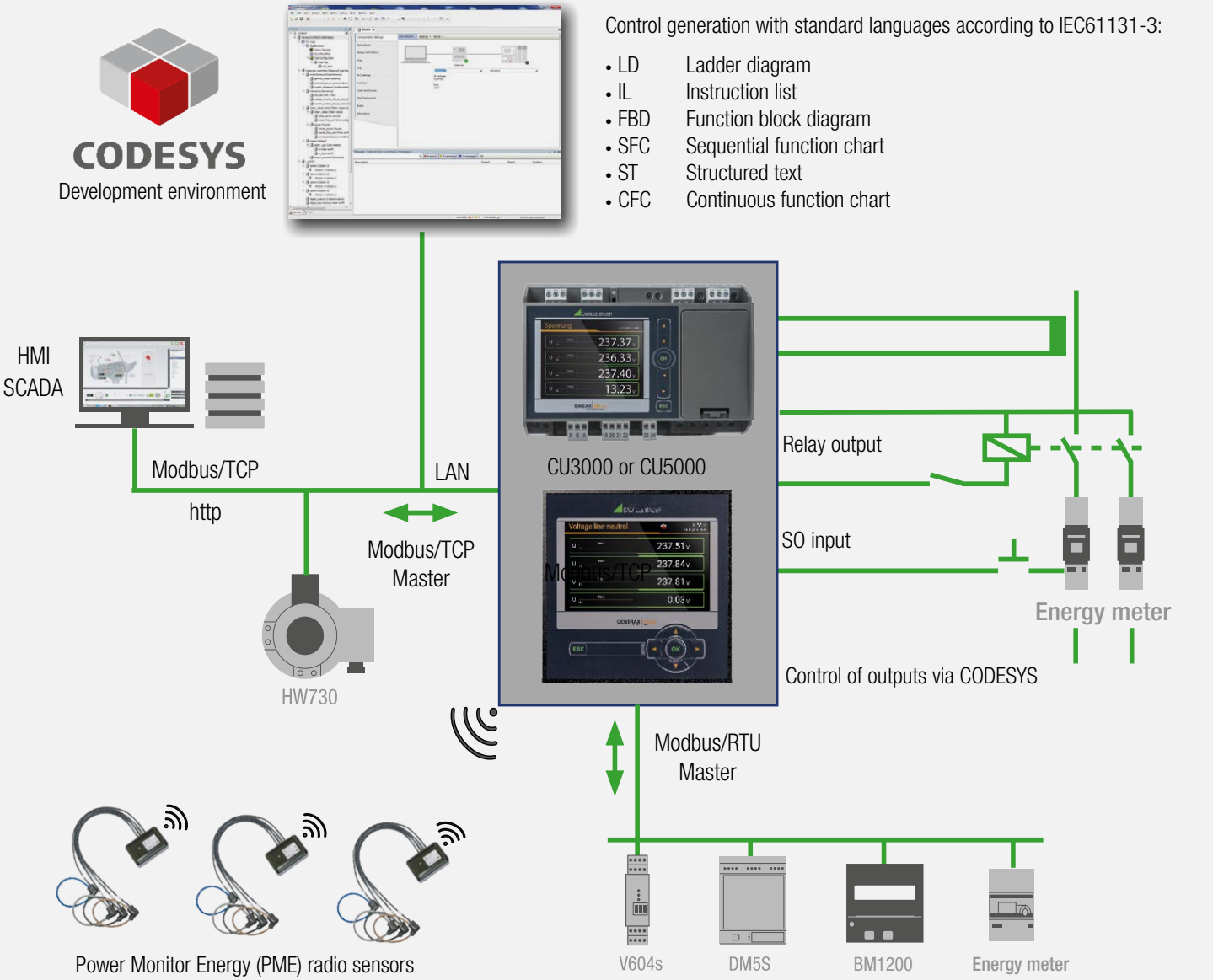
Configurable access authorisation

SCALABLE

Combinable device version (functionality, interfaces, I/Os, power supply)

Selectable design: Top hat rail or panel installation (96x96 or 144x144mm)

Integration as a standard object into the SMARTCOLLECT® SC² software



INDIVIDUAL SYSTEM SOLUTIONS

The approach of the CENTRAX CU3000 / CU5000 is the use of the SINEAX AM3000 resp. DM5000 as a measuring instrument, supplemented by a freely programmable control application, based on the widely used CODESYS, which takes over the function of the control system or PLC. The control functionality is provided in different performance classes:

- **BASIC:** Flexible processing of the measuring data of the measuring instrument with full use of the I/O functionality
- **ADVANCED:** In addition, the possibility to read and use data from other measuring instruments via Modbus RTU/TCP, as well as to trigger time-depending processes
- **PROFESSIONAL:** To create your own web visualization and to use the local display for self-defined visualizations

POSSIBLE APPLICATIONS

- Load balancing, load control
- Acquisition of energy consumption of any kind
- Energy management, summation station
- Monitoring of production equipment such as transformers, motors, generators, etc.
- Load management, peak load optimization, power factor compensation
- Local data display and control unit
- Monitoring of changes (Long-time-Drift / Degradation)
- Start / Stop process control, i.e. for control and monitoring of process steps

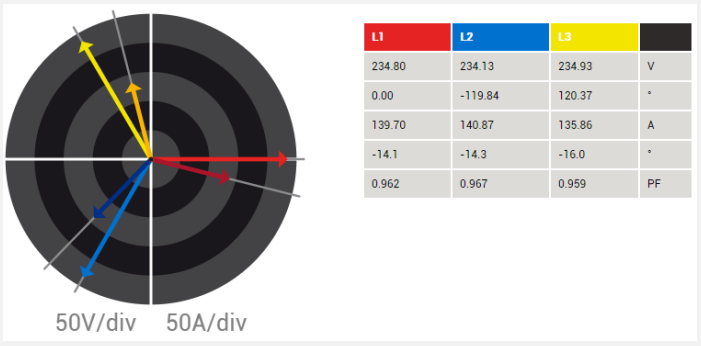
MEASURED VALUES

The CENTRAX CUx000 has a broad basic measurement functionality according to the table below. Further functions, such as automated data export, extended data recording capabilities or cyber security protection, are described in detail in the documentation of SINEAX AM3000 or DM5000.

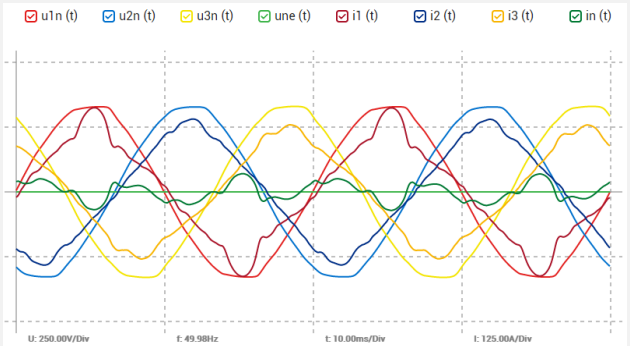
MEASURED VALUE GROUP	APPLICATION
INSTANTANEOUS VALUES	
U, I, IMS, P, Q, S, PF, LF, QF ...	Transparent monitoring of present system state
Angle between voltage phasors	Fault detection, connection check, sense of rotation check
Min/max of instantaneous values with time stamp	Determination of grid variable variance with time reference
EXTENDED REACTIVE POWER ANALYSIS	
Total reactive power, fundamental frequency, harmonics	Reactive power compensation
cosϕ, tanϕ of fundamental frequency with min values in all quadrants	Verification of specified power factor
HARMONICS ANALYSIS (ACCORDING TO EN 61 000-4-7)	
Total harmonics content THD U/I and TDD I	Evaluation of the thermic load of equipment
Individual harmonics U/I up to 50th	Analysis of system perturbation and consumer structure
IMBALANCE ANALYSIS	
Symmetrical components (positive, negative, zero sequence system)	Equipment overload protection
Imbalance (from symmetrical components)	Fault/earth contact detection
Deviation from U/I mean value	
ENERGY BALANCE ANALYSIS	
Meters for the demand/supply of active/reactive power, high/low tariff, meters with selectable fundamental variable	Preparation of (internal) energy billing
Power mean values active/reactive power, demand and supply, freely definable mean values (e.g. phase power, voltage, current and much more).	Determination of energy consumption versus time (load profile) for energy management or energy efficiency verification
Mean value trends	Energy consumption trend analysis for load management
OPERATING HOURS	
Operating hours of the device	

WEB VISUALIZATION

All of the measured data may be displayed via webpage



Voltage and current phasors and power factors of all phases



Waveform of all voltages and currents

TECHNICAL DATA

INPUTS

NOMINAL CURRENT 1 … 5 A
Maximum 7,5 A
Strommessung via Rogowski-Spulen (CU5000)
Messbereich 0…3000 A (max. 3800A)

NOMINAL VOLTAGE 57,7 … 400 V_{LN}, 100 … 693 V_{LL}
Maximum CU3000: 480 V_{LN}, 832 V_{LL} (sinusoidal)
CU5000: 520 V_{LN}, 900 V_{LL} (sinusoidal)
Nominal frequency 42 … 50 … 58 Hz, 50,5 … 60 … 69,5 Hz
Sampling rate 18 kHz

POWER SUPPLY VARIANTS
Nominal voltage 100…230V AC/DC (CU5000)
110…230 V AC, 130…230 V DC (CU3000)
110…200 V AC, 110…200 V DC (CU3000)
24 … 48 V DC (CU3000/CU5000)
Consumption ≤ 27 VA, ≤ 12 W (CU5000); ≤ 30 VA, ≤ 13 W (CU3000)

UNINTERRUPTIBLE POWER SUPPLY (UPS) (optional)
Type (3,7 V) VARTA Easy Pack EZPAckL, UL listed MH16707

TYPES OF CONNECTION

- Single phase or split phase (2-phase system)
- 3 or 4-wire balanced load
- 3-wire balanced load [2U, 1I]
- 3-wire unbalanced load, Aron connection
- 3 or 4-wire unbalanced load
- 4-wire unbalanced load, Open-Y

I/O-INTERFACE

ANALOG OUTPUTS (optional)
Range ±20 mA (24 mA max.), bipolar

RELAYS (optional)
Contacts Changeover contact
Load capacity 250 V AC, 2 A, 500 VA; 30 V DC, 2 A, 60 W

DIGITAL INPUTS PASSIVE
Nominal voltage 12/24 V DC (30 V max.)

DIGITAL INPUTS ACTIVE (optional)
Open circuit voltage ≤ 15 V

DIGITAL OUTPUTS
Nominal voltage 12/24 V DC (30 V max.)

FAULT CURRENT MONITORING For grounded systems (optional)
Number of meas. channels 2 (2 measurement ranges each)
Application RCM or earth current monitoring

TEMPERATURE INPUTS (optional)
Number of channels 2
Measurement sensor Pt100 / PTC; 2-wire

BASIC UNCERTAINTY ACCORDING IEC/EN 60688

VERSION WITH ROGOWSKI CURRENT INPUTS
The additional uncertainty of the Rogowski coils ACF 3000 is not included in the following specifications: See operating instructions of Rogowski coil ACF 3000_x/24 or ACF 3000_67/13.

Voltage, current	±0,1 %	
Power	±0,2 %	
Power factor	±0,1°	
Frequency	±0,01 Hz	
Imbalance U, I	±0,5 %	
Harmonic	±0,5 %	
THD U, I	±0,5 %	
Active energy	Class 0.2S	(IEC 62 053-22: 2003)
Reactive energy	Class 0.5S	(IEC 62 053-24: 2014)

INTERFACES

ETHERNET RJ45 socket
Protocols Modbus/TCP, http, https, NTP, IPv4, IPv6
IEC61850 **optional**
Physics Ethernet 100BaseTX, RJ45 sockets, 2 ports
Mode 10/100 Mbit/s, full/half duplex, auto-negotiation
Protocol IEC61850, NTP
MODBUS/RTU Standard (CU5000), optional (CU3000)
Baud rate 9,6 to 115,2 kBaud

TIME REFERENCE Internal clock
Clock accuracy ± 2 minutes/month (15 to 30°C)
Synchronisation NTP server, GPS or IRIG-B (TTL)

ENVIRONMENTAL CONDITIONS, GENERAL INFORMATION

Operating temperature without UPS: –10 up to 15 up to 30 up to + 55 °C
with UPS: 0 up to 15 up to 30 up to + 35 °C

MECHANICAL PROPERTIES

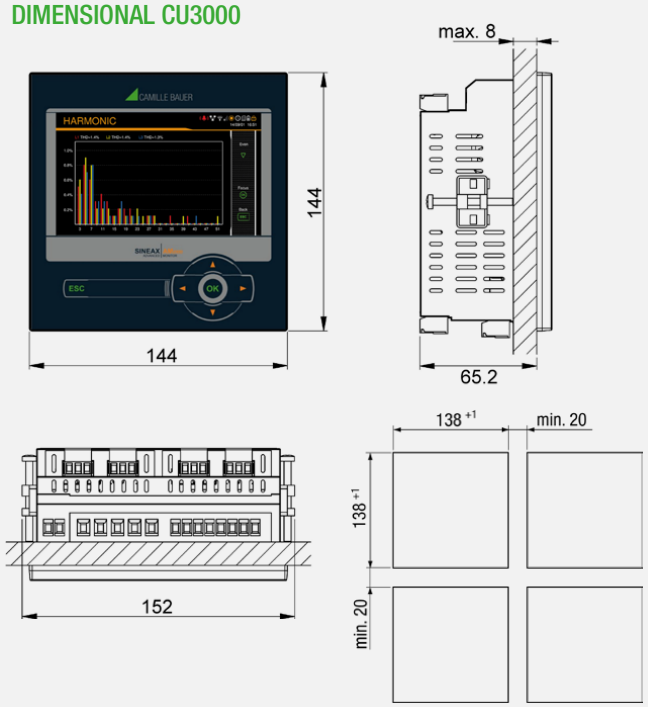
Housing material Polycarbonate (Makrolon)
Weight 800 g (CU3000), 600 g (CU5000)

SAFETY

Current inputs are galvanically isolated from each other.
Protection class II (protective insulation, voltage inputs via protective impedance)
Measurement category U: 600 V CAT III, I: 300 V CAT III

Further technical data is available in the operating instructions of the instrument.

DIMENSIONAL CU3000



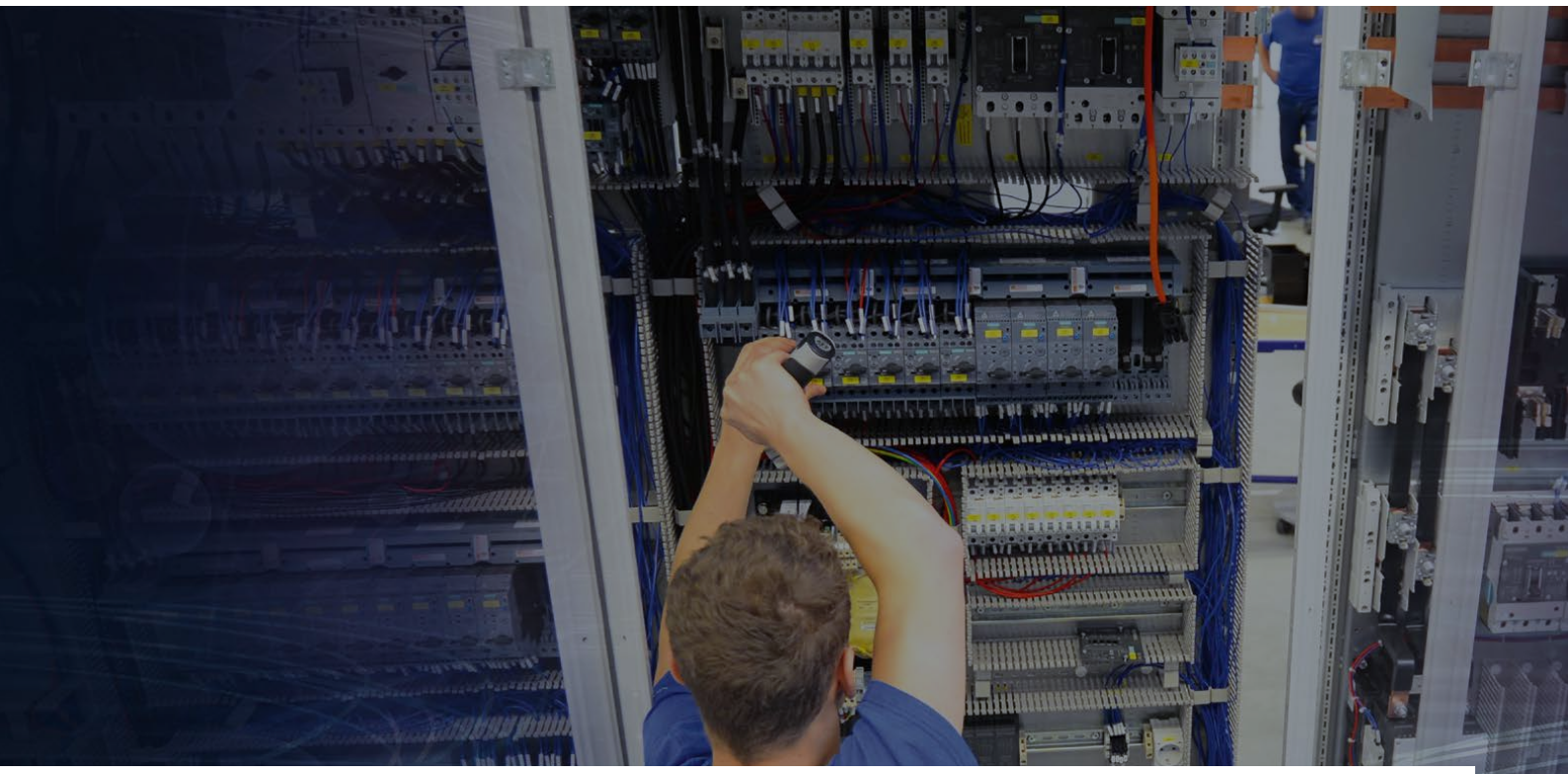
DIMENSIONAL CU5000

CENTRAX® CU5000, Power Measurement Deevice with PLC Functionality

Basic device for top-hat rail-mounting	On-site service and monitoring		PLC functionality	Input frequency range		Power supply	Bus interface	Standard protocol	Uninterruptible power supply	Extension 2		Extension 2 (Connectivity)	Test certificate	Typenbezeichnung
Periodical data + events	Without display	With TFT display	Performance class PROFESSIONAL	4 current inputs, 42..50/60..69.5Hz	Rogowski current inputs, 42..50/60..69.5 Hz	Nominal voltage 100...230 V AC/DC	RS485 + Ethernet (Web, Modbus)	REST Interface + Modbus	With UPS	Without extesion 1	PME central unit	Without Extension 2	Test certificate English	
•	•	-	•	-	•	•	•	•	•	•	-	•	•	193193

CENTRAX® CU3000 auf Anfrage

ZUBEHÖR	ARTIKEL-NR
Rogowski-Spule, einphasig, ACF3000_4/24, Ø 200mm, 2m	172 718
Rogowski-Spule, einphasig, ACF3000_31/24, Ø 200mm, 5m	173 790
Rogowski-Spule, einphasig, ACF3000_67/13_L1, Ø 100mm, 2.5m	191 585
Rogowski-Spule, einphasig, ACF3000_67/13_L2, Ø 100mm, 2.5m	191 593
Rogowski-Spule, einphasig, ACF3000_67/13_L3, Ø 100mm, 2.5m	191 601
Rogowski-Spule, einphasig, ACF3000_67/13_N, Ø 100mm, 2.5m	191 609
Schnittstellen-Konverter USB <> RS485	163 189
GPS-Empfänger 16x-LVS, konfiguriert	181 131
Stromwandler für Fehlerstromerkennung siehe Zubehör Stromwandler	
PME Rogowski-Funksensor 3P, 3-kanalig, Ø 75 mm, ohne Batterien	189 281
PME Rogowski-Funksensor 3PN, 4-kanalig, Ø 75 mm, ohne Batterien	189 273



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