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► Technical System Catalogue Modular PDU (PSM)



ENCLOSURES

POWER DISTRIBUTION

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SOFTWARE & SERVICES



Modular PDU (PSM)



Benefits of PSM busbars at a glance

- Modular configuration, flexibly extendible
- Redundant designs in busbars are supported
- Vertical mounting in the rack without loss of U space
- Configuration changes are supported at any time with the system operational by replacing the module
- Shock-hazard-protected assembly of the power distribution
- Choose from different connection types and phase currents
- Extensive range of accessories for connection cables and mounting kits
- Integral energy measurement and remote monitoring via CMC III (with special PSM measuring bars)

Modular PDU (PSM)

Modular PDU (PSM busbars)

The PSM system is a unique, modular power distributor for integration into IT network and server racks. The configuration (type and quantity of output slots) can be modified to accommodate altered requirements at any time, even whilst operational.

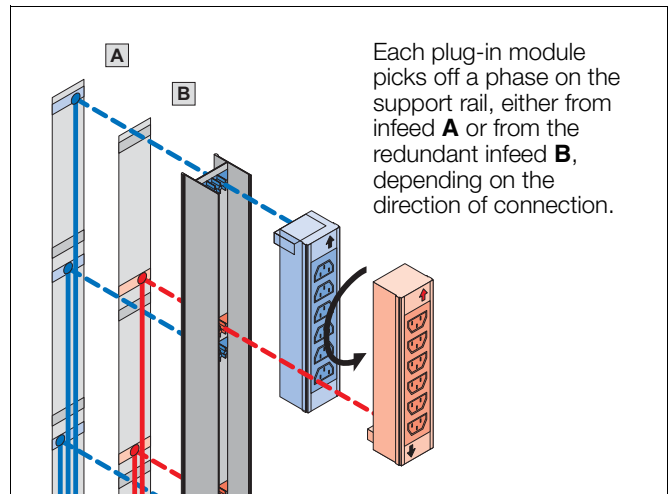
The modular PDU comprises a support rail which is fitted vertically into the IT rack. This PSM busbar has individual module slots into which various PSM plug-in modules may be integrated.

These plug-in modules are available in a range of output pin patterns and functions. Alongside purely passive distribution modules, special active modules with switching and measuring functions may also be integrated into the PSM busbar.

The electrical connection is made using the preassembled plug&play connection cable available as an accessory, but also can be made directly by a qualified electrician using the Wago X-COM connector included in the supply pack.

Some versions of PSM busbars, including all 32 A versions, have a fixed, prefitted connection cable with CEE connector (to IEC/EN 60 309).

A range of mounting kits are available for flexible rack mounting, so as to accommodate varying requirements such as vertically hinged installation or quick installation in the TS IT rack.



Criteria for selecting the correct PSM busbar

- Enclosure height
- No. of infeeds
- Type of infeed (e.g. fixed infeed)
- Phase current (16 A, 32 A)
- No. of phases (single or three-phase)
- No. of required PSM plug-in modules
- Additional measurement and management functions required

Modular PDU (PSM)

Function

| Model No. | 7856.005 | 7856.006 | 7856.008 | 7856.010 | 7856.020 | 7856.321 | 7856.323 | 7856.050 | 7856.053 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Minimum height of rack (mm) | 2000 | 2000 | 2200 | 1200 | 2000 | 2000 | 2000 | 2000 | 2000 |
| Type of connection/length | Fixed/3 m | Fixed/3 m | WAGO jack | WAGO jack | WAGO jack | Fixed/3 m | Fixed/3 m | WAGO jack | Fixed/3 m |
| Connector | CEE | CEE | Various | Various | Various | CEE | CEE | Various | CEE |
| No. of infeeds | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 |
| No. of phases | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 1 |
| Phase current (A) | 16 | 16 | 16 | 16 | 16 | 32 | 32 | 16 | 32 |
| Various connection cables, also for single-phase connection | - | - | ■ | ■ | ■ | - | - | ■ | - |
| No. of PSM module slots | 7 | 7 | 8 | 4 | 7 | 6 | 6 | 6 | 6 |
| Integral energy measurement of voltage, current, active power, apparent power, active energy, power factor, mains frequency | - | - | - | - | - | - | - | ■ | ■ |
| Measurement accuracy (U, I, f, P, S) | - | - | - | - | - | - | - | 2% | 2% |
| Measurement accuracy (E/kWh) | - | - | - | - | - | - | - | 1% | 1% |
| Graphic display for visualising the measurements (24 V DC required) | - | - | - | - | - | - | - | ■ | ■ |
| CAN bus interface for connecting to CMC III system | - | - | - | - | - | - | - | ■ | ■ |
| Web server (IPv4, IPv6, SNMP, SSH) via CMC III (PU III - 7030.000) | - | - | - | - | - | - | - | ■ | ■ |
| E-mail forwarding of exceeded limits and alarms (CMC III required) | - | - | - | - | - | - | - | ■ | ■ |
| Operating temperature (°C) | 5 - 45 | | | | | | | | |
| Ambient humidity % (non-condensing) | 10 - 90 | | | | | | | | |
| Protection category IP (to IEC 60529) | IP 20 | | | | | | | | |
| Approvals | CE | CE | CE | CE/VDE | CE/VDE | CE | CE | CE | CE |

Modular PDU (PSM)

Modular PDU (PSM plug-in modules)

Choose from a wide range of PSM plug-in modules to configure the PSM busbar with the required output slots. The modules are snap-fastened into the PSM busbar without the use of tools, and the slots are then available for the equipment. It may be assembled while operational and connected to the power supply (but only off-load). A range of different pin patterns and functions are available (e.g. switching the outputs and power measurement), so that every PSM busbar can be configured individually depending on the preferred application.

Data communication and network connection occur via the CMC III. Together with the CMC III and in conjunction with other CMC III sensors e.g. for ambient parameters such as temperature and humidity, this creates a comprehensive monitoring solution.

PSM plug-in modules (passive, distribution only)

| Model No. | 7856.080 | 7856.082 | 7856.100 | 7856.240 | 7856.230 | 7856.070 | 7856.220 | 7856.090 | 7856.120 | 7856.191 | 7859.120 | 7859.130 |
|---|------------------------------------|---------------|----------------|----------------|---------------|---------------|---------------|----------------|----------------|-------------|---------------|---------------|
| Occupied slots in PSM busbar | 1 | | | | | | | | | | | |
| Pin pattern (type) | IEC 60320 C13 | IEC 60320 C13 | CEE 7/3 type F | CEE 7/3 type F | IEC 60320 C19 | IEC 60320 C13 | IEC 60320 C13 | CEE 7/3 type F | CEE 7/5 type E | T 23 type J | IEC 60320 C13 | IEC 60320 C19 |
| Number of outputs | 6 | 6 | 4 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 6 | 4 |
| Colour of slots | black | red | black | red | black | black | black | black | black | black | black | black |
| Lockable connectors (optional) | ■ | ■ | - | - | - | - | ■ | - | - | - | - | - |
| Miniature fuse per output | - | - | - | - | - | - | ■ | - | - | - | - | - |
| Thermal overload protection | - | - | - | - | - | ■ | - | ■ | - | - | - | - |
| Optical LED current display (total current) | - | - | - | - | - | - | - | - | - | - | ■ | ■ |
| Switchable outputs (via CMC III) | - | - | - | - | - | - | - | - | - | - | - | - |
| Current measurement per module/output | - | - | - | - | - | - | - | - | - | - | - | - |
| Dimensions W x H x D mm | 52 x 250 x 45 | | | | | | | | | | | |
| Operating temperature (°C) | 5 – 45 | | | | | | | | | | | |
| Ambient humidity % (non-condensing) | 10 – 95 | | | | | | | | | | | |
| Material | Extruded aluminium section/plastic | | | | | | | | | | | |
| Approvals | CE | CE | CE/VDE | CE | CE | CE | CE | CE | CE | CE | CE | CE |



Modular PDU (PSM)

PSM plug-in modules with power monitoring and output switching function

As well as passive PSM plug-in modules, which merely distribute power via various types of output slots, there are also smart PSM plug-in modules with additional functions.

These modules are ideally suited for retrofitting a power and load management system and provides remote switching functionality if the PSM busbar has already been installed and commissioned. There is a choice of three modules with identical functions but different slot configurations.

Data forwarding (or switching function) occurs with the aid of a CMC III PU or PU compact. The modules have a CAN bus interface for direct connection.

One LC display per module is available for local display in the rack. The colour of the background lighting visualises the various system states and exceeded limits clearly and intelligibly. LEDs on the slots visualise the current switching status.

Functions:

- Measurement of power consumption per module
- Output slots may be switched individually and in groups
- LEDs per slot to visually indicate the switching status
- LC display with multi-coloured backlight for local display
- Adjustable limits for voltage, current and active power
- Configurable overload detection per module
- High level of measurement accuracy
- Alarm signalling via the display
- Alarm management via CMC III (e.g. e-mail or text message)
- Visualisation of the switching status on the CMC III website and RiZone
- Up to 16 PSM modules on one CMC III PU (per IP address)
- Rights management via CMC III (e.g. restriction of the switching function)
- Facilitates the implementation of requirements to EN 16001/ISO 50001 and EN 50600-2-2
- Stable aluminium section with plastic socket inserts
- Supports universal connector locking of the IEC 60320 C13 and C19 slots
- Supports the closure of unneeded IEC 60320 C13 and C19 slots
- PSM module is easily fitted into and removed from the PSM busbar, for use at different locations
- Compatible with the European PSM busbar range
- Depending on the PSM busbar, up to four modules per bar may be fitted



Modular PDU (PSM)

PSM plug-in modules with power monitoring and switching function

| Product characteristics | | Unit | PSM module type | | |
|---|------------------|----------|---|----------|----------|
| Model No. | | 1 pc(s). | 7859.410 | 7859.420 | 7859.430 |
| No. of IEC 60320 C13 slots | | | 8 | 2 | 2 |
| No. of IEC 60320 C19 slots | | | – | 4 | – |
| No. of earthing-pin slots (CEE 7/3 or type F) | | | – | – | 4 |
| Total no. of all switchable outputs | | | 8 | 6 | 6 |
| No. of slots required in the PSM busbar | | | 2 | | |
| Module dimensions (W x H x D) | mm | | 53 x 500 x 45 | | |
| Section | | | Aluminium, anodised | | |
| Plastic | | | PA6 GF 30 V1 | | |
| Electrics | | | | | |
| No. of infeeds per module | Qty. | | 1 | | |
| Input voltage | V AC | | 230 | | |
| Input voltage, tolerance | V AC | | 207–250 | | |
| Rated current | A | | 16 | | |
| Distribution output per module (at 230 V) | W | | 3680 | | |
| Power supply (via CMC III system, alternatively with power pack 7201.210) | V DC | | 18-24 | | |
| Functional overview | | | | | |
| Measurement functions | | | Per module | | |
| Switching functions | | | Per output slot | | |
| Relay type | | | Dual coil/bistable | | |
| Relay switching load | VA | | 4000 | | |
| Display (LC matrix display with coloured backlight) | | | Per module | | |
| LEDs (blue) to indicate switching status | | | Per output slot | | |
| Status LEDs - CAN bus communication | 4 pc(s). | | Per module | | |
| Keys for operation & configuration | 4 pc(s). | | Per module | | |
| Location sensor for correct display and Web view | | | in 90° increments | | |
| Connector lock (optional, for C13 & C19 slots) | 20 pc(s). | | 7955.020 | | |
| Measurement functions | | | | | |
| Voltage (V), current (A), frequency (Hz) | | | ■ | | |
| Active power (kW), active energy (kWh) | | | ■ | | |
| Reactive power (kVar), reactive energy (kVarh) | | | ■ | | |
| Apparent power (kVA), apparent energy (kVAh) | | | ■ | | |
| Power factor (cos ?), crest factor (amplitude factor) | | | ■ | | |
| Operating hours meter (d. h. min) | | | ■ | | |
| Measurement accuracy | % | | +/-1 | | |
| Resettable measurement functions/reset via software/interval measurement | | | | | |
| Active energy (kWh) | | | ■ | | |
| Operating hours meter (h) | | | ■ | | |
| Threshold values (warning/alarm), freely configurable | | | Voltage, current, power | | |
| Connectivity / management functions (in conjunction with CMC III) | | | | | |
| Maximum no. of modules that may be used per CMC III Processing Unit | Qty. | | 16 | | |
| Maximum no. of modules that may be used per CMC III Processing Unit Compact | Qty. | | 4 | | |
| CAN bus for direct linking to CMC III system | pc(s). | | 2 (RJ45) | | |
| Network functionality (only in conjunction with CMC III system) | | | IPv4, IPv6, SNMPv3, Modbus/TCP, OPC-UA | | |
| Ambient conditions | | | | | |
| Operating temperature | °C | | +5...+50 | | |
| Operating temperature (at max. 8 A per output slot) | °C | | +5...+60 | | |
| Storage temperature | °C | | -20...+70 | | |
| Ambient humidity (non-condensing) | rel. humidity, % | | 10 – 90 | | |
| Maximum installation height | m | | 2000 | | |
| Overvoltage category | | | II | | |
| Contamination level | | | 2 | | |
| Protection class (IEC 60529) | | | IP 20 | | |
| Approvals and standards | | | | | |
| Approval | | | CE, RoHS II | | |
| Standards (excerpt) | | | Low Voltage Directive 2014/35/EU EMC Directive 2014/30/EU EN 50600-2-2 EN 60 950 | | |

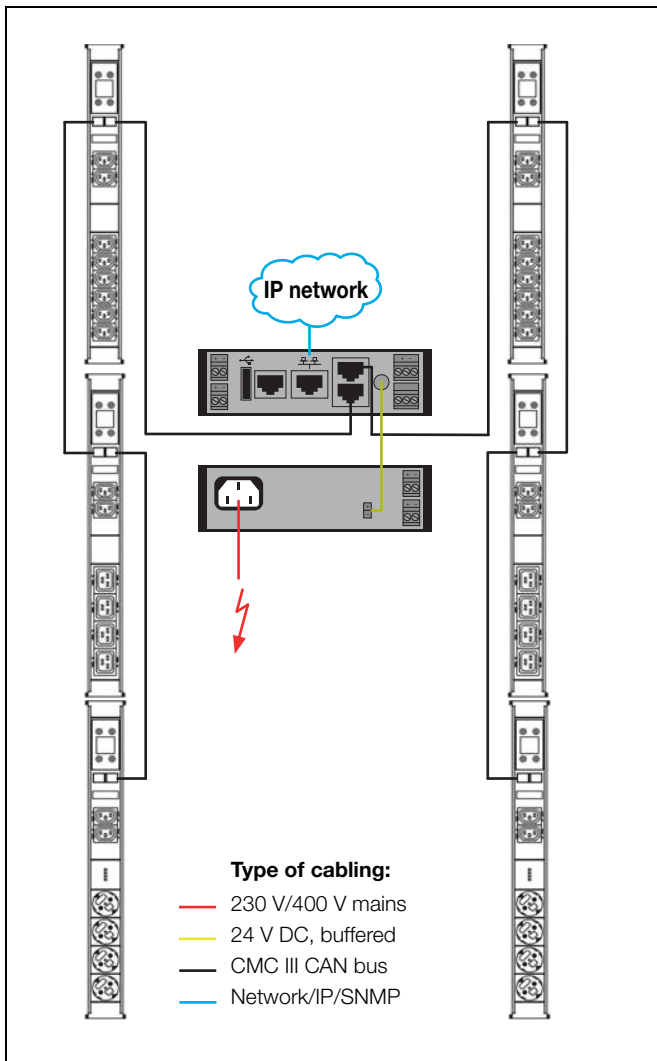
Modular PDU (PSM)

Control and monitoring with CMC III management system

The CAN bus connection with the CMC III monitoring system is made for control and remote management of the PSM busbars, PSM measurement modules and MID measurement modules (482.6 mm (19") inline meter). The CMC III provides a connection to the outside world using a range of protocols (IPv4, IPv6, SNMP, OPC-UA, Modbus/TCP, SSH etc.) In this way, multiple busbars and PSM modules, even distributed across several racks, can be combined and managed under one IP address. Logical links with other CMC III sensors (e.g. temperature, humidity, smoke alarm etc.) are also supported.

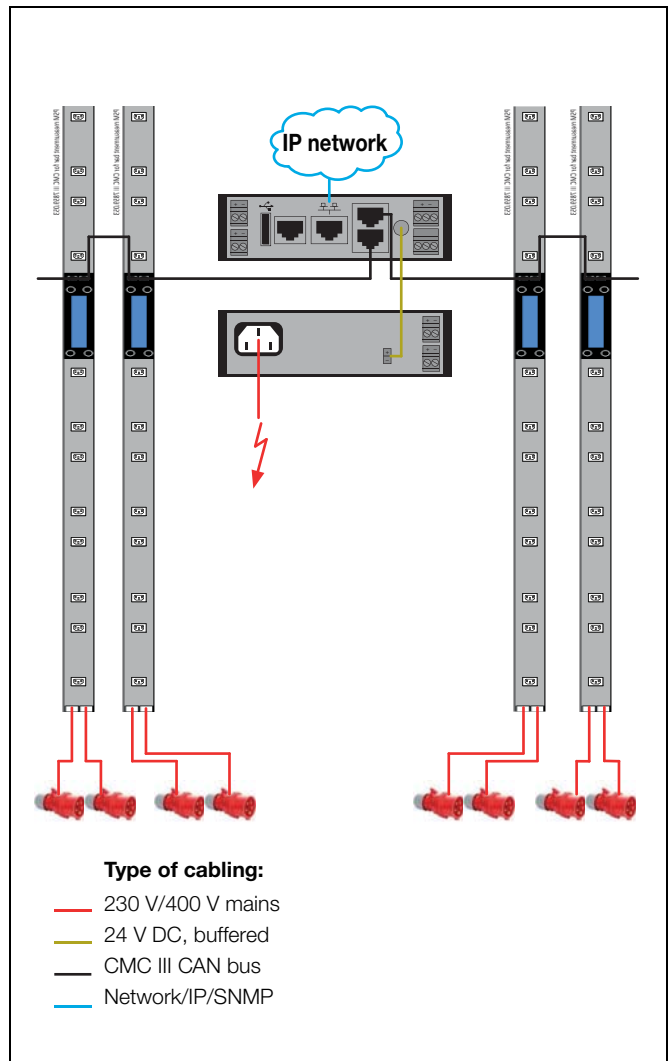
The benefits of PSM plug-in modules at a glance:

- May be installed and replaced at any time, even while live, without specialist knowledge
- Various pin patterns for every application
- Modules with switching and measurement functions, also suitable for retrofitting
- Versions with miniature fuses and load display via LED are available
- VDE-tested (some versions)
- Compact design, despite modularity



PSM measurement modules, connection to CMC III

Max. 8 modules per CAN bus
 Connection of PSM measurement modules to the CMC III PU and network 230 V supply to the PSM modules via PSM busbar!



PSM measurement bars, connection to CMC III

Max. 4 PSM measurement bars per CAN bus
 Connection of PSM measurement bars to the CMC III PU and network

Modular PDU (PSM)

Visual load management with PSM

In many cases, fast identification of the module or phase load is useful. However, companies often shy away from investing in complex measurement technology. For such cases, special PSM modules are available which visualise the current rating of all connected equipment without the need for additional accessories. These modules can be integrated into any existing PSM busbar, or replace existing PSM modules.

There are two versions available with 6 x IEC 60320 C13 (7859.120) or 4 x IEC 60320 C19 (7859.130) output slots.

Using these PSM modules with LED current display allows you to visualise the load distribution in the PSM busbar. You can see at a glance which PSM module can accommodate further equipment without causing a phase overload.

Once the prescribed load limit of the module is reached, any remaining slots may be sealed with optionally available IEC 60320 C13 or C19 covers to prevent mistakes being made in the hectic environment of data centre operation.

The limits are preset in the factory and cannot be altered.

Current limits:

0 – 7 A (green), 7 – 13 A (yellow) and >13 A (red)

These PSM plug-in modules with LED load display are ideally suited for retrofitting to existing PSM installations to enhance the reliability of the supply.

To match the LED modules with load display, IEC 60320 C13/C19 slot covers are also available, to prevent overloading with additional equipment. The cover is easily removed with a release tool if necessary.



Ingeniously simple: Optical load indicators
Phase loads are clearly visible at all times. No more worries about unnoticed overloading or unbalanced power distribution in the rack.



PSM plug-in module with load display



Covers for secure load management

Modular PDU (PSM)

PSM MID measurement module for 482.6 mm (19") installation

This measurement device is connected into the connection cable (infeed) of the equipment or the power distributor, and records the consumed active energy with 1% accuracy. MID approval means that the module is licensed for use in the European Union for energy billing purposes. As well as measuring energy, it also measures other performance data such as voltage, current, active and apparent power, power factor, and neutral conductor current. Measurement of the neutral conductor current aids the reliable detection of asymmetries (different phase utilisation levels) in power distribution.

The meter is fitted horizontally in the 482.6 mm (19") level. There are two versions available, for 16 A and 32 A phased current, which are connected using cable sets available as accessories. A special preassembled connection cable set is available for connecting to PSM busbars with Wago X-COM connectors. In this way, a power distributor without measurement capabilities is quickly and easily extended.

Approval for energy billing purposes is valid for 8 years and can be extended for a further 8 years by recalibrating.



What is MID?

MID stands for "Measurement Instruments Directive" and regulates 10 types of measurement equipment based on EU Directive 2004/22/EC.

The aim is to harmonise the approval of measurement equipment in the Member States. However, country-specific regulations (such as the Calibration Act in Germany) continue to apply.

MID regulates the entire manufacturing process, from development, to production, through to final testing of the measurement equipment. General and device-specific performance requirements are defined in the MID, which the manufacturer must comply with. Following successful testing, the MID-approved devices are labelled and may be sold throughout the EU.

Benefits of the MID measurement module:

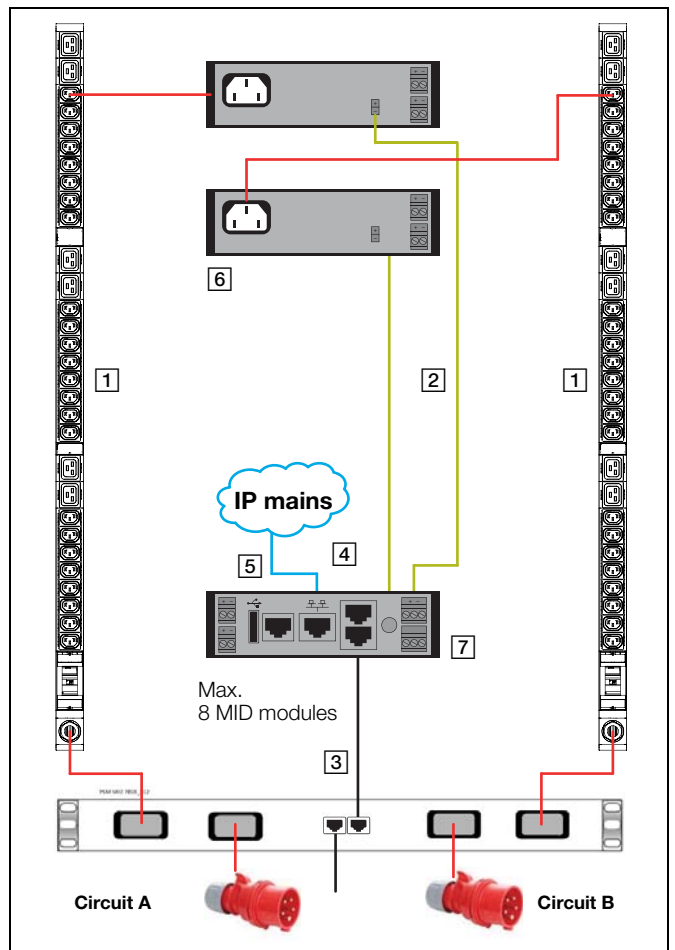
- Easy to install active energy meter based on the plug & play system
- Variants for 16 A and 32 A phase current
- Two independent circuits in each case (3-phase)
- Pre-assembled connection cable with CEE connector / coupling
- Simple, flexible assembly
- Billable MID measurement units
- CAN bus for connection to CMC III system
- Extensive monitoring functions (via CMC III)
- High-MTBF and measurement accuracy of 1%
- Energy-efficient electric design – minimal inherent power consumption
- High-quality sheet steel enclosure

IT network/server rack

IT rack with redundant power supply (PSM or PDU basic)
Measurement via MID inline meter

Type of cabling:

- 1 230 V/400 V mains
- 2 24 V DC, buffered
- 3 CMC III CAN bus
- 4 Network/IP/SNMP
- 5 Serial connection
- 6 CMC III power pack (redundant design with 2 power packs optionally supported)
- 7 CMC III PU/PU Compact



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