

# Rittal – The System.

Faster – better – everywhere.

## ► Technical System Catalogue Power Distribution Unit



ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES



# Power Distribution Unit

## Economical and safe, with measurement and monitoring

- Comprehensive management and monitoring functions
- Measurement of power, current, active and apparent power and power factor
- Measurement of energy consumption and neutral conductor current (with 3-phase PDUs)
- Connection options for CAN sensors (temperature/humidity/access)
- TCP/IP v4 and v6, plus SNMP, OPC-UA and Modbus/TCP
- Future-proof – with optional integration via the IP interface, e.g. into DCIM software RiZone or third-party systems
- Minimal energy consumption thanks to bistable relays

## Fits everywhere

- Complete range of international sockets
- Various designs to suit every application
- Super-easy assembly – with time-saving, tool-free snap-in system in the TS IT rack
- Flexible installation at the required height in the zero-U space
- Two bayed PDUs may be fitted in 800 mm wide racks



# Power Distribution Unit

## Power Distribution Unit PDU

The Power Distribution Unit (PDU) is designed for incorporation into each rack of a data centre. Within the rack, the PDU delivers the necessary power supply for the server and network components via a given number of suitable connector sockets. Thanks to the compact PDU, any IT rack may be quickly and easily equipped with a professional power distribution system.

With the new IT rack, installation is tool-free and takes just seconds. The required mounting kits and assembly parts are included with the supply.

What is more, the required connection cable with CEE connector is already pre-fitted, so that the PDU is ready to use immediately.

Single-phase and 3-phase PDU versions are available with input currents ranging from 16 A to 63 A, so that the correct power distribution is available to suit every rack and its specific energy requirements.

In contrast to the modular PSM busbar system for IT racks, the required configuration and function scope must already be specified at the time of ordering. Later on-site adaptation of the configuration is not possible.

It is precisely the waiving of modularity, however, which enables an even more compact design and an even more favourably priced product portfolio.



## Criteria for selection of the correct PDU

- Phase current (13 A, 16 A, 32 A, 63 A)
- Number of phases (single- or three-phase)
- Output class: 3.6 kW, 7.2 kW, 11 kW, 22 kW, 44 kW
- Type of output socket (IEC 60320 C13 and C19 or BS1363/UK plug)
- Number of slots and their allocation to individual phases and fuses
- Additional measurement, switching and management functionalities required



# Power Distribution Unit

## Available PDU versions

### Variants

Four PDU design variants are distinguished:

#### ■ PDU basic

- Robust, compact basic power distributor for the IT environment

#### ■ PDU metered

- Basic version supplemented by energy measurement per phase and/or infeed
- Rapid overview of the power requirements of a complete IT rack

#### ■ PDU switched

- Measurement function per phase/input and individually switchable output slots

#### ■ PDU managed

- High-end IT rack power distribution
- Energy measurement function for each individual output and individually switchable outputs. This version supports comprehensive monitoring of each individual output slot, to allow early detection of changes to the current rating or malfunctions in power packs

## Applications



### PDU basic

Power distribution in network and server racks with a static load distribution. Energy consumption levels are known and generally low. Similarly ideal where energy metering is realised centrally at the distribution board and further metering at the rack is thus superfluous.



### PDU switched

This variant is the ideal form of power distribution wherever selective control of the individual output slots is required. This is the case where the installations to be monitored and controlled are operated without on-site personnel or else remote emergency control is imperative at night or at weekends in order to safeguard system availability.



### PDU metered

Use in server racks where the total energy requirement of the rack is to be monitored. Simple monitoring of the power consumption, together with possibilities for the identification and targeted utilisation of available power reserves. Use in all applications where selective control of the energy consumption is not required. A further field is that of blade server applications, as management is handled directly by the software. In this case, power disconnection is not necessary.



### PDU managed

The high-end solution for IT rack power distribution, providing a comprehensive spectrum of energy measurement and management functions. The energy consumption is monitored for each individual output slot, and the power supply to an individual output can also be switched selectively. Detailed consumption analyses can be performed down to server level, as a basis for targeted reductions in energy consumption.

# Power Distribution Unit

## Simple configuration

A web interface enables straightforward configuration and administration of the power distribution. In addition, the PDU can supply data to a DCIM software solution (e.g. Rittal RiZone) for efficient and reliable recording and visualisation of the energy consumption.

Thanks to a comprehensive user administration system, the power distribution is protected against unauthorised access and misuse. A colour graphic display can be activated locally at the rack to provide a fast overview of the energy management parameters and the operating state of the PDU.

Convenient energy data management can also be realised directly on the PDU. Using a USB memory stick, parameters such as voltage, current and energy consumption can be logged, exported as a CSV file or presented directly via the PDU WebIF.





# Power Distribution Unit

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## High measurement accuracy and additional certainty through measurement of the neutral conductor current

Besides reliable power distribution, the PDU offers a comprehensive spectrum of measurement and management functions. In addition to the usual recording of voltages, currents and the active and apparent power, this includes also determination of the power factor. (Not for PDU basic).

The latter information can be used to identify problems which could possibly be manifested in the near future (e.g. problems attributable to component ageing in the switched power supplies of the server hardware). With the switched PDU versions (PDU switched/managed), the switching states are signalled via LEDs directly at the individual output slots and also visualised correspondingly via the web interface.

With 3-phase PDUs, measurement of the neutral conductor current permits reliable detection of a potentially critical load imbalance in the power supply. This enables timely reaction before an overload situation arises or – even worse – the loss of individual phases or the loss of UPS redundancy occurs.

The PDU records all measured values with an accuracy tolerance better than 2%. For important parameters such as active power and active energy, this tolerance is narrowed further to just 1%.



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## Built-in energy efficiency – good for the environment and your pocket

The power supply to a data centre must be guaranteed 24/7, 365 days a year. That also means that the PDU is in constant operation. Alongside the initial investment costs, the inherent energy consumption of the PDU thus plays a significant role. There are usually 2 power distribution units operating in a redundant configuration in each rack, and the total number can very quickly run into the hundreds in larger data centres.

Rittal attached particular importance to low inherent consumption when developing the intelligent PDU socket strips. The energy-saving OLED display, for example, is switched off automatically and can be activated at the press of a button as required. That extends the service life and saves energy.

For the switched versions (PDU switched/managed), it was a deliberate decision to use bi-stable relays (which require only a short current pulse to change their state) instead of permanently energised relays. Especially with these switched PDUs, the energy saving is considerable.

Thanks to this complex technical optimisation, the inherent energy consumption of a Rittal PDU is just 5 to 13 W, depending on the version!

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## Fast assembly – and that even tool-free in the new Rittal IT rack

High-quality components deserve the protection of a high-quality housing. Consequently, the electronics are accommodated in a black-anodised extruded aluminium section. On multi-phase PDUs, the phases and circuits are colour-coded.

The enclosed universal bracket permits variable mounting of the PDU on the standard punched holes of an enclosure frame. A plug-&-play mount is supplied for the Rittal IT rack.

In addition to the defined standard range, Rittal offers a possibility to build customer-specific solutions from corresponding modular elements, in order to be able to satisfy special customer requirements. Customer-specific versions are also available worldwide.

# Power Distribution Unit

## Rittal PDU – carefully thought-out range of accessories

Optional locking facilities for all typical IEC 60320 C14 and C20 connectors prevent accidental removal and further enhance power supply reliability. The connector locks can be used independently of the cable manufacturer.



Optional slot covers for IEC 60320 C13 and C19 sockets eliminate the risk of overloading individual circuits by preventing the inadvertent connection of too many consumers.

The covers can be removed with an unlocking tool should the use of the further slots in the PDU become necessary.



## The benefits of the PDU international at a glance

- Compact design
- Easy to assemble
- Necessary accessories are included in the scope of supply
- Over 50 variants, and thus the ideal power distribution solution for every application
- Different pin patterns and input currents
- Lockable covers can be placed over unused output slots (C13 and C19) to prevent unauthorised use.
- Intelligent connector locks for C13 and C19 slots, suitable for all typical connector housing forms and connecting cables (available as an option)
- Energy-efficient PDU layout, minimal inherent consumption by the PDU itself, thanks to the use of bistable relays and OLED display with power-saving function
- Integral web server for direct network connection (not PDU basic/slave PDU)
- Network integration via TCP/IP v4, TCP/IP v6, SNMP v1, v2c, v3, Modbus/TCP, OPC-UA
- Measurement of voltage (U [V]), current (I [A]), frequency (f, [Hz]), active power (P, [kW]), reactive power (Q [kvar]), apparent power (S [kVA]), power factor (PF), active energy (E [kWh]) and apparent energy (ES [kVAh]), as well as neutral conductor current as a means to detect load imbalance on 3-phase PDUs
- Additionally, user-resettable meters for active energy and operating hours
- On PDU versions with circuit-breakers (32 A/63 A versions), tripping of the circuit-breakers is monitored to enable an alarm to be output
- Redundant PDU power supply from all 3 phases and, for PDU switched/managed, additionally via an existing PoE network (Power-over-Ethernet) to safeguard reliable operation also in case of a mains failure
- Comprehensive management and monitoring functions
- Software updates for later function expansion, guaranteeing a long useful lifetime and future-proof investment
- High-MTBF and measurement accuracy down to within 1%
- CAN bus for connecting slave PDUs (not PDU basic)
- Ambient monitoring with up to 4 CMC III sensors (e.g. temperature, humidity, access)
- High-quality PDU housing with flexible mounting possibilities
- Cost-effective slave PDUs for connection to a master unit or to a CMC III system, enabling several PDUs to be addressed via a single IP node
- International PDU versions: Worldwide availability directly from stock

# Power Distribution Unit

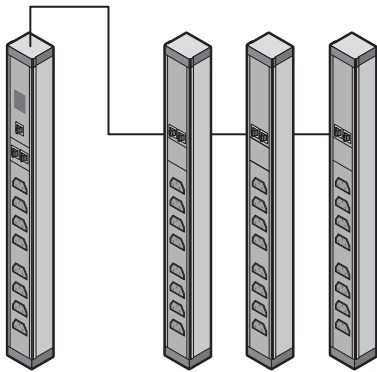
## Sample applications

### Master-slave principle

Up to 3 slave PDUs may be connected to one PDU.

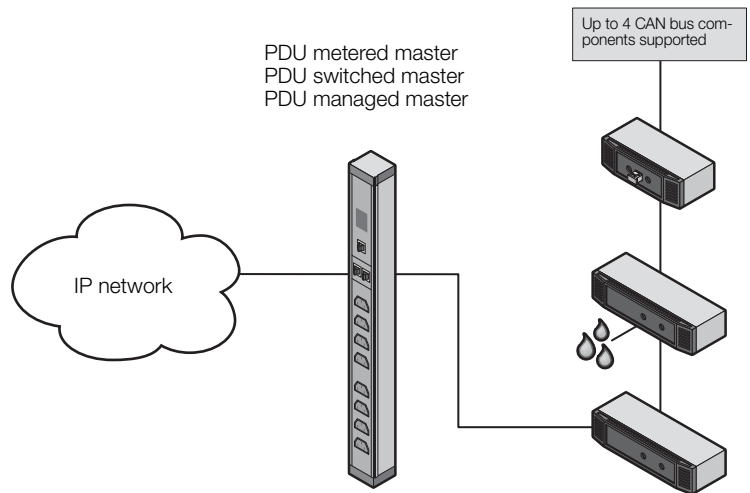
PDU metered master  
 PDU switched master  
 PDU managed master

managed slave  
 (without display)



### Connection of CAN bus sensors

Up to 4 additional CMC III CAN bus sensors may be connected to the PDU master for ambient monitoring (temperature, humidity, access, vandalism).



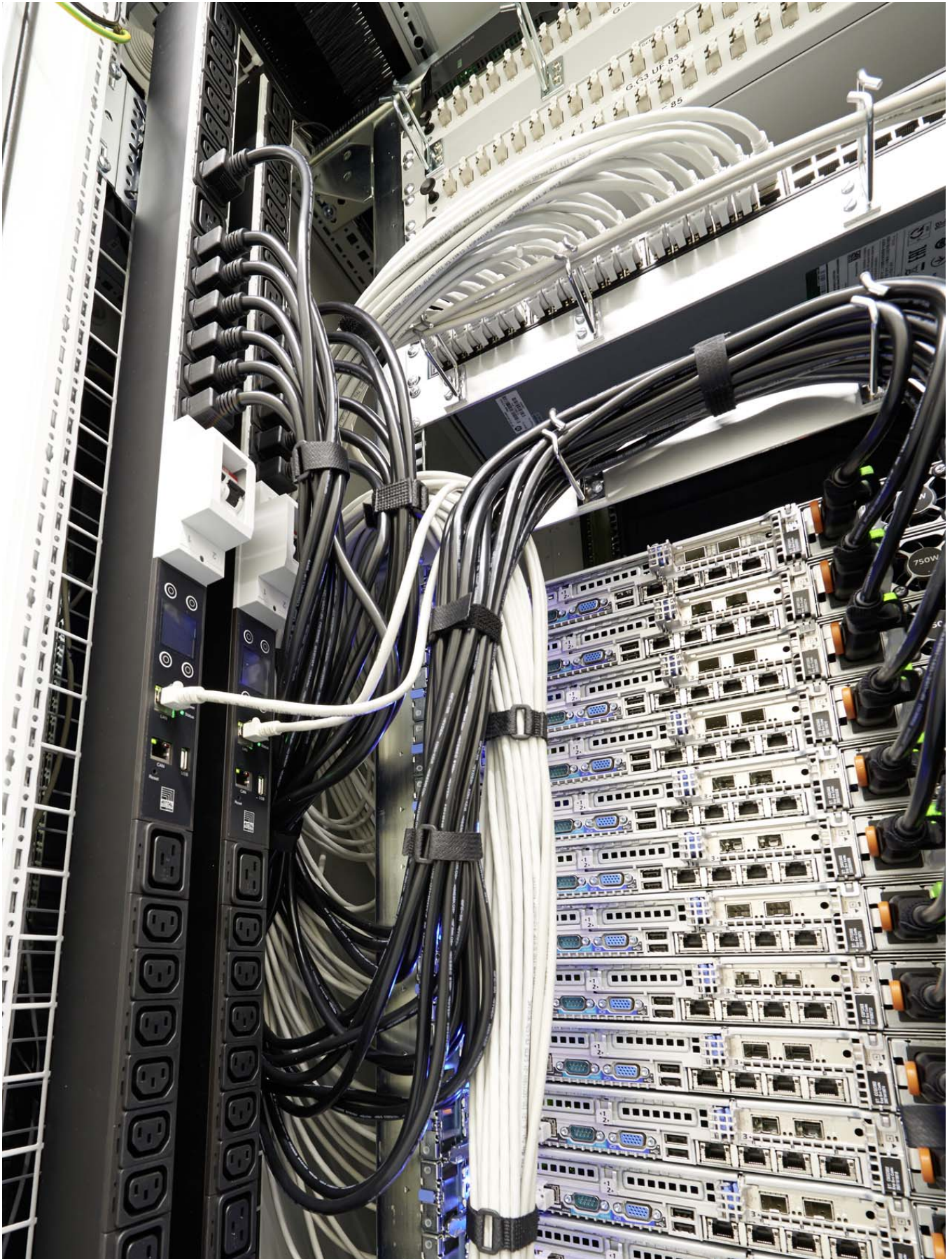
## Power Distribution Unit, allocation of fuses, phases, slots

Model No.	Infeed PDU	Fuse (type C16 A)	Phase 1		Phase 2		Phase 3	
			String 1 (F1)	String 1 (F2)	String 2 (F1)	String 2 (F2)	String 3 (F1)	String 3 (F2)
7955.X01	230 V/1~/16 A	-	12 x C13	-	-	-	-	-
7955.X10	230 V/1~/16 A	-	24 x C13 + 4 x C19	-	-	-	-	-
7955.X11	230 V/1~/32 A	2 x	12 x C13 + 2 x C19	12 x C13 + 2 x C19	-	-	-	-
7955.X31	400 V/3~/16 A	-	6 x C13 + 1 x C19	-	6 x C13 + 1 x C19	-	6 x C13 + 1 x C19	-
7955.X32	400 V/3~/16 A	-	8 x C13 + 2 x C19	-	8 x C13 + 2 x C19	-	8 x C13 + 2 x C19	-
7955.X33	400 V/3~/32 A	6 x	8x C13	2 x C19	8 x C13	2 x C19	8 x C13	2 x C19
7955.X34	400 V/3~/32 A	6 x	6 x C13 + 1 x C19	6 x C13 + 1 x C19	6 x C13 + 1 x C19	6 x C13 + 1 x C19	6 x C13 + 1 x C19	6 x C13 + 1 x C19
7955.X35	400 V/3~/16 A	-	14 x C13	-	14 x C13	-	14 x C13	-
7955.X36	400 V/3~/32 A	6 x	8 x C13	8 x C13	8 x C13	8 x C13	8 x C13	8 x C13



# Power Distribution Unit

## Sample application



# Rittal – The System.

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