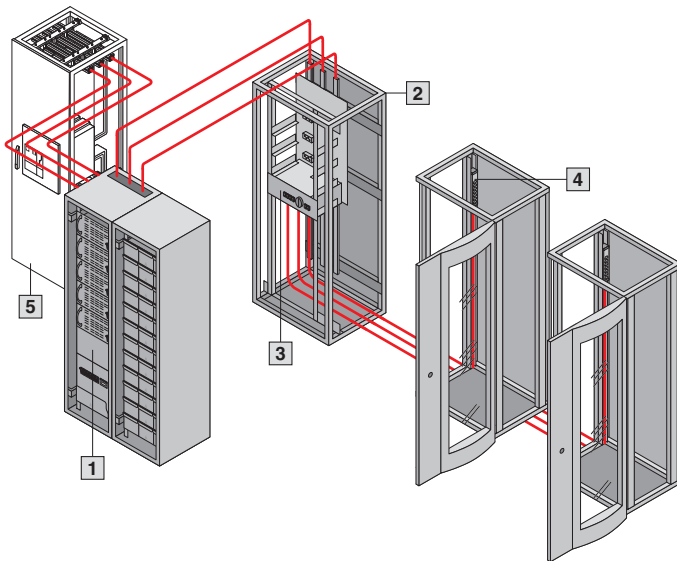


Rittal IT power concept



- 1** Modular Power Concept PMC 200
- 2** Power Distribution Rack PDR
- 3** Power Distribution Module PDM
- 4** Power System Module PSM
- 5** Power distribution, further information see page 332.



1 Power Modular Concept PMC 200 – The guaranteed safe option

The efficient Power Modular Concept PMC is the scalable UPS concept from Rittal for a protected power supply. Its modularity, coupled with the unique Decentralised Parallel Architecture (DPA), ensure a high degree of availability for critical applications and requirement-based investments. The adaptive Rittal UPS concept accommodates versatile data centre requirements and is easily expanded with additional, safe-swappable UPS modules. High initial investments for first-time installation are avoided, thanks to the modular design concept, since UPS capacities may be upgraded at any time as and when required. The adaptive concept allows you to invest as your requirements grow.

This modular rack-mounted concept keeps the purchasing and operating costs of redundant solutions low. As your performance requirements grow, the UPS grows with you, thanks to its flexible scalability – even in the most confined spaces, and with the system operational. Your benefits: Less capital tie-up, inexpensive expansion, and minimal space requirements. The high efficiency of the UPS of 95 % load, and in the partial load range from just 25 % load, ensures that operating costs in the data centre are kept to a minimum.

Convincing benefits:

- “N+1” technology in a single rack
- True rack-mounted modularity
- Service-friendly, thanks to the modular layout, plus short MTTR
- High level of efficiency
- 8 – 40 kW modules
- 200 kW per rack
- Classification VFI-SS-111

2 Power Distribution Rack PDR – Central power management for IT racks

- Accommodation of up to 8 PDM systems
- Sub-distribution up to 250 A per phase
- PDM may be retrofitted whilst operational
- A maximum of 32 racks may be fitted to the sub-distributor
- Fully shock-hazard protected
- VDE-certified
- Cable connection in the PSM rail for maximum planning flexibility

3 Power Distribution Module PDM

Power management between IT racks

Plug & play installation of a power supply in the IT rack with complete shock-hazard protection means significantly reduced assembly costs plus a high level of investment confidence.

Convincing benefits:

- Cabled expansion
- Shock-hazard protected plug & play system
- Keyable connection
- Modules may also be replaced by trained staff
- Modules may be retrofitted with the system operational
- VDE-certified
- 19” modules for sub-distribution of 40 kW into server and network enclosures
- 4 individually fused, 3-phase outlets
- Connected load 400 V/3~, max. 63 A

4 Power System Module PSM – Intelligent power distribution inside the rack

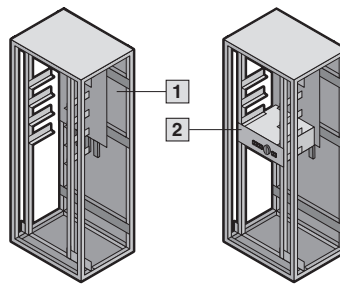
Power System Module PSM – Power solutions that connect

- Contact hazard-proof busbar
- Redundant configuration thanks to two separate circuits
- Load capacity up to 2 x 16 A with single-phase infeed, and up to 192 A with 3-phase infeed
- Modules may be retrofitted with the system operational
- Active modules feature individual slot switching with SNMP/HTTP and user management
- Max. 42 slots in one 2 m system
- Optimised cable management

Convincing benefits:

- Flexible and redundant layout
- Installation without loss of U
- Modules may be retrofitted with the system operational
- Remote monitoring via web browser and SNMP

Power Distribution Rack PDR



1 Power Distribution Rack PDR
2 Power Distribution Module PDM

- Power Distribution Rack to accommodate a maximum of 8 PDMs
- Height 1.20 m for 4 PDMs and 2 m height for 8 PDMs
- PDM may be retrofitted whilst operational
- A maximum of 32 racks may be fitted to the sub-distributor
- Fully shock-hazard protected
- Main switch in various options¹⁾:
 - Isolator switch
 - On-load isolator
 - Power circuit-breakers
 - RC circuit-breaker

- Low-voltage distribution up to 250 A

¹⁾ Depending on the standards of the local power supply company

Note:
Observe the standards of the local power supply companies.

Material:
Sheet steel

Surface finish:
Enclosure frame: Dipcoat-primed
Doors, roof and base/plinth: Dipcoat-primed, powder-coated in RAL 7035

Gland plates, punched sections with mounting flanges and mounting angles:
Zinc-plated, passivated

Supply includes:
Enclosure frame with door (without tubular door frame), rear panel, side panels and roof plate, levelling feet including base/plinth adaptor, earthing of all enclosure panels, busbars shock-hazard protected, main switch integrated.

Extended delivery times.



Also required:

Power Distribution Module PDM, see page 787.

Detailed drawing, available on the Internet.



Power Distribution Rack PDR 1	Packs of		
Possible number of PDM modules 2		4	8
Dimensions mm ¹⁾	W	800	800
	H	1200	2000
	D	500	500
Model No. DK	1	7857.310	7857.300

Accessories				
Base/plinth components, front and rear	Height 100 mm	1 set	8601.800	8601.800
	Height 200 mm	1 set	8602.800	8602.800
Base/plinth trim, side	Height 100 mm	1 set	8601.050	8601.050
	Height 200 mm	1 set	8602.050	8602.050

¹⁾ All sizes given are nominal dimensions. For absolute dimensions, please refer to the detailed drawing on the Internet.



2 Power Distribution Module PDM

- 482.6 mm (19") Power Distribution Module mechanically locked in the PDR
- Scalable
- Including master switch, optional RC circuit-breaker
- 4 fused 3-phase outlets to the rack
- 3 x 230 V/16 A per outlet
- Connected load 400 V/3 AC, max. 63 A

Supply includes:
482.6 mm (19") module, 3 U

Design	Model No. DK
PDM 482.6 mm (19"), 4 outlets per 10 kW	7857.320
PDM 19", 4 outlets, project-specific	7857.350
Connection cable 32 A CEEkon connector, for operation without PDR	7857.321



Also required:

Plug & play connection cable to the server racks:

Length	Packs of	Model No. DK
3 m	1	7857.130
5 m	1	7857.150
8 m	1	7857.180
9 m	1	7857.190

Power Distribution Module PDM/system network analysis



PDM socket strip

Socket strip for the direct connection of single-phase equipment to a Power Distribution Module PDM

482.6 mm (19") power distributor with three-phase infeed. The standard plug & play connection cables may be used. Each group of three colour-coded connectors is supplied by one phase.

Benefits:

- Simple connection of single-phase equipment when using PDM
- Compatible with standard plug & play connection cables
- Prepared for the connection of **LCP, CMC-TC, SSC** etc.

Design	Model No. DK
6 x C13/3 x earthing-pin	7857.325

Technical specifications:

Input:

Mains voltage: 400 V/50 Hz, three-phase
Rated current: 16 A per phase
Connection: X-Com connector

Output:

Mains voltage: 230 V/50 Hz, three-phase
Rated current: 10 A per phase



System network analysis

The quality of the energy supply is an important component of a functioning IT system. There are UPS protection systems available which can help. The quality of the energy supply from different power supply companies in conjunction with different IT applications may vary extremely widely.

Rittal offers the network analysis system. It may be integrated into the Power Distribution Rack (PDR), where it will analyse the power infeed.

The system performs network quality measurements to EN 50 160. It has a large illuminated display for the direct retrieval of measurement results. Furthermore, all information is available in the network via the integrated Web server. Evaluation software is also included with the supply, and is capable of reading the measurements via the network and analysing them to DIN EN 50 160 and EN 61 000-2-4.

The electronic measuring device, which is equipped with 4 current and voltage inputs, records and digitises the effective values (RMS) of currents and voltages in a 15 – 75 Hz network. Based on the scanned values, the built-in micro-processor calculates the electric variables. For measurement in the three-phase system, the relevant voltage may be defined as a conductor-zero or conductor-conductor voltage. This voltage is used by the Rittal network analysis system to measure harmonics and to log transients and events, and for the flickermeter.

System network analysis	Available on request.
-------------------------	-----------------------

Measurement functions:

- Automatic adjustment to a network frequency of 15 ... 75 Hz
- Measurement intervals of 10 (50 Hz) or 12 (60 Hz) period (200 ms)
- Continuous scanning and calculation of the following measurements: Voltage L-N, neutral-point displacement voltage and asymmetry L1...L3, voltage L-L, frequency, current, aggregate current L1...L3 and L1...L3+N, active power, reactive power, apparent power, power factor, distortion reactive power, fundamental power, cosphi, phase shift, work of main and auxiliary system, reactive power demand (capacitive and inductive) 1...50 harmonic of current and voltage, distortion factor (THD) of current and voltage, short- and long-term flickermeter readings, level of ripple-control signals.

Technical specifications:

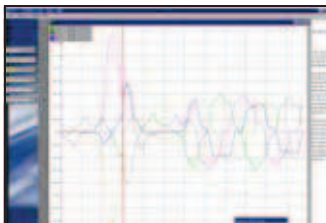
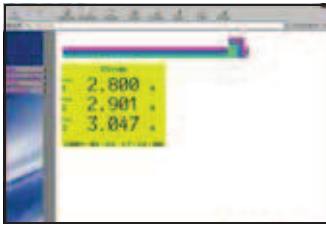
Dimensions W x H x D: 144 x 144 x 90 mm
Auxiliary voltage:
95...265 V AC; 100...370 V DC; 25 VA
Voltage measurement:
L-N 0...500 V AC; 0.2 VA; 15 – 75 Hz
L-L 0...870 V AC; 0.2 VA; 15 – 75 Hz
Current measurement:
5 A (1 A), (larger values via converter)
Operating temperature range: –10 to +55°C

I/O:

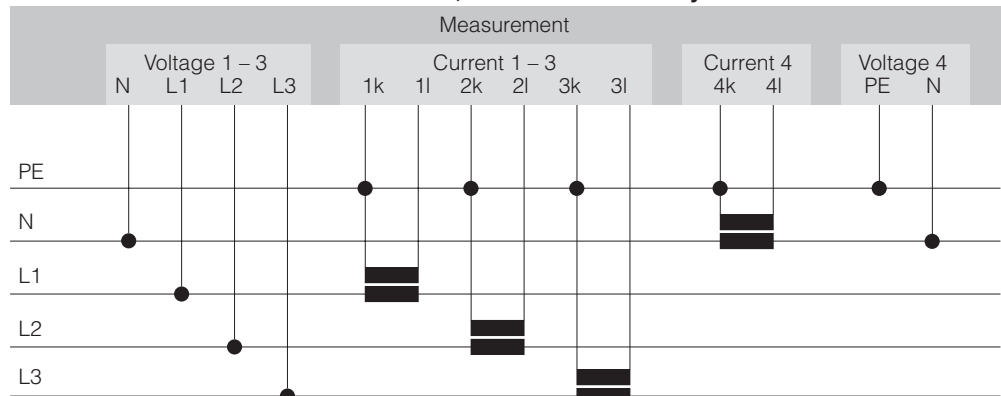
Digital inputs: 8
Digital outputs: 5

Protection category:

IP 20



Measurement in the four-conductor network, with main and auxiliary measurement



Power System Module PSM



Power System Module PSM

Busbar, current carrying capacity up to 96 A per rack

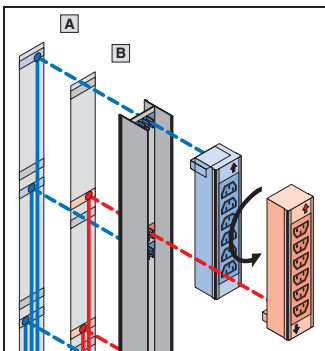
The ever-expanding power requirements of modern IT infrastructures demand refined solutions for power distribution inside the racks. This leads to an associated requirement for additional sockets. The new "intelligent power distribution system" from Rittal significantly reduces cabling and assembly work.

The modular system facilitates basic configuration of the racks, thanks to a vertical support rail with 3-phase infeed. The various insert modules may be snap-fitted into the support rail. This can even be done whilst the system is operational, because the support section is shock-hazard protected.

The various modules, earthing pins, IEC 320 etc. may be inserted into the support rail in any combination. This is easily achieved, even by non-electricians, thanks to the shock hazard protected plug & play system.

Technical specifications/benefits:

- 3-phase construction with a maximum current of 3 x 16 A.
- A redundant three-phase infeed with 3 x 16 A may also be added.
- The redundant circuit is completely separate from the 3 phases of the support rail.
- Each plug-in module picks off a phase on the support rail, either from infeed **A** or from the redundant infeed **B**, depending on the direction of connection.



- Modules may be retrofitted whilst the system is operational.
- Plug-in modules may be equipped with integral overcurrent protection, so that only the affected module is deactivated in the event of an excessively high current. The other modules remain operational.
- Overvoltage protection may be integrated into the supply line.
- Support rail may be integrated into the vertical frame section of the flexRack(i) without additional equipment.

The vertical support rail allows the slots to be used flexibly across the entire enclosure height, and configured in a redundant manner via separate power infeed to the individual modules.

Supply includes:

Busbar with connection socket, assembly parts and operating instructions. Without cable.



Also required:

Connection cable, see page 793.
Plug-in modules, see page 790.

Note:

Observe the country-specific connection data.



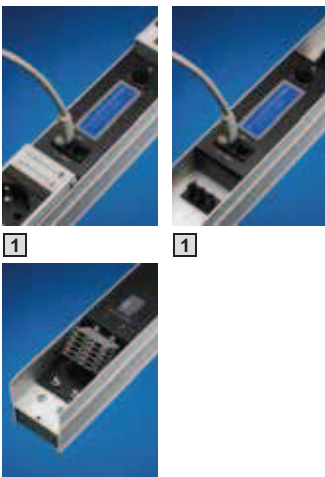
Busbar			
For enclosure height mm	Number of modules	Model No. DK	
		EU type	US type
1200	4	7856.010	7856.050¹⁾
2000	7	7856.020	7856.060¹⁾

Also required:			
Mounting kit		Without cable routing	With cable routing
For TS	For static installation	7856.011	7856.022
	Adjustable, for open 19" level	7856.012	7856.023
For TE	For static installation	7000.684	–

¹⁾ Delivery times available on request.

Power

B
5.4



PSM rail with measurement

Busbar with integral output measurement

Display and monitoring of the complete three-phase connection current and the power per rail. The display is local.

In conjunction with CMC, the rail may be remotely administered and configured using standard protocols (SNMP, HTTP).

The following active functions are provided:

- Local display, legibility is independent from the installation position.
- Measurement and monitoring of the current per phase. Min./max. limits may be set. Measurement range 0 – 16 A.
- Measuring and monitoring of the voltage per phase. Min./max. limits may be set. Measurement range 0 – 250 V.
- Alarm notification via a flashing display.
- Remote administration of the PSM rail, editing and monitoring of remote limits, SNMP trap message in case of alarm.

- 1 Simple connection via RJ connector.

For enclosure height mm	Maximum no. of modules	Model No. DK
2000	6	7856.016

Supply includes:

Busbar with connection socket, assembly parts and operating instructions. Without cable.

Note:

Observe the country-specific connection data.



Accessories:

Recommended CMC-TC accessories, see page 817.



Also required:

Connection cable, see page 793.
Plug-in modules, see page 790.
Mounting kit, see page 789.

In stand-alone mode without CMC-TC, a separate power pack DK 7201.210 with connection cables is required.

Power System Module PSM



PSM rail for 120/208 V

with coded circuits 120/208 V, 50/60 Hz, for applications in North America.

The circuits are preset.
Circuit 1 may be used for 208 V/3~ and only with the coded C19 PSM modules in the table.
Circuit 2 may be used for 120 V/1~ and only with the coded C13 modules in the table.

Design	Length mm	Model No. DK
PSM rail with coded circuits	2000	7856.051
PSM module C13 coded		7856.052
PSM module C19 coded		7856.053



PSM busbar

Single- and three-phase design with 32 A phase current.

Technical specifications:

- Single- and three-phase design with a max. current of 32 A per phase, 1 x 32 A or 3 x 32 A, 400/230 V, 50/60 Hz
- Accommodates up to 6 passive PSM modules
- Integral circuit-breaker 16 A, Class C
- Modules may be retrofitted whilst the system is operational

Supply includes:

Busbar with CEEkon-conforming connector, assembly parts and operating instructions.

Enclosure height mm	Number of modules	Model No. DK	
		Single-phase	Three-phase
2000	6	7856.321	7856.323



Also required:

Mounting kit, see page 789.
Plug-in module PSM, see page 790



Accessories:

Cable lock PSM, see page 790.



Plug-in modules PSM

for busbar version EU and US.
Length 250 mm.

Plug-in modules

Plug-in module	Number of sockets	Without overcurrent protection	With overcurrent protection
EN 60 320 C13	6	7856.080	7856.070
EN 60 320 C13	4	–	7856.220²⁾
D/NL/A earthing-pin	4	7856.100	7856.090
F/B	4	7856.120¹⁾	7856.110¹⁾
USA	5	7856.140¹⁾	7856.130
UK	3	7856.160¹⁾	7856.150¹⁾
CH	5/4	7856.190¹⁾	7856.180¹⁾
EN 60 320 C19	4	7856.230	–
EN 60 320 C13 red	6	7856.082	–
Earthing-pin socket red	4	7856.240	–

¹⁾ Extended delivery times.
Other modules available on request.
²⁾ With individual overcurrent fusing.

Applicable to DK 7856.230:



Cable lock PSM

for all modules with EN 60 320 C13 connector configurations

The bars, developed especially for the PSM system, can hold two connection cables. In this way, all connection cables of the terminal equipment are protected against accidental disconnection of the power supply. Two bars are needed for two cables.

Design	Length m	Packs of	Model No. DK
Bar		20	7856.013
Connection cable C13/C14 Connector/jack	0.5 ¹⁾	2	7856.014

¹⁾ Other lengths available on request.

Note:

Optimum locking function only occurs with connection cable DK 7856.014.

Power System Module PSM



Light module PSM

for use as a portable lamp

The PSM light module is compatible with all PSM busbars. Equipped with a powerful NiMH battery, the module may be removed and used as a portable lamp. Thanks to the integral magnet, the module is easily attached to any metallic surface inside the rack.

The light module is equipped with an electricity-saving LED lamp to allow a long illumination time of up to 4 h.

To recharge, the module is inserted into a free slot in the PSM bar.

Design	Model No. DK
Light module PSM	7856.210

Note:

Please observe the connection voltage (230 V) of the busbar.



Active PSM, 4-way

The module has 4 x IEC320 C13 sockets and an integral overload tripping device.

The following active functions are additionally achieved:

- 2-digit local LED 7-segment current display on the module. Legibility is independent from the installation position.
- Measuring and monitoring of the current per module. Min./max. limits may be set. Measurement range 0 – 16 A.
- Alarm indication via a flashing 7-segment display.
- Monitoring of the overload fuse.
- Modules may be combined via the bus system, thereby enabling sequential activation.
- In conjunction with the CMC-TC, the modules may be activated and deactivated via HTTP and SNMP. The 4 jacks are always activated and deactivated together.

The 4 free channels of the Processing Unit II (PU II) DK 7320.100 can be switched with up to 4 active PSM systems in each case.

The active PSM does not require any separate power pack in conjunction with PU II.

Design	Packs of	Model No. DK
4-way	1	7856.200

- Remote administration of the power supply, editing and monitoring of remote limits, SNMP trap message in case of alarm.
- 4 IEC320 C13 sockets per module.

Material:

Aluminium section with plastic cover

Supply includes:

- 1 module (max. 10 A per module),
- 10 A integral overload tripping device,
- 1 bus cable,
- 1 infeed cable 24 V DC,
- 1 adaptor for power pack 24 V DC.



Also required:

A separate power pack (100 – 240 V AC/24 V DC) is required for stand-alone operation without CMC-TC (DK 7201.210) and the relevant connection cables.



Active PSM 6-way, individually switchable

For further details, see page 791.

Material:

Aluminium section with plastic cover

Supply includes:

- 1 module (max. 16 A per module),
- 1 infeed cable 24 V DC or 1 bus cable.

Design	Model No. DK
2 x C13 and 4 x C19	7856.204
2 x C13 and 4 x earthing-pin	7856.203



Also required:

A separate power pack (100 – 240 V AC/24 V DC) is required for stand-alone operation without CMC-TC (DK 7201.210) and the relevant connection cables.

Power System Module PSM



Active PSM 8-way, individually switchable

The module has 8 current outlets with IEC320 C13 slots. Each of the 8 slots is individually switchable (via the CMC-TC system). Furthermore, a current indicator, circuit display and thermal overload protection are integrated into the module. The module is twice the length of a standard PSM module, so that a maximum of 2 modules may be inserted into a 1200 mm long PSM rail, and a maximum of 3 modules into a 2000 mm long PSM rail.

Operate the module without CMC-TC:

For operation of the module, power pack DK 7201.210 and a connection cable are needed. Up to 2/3 modules may be operated in one PSM rail (1200/2000 mm) with one power pack.

Available functions: Current display, circuit display and automatic selective activation

Operate the module with CMC-TC:

No additional power pack is needed; the module is supplied with power via the CMC-TC system. Up to 4 x 4 modules may be connected to one Processing Unit II (DK 7320.100).

Available functions: Current display, circuit display, automatic selective activation, via CMC-TC in the network: Individual switching of the 8 current outlets, current limit monitoring, delayed switching of the individual current outlets, status display of the module.

Recommended accessory list CMC-TC:

- DK 7320.100 CMC-TC Processing Unit II
- DK 7320.425 CMC-TC power pack 24 V, input 100 – 230 V AC
- DK 7320.440 CMC-TC 1 U mounting unit
- DK 7320.472 CMC-TC connection cable sensor unit 2 m
- DK 7200.210 CMC-TC connection cable D 230 V AC (depending on country version)
- DK 7200.221 CMC-TC programming cable

Design	Model No. DK
8-way	7856.201

Description of functions:

- 2-digit local LED 7-segment current display on the module. Legibility is independent from the installation position.
- Measuring and monitoring of the current per module. Min./max. limits may be set. Measurement range 0 – 16 A.
- Alarm messages are indicated via a flashing 7-segment display.
- Monitoring of the thermo-fuse.
- Modules may be combined via the bus system, to enable selective activation.
- In conjunction with the CMC-TC, the 8 individual current outlets of the modules may be activated and deactivated individually via HTTP and SNMP.
- Remote administration of the power supply, editing and monitoring of remote limits, SNMP trap messages in case of alarm.
- 8 IEC320 C13 sockets per module.
- User administration.

Material:

Aluminium section with plastic cover

Supply includes:

- 1 module (max. 10 A per module),
- 1 infeed cable 24 V DC or 1 bus cable,
- 1 adaptor for power pack 24 V DC.



Also required:

A separate power pack (100 – 240 V AC/24 V DC) is required for stand-alone operation without CMC-TC (DK 7201.210) and the relevant connection cables.



Measurement module PSM

For power measurement of existing PSM or for new installations.

Suitable for for PSM busbar:
DK 7856.010, DK 7856.020, DK 7856.050,
DK 7856.060.

Note:

Detailed information, see PSM rail with measurement, page 789.

Packs of	Model No. DK
1	7856.019



Overvoltage protection PSM

Is connected upstream of the busbar.

- Fine fuse
- Connection:
Socket Wago X-Com
Plug Wago X-Com

Overvoltage protection	Packs of	Model No. DK
With adaptor connector	1	7856.170



Connection cable for PSM rail

Connection cable, 3-phase			
	Length	Packs of	Model No. DK
CEEkon 5-pole/16 A	3 m	1	7856.025
US type NEMA		1	7856.055¹⁾
Connection cable, single-phase			
CEEkon 3-pole/16 A	3 m	1	7856.026
Connection cable, UPS, single-phase			
C14/X-Com	3 m	1	7856.027
Connection cable C19/C20			
16 A	2 m	1	7200.217
Connection cable C13/C14			
16 A	0.5 m ²⁾	2	7856.014

¹⁾ Delivery times on request. ²⁾ Other length available on request.



Rittal Power Control Unit (PCU)

Socket strip, IP-compatible

The 1 U PCU socket strip has 8 current outlets with IEC320 C13 slots. Each of the 8 slots is individually switchable (via the CMC-TC system). Furthermore, a current indicator, circuit display and thermal overload protection are integrated into the module. The socket strip may be installed on the enclosure frame or in the 482.6 mm (19") section (1 U) of a rack.

Operate the socket strip without CMC-TC:

For operation of the socket strip, power pack 7201.210 and a connection cable (see page 818) are needed. Up to 4 socket strips may be operated with one power pack.

Available functions: Current display, circuit display, automatic selective activation

Operate the socket strip with CMC-TC:

No additional power pack is needed; the PCU is supplied with power via the CMC-TC system. Up to 4 x 4 PCUs may be connected to one Processing Unit II.

Available functions: Current display, automatic selective activation, via CMC-TC in the network: Individual switching of the 8 current outlets, current limit monitoring, delayed switching of the individual current outlets, status display of the module.

Recommended accessory list CMC-TC:

- 7320.100 CMC-TC Processing Unit II
- 7320.425 CMC-TC power pack 24 V, input 100 - 230 V AC
- 7320.440 CMC-TC 1 U mounting unit
- 7320.472 CMC-TC connection cable, sensor unit 2 m
- 7200.210 CMC-TC connection cable D 230 V AC (depending on country version)
- 7200.221 CMC-TC programming cable

Design	Model No. DK
8-way	7200.001

Description of functions:

- 2-digit local LED 7-segment current display on the PCU. Legibility rotates according to the installation position.
- Measuring and monitoring of the current per PCU. Min./max. limits may be set. Measurement range 0 – 16 A.
- Alarm indication via a flashing 7-segment display.
- Monitoring of the thermo-fuse.
- PCUs may be combined via the bus system, thereby enabling selective activation.
- In conjunction with the CMC-TC, the 8 individual current outlets of the PCUs may be activated and deactivated individually via HTTP and SNMP.
- Remote administration of the power supply, editing and monitoring of remote limits, SNMP trap messages in case of alarm.
- 8 IEC320 C13 slots per PCU.
- User administration.

Material:

Aluminium section with plastic cover

Supply includes:

- 1 socket strip PCU 1 U (max. 10 A per socket strip),
- 1 bus cable,
- 1 infeed cable 24 V DC,
- 1 adaptor for power pack 24 V DC,
- 1 connector for power supply,
- 1 connection cable 3 m.



Also required:

A separate power pack (100 – 240 V AC/24 V DC) is required for stand-alone operation without CMC-TC (DK 7201.210) and the relevant connection cables.

Power System Module PSM Plus



Power System Module PSM Plus

Current carrying capacity up to 192 A per rack

Additional variant of the successful Rittal PSM concept, comprising a busbar with redundant configuration and three-phase infeed. The external dimensions remain the same, as do the familiar attachment options.

By integrating two **further** three-phase circuits the PSM now has **four** independent three-phase infeeds. Each of the feeds can be supplied with up to 3 x 16 A. In total, this produces a maximum of 192 A.

This PSM is used particularly in applications with highly-integrated blade server applications. Thanks to the design with four independent infeeds, it is possible to configure a redundant, high-availability power supply system for IT racks. With all the benefits of the familiar PSM: Shock-hazard-protected; may be retrofitted whilst the system is operational.

The benefits at a glance:

- 2 m busbar with four independent infeeds (**A, B, C, D** each 400 V/3~, 50/60 Hz, 3 x 16 A).
- With four integral connection cables, 5 x 2.5 mm and Wieland GST connectors.
- Directly suitable for connecting to Rittal PDM.
- Easily integrated into existing applications with standard extension cables.
- 6 slots per 2 m rail.
- Attachment with no loss of U in the rack.

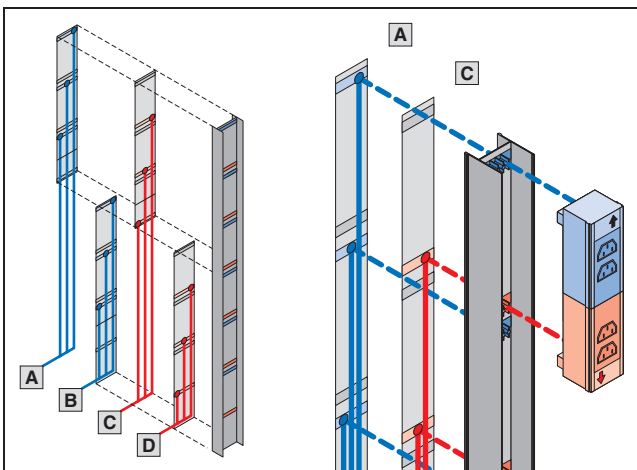
Note:

There are modules with two infeeds for use of the new PSM Plus rail. This means that redundancy can now be achieved at module level. PSM modules DK 7856.070 to DK 7856.240 may also be used. The second infeed option of the rail is not used.

The following modules are available:

- 6-way C13, two infeeds with max. 16 A per 3 x C13
- 4-way C19, two infeeds with max. 16 A per 2 x C19
- 2-way earthing pin, two infeeds with max. 16 A per earthing-pin socket

Busbar	For enclosure height mm	Number of modules	Model No. DK	
	2000		6	7856.015
Mounting kit			Without cable routing	With cable routing
	For TS	For static installation	7856.011	7856.022
		Adjustable, for freely accessible 482.6 mm (19") level	7856.012	7856.023
	For TE	For static installation	7000.684	–
Plug-in modules (each half of the modules is supplied with one infeed)		Number of sockets	Without miniature fuse	
	EN 60 320 C13	6 (3 x per infeed)	7856.081	
		4 (2 x per infeed)	–	
	EN 60 320 C19	4 (2 x per infeed)	7856.231	
2 (1 x per infeed)		–		
Earthing-pin socket	2 (1 x per infeed)	7856.101		
Connection cable	Type	Length 5 m		
	Three-phase mains connection cable, EN 60 309	Three-phase connector EN 60 309 on Wieland GST socket	7856.018	
	Extension cable	Wieland GST socket on Wieland GST 18 connector	7856.017	



UPS, single-phase, output range 1 – 12 kVA N+1 redundant



The UPS is distinguished by the use of double-conversion technology.

Double-conversion technology provides the basis for an optimum supply voltage to all connected loads. This means that the Rittal PMC 12 UPS is ideally suited to all applications in the IT environment, as well as for all other requirements such as medical technology, automation technology, plant control etc. A scalable autonomy of up to 2 h at 100 % load ensures a broad spectrum of applications.

Rittal Power Modular Concept PMC 12

- Double conversion technology VFI-SS 111
- For use as a rack or floor-standing enclosure with 90° rotating LCD display
- 2 U high
- Serial/USB interface and Emergency Power Off (EPO) contact
- Batteries “hot swap” compatible, may be exchanged from the front
- Integral batteries with 1 – 3 kVA
- External batteries with 4.5 kVA and 6 kVA
- Parallel switching 4.5 kVA and 6 kVA UPS up to 12 kVA N+1 redundant
- Optional SNMP card

DK 7857.430, DK 7857.431, DK 7857.432

Supply includes:

Single-phase UPS systems in double-conversion technology (VFI-SS 111) with internal “hot swap” compatible batteries, USB and serial interface.

DK 7857.433, DK 7857.434

Supply includes:

Single-phase UPS systems in double-conversion technology (VFI-SS 111), USB and serial interface.

Available on request:

Replacement battery packs and AS 400 interface adaptor.



Also required:

Country-specific connection cables and slide rails are required to operate the UPS systems.

For DK 7857.433, DK 7857.434

Parallel Hot Swap Chassis (DK 7857.443 or DK 7857.444). External 3 U battery pack (DK 7857.442).

UPS for 482.6 mm (19") racks or as floor-standing enclosures		UPS with integral battery			UPS control unit	
Model No. DK		7857.430	7857.431	7857.432	7857.433	7857.434
Power	VA	1000	2000	3000	4500	6000
	Watts	700	1400	2100	3150	4200
	Max. heat loss (W)	105	210	252	315	420
Input	Rated voltage	230 V (160 – 288 V)				
	Frequency	50/60 Hz ±5 %				
	Power factor	> 0.99 with linear load				
Output	Voltage	230 V ≤ ±1 % (200/208/220/230/240 V adjustable)				
	Frequency, synchronised	± 1 Hz				
	Frequency, asynchronous	±0.1 %	±0.1 %	±0.1 %	±0.2 %	±0.2 %
	Crest factor	3 : 1				
	Non-linear distortion	≤ 7 %	≤ 7 %	≤ 7 %	≤ 6 %	≤ 6 %
	Wave shape	≤ 3 %				
	Operating ratio, AC mode	85 %	85 %	88 %	90 %	90 %
	Operating ratio, battery mode	83 %	83 %	85 %	87 %	87 %
Battery	Power factor	0.7				
	Autonomy at 100 % load	5 years EUROBAT	5 years EUROBAT	5 years EUROBAT	5 years EUROBAT	5 years EUROBAT
Overload	105 %	continuous				
	120 %	30 sec	30 sec	30 sec	160 sec	160 sec
	150 %	10 sec	10 sec	10 sec	160 sec	160 sec
Communication	Interface	1 x USB, 1 x RS-232				
	SNMP	Optional SNMP card DK 7857.420				
	Operating systems supported	Windows, Unix, Linux, OS/2, Novell, Apple; RCCMD shutdown licence DK 7857.421				
	Emergency Power Off (EPO)	■				
Mechanics	Width mm	440				
	Height mm	88				
	Depth mm	405	650	650	660	660
	Weight kg	15.7	29.4	29.7	24	24
	Input connection 230 V	10 A C14			10 A C20	Compact connector
Operating environment	Output connection 230 V	6 x 10 A, C13, 2 units switched		4 x 10 A, C13, 2 units switched, 1 x 16 A, C19	Compact connector	Compact connector
	Humidity	0 – 90 %, non-condensing				
	Noise level	50 db (A)				
Standards and certifications	Safety	IEC/EN 62 040-1, EN 60 950-1				
	Power	IEC/EN 62 040-3				
	EMC	EN 50 091-2/EN 62 040-2 class A, EN 61 000-4-2/-3/-4/-6-8/-11, EN 61 000-3-2/-3				
	Labelling	CE, FCC, cUL				

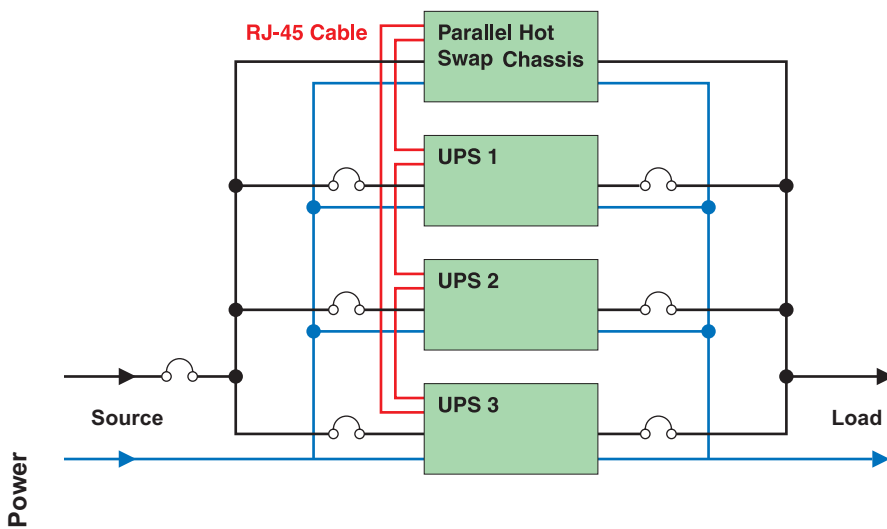
Power

UPS, single-phase, output range 1 – 12 kVA N+1 redundant

Accessories for Model No. DK	7857.430	7857.431	7857.432	7857.433	7857.434
External bypass ^{1) 6)}	7857.439	7857.440	7857.441	–	–
Battery pack ²⁾	7857.435	7857.436	7857.437	7857.442	7857.442
Parallel Hot Swap Chassis for 2 UPS systems ³⁾	–	–	–	7857.443	7857.443
Parallel Hot Swap Chassis for 3 UPS systems ³⁾	–	–	–	7857.444	7857.444
PDM for PMC 12 ⁴⁾	–	–	–	–	7857.445
SNMP card	7857.420	7857.420	7857.420	7857.420	7857.420
RCCMD shutdown licence	7857.421	7857.421	7857.421	7857.421	7857.421
Connection cable for 4.5 and 6 KVA ⁵⁾	–	–	–	7857.446	7857.446
Connection cable, UPS, single-phase	7856.027	7856.027	–	–	–
Connection cable, UPS, single-phase, C20	–	–	7856.030	–	–
Slide rail, depth-variable	7063.883	7063.883	7063.883	7063.883	7063.883

⁵⁾ Not required when using the Hot Swap Chassis. ⁶⁾ Extended delivery times.

Block diagram parallel redundant UPS DK 7857.433/.434



1) External bypass:

The external bypass allows the UPS to be swapped with the system operational.

2) Autonomy (min) at 100 % load:

UPS type	In supplied state	Battery packs		
		1	2	3
1 kVA	7 min	1:09 h	2:13 h	–
2 kVA	7 min	34 min	1:09 h	–
3 kVA	5 min	30 min	1:02 h	–
4.5 kVA	–	12 min	31 min	54 min
6 kVA	–	8 min	20 min	36 min

3) Parallel Hot Swap Chassis:

The parallel hot swap chassis for the 4.5 kVA and 6 kVA module allows up to 3 UPS systems to be connected together. This can be used to boost output and to achieve N+1 redundancy. An **external bypass** is additionally integrated into the Parallel Hot Swap Chassis.

4) PDM for PMC 12:

Single-phase power distribution for use with the Parallel Hot Swap Chassis DK 7857.444. The PDM offers the opportunity of connecting two single-phase 32 A CEE connectors and four EN 60 320 C19 16 A connectors. All outputs have pre-fuses.

Power

B
5.4

UPS, Rittal Modular Power Concept – PMC 200

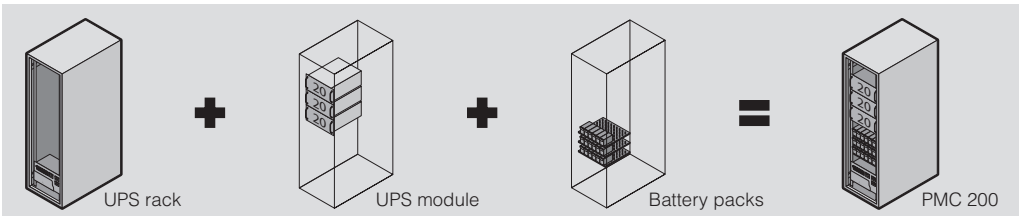
Maximum availability, modularity and a compact design!

Rittal PMC 200 ensures optimum availability for critical applications by combining modularity (flexible, unlimited scalability and redundancy) with decentralised parallel architecture or DPA (redundant protection without “single point of failure”). The UPS modules are transformerless, genuine online, double-conversion UPSs with static bypass and classification code VFI-SS-111.

This modular concept keeps the purchasing and operating costs of redundant solutions low. As your performance requirements grow, the UPS grows with you, thanks to its flexible scalability – even in the most confined spaces, and with the system operational. Your benefits: Less capital tie-up, inexpensive expansion, and minimal space requirements.



The new UPS generation: Rittal PMC 200



Your individual UPS based on standard modules
Rack plus UPS modules plus battery packs produce a customised UPS to suit your current requirements.

Output density up to 200 kW (160 kW redundant) in one rack.

Might you need more in future?
No problem: The system supports modular expansion of performance and autonomy whilst operational!



The best UPS concept for you is an “individual concept”

The uninterrupted power supply to your data centre and all your IT is more than just a question of kilowatts, autonomy and UPS redundancy.

For this reason, we consider your individual UPS requirements in great depth in order to offer you optimum protection at an attractive price.

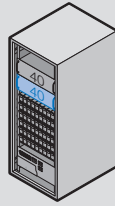
Thanks to the cost benefits afforded by mass production of the UPS modules, individual configuration produces a highly beneficial symbiosis for you.

UPS, Rittal Modular Power Concept – PMC 200

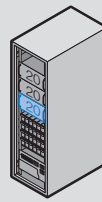


N + 1 = Perfect redundancy in a rack with PMC 200

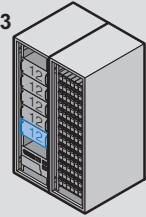
Example 1



Example 2



Example 3



Three examples of a 40 kW UPS with redundancy:

All modules operate in parallel mode. In all cases, one module may fail without impairing the connected load.

Example 1

- 1 + 1 (40 kW + 40 kW)
Advantage: Just two UPS modules, minimal space requirements. Disadvantage: 100 % of the required output must be provided as redundancy.

Example 2

- 2 + 1 (2 x 20 kW + 20 kW)
Advantage: Compact and energy-efficient.

Example 3

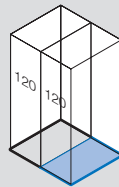
- 4 + 1 (4 x 12 kW + 12 kW), an additional battery rack is needed for batteries. Advantage: Only 12 kW needs to be buffered for redundancy. Disadvantage: Greater space requirements.

► We will be happy to work with you to project-plan the exact solution best-suited to your individual requirements.

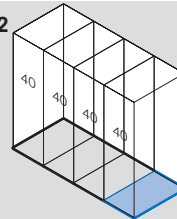


Extremely small installation space with PMC 200

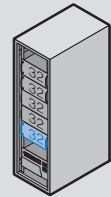
Example 1



Example 2



Example 3
PMC 200



Maximum performance density in one free-standing enclosure!

In examples 1 and 2 we compare the space requirements of two non-modular systems for 120 kW output plus redundancy with the modular UPS system

Rittal PMC 200 (example 3), which is configured according to the 4 + 1 concept with five 32 kW modules.

The minimised construction size of the Rittal PMC 200 concept allows three modules plus battery packs or five modules each with up to 40 kW in one Rittal 482.6 mm (19") TS 8 UPS enclosure.

► Benefits thanks to minimised construction size and modular design.



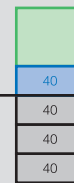
Maximum energy efficiency with PMC 200

Example 1



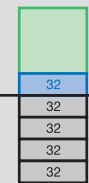
120 + 120 = 240 kW

Example 2



120 + 40 = 160 kW

Example 3



128 + 32 = 160 kW

Minimal energy requirement means low costs and minimal pollution:

With the PMC 200 concept, you not only protect the critical load, but also safeguard the operating ratio of the UPS. Let us advise you to find the most suitable concept.

Example 1

This 120 kVA + 120 kW solution requires the most output for redundancy.

Example 2

This variant with three 40 kVA modules only requires 1/3 of the output compared with example 1 for redundancy purposes.

Example 3

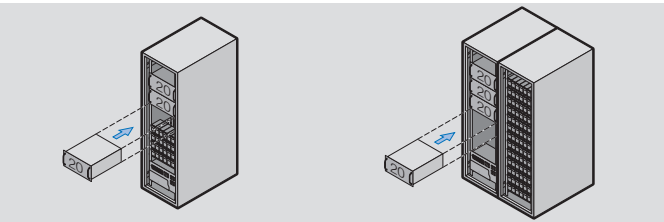
With five 32 kW modules only 1/4 is required for the buffer output of redundancy, compared with a single redundant 120 kW UPS. However, there is no space left in the rack for battery packs, i.e. an additional battery enclosure is needed.

► PMC 200 is an excellent solution with regard to energy and space requirements and also with a view to future expansion.

UPS, Rittal Modular Power Concept – PMC 200



Flexible scalability with PMC 200



Simple expansion while operational

Output may be expanded from 2 to 3, 4 or 5 UPS modules via "hot swap" with the system oper-

ational, without having to switch to bypass mode.

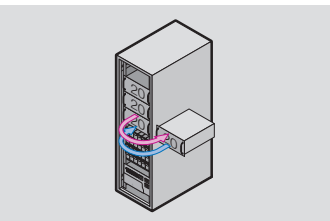
For four modules or more, an additional battery rack will be needed.

The autonomy may also be flexibly modified to suit your requirements.

The Rittal PMC 200 modular system combines flexible adaptation to customer-specific requirements with investment reliability and a high level of availability.



Super-fast service with PMC 200



Extremely short MTTR (Mean Time To Repair)

If servicing is required, a 12 kW or 20 kW module may be

replaced with a 20 kW module, and a 32 kW or 40 kW module with a 40 kW module. This simplifies the logistics and ensures fast, flexible, cost-effective servicing.



PowerDecider

To obtain maximum benefits from the scalability of the modular Rittal PMC 200 UPS system and to avoid incorrect sizing and thus unnecessary additional costs, Rittal offers a professional power determination service.

PowerDecider

Service includes:

- Measurement of the power supply (voltage, current, frequency, apparent power, effective power and reactive power, asymmetries and harmonics, etc.)
- Logging of voltage drops and rises, transients, interruptions and fast voltage changes

	Model No. DK
PowerDecider	on request
PowerDecider Plus	on request

- Determination of your exact kVA and kW requirements
- Execution within ten days after receiving the order
- Data acquisition period: 2 hours
- Report with results/evaluations: Within 5 working days

PowerDecider Plus

Service includes:

- As PowerDecider and additionally
- Execution within 5 days after receiving the order
- Data acquisition period: At least 3 days
- Report with results/evaluations: Within 3 working days



Sub-distributor 482.6 mm (19") UPS, modular

The distributor may be fitted directly in the UPS PMC 200 rack. This allows a compact complete system to be realised with a 0.6 m² footprint that contains a rack-mounted modular UPS PMC 200, batteries and distributor.

Application area:

UPS systems Rittal Power Modular Concept PMC 200 up to 20 kW N+1.

Technical specifications:

- 482.6 mm (19"), 6 U
- 12 outlets, three-phase 400 V/50 Hz with 10 A
- On-load isolator for disconnecting
- Circuit-breaker 10 A per phase

Design	Model No. DK
19", 6 U	7857.372

Supply includes:

482.6 mm (19") modules, 6 U, instructions.

Note:

Observe the country-specific connection data.



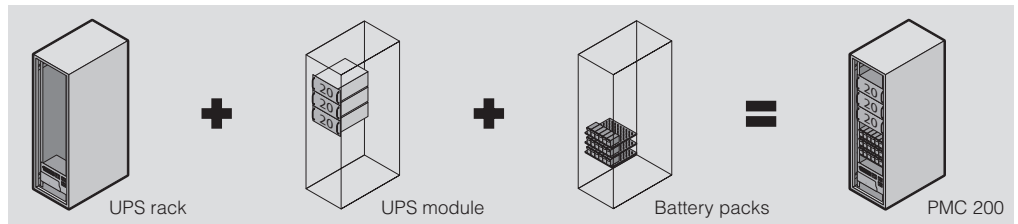
Also required:

Plug & play connection cable to the server racks:

Length	Packs of	Model No. DK
3 m	1	7857.130
5 m	1	7857.150
8 m	1	7857.180
9 m	1	7857.190

Power

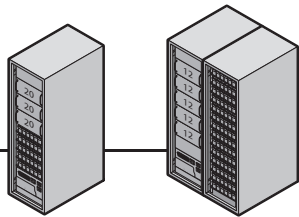
UPS, Rittal Modular Power Concept – PMC 200



Minimum floor space is required by a rack with three modules (2 + 1 redundancy) and batteries with autonomy integrated into a single rack.

The Rittal PMC 200 allows the integration of up to 5 modules (4 + 1 redundancy) in one rack. For this configuration, an additional battery rack is always

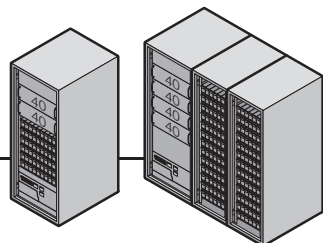
required. The autonomy may be flexibly adapted to suit your requirements.



UPS racks: W 600 x H 2000 x D 1000 mm
Battery racks: W 600 x H 2000 x D 1000 mm

Examples of 12 and 20 kW module configurations and autonomies

	without		with		without		with		without		with	
Redundancy	1/-	-	1/-	1/-	1/-	1/-	1/1	1/1	1/1	1/1	1/1	1/1
UPS rack/battery rack	1	-	2	2	3	3	4	4	5	5	5	5
Number of UPS modules												
PMC 12 module type, power in kW	12	-	24	12	36	24	48	36	60	48	60	48
Battery autonomy ¹⁾	60	-	14	14	14	14	24	24	24	24	24	24
PMC 20 module type, power in kW	20	-	40	20	60	40	80	60	100	80	100	80
Battery autonomy ¹⁾	33	-	7	7	7	7	12	12	12	12	12	12



UPS racks: W 800 x H 2000 x D 1000 mm
Battery racks: W 600 x H 2000 x D 1000 mm

Examples of 32 and 40 kW module configurations and autonomies

	without		with		without		with		without		with	
Redundancy	1/-	-	1/-	1/-	1/-	1/-	1/2	1/2	1/2	1/2	1/2	1/2
UPS rack/battery rack	1	-	2	2	3	3	4	4	5	5	5	5
Number of UPS modules												
PMC 32 module type, power in kW	32	-	64	32	96	64	128	96	160	128	160	128
Battery autonomy ¹⁾	18	-	9	9	9	9	12	12	12	12	12	12
PMC 40 module type, power in kW	40	-	-	-	-	-	160	120	200	160	200	160
Battery autonomy ¹⁾	15	-	-	-	-	-	9	9	9	9	9	9

¹⁾ Minutes/modules with cos φ 1.0/Autonomy may be extended to order. Delivery times available on request.

Note:
This table contains only sample configurations.
We would be happy to work with you to project plan your individual solution.

Technical specifications

1. Rectifier data								
Module range		up to 100 kW				up to 200 kW		
Module types		10	15	20	25	30	40	50
Output per module	kVA	10	15	20	25	30	40	45
Output per module	kW	8	12	16	20	24	32	40
Nominal input voltage	V	3 x 380/220 V+N, 3 x 400/230 V+N, 3 x 415/240 V+N						
Input voltage tolerance	V	3 x 306/177 V to 3 x 464/264 V for < 100 % load 3 x 280/161 V to 3 x 464/264 V for < 80 % load 3 x 160/138 V to 3 x 464/264 V for < 60 % load						
Input frequency	Hz	35 – 70						
Power factor input		PF = 0.99 @ 100 % load						
Starting current	A	Limited by soft start/max. I _N						
Distortion factor, THDI		Sine-wave THDI = < 3 % @ 100 % load						
Input with charged battery and rated voltage	kW	8.4	12.6	17.4	21	26	34	42
Input with battery charging and rated output	kW	9.3	13.8	19.2	22.9	28.2	38	45.8

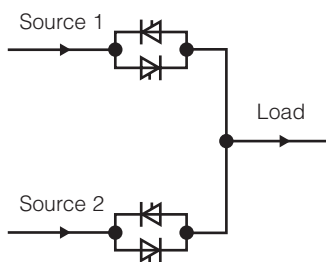
2. Battery data								
Module range		up to 100 kW				up to 200 kW		
Module types		10	15	20	25	30	40	50
No. of 12 V batteries	No.	30 – 50			40 – 50	40 – 50	30 – 50	40 – 50
Maximum charging current	A	6 A standard				10 A standard		
Battery charging curve		Ripple free; IU (DIN 41 773)						
Temperature-controlled battery charging		Standard (temp. sensor optional)						
Battery test		Automatic and periodic (adjustable)						
Battery type		Maintenance-free lead and NiCd						

3. Output data								
Module range		up to 100 kW				up to 200 kW		
Module types		10	15	20	25	30	40	50
Output per module	kVA	10	15	20	25	30	40	45
Output per module	kW	8	12	16	20	24	32	40
Output current I _N at cosphi 1.0 (400 V)	A	11.6	17.4	23.2	29	35	46.5	58
Output voltage	V	3 x 380/220 V or 3 x 400/230 V or 3 x 415/240 V						
Output voltage stability		Static: < ± 1 % Dynamic (step load 0 % – 100 % or 100 % – 0 %): < ± 4 %						
Output voltage distortion		With linear load: < ± 2 % With non-linear load (EN 62 040-3; 2001): < ± 4 %						
Output frequency		50 Hz or 60 Hz						
Output frequency tolerance		Synchronous to input, network-led: < ± 2 % or: < ± 4 % Asynchronous quartz oscillator: ± 0.1 %						
Bypass mode		Nominal input voltage at 3 x 400 V or 190 V – 264 V p-h-N: ± 15 %						
Admissible load unbalance (all 3 phases are controlled independently)	%	100						
Phase angle tolerance (with 100 % unbalanced load)	Deg.	± 0						
Overload capacity in inverter mode		125 % load: 10 min 150 % load: 60 sec						
Short-circuit capacity	A	Inverter: 2 x I _N during 250 ms Bypass: 10 x I _N during 10 ms						
Crest factor		3 : 1						
Efficiency AC – AC at 100 %/75 %/50 %/25 % load (cosphi 1.0)	%	96/95/95/95						
Eco-mode efficiency at 100 % load	%	98						

4. Standards	
Safety	EN 62 040-1-1: 2003, EN 60 950-1: 2006
EMC	2006, EN 61 000-3-2: 2000, EN 61 000-3-3: 2006, EN 61 000-6-2: 2006, EN 61 000-6-4: 2002
Classification code VFI SS 111	EN 62 040-3: 2002
Product conformity	CE
Protection rating	IP 20

Technical specifications

5. General technical specifications								
Module range		up to 100 kW				up to 200 kW		
Module types		10	15	20	25	30	40	50
Noise level at 100 %/50 % load	dB (A)	55/49	57/49	57/49	57/49	59/51	63/53	63/53
Ambient temperature UPS	°C	0 – 40						
Ambient temperature for batteries (recommended)	°C	20 – 25						
Storage temperature	°C	–25 to +70						
Battery storage time at ambient temperature		Max. 6 months						
Max. height (above sea level)		1000 m (3300 ft) without de-rating (max. 3000 m (10000 ft))						
Relative humidity		Max. 95 % (non-condensing)						
Accessibility		Total accessibility from the front for servicing and maintenance (side, no access required from the roof or rear)						
Siting		Min. 20 cm spacing from the wall (required for cooling)						
Input and output wiring.		From the front, below						
Efficiency AC – AC at 100 %/75 %/50 %/25 % load (cosphi 1.0)	%	96/95/95/95						
Eco-mode efficiency at 100 %	%	98						



Static Transfer Switch (STS)

The use of a static transfer switch allows “single-corded devices” (devices that have only one power pack) to be operated with a redundant power supply. STS has two infeeds that are switched automatically. The switching time is < 5 ms. This ensures that sensitive devices can be operated without interference. The “Break before Make” transfer ensures that the load is not fed concurrently from two sources.

Operation:

The operating panel mounted on the housing front shows all central functions and messages of the Static Transfer Switch. All messages may also be evaluated with floating contacts. The STS may optionally be supplemented with a quick-change frame equipped with an external bypass. This function allows the load to be switched manually onto the mains for servicing purposes.

Design	Model No. DK
STS 16 A without serial interface	7857.070
STS 16 A with serial interface	7857.080
STS 16 A with serial interface and quick-change frame	7857.090
STS 20 A with serial interface and quick-change frame	7857.100

Delivery times available on request.

Connectivity:

The optional SNMP card makes it possible for the Static Transfer Switch STS to be integrated into a network management system. The web server integrated in the SNMP card provides password-protected access to the STS using a web browser.

Available on request:

STS with superior switching load, quick-change frame with external bypass.

Note:

Up-to-date information such as operating instructions, software update and product information may be found at www.rimatrix5.com

Technical specifications:

Nominal current strength	16 A and 20 A
Voltage	1-phase 120/220/230/240 V
Tolerance of input voltage	Adjustable (±15 % as standard)
Frequency	50 or 60 Hz
Short-circuit resistance	up to 20/15 I _N according to the nominal current strength
Admissible Crest factor	up to 4
Changeover	Phase/zero conductor
Transfer mode	Synchronous/asynchronous without overlapping the current sources
Switch-over time	< 5 ms



Monitoring of UPS and Static Transfer Switch (STS)

This monitoring and management software can be used to manage all active components and power from RimatriX5. One interface for all single and 3-phase UPSs and for the Static Transfer Switch is typical of an integrated operating concept. If an emergency generating unit is being used, it too may be monitored with the SNMP adaptor.

SNMP functionality

May easily be integrated into an existing SNMP monitoring system.

An additional MIB, in addition to the standard MIB RFC1628, handles the display of all parameters. An optional "snap-in" for HP Open View is additionally available.

E-mail functionality

The integrated mail client can be used to send status e-mails to the administrator. The configured event/alarm management provides a tool that allows the filtering of messages.

Web functionality

The integrated web interface shows all relevant information for the UPS or STS at a glance. Password protection prevents unauthorised access to the SNMP card. The integrated NTP client handles the synchronous operation of all plants.

The optional PPP interface allows you to access the SNMP card from outside the intranet or supports access to the SNMP card if the network infrastructure is not available.

In addition to the web interface, the UPS MON program can also be used to monitor the UPS.

UPS MON is available for the following operating systems:

Windows, Unix, Novell Netware, OS/2, MacOSX. The servers connected to the UPS may be shut down with the aid of a service controlled by the UPS. All standard operating systems are supported. An optional software solutions supports targeted shutdown of the servers to give greater autonomy to key services.

Supported protocols of the Ethernet interface:

- HTTP/Java/UPS MON interface
- WAP
- Remote Program Start
- SNMP
- SMTP/SMS
- Mod Bus over IP
- Telnet/FTP
- Log file
- Snap-in for HP Open View

