User Manual - English

FUJITSU

PRIMECENTER M1 19-inch Rack

Rack System for PRIMERGY, PRIMEQUEST, BS2000, STORAGE

February 2012

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Feel free to send us your comments by e-mail to email: manuals@ts.fujitsu.com.

Certified documentation according to DIN EN ISO 9001:2008

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2008.

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This manual contains important information for safely and correctly using this product.

Carefully read the manual before using this product. Pay particular attention to the accompanying manual "Safety notes and other important information" and ensure these safety notes are understood before using the product.

Keep this manual and the manual "Safety notes and other important information" in a safe place for easy reference while using this product.

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1 Preface

The data centers of today and tomorrow have to meet the continuously increasing requirements and demands of operators. Fujitsu has been offering well thought-out and permanently evolved rack systems for decades now. This in-depth experience with the development and operation of data centers and the associated close contact with operators is also reflected in the latest PRIMECENTER M1 19-inch rack family.

In addition to the proven racks with asymmetrical base frames for the unique, optimized Fujitsu cable management, the rack family has been supplemented by symmetrical racks in widths of 600 und 700 mm. By removing the side mounting locations the additional symmetrical version with a width of 600 mm requires less space within the data center. This makes it ideally suited for data centers, where minimal space requirements for the rack are an issue.

Figure 1: Different variants of the PRIMECENTER M1 19-inch rack

Constant changes in infrastructure requirements as well as increasing cost pressures on companies call for flexible and expandable solutions. The new PRIMECENTER M1 rack family of Fujitsu Technology Solutions offers precisely

the flexibility you need to cover your current requirements. Consequently, PRIMECENTER M1 racks can also be integrated in future concepts and thus offer long-term investment protection.

The rack technology combines an entire IT infrastructure with rack servers, storage systems, power supply components as well as controls, such as consoles and switches, within the smallest data center footprint. The PRIMECENTER M1 racks can be expanded horizontally and blend into existing IT scenarios. They are based on the industry standards EIA-310-D, DIN41494 and IEC60297. The new PRIMECENTER M1 racks are available as asymmetrical and symmetrical versions.

As a special feature the symmetrical version also has up to 4 vertical slots of 1 height unit for the installation of additional devices, e.g. switches. Asymmetrical PRIMECENTER M1 racks are equipped with up to 6 vertical slots to the left of the 19-inch area. Proven Fujitsu cable management with its arrangement on the side enables optimal ventilation with high heat throughput even in fully equipped and cabled racks with a low rack depth of 1050 mm. The design ensures serviceability and ease of maintenance through a one-piece front door and split rear doors.

The PRIMECENTER M1 rack systems with their lockable doors offer access protection for servers, backup media and optical drives. They also offer protection against electromagnetic influences, up to protection of cabling.

PRIMECENTER M1 racks with 16 and 24 height units are ideally suited to provide secure and space-saving IT solutions not only, but particularly for office environments. Fujitsu Technology Solutions has therefore had optimal rack systems in its product portfolio for decades now, and in addition to servers has also had the associated storage subsystems, uninterruptible power supplies and other accessories such as rack management components, console switches and systems for mounting tape drives.

PRIMECENTER M1 Racks ensure optimal and reliable installation of 19" rack components and high passive throughput in ventilation thanks to optimized cable routing and a new door design.

1.1 Features

The new PRIMECENTER M1 rack family offers in an attractive new design a large selection of rack heights and widths for the various requirements in data centers or IT rooms.

The optimized cable management patented by Fujitsu Technology Solutions is a major highlight in the asymmetrical PRIMECENTER M1 rack system. The asymmetrical rack structure with a section for side cable routing reduces the impairment to the air flow behind the rack devices. Guiding of the cables via swivel arms on the systems and within the cable conduit permits perfect routing of the cables, prevents their being stressed below the minimum bending radius, secures cables against dropping or twisting, and thus permits clean and clear cabling in the entire rack. This means of cabling, particularly in fully equipped racks, increases system availability and reduces maintenance and upgrade times. The offer is supplemented by new symmetrical racks in widths of 600 mm and 700 mm. The symmetrical 700 mm racks also offer as a special feature up to 4 slots on the front for the installation of switches or the switch cabling in the rack.

New rack doors in an attractive design with honeycomb-shaped perforations also offer (approx. 80% holes) optimal prerequisites for the cooling of high-performance systems.

Design:	24U and 42U 700 mm x 1050 mm asymmetrical
	24U and 42U 700 mm x 1050 mm symmetrical
	16U, 24U and 42U 600 mm x 1050 mm symmetrical
Rack height:	Max. rack height approx. 2000 mm (without pallet)
Capacity:	16 to 42 height units plus up to 6 vertical height units (depth of up to 300 mm incl. cable space)
	Additional load of 20 kg per horizontal height unit, 3.5 kg per vertical height unit, maximum weight up to 1000 kg.
Design doors:	One-piece front door and two-piece rear door with high percentage of holes (approx. 80%) for improved server cooling. Ergonomic door handles.
Security:	Lockable doors and side panels with a standard key, up to 200 different locking cylinders, electronic access protection optional.
	Optional, telescopic anti-tilt protection. Earthquake security on request.
Cable management:	Optimized cable routing solutions for all symmetrical and asymmetrical rack types. Asymmetrical racks prepared for the patented lateral cable management. Cabling openings in the roof of the rack, in the floor group and in the rear door.

	Asymmetrical racks prepared for the patented lateral cable management.
	Cabling openings in the roof of the rack, in the floor group and in the rear door.
Service:	Doors can be optionally mounted to the left or right, and can be unhinged easily by a single person.
	Split rear doors to reduce the required service space.
	Increased space for cabling at the front (80-100 mm) and rear (180 mm).
	19" rack profiles with 740 mm depth distance.
	Numbering of the height units can be seen from the front and rear.
	Complete extraction thanks to telescopic rails available for servers with hot-replace components.
Shipment:	Optional ex works, fully mounted and tested including cabling.
	Shipment including 4 heavy-duty castors and 4 adjusting feet on a shock-absorbing pallet.
Other features:	Extension: can be placed horizontally in a row (provided identical variants are used).
	Operation in normally air-conditioned rooms up to 35°C. Optional anti-tilt protection solution; can be mounted under the rack, telescopic.
	Large portfolio of rack infrastructure components that can be configured using the rack configuration tool SystemArchitect® with a cabling assistant for automatic console and power cabling as well as power value calculation (Power-Calculator).
	PRIMECENTER M1 Racks meet national and international standards: – EIA-310-D – DIN 41494 – IEC 60297

1.2 Target Group

This manual is intended for those responsible for installing and maintaining the PRIMECENTER M1 19-inch rack (service personnel, technicians and technical specialists).

The manual is organized in a way that you can commission the rack without prior special knowledge. Knowledge of the hardware to be integrated is helpful for understanding the various connection options. The 3-phase power connection is an exception and must only be installed by an authorized electrician approved by the local utility company.

The manual does not include technical descriptions of services that only the service department of Fujitsu Technology Solutions GmbH or appropriately trained specialist staff are allowed to carry out.

1.3 Where to find which information

On the customer documentation CD, which is part of the rack delivery, you will find the "PRIMECENTER M1 19-inch Rack User Manual" in pdf format.In addition, the delivery package comprises a printed version of the Safety Notes. All information can also be found at the web:
http://manuals.ts.fujitsu.com/index.php?id=5406-5605-5606

Document	Description	Format
User manual	This manual provides information on features and technical data of the rack. The manual explains how to install, set up, and operate the rack.	

Table 1: Overview of the PRIMECENTER M1 19-inch Rack documentation

Document	Description	Format
Quick Start Guides	In these guides you will find precautions and information about unpacking, checking and installing the rack and its components.	
Safety Notes and regulations	The safety instructions listed in this leaflet will help you to avoid making serious errors that could impair your health or damage the devices.	

Table 1: Overview of the PRIMECENTER M1 19-inch Rack documentation

1.4 Structure of the manual

This manual describes how to set up the PRIMECENTER M1 19-inch rack, how to install accessories and how to route the cables.

The installation of the current components, such as servers and storage expansion units, for example, is described in the respective manuals for these devices.

You will find additional information:

– in the “Safety Notes and Regulations” manual

– in the documentation for the individual components installed in the rack

1.5 Notational Conventions

bold type	Used for emphasis in the body of the text
“quotation marks”	Used for references to other chapters, sections or manuals
►	Identifies an action that you need to take
	Alerts you to important information, notes and tips
 **CAUTION!**	Warning sign indicating that your health, the correct functioning of your system or the security of your data may be at risk if you ignore the information given at this point

2 Important Information

2.1 Safety Instructions

The following safety instructions are also provided in the manual "Safety Notes and Regulations".

CAUTION!

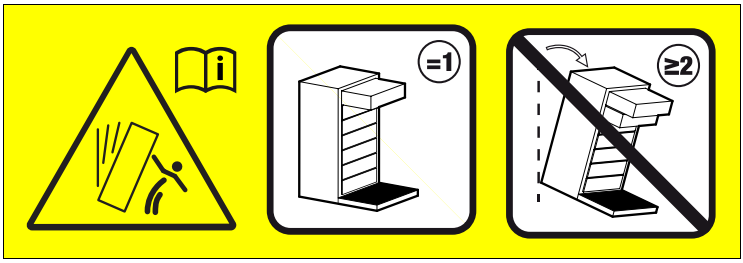
Observe the safety instructions in the documentation for the individual components mounted in the rack and the following notes on safety.

- The activities described in this manual may only be performed by technical specialists. Ignoring the instructions in this manual can result in personal injury or damage to equipment (risk of tipping over, etc.).
- When the unit is transported, it is only allowed to have a lean angle of max. 10°.
- The unit must remain in the original package till its installation location.
- Make sure the floor at the final place of installation has sufficient load-bearing capacity.
- Always ensure that the anti-tilt plate is mounted when you set up the PRIMECENTER M1 19-inch rack **and** teleskopic rails are used (risk of tipping over).
- When connecting or disconnecting cables, refer to the relevant notes in the section "Connecting and disconnecting cables" on page 56.
- Route the cables in such a way that they do not form a potential hazard (make sure no one can trip over them) and that they cannot be damaged.
- When mounting a server, pull the telescopic rails out all the way until they click into position.
- Notice that a 42HU rack must weight at least 114 kg and a 24 HU rack must weight at least 75 kg to fulfill the safety regulations. There is no minimum weight for a 16HU rack.

CAUTION!

- The maximum transport weight may not exceed a specific maximum (see table "Summary of all rack types" on page 26).
- For safety reasons, **no more than one unit must be pulled out of the rack** at a time, otherwise the rack may tip over.

  This is illustrated by the following pictograms:



- Before mounting a server in the PRIMECENTER M1 19-inch rack, remove all heavy and easily removable server components such as hot-plug disks and power supply modules since this makes the server lighter and easier to mount. Follow the instructions in the user manual of the server.
- If necessary, have other people help you mount the individual components in the rack because of the weight involved.
- Before pushing extended telescopic rails back into the rack, pull the ball cage of the telescopic rail forward as far as it will go.
- Install only system expansions that satisfy the requirements and rules governing safety. If you install other expansions, you may damage the system or violate these safety regulations. Information can be obtained from customer service or your local sales office.
- If you cause a defect on the device by installing or exchanging system expansions due to wrong handling, the warranty is invalidated.
- The configurations available in the PRIMECENTER M1 19-inch rack can carry a leakage current >3.5 mA. Therefore, a ground connection must be established before connecting to the mains (see chapter "Power Distribution" on page 67).

CAUTION!

The AC main power connection for the PRIMECENTER M1 19-inch rack must be installed by an authorized electrician approved by the local utility company.

2.2 Notes on mounting the rack components

Before you start mounting components in the rack, please identify the positions of the individual components in the PRIMECENTER M1 19-inch rack according to the configuration generated using the "SystemArchitect" (see page 35). You should then mark the positions using the relevant assembly aid, if one was supplied with the rack component.

Marking and numbering the height units simplifies the assembly when installing and adding on components.

The maximum mounting height for the PRIMECENTER M1 19-inch rack is 16/24/42 height units (HU). One height unit corresponds to 44.45 mm (see page 44).

Observe the following rules when mounting the components:

- Mount the components in the rack from bottom to top.
- Mount heavy parts at the bottom, e.g. the uninterruptible power supply.
- Mount the keyboard or rack console at a height that makes it easy to operate (HU 17 - 21).
- Position the dummy covers so that later planned extensions can be installed without having to rearrange components.
- To accommodate the ventilation concept and ensure proper ventilation of all the components in the rack, any unused areas must be closed using dummy covers.
- Mount the unit in accordance with the technical manual and assembly aid supplied.

2.3 Environmental Protection

Environmentally Friendly Product Design and Development

This product has been designed in accordance with the Fujitsu standard for "environmentally friendly product design and development". This means that key factors such as durability, selection and labeling of materials, emissions, packaging, ease of dismantling and recycling have been taken into account. This saves resources and thus reduces the harm done to the environment. Further information can be found at:

– *http://ts.fujitsu.com/products/standard_servers/index.html* (for the CEMEA market)

– *http://jp.fujitsu.com/platform/server/primergy/concept/* (for the Japanese market)

Energy-saving information

Devices that do not need to be constantly switched on should be switched off until they are needed as well as during long breaks and after completion of work.

Notes on Saving Energy

Devices that do not have to be on permanently should not be switched on until they are needed and should be switched off during long breaks and when work is finished.

Notes on Packaging

We recommend that you do not throw away the original packaging in case you need it later for transportation. If possible, devices should be transported in their original packaging.

Notes on Labeling Plastic Housing Parts

Please avoid attaching your own labels to plastic housing parts wherever possible, since this makes it difficult to recycle them.

Take-back, Recycling and Disposal

For details on take-back and reuse of devices and consumables within Europe, contact your Fujitsu Technology Solutions branch office/subsidiary or our recycling center in Paderborn:

Fujitsu Technology Solutions GmbH
Recycling Center
D-33106 Paderborn

Tel. ++49 5251 525 - 1410

Fax ++49 5251 525 - 321410

3 Overview

The PRIMECENTER M1 19-inch Rack is a universal rack system for the creation of integrated data center infrastructure solutions from server, storage, network, management and UPS components.

In addition to Fujitsu servers, storage subsystems, UPSs, modems, etc. are also available for installation. Additional options especially developed for rack installation include a console drawer (1U) with foldaway TFT monitor, touchpad and keyboard as well as diverse analog and digital console switches and various rack accessories. Competitors' products or products from third-party vendors, such as electric door locks, rack management and power supply components can also be installed.

Thanks to new cable conduits and an expanded cable management concept all cables are routed in an orderly and service-friendly manner. This in conjunction with the telescopic rails means that all servers can be removed from the rack during operation. This permits maintenance and repair to be carried out as part of the high-availability functions of the servers (e.g. hot-plug hard disks, hot-plug fans).

The rack anti-tilt protection required in case of maintenance must be mounted under the rack and pulled out in case of service. Several rack servers can be operated simultaneously via an electronic switch (console switch) using just one monitor and one keyboard. Improved access control based on lockable doors or optional electronic security ensures complete protection of the installed modules against tampering.

Expansion concept

The PRIMECENTER M1 racks are available in the gradations 16, 24 and 42 height units with a rack depth of 1050 mm and can be placed horizontally in a row. The side panels remain on the rack to permit uniform ventilation, and internal cabling of the cabinets with each other is ensured. The side panels are lockable and remain accessible even when the racks are fully equipped.

PRIMERGY/ SPARC Enterprise rack server slide-in modules

Many of the proven Fujitsu PRIMERGY and SPARC Enterprise servers are available as rack versions. These rack servers combine high computing power with minimal space requirements, since larger memory capacities can be addressed by using additional storage devices.

Rack system with horizontal ventilation

The PRIMECENTER M1 rack is ventilated from the front to the rear. A fully configured rack in normal air-conditioned rooms can be operated at temperatures up to 35°C. The volume of air required to cool the rack modules is supplied via the integral horizontal ventilation system. The rack conforms to protection class IP20 (i.e. protection against solid foreign bodies/without any special protection against water; IP = International Protection). Honeycomb-shaped holes in the doors (up to 80% holes) enable uniform, passive ventilation.

Hard disk expansion / Extension for tape drives

Fujitsu offers a large portfolio of storage subsystems to expand the hard disk capacity as well as for data backup.

Automatic console switching

The administration of several servers can be performed as an option via the rack console by means of console switches. Console switches are offered with 4, 8, 16 and 32 channels. Switching over is carried out by means of hotkeys or the OSD (on screen display) function. Digital KVM (Keyboard-/Video-/Mouse-) switches can be used to integrate rack systems in a LAN and administered worldwide.

UPS systems

The availability of the systems can be increased through the use of optional UPS (interruptible power supply) modules. These provide the systems with adequate protection against power outages and fluctuations in the line voltage. Depending on configuration within the rack, a number of systems can be protected by a single UPS. APC modules rated at 1,500 VA, 3,000 VA and 5,000 VA, and online UPS rated 3 / 5 KVA and 8 / 10 / 20 KVA are currently available. All UPS modules are equipped with an SNMP interface (signal line). All the parameters and statuses of the installed UPSs can thus be set and monitored with the server management. A power failure can be automatically reported to every connected server by means of traps.

Ease of serviceability and maintenance

The rack servers and expansion modules, which are mounted on telescopic or sliding rails, can be installed in a rack without the need for any tools. If telescopic rails are used, systems can be withdrawn toward the front. This facilitates maintenance and upgrade operations by allowing technicians access to all the

installed components upon removal of the upper/side covers. Optimized cable management solutions for the various rack types also play their part in this by allowing reliable and orderly routing of cables. Hot-plug hard disks and hot-plug power supply modules can be exchanged online even more easily. The rack doors can be easily unhinged and replaced again by a single person without any tools. An HU scale, which is visible both from the front and the rear and on which the heights units are numbered and marked, facilitates the installation and retrofitting of components.

Fujitsu Technology Solutions configuration tool "SystemArchitect"

The SystemArchitect, a configuration tool with a graphical user interface, can be used to obtain an early overview of the desired configuration at the planning stage. The tool runs a simultaneous consistency check to ensure the completeness and functionality of the desired system.

Once the required configuration has been created, the SystemArchitect also provides further information concerning the appropriate installation requirements (power connection, heat dissipation, weight and the requisite footprint as well as the maximum floor loading at the installation site). A conflict is created when the weight of a configuration exceeds 1,000 kg and a warning is given (as of SystemArchitect V 6.6) when the weight exceeds 250 kg.

Enterprise ServerView Suite

The Fujitsu Technology Solutions administration tool "Enterprise ServerView Suite" is also used to display the position of the server or disk node in the rack. This provides a greatly improved overview for administration and diagnostic tasks.

Transport

Racks with installed servers may not be tilted. All racks are supplied on shock-absorbing pallets and can be rolled short distances to the installation site in the data center on heavy-duty castors (note the condition and load-bearing capacity of the floor). Please check requirements regarding transport to end users for 42U racks and delivery weight (rack and installed servers) in excess of 250 kg.

Security

The rack is suitable for installation and operation of rack management systems. If rack devices with telescopic rails are used, it is necessary for security reasons to ensure that racks are protected against tilting by means of suitable anti-tilt protection. Optional available for Fujitsu Racks is an anti-tilt protection that can be pulled out in case of service.

Standards

Each rack has power connections complying with European and international standards. There are at least two multiple socket outlet distributions and two power connections for configuration.

Due to the high leakage current of a fully fitted rack, CEE (IEC60309) connectors are used. Connection kits for single-phase and three-phase supply are available, as is a three-phase non-detachable connection. Reliable grounding in the rack is ensured by the use of IEC60309 connectors.

The power supply components are ideal for these applications and the design of the power supply ensures reliable and permanent grounding. IEC 60320 connectors are used inside the rack. If grounding in a power supply cable is interrupted, the leakage current remains limited to < 3,5mA.

Summary of all rack types

Base unit	Type	Dimensions (W/D/H)	Max. pay load / max. dynamic load	Net weight
16 HU	symmetrical	600x1050x847 mm	320 kg / 380 kg	60 kg
24 HU	symmetrical	600x1050x1203 mm	480 kg / 565 kg	85 kg
42 HU	symmetrical	600x1050x2003 mm	840 kg / 960 kg	120 kg
24 HU	symmetrical	700x1050x1203 mm	480 kg / 590 kg	85 kg
42 HU	symmetrical	700x1050x2003 mm	840 kg / 975 kg	120 kg
24 HU	asymmetrical	700x1050x1203 mm	480 kg / 590 kg	85 kg
42 HU	asymmetrical	700x1050x2003 mm	840 kg / 995 kg	120 kg

CAUTION!

The maximum transport weight may not exceed 1000 kg.

4 Preparations

This chapter describes the preparations for installation and all the tasks involved in setting up and operating the PRIMECENTER M1 19-inch rack.

The service areas

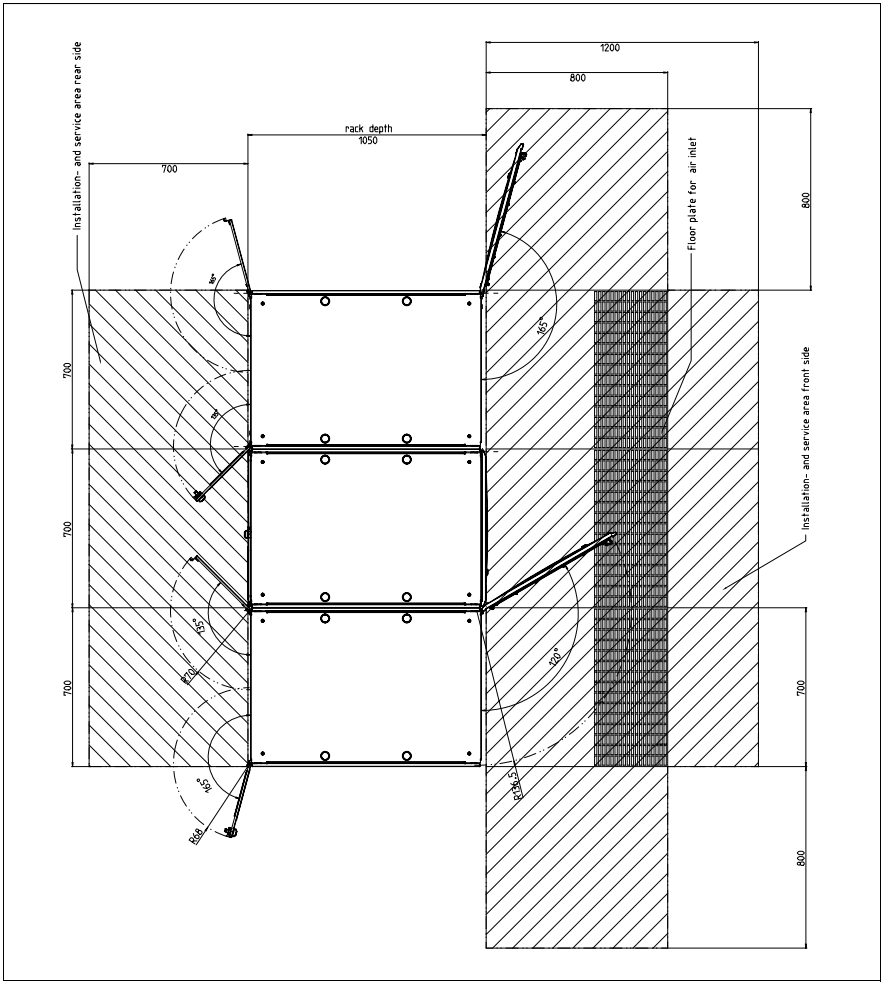


Figure 2: Service areas for 700 mm racks

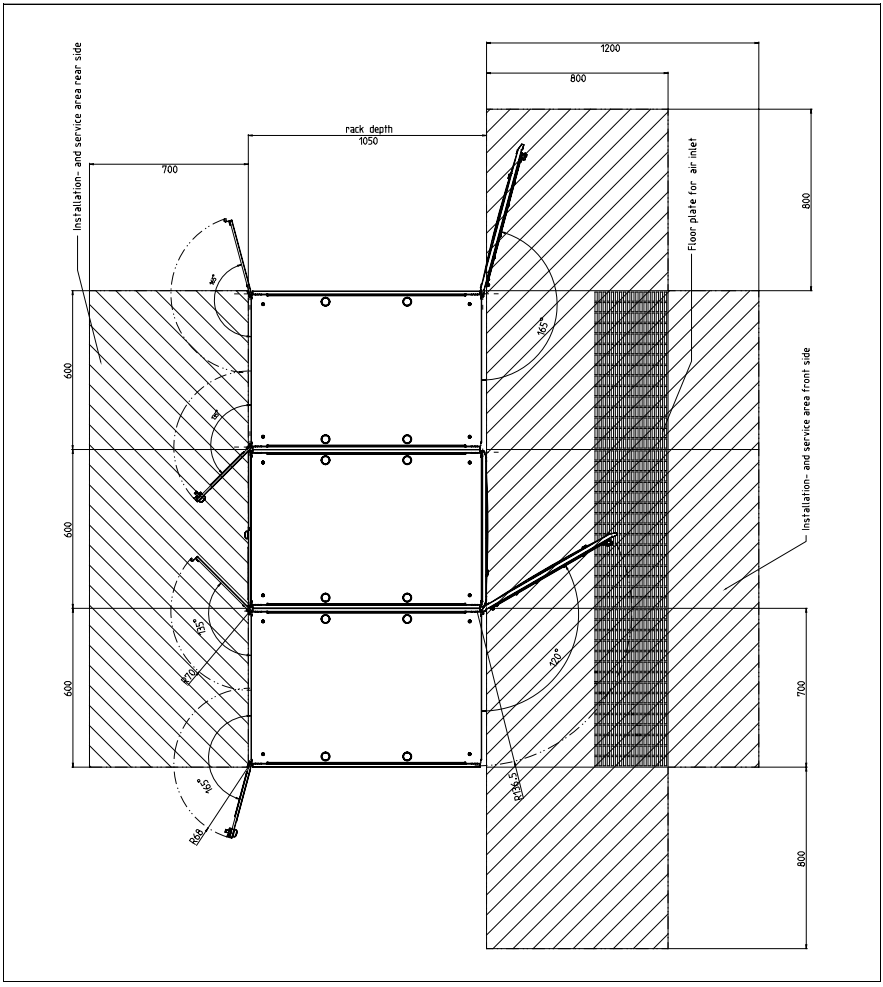


Figure 3: Service areas for 600 mm racks

The figures above show the specific service areas for 700 mm (see figure 2 on page 27) and 600 mm (see figure 3) racks.

4.1 Unpacking the delivery unit

For a description to unpack the PRIMECENTER M1 19-inch rack please refer to the info-sheet delivered with the rack.

4.2 Rolling off the PRIMECENTER M1 19-inch rack from the transport palette

For a description to roll off the rack from the transport palette please refer to the info-sheet delivered with the rack.

4.3 Setting up the PRIMECENTER M1 19-inch rack

Introduction

To ensure that the rack has a firm foothold, it is necessary to align it in all 3 axis exactly horizontal.

Required tools

The following tools are required to perform this task:

– Hexagon key 6 mm

– Spirit level

Performing the task

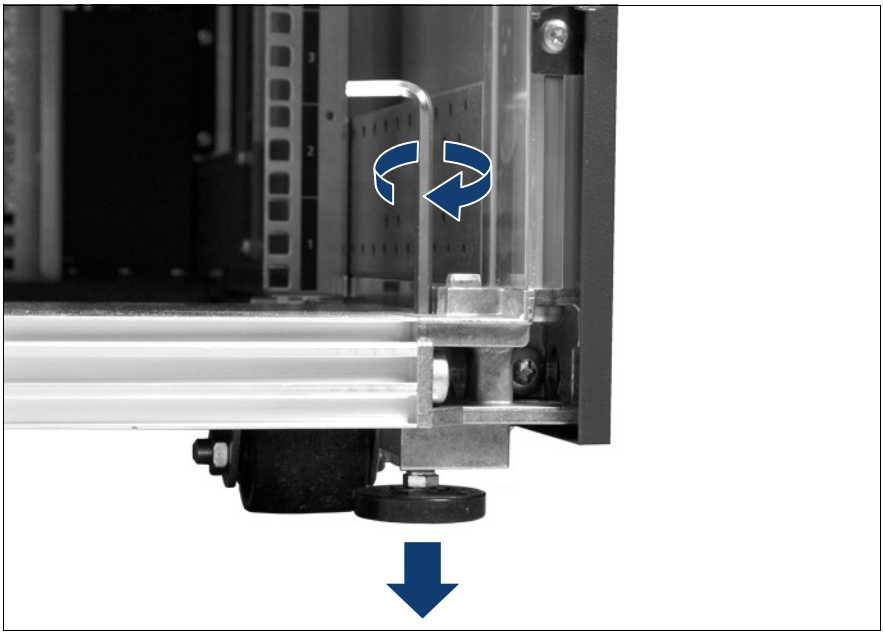


Figure 4: Screwing down the leveling feet

► Screw down the four leveling feet using a 6 mm hexagon key.

The leveling feet are easier to adjust if not carrying the full weight of the rack. If necessary, please ask another person to tilt the rack slightly in order to relieve the leveling foot in question.

Figure 5: Adjusting the PRIMECENTER M1 19-inch rack

► Adjust the rack on all three axes (X,Y,Z) with the leveling feet. Use a spirit level to make sure the rack is exactly level!

The horizontal orientation of the rack is required to ensure the pull-out functions of the components mounted to the rack. The rack is set up properly, as a rule, when the front panels of the mounted components add up to form a continuous vertical line!

4.4 Installing the tilting protection

CAUTION!

- A tilting protection is mandatory as soon as one component is installed that can be pulled out (e. g. for maintenance reasons) via teleskopic rails. The tilting protection prevents the rack from tipping over.
- The tilting protection must make firm contact with the ground at the front.
- Make sure that no cables were cut off when installing and moving the tilting protection.

For a description to install the tilting protection for the PRIMECENTER M1 19-inch rack please refer to the Quick Start Guide delivered with the rack (Web: *.http://manuals.ts.fujitsu.com/index.php?id=5406-5605-5606*).

4.5 Opening the rack door

The door of the rack has to be opened carefully as described below:

Figure 6: Opening the rack door

1. Turn the key clockwise as far as it will go (1).
2. Grasp the green marked grip and swivel it in the direction of the arrow (2).

Closing the rack door proceeds in reverse order.

A description to convert the door can be found in chapter "Appendix" on page 109

4.6 Inserting mounting elements

4.6.1 Inserting Cage Nuts

Introduction

Cage nuts are placed into the support uprights. A special tool helps you to mount it (see figure 7).

Performing the task

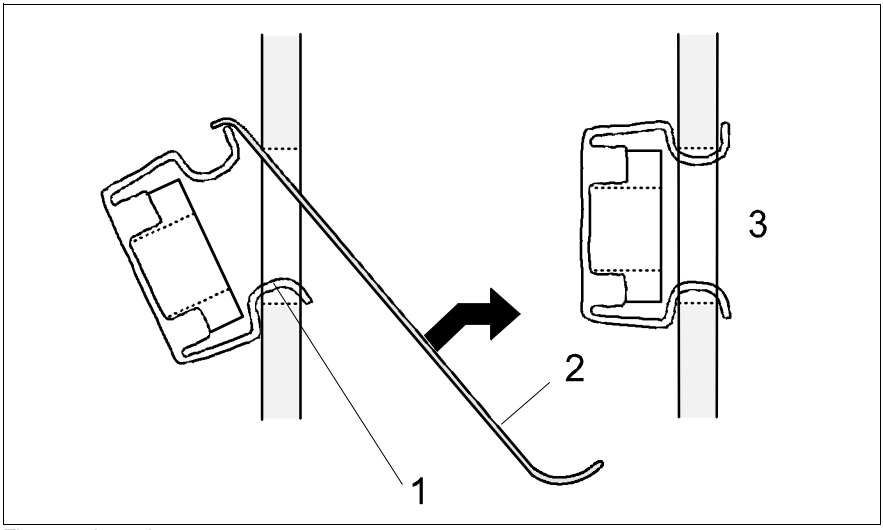


Figure 7: Inserting cage nuts

- ► Insert the cage nut as shown in the figure with the bottom part of the cage in the appropriate mounting hole of the support upright **(1)**.
- ► Use the tool supplied to lever the upper part of the cage nut into the mounting hole as shown **(2)**.

The cage nut should lock into the mounting hole as shown **(3)**.

4.6.2 Inserting Spring Nuts

Introduction

You need spring nuts for mounting socket strips for the power supply of the rack components.

Performing the task

- ► Mark the position of the components to be fitted on the four support uprights.

  i In order to facilitate the positioning, assembly aids are shipped with the rack components.

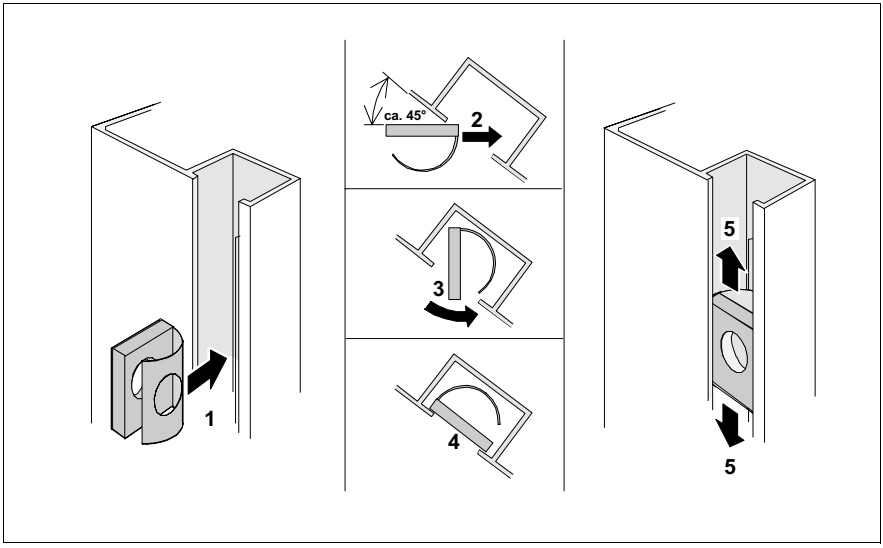


Figure 8: Inserting spring nuts

- ► Insert the spring nut into the appropriate groove on the support upright at the marked location **(1)** - **(4)**.
- ► If necessary, slide the spring nut within the groove until it locks in the correct position **(5)**.

5 Preparing to install rack components

This chapter describes how to prepare the PRIMECENTER M1 19-inch rack to install rack components. Refer to the appropriate delivery documentation (i.e. Quick Start Guide) for information on how to mount the components themselves.

The rack has three areas in which components can be mounted:

– the 19-inch area with 16/24/42 HU, which is accessible from the front and is used for mounting the rack components horizontally.

– only for 700 mm racks:

  the optional expansion area with 1 x 2 HU, 2 x 2 HU and 3 x 2 HU, which is accessible from the front and is used for mounting the rack components vertically.

– the 19-inch area, which is accessible from the rear and is used for mounting the rack components horizontally if not already occupied by other components.

Before you prepare the PRIMECENTER M1 19-inch rack and start mounting components, you should use the SystemArchitect (see next paragraph). Also observe the information in the section "Notes on mounting the rack components" on page 19.

CAUTION!

Make sure the floor at the final place of installation has sufficient load-bearing capacity!

The configuration tool "SystemArchitect"

The SystemArchitect is used as an aid for configuring the PRIMECENTER M1 19-inch rack.

Before you start mounting components in the PRIMECENTER M1 19-inch rack, you should identify the positions for mounting the individual components in the rack according to the configuration generated using the SystemArchitect and, if available, the assembly aid supplied with the component.

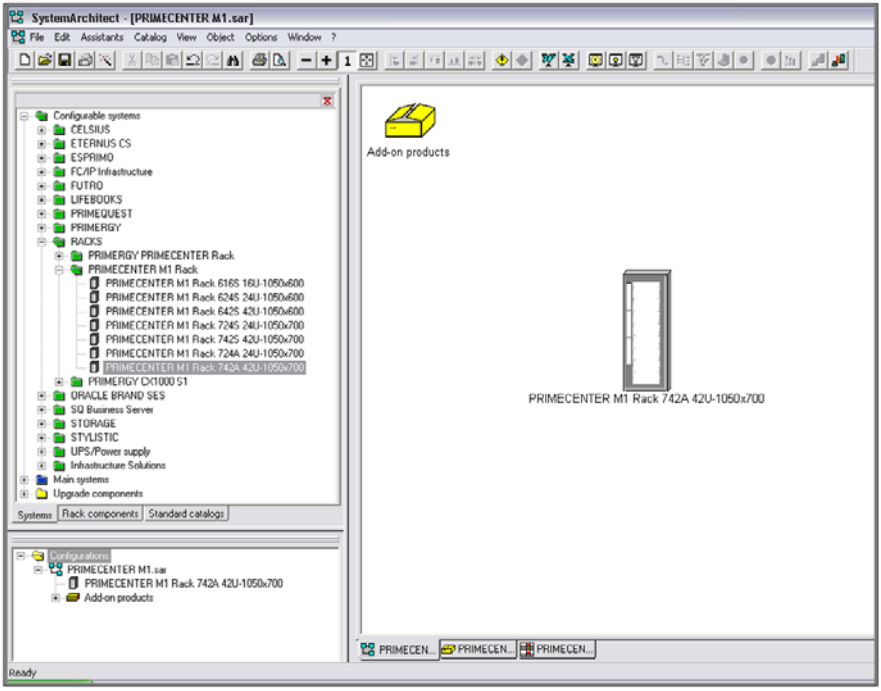


Figure 9: Screen of the SystemArchitect

More information can be found at the following web site:
http://configurator.ts.fujitsu.com/public/public_en.html

The Height Unit (HU)

The unit of measurement used in the PRIMECENTER M1 19-inch rack is the height unit (HU). One height unit comprises a 3-hole section in the front area and mounting area (starts and ends with a narrow metal bar) and corresponds to 44.45 mm or 1 ¾ inches.

The height units are numbered consecutively in ascending order from 1 upwards on each vertical support upright.

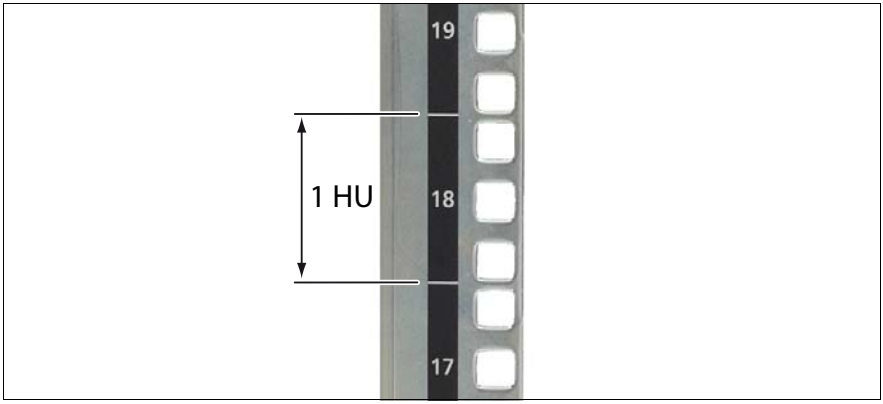


Figure 10: Height unit (HU)

5.1 Support Systems

Support systems are needed in order to be able to integrate system components effortlessly into the rack. The PRIMECENTER M1 19-inch rack supports all support systems with a depth of 740 mm that correspond to industry standards EIA-310-D, DIN41494 and IEC60297 (see the configurator at: *http://configurator.ts.fujitsu.com/public/public_en.html*)

The mounting description of the specific support system is part of the delivery of the specific Rack Mount Kit. Please refer to this description. You can also find this description on the Web: *http://manuals.ts.fujitsu.com/index.php?id=5406-5605-5606*

5.2 Mounting in the front 19-inch area

Introduction

Components are mounted in the front 19-inch area of the PRIMECENTER M1 19-inch rack using either telescopic rails or rails with L-brackets. Light weight components can also be mounted via the front panel (e.g. switches, which can be installed with screws on the front support uprights).

If components are mounted using telescopic rails, all the cables leading to the components are routed to the component's rear side via a cable management for 19-inch DC-PC-racks. If service work needs to be performed, the cables can remain connected when the components are removed from the PRIMECENTER M1 19-inch rack. This makes servicing much easier and also allows device components in hot-plug slots to be replaced during operation.

If components are mounted using rails with L-brackets, all the cables are routed directly to the components and are connected without any special aids, i.e. without using a cable management for 19-inch DC-PC-racks. If service work needs to be performed, all connected cables must be disconnected before the components can be removed from the PRIMECENTER M1 19-inch rack.

5.2.1 Mounting support brackets

Support brackets are required only for asymmetrical PRIMECENTER M1 19-inch racks.

A support bracket is required for mounting components regardless of whether telescopic rails or sliding rails are used.

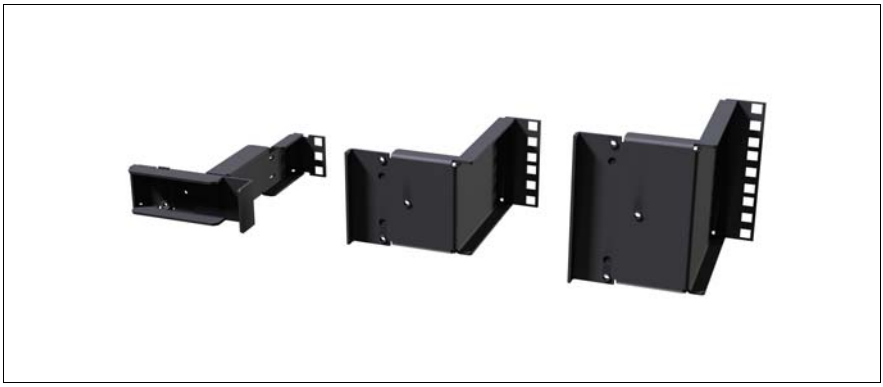


Figure 11: Support brackets for 1 HU (left), 2 HU (middle) and 3 HU (right)

Support brackets with a load capacity of 15 kg (1 HU), of 35 kg (2 HU), of 50 kg (3 HU) and of 200 kg (10 HU) are available. A cable clip can be mounted on each support bracket for vertical cabling.

The support bracket is mounted at the appropriate height on the rear left support upright and is used to fasten the left sliding or telescopic rail at the rear.

Required tools

The following tools are required to perform this task:

– Torx screwdriver

Performing the task

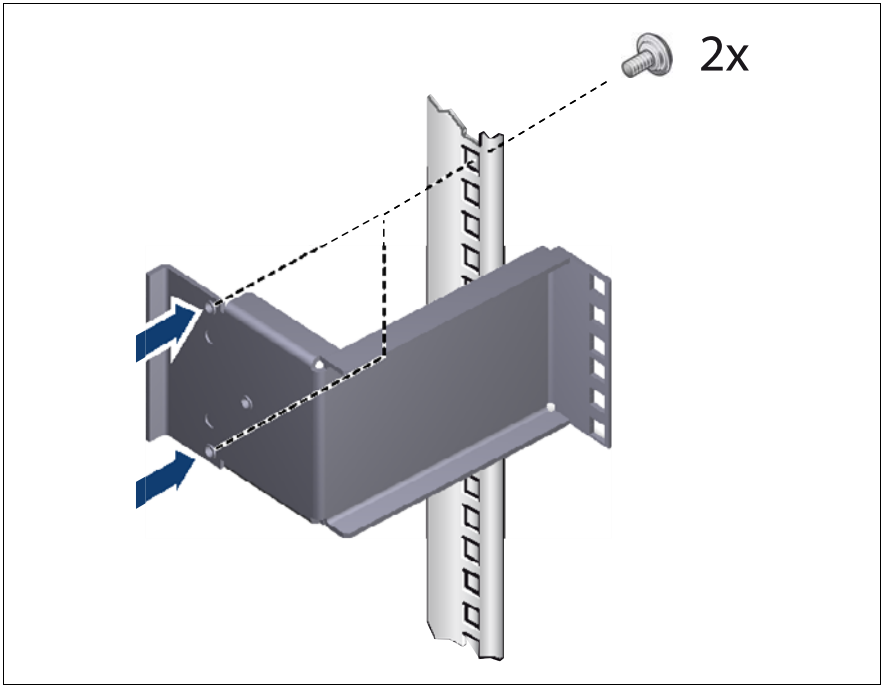


Figure 12: Sample of mounting a 2 HU support bracket

- ► Mount the support bracket as shown and screw it to the rear left support upright at the appropriate height using the delivered screws.
- ► If necessary, you can mount one additional cable clip to each support bracket for vertical cabling.

5.3 Mounting in the rear 19-inch area

You can mount additional rack components in the rear 19-inch area if:

– the front area is not occupied with rack components

– the rack components mounted in the front area leave enough space for additional components to be mounted at the rear (in the rear area)

– the rack components in the rear do not hinder the cooling air stream for the components in the front area.

Be aware that the temperature level in the rear is much higher than at the front.

Figure 13: Example of how to mount a rack component in the 19-inch area at the back

► Mount the rack component using the support uprights (1).

Only for asymmetrical PRIMECENTER M1 19-inch rack**s:**
An appropriate support bracket is required for mounting rack components on the left-hand side. If you cannot use an existing bracket, you will have to mount a new support bracket at the appropriate position.

► Mount a support bracket with the appropriate load capacity **(2)** (see page 39).

► Use the support upright **(1)** for mounting rack components on the right-hand side (frontside view).

CAUTION!

Please pay heed to the ventilation concept. The cooling of the built-in rack components must be ensured.

5.4 Mounting in the expansion area

19-inch rack components can be mounted vertically in the optional expansion area to the left of the 19-inch area.

The expansion area is only available in 700 mm racks.

The following applies to **symmetrical** 700 mm racks:
Only 19-inch rack components with a height of **1 HU** can be mounted.

The following applies to **asymmetrical** 700 mm racks:
Only 19-inch rack components with a height of **2 HU** can be mounted.

The cable management (only possible in 700 mm **asymmetrical** racks) restricts the depth of the components to 290 mm. Gaps that occur when you mount 1 HU components must be covered.

5.4.1 Mounting Rack Components

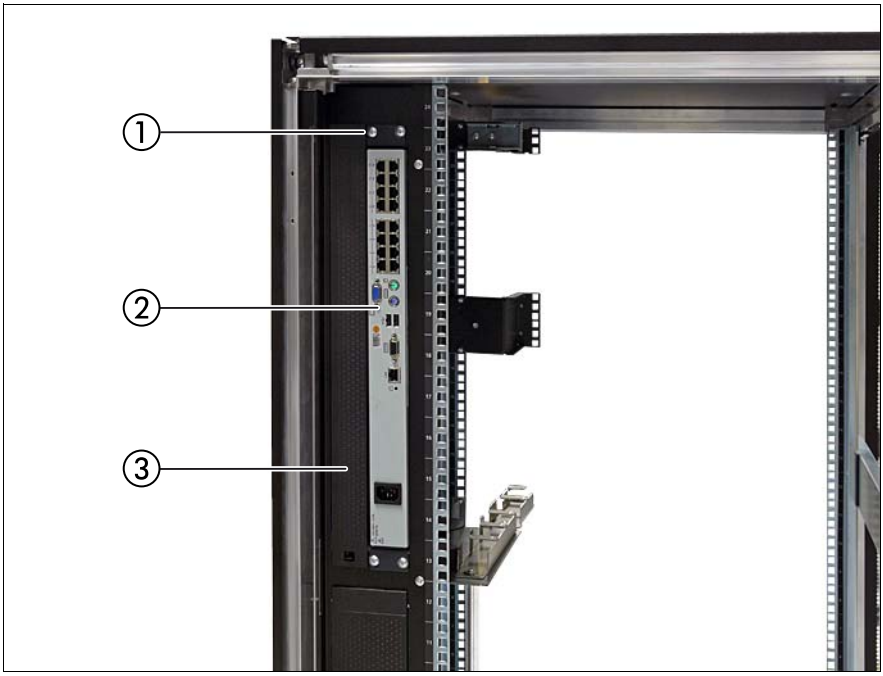


Figure 14: Mounting a rack component in the expansion area

- ► Remove the cover (3) from the appropriate slot.
- ► Insert the cage nuts as required for the component to be installed (1).
- ► Install the rack component (2) and cover any resulting gap with an appropriate cover.

5.5 Rack cable routing with external cabling

5.5.1 Cable routing in the lower area

Cables can be routed in the lower area:

- within asymmetrical racks: only on the left (frontside view)
- within symmetrical 700 mm racks: on the right and on the left (frontside view)

as well as in the back of the 19-inch server area.

Cable routing through the false floor

Figure 15: Cable routing through the false floor

The plugs of the socket strips have to be routed through the false floor. Otherwise the plugs have to be removed and reinstalled. The connection may only be performed by an authorized electrician.

The following figure shows the cable cut-outs in the bottom area in 600 mm racks:

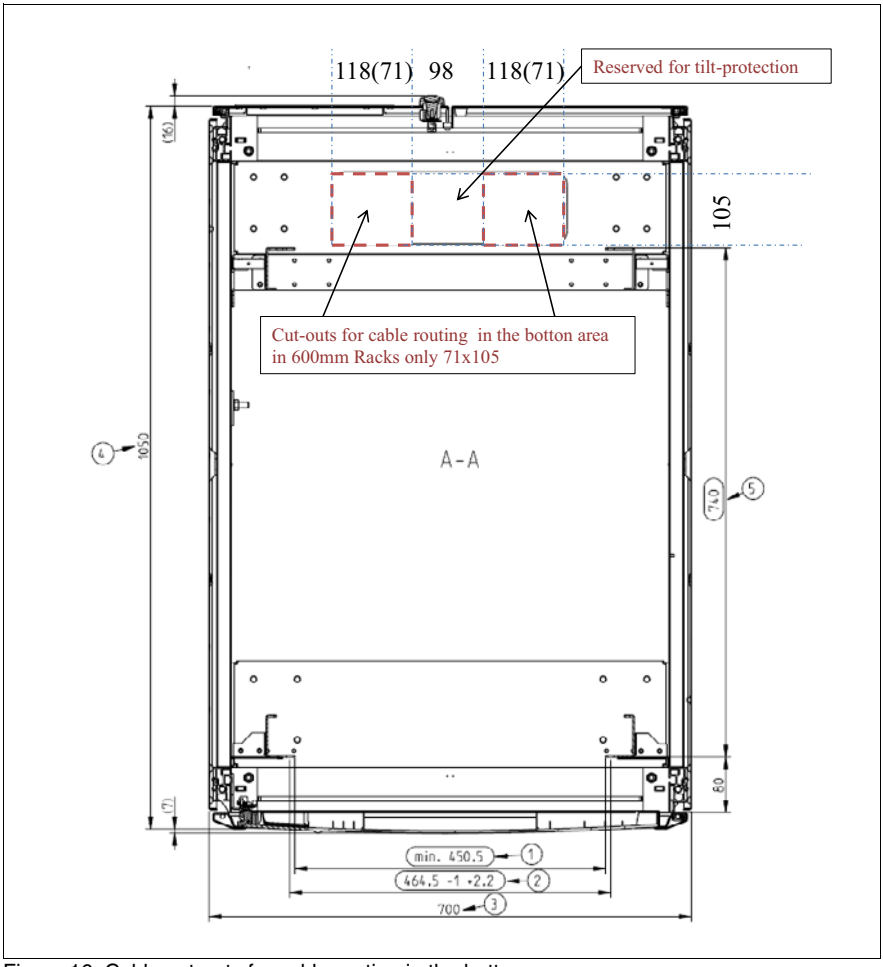


Figure 16: Cable cut-outs for cable routing in the bottom area

Cable cut-out at the lower rear door

A cable cut-out (so-called "cat door") can be found at the lower end of the right rear door (see following figure). To install the cat door proceed as follows:

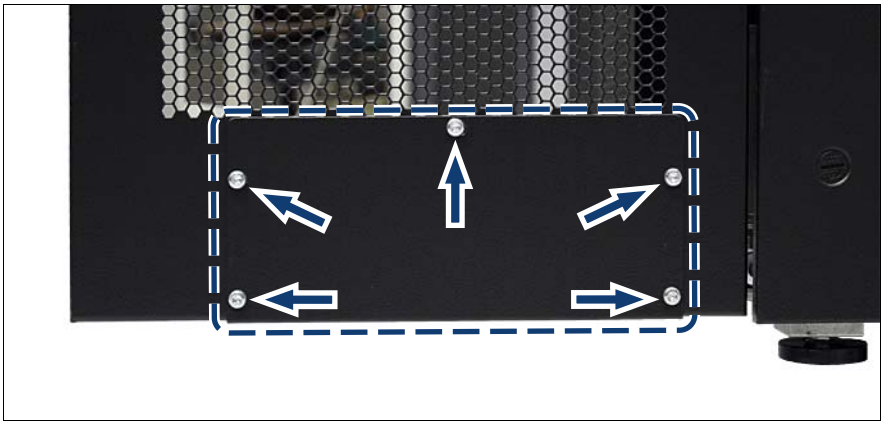
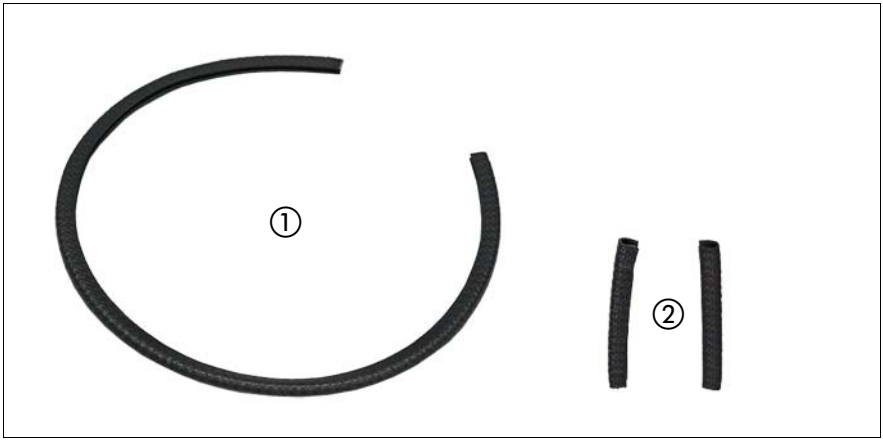


Figure 17: Cover for the cable cut-out at the lower rear door

► Unscrew the 5 screws that fix the cover for the cat door.



► Confect two edge protectors (length: 70 mm (2)) from the edge protector oval (1).

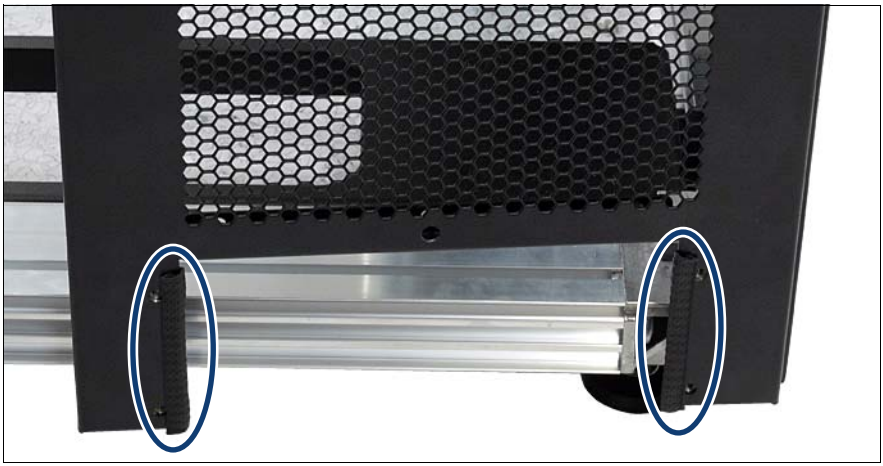


Figure 18: Cable cut-out with edge protectors

► Mount the edge protectors to the cut-out (see following figure).

Make sure that both edge protectors are flush with the door edge.

Option: Brush for the cat door

A plastic brush can be mounted optionally to the opening (see following figure).

Figure 19: Fastening point for the brush

► Screw the brush with one screw onto the rear door.

Take care, that the brush is installed horizontal and fasten the screw with a torque value of 2.5 Nm.

Figure 20: Cables leaving the rack through the cat door

► Lead the cables through the cat door as shown in the figure above.

5.5.2 Cable routing through the top cover

The 42 HU racks offer the possibility to route cables through the top cover by means of the brush panel kit. Two special cut-outs have been foreseen which can be opened by cutting through the micro-joints of the cover sheet.

Cable routing via the cut-out without the brush panel kit is not allowed, because cables may be damaged by sharp edges.

The following parts are delivered with the brush panel kit:

Figure 21: Delivered parts of the brush panel kit

1	Edge protector
2	Top cover brush (2x)

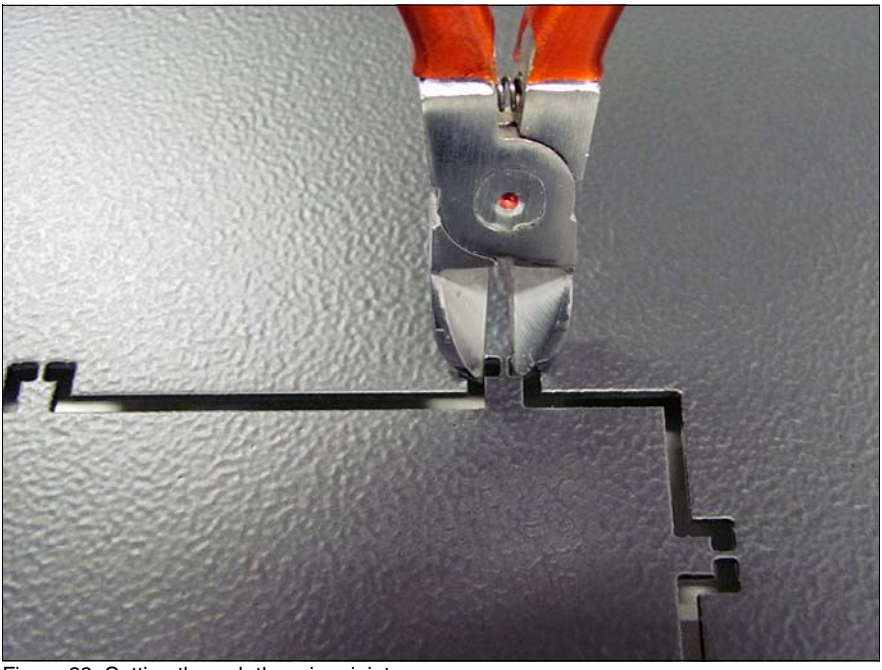


Figure 22: Cutting through the micro-joints

► Cut through the micro-joints of the top cover cable cut-out.

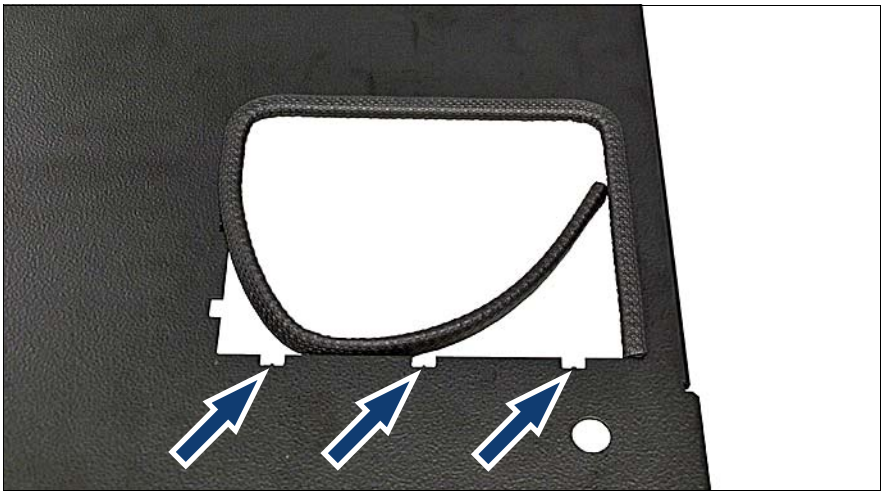


Figure 23: Mounting the edge protector

► Mount the edge protector around the top cover cut-out to prevend cable damaging by sharp edges (see arrows).

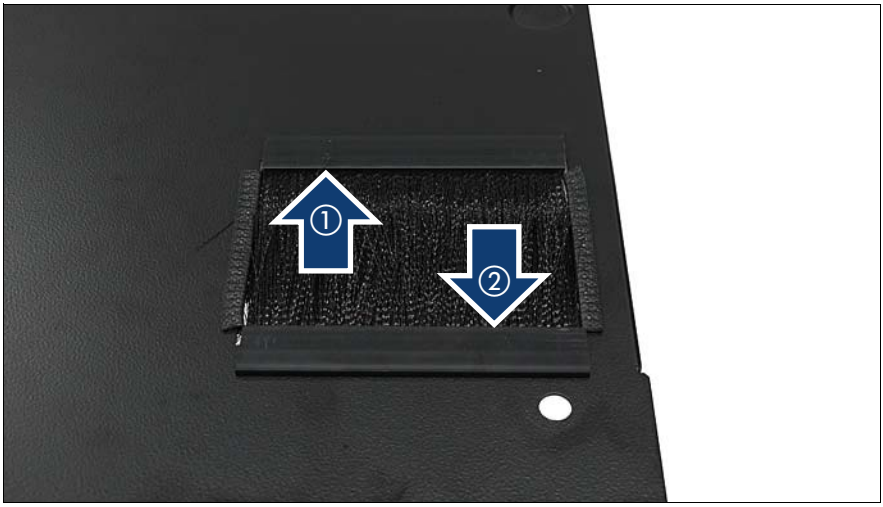


Figure 24: Cable cut-out on top with brush panel kit

► Mount the two brushes at both sides of the top cover cut-out.

6 Cable Management

The cable management comprises the following parts:

– lateral cable management (only for asymmetrical 700 mm PRIMECENTER M1 19-inch racks)

– cable guides with cable clips

– cable management arms (see description provided)

6.1 Mounting components of the cable management

6.1.1 Lateral cable management

The lateral cable management can **only** be used in **asymmetrical** 700 mm PRIMECENTER M1 19-inch racks.

Introduction

The lateral cable management for 19-inch DC-PC-racks is used for rack components that are mounted in the rack using telescopic rails.

The mounting height of the lateral cable management depends on the rack component to be installed and must not interfere with the telescopic rails.

Several cable managements can be stacked depending on the type of server they are used for.

Performing the task

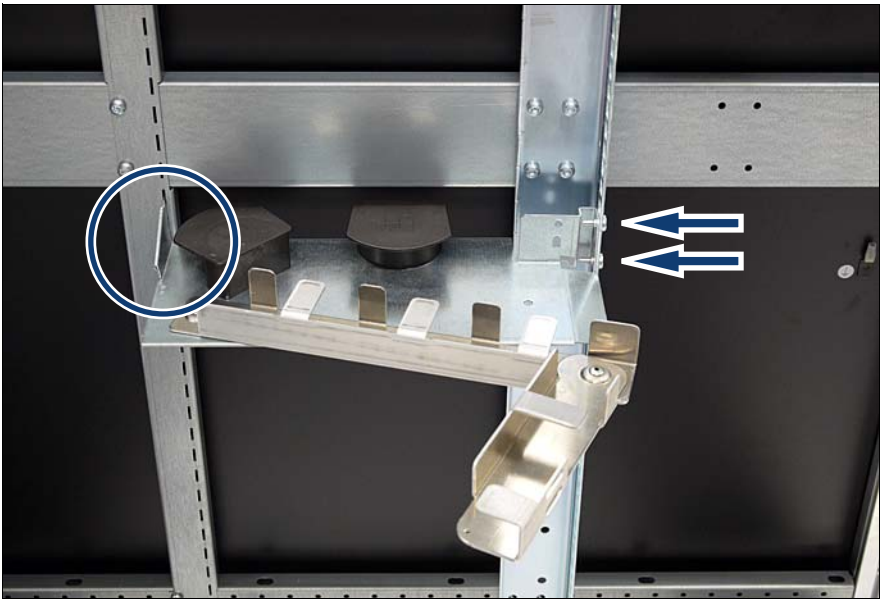


Figure 25: Mounting a lateral cable management for 19-inch DC-PC-racks

- ► Insert the lateral cable management into the openings in the special upright (see circle) at the appropriate height as shown.
- ► Fasten the lateral cable management to the rear support upright using two centering screws (see arrows).

The lateral cable managements for some rack components can be installed completely in the free height units. A distance should be left to the next lateral cable management to facilitate cable upgrades.

6.1.2 Cable guide with cable clips

The cable guide with cable clips can only be used in asymmetrical 700 mm PRIMECENTER M1 19-inch racks.

Introduction

You can use one or more cable guides with cable clips to store excess lengths of cable in an orderly fashion at appropriate locations in the rack.

The other cable clips supplied can be distributed over the rack and mounted on the support brackets as needed.

Performing the task

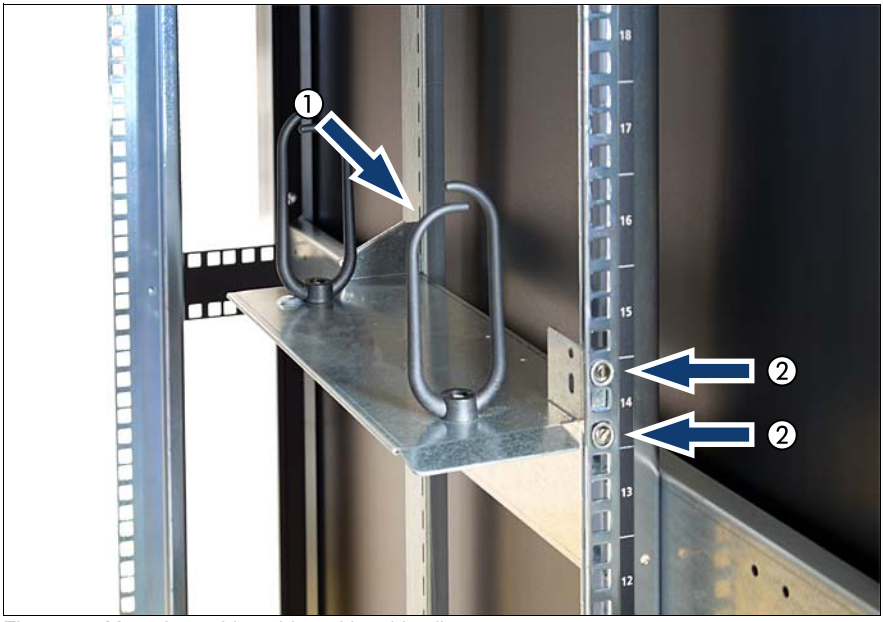


Figure 26: Mounting cable guides with cable clips

- Insert the cable guide with cable clips into the support upright for the cable guide (1) at the appropriate height as shown in the figure above.
- Fasten the cable guide with cable clips to the rear support upright using two screws with integrated plugwashers (2).

6.2 Connecting and disconnecting cables

Introduction

The following advices have to be observed when connecting cables to the rack.

CAUTION!

- The power plug(s) must be pulled out!
- Read the documentation for the device before you connect it.
- Make sure that all signal cables are free of electrostatic charge before they are plugged.
- Never connect or disconnect cables during thunderstorms.
- When disconnecting a cable, always grasp the plug. Never pull on the cable.
- Connect or disconnect cables in the sequence shown below.

6.2.1 Connecting Cables

Observe the safety notes in chapter "Important Information" on page 17.

Performing the task

- ► Switch off all affected devices.
- ► The power plugs of all affected devices must be pulled out of the sockets on the socket strip in the PRIMECENTER M1 19-inch rack.
- ► Attach all cables to the devices. Mark the cables and note what function each cable serves.
- ► Plug all data transmission cables into the sockets provided for the data transmission or telephone networks.
- ► Plug the mains power plugs of all devices into the sockets on the socket strip(s) in the rack.

  In case of a 3-phase connection:

  Make sure that the power cables of the devices are plugged in so that there is an even distribution of power to the three phases (L1, L2, L3) (see chapter "Power Distribution" on page 67).

Make sure that the cabling of devices with a "dual power feed" fulfils the conditions of the high availability requirements of the system.

6.2.2 Disconnecting Cables

Performing the task

- ► Switch off all affected devices.
- ► Pull the power plugs of all affected devices out of the sockets on the socket strip in the PRIMECENTER M1 19-inch rack.
- ► Pull all data transmission cables out of the sockets provided for the data transmission or telephone networks.
- ► Disconnect all cables on the devices.

6.3 Routing Cables

This section contains several examples of how to route cables in the PRIMECENTER M1 19-inch rack.

Introduction

Only internal cables are routed at the factory before delivery. All other cables must be routed during rack installation at customer site.

If one or more lateral cable managements are mounted with an installed device, all external cables must be routed in these guides. If the installed lateral cable managements are not sufficient for the number of cables, you must install additional ones.

The lateral cable managements must be installed 1 HU apart. If this is not possible, the cables must be routed in the rack before installing the device.

For easier access to the lateral cable managements you can pull out the systems above and below the guides toward the front.

Using cable ties

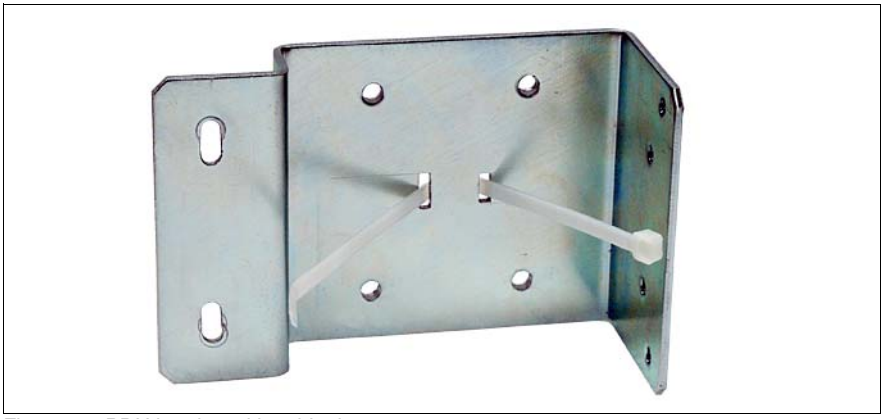


Figure 27: PDU bracket with cable tie

- ► Thread a cable tie through the two openings (see circles in figure above) in the PDU bracket
- ► Mount the PDU brackets into the groove of the rear pillars using two spring nuts M5 and two screws M5x10 mm.

6.3.1 Routing cables in the rack

The following photo shows as a sample how to route cables in the rack:

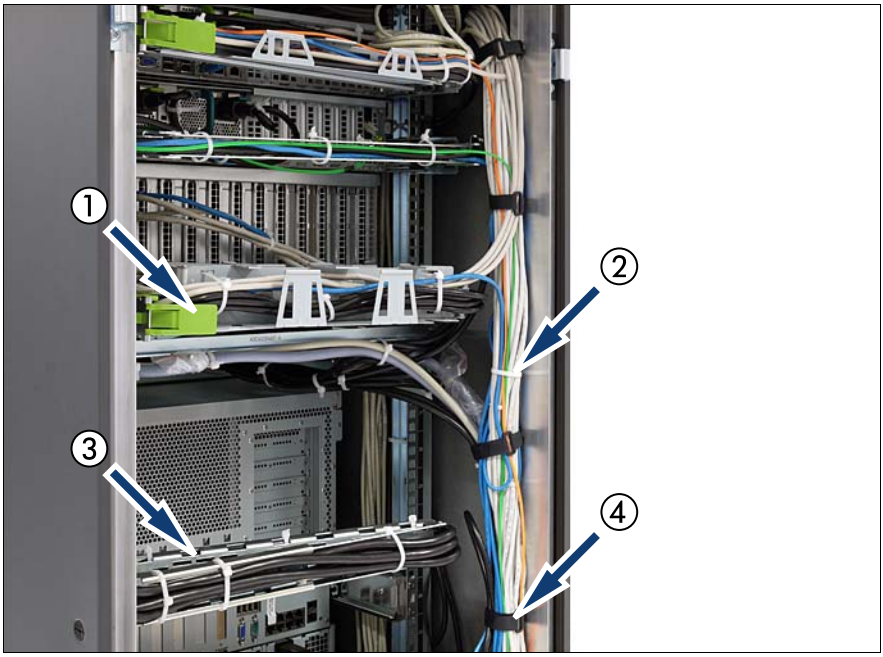


Figure 28: Sample of cable routing within a 600 mm rack

The following aids are useful to route the cables within the rack:

(1) Cable management arm
(2) Cable ties
(3) Cable arm
(4) Hook-and-loop tape

6.3.2 Routing cables using a lateral cable management

Performing the task

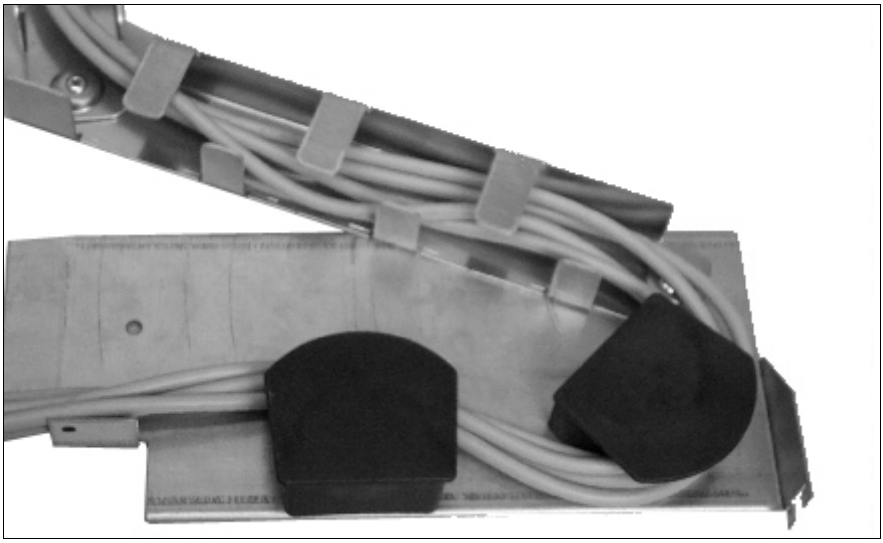


Figure 29: Routing cables using a lateral cable management for 19-inch DC-PC-racks

► Route the cables as shown in the figure above.n

6.3.3 Cable routing and strain relief for the built-in rack components in asymmetrical racks

The rack component is inserted in the PRIMECENTER M1 19-inch rack and secured. The cables are attached to the relevant plug connectors and should be routed in the lateral cable management system with a reserve length by making a loop over the center axis of the rack component (see figure 30).

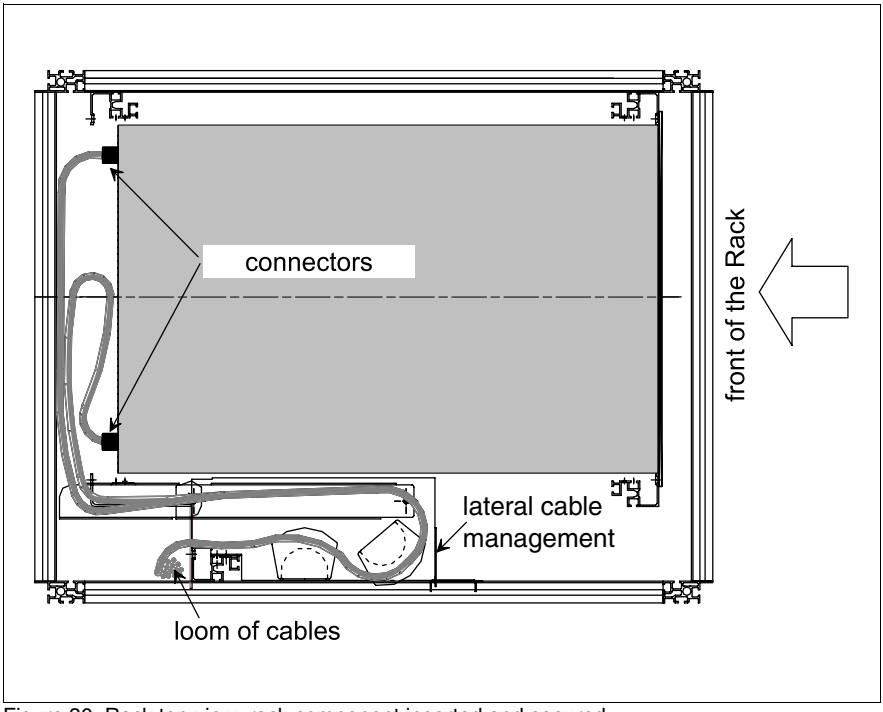


Figure 30: Rack top view: rack component inserted and secured

When the rack components are extracted, the cables fixed in the lateral cable management are also pulled out. The lateral cable management stabilizes the cables at the appropriate rack component height and thus ensure a trouble-free insertion and removal (see figure 31 below and figure 32 on page 63). The mechanical attachment is performed using the strain relief fitting on the connectors.

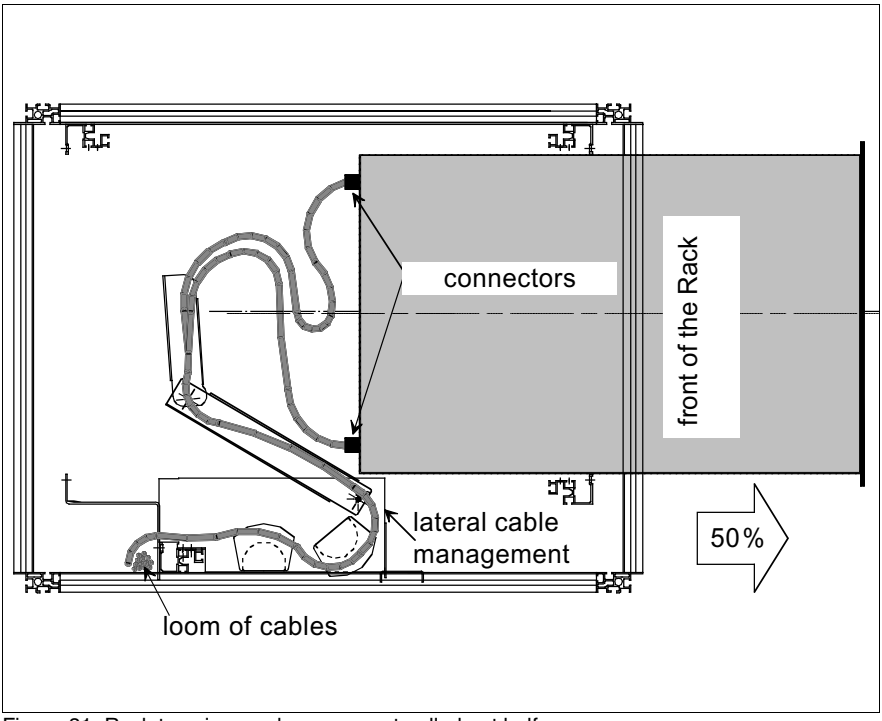


Figure 31: Rack top view: rack component pulled out half way

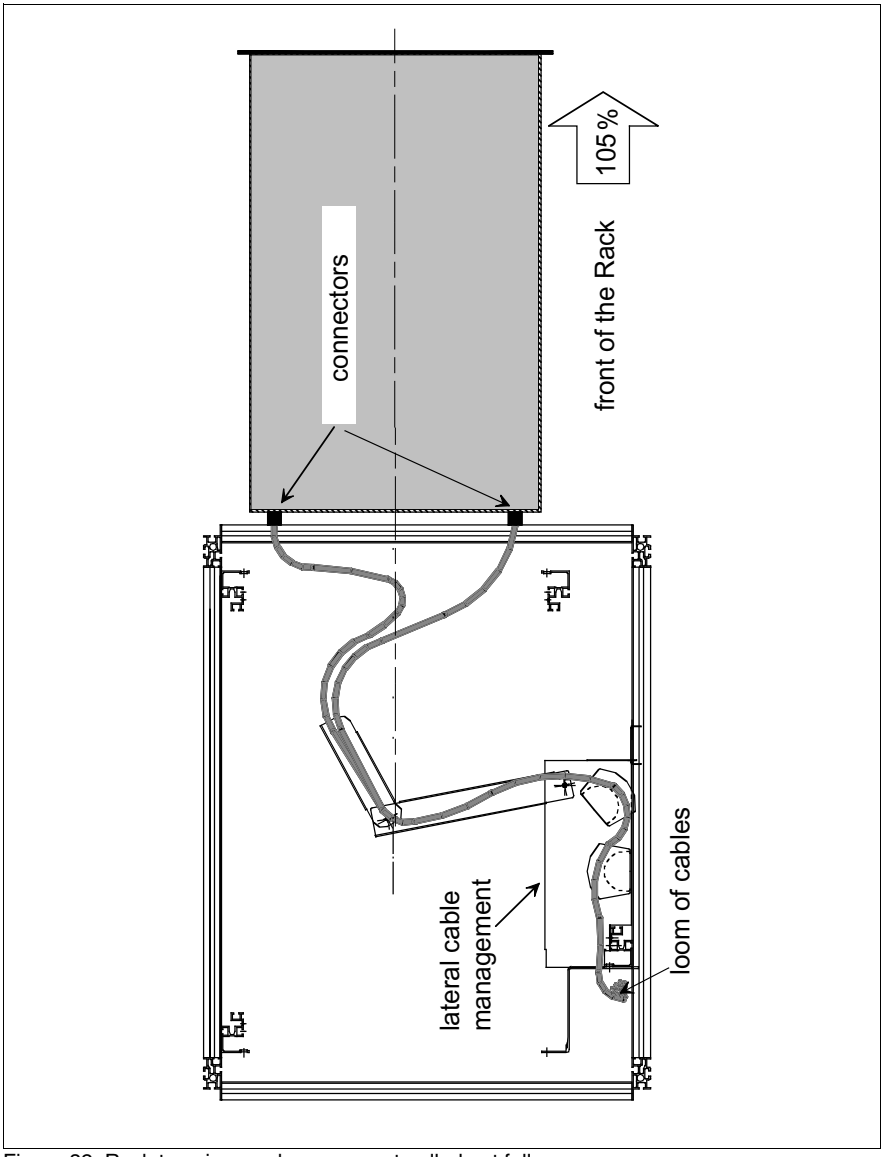


Figure 32: Rack top view: rack component pulled out fully

6.3.4 Cable Guide with Cable Clips

The example below shows you how to route excess lengths of cable in the PRIMECENTER M1 19-inch rack using a cable guide with cable clips.

Caution!

In the case of fiber-optic cables, a minimum bending radius must be adhered to.

The cable guide with cable clips can only be used in asymmetrical 700 mm PRIMECENTER M1 19-inch racks.

Figure 33: Routing cables using a cable guide with cable clips

► Route the cables as shown in the figure above.

6.3.5 Direct Connection

The example below shows how to connect cables directly to a rack component installed on sliding rails.

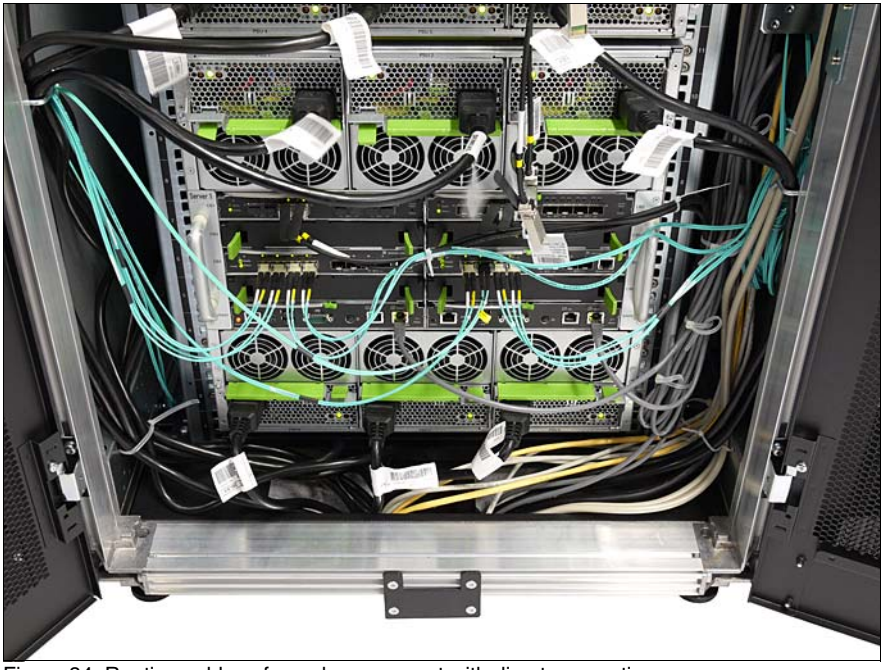


Figure 34: Routing cables of a rack component with direct connection

► Route the cables in the side area of the rack as shown in the figure above.

CAUTION!

The ventilation slots of the devices installed underneath must not be covered by the cables.

7 Power Distribution

The PRIMECENTER M1 19-inch rack offers various possibilities for distributing power to the integrated rack components. Therefore only a few selected proposals are described here. For more information, please refer to the web: *http://manuals.ts.fujitsu.com/index.php?id=5406-5605-5606*

The following socket strips are currently available:

Total no. of sockets	**Name of socket strip**	**Remarks**
5 sockets	Socket strip 3x 16 A + 2x 10 A IEC 60320	Single-phase "Blade"-PDU
10 sockets (6x16 A + 4x10 A)	PDU 50A 2U, 6x16A + 4x10A IEC 60320	Single-phase "Blade"-PDU w/o plug
15 sockets (9x 16 A + 6x 10 A)	Socket strip 3x3 16A + 3x2 10A IEC322	Blade-PDU with CEE plug (3-ph./32 A red) and Fuses
24 sockets	Socket strip 3-phase 3x8 sockets	with CEE plug 3x16 A (red)
8 sockets	Socket strip 8x 10A IEC60320 + 32A IEC60309 plug	Single-phase with CEE plug (32 A) and Fuses
10 sockets	Socket strip 1x 10 outlets + ass.	Single-phase with CEE plug (16 A)
ditto	Socket strip 1x 10 outlets for USA/CAN	Single-phase with USA/CAN plug (208 V AC)
ditto	Powersocket outlet 10x IEC6 0320 C13 for UPS	Single-phase for UPS units
3 safety sockets	Socket strip exp. 3 safety plugs + ass.	Single-phase PDU
4x socket 10 A + 1x safety socket	Socket strip	can not be mounted on PDU kit 3HU

The connection conditions described in the relevant manuals for the integrated rack components should be complied with in all cases.

Redundancy concept

The power supply to the PRIMECENTER M1 19-inch rack can be included optionally as part of a redundancy concept. In the simplest scenario, redundancy is achieved with the 3-phase mains connection by distributing redundant power supplies to the phases.

Ever higher redundancy is achieved by duplicating the current distribution components so that the PRIMECENTER M1 19-inch rack can be connected to two independent inhouse power distribution networks via a dual power feed. This option is offered both in 1-phase and 3-phase socket strips.

CAUTION!

Remember in configurations with several mains supply cables that **all cables** must be **disconnected before working** with the cabling so that there is no current flowing to the rack!

The power supply complies with the requirements of the EN60950 regulations. This allows a PRIMECENTER M1 19-inch rack to be connected with flexible 3 or 5-wire cables to a rated current of up to 16 A/32 A/50 A per phase. The respective line cross-sections should be noted.

Because of the high number of power supply units within the PRIMECENTER M1 19-inch rack , the configuration can carry leakage currents > 3.5 mA. For this reason, the PRIMECENTER M1 19-inch rack may generally only be connected to internal power distribution networks via rigid connections or via industrial connections in accordance with IEC309.

Note the requirements outlined in the data sheets when installing the power distribution unit.

7.1 Installing PDU brackets

Introduction

All PDUs have to be mounted using versatile mounting brackets (PDU brackets). These PDU brackets (see following figure) can be mounted in various heights on both sides of the rack's rear side.

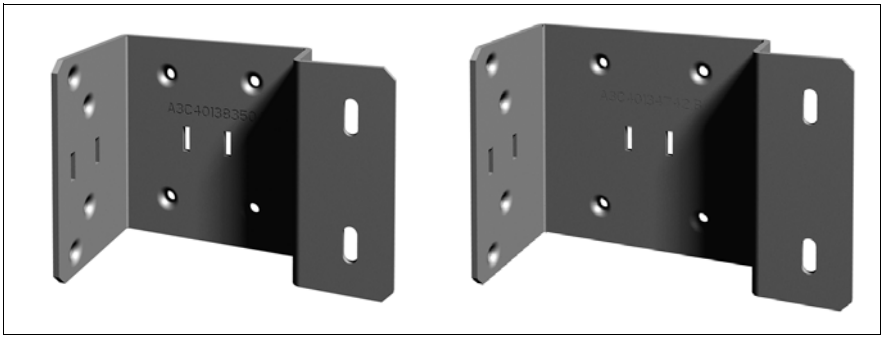


Figure 35: Samples of the short (left side) and the long PDU bracket (right side)

Required tools

The following tools are required to perform this task:

– Torx screwdriver

Performing the task

Figure 36: Two installed spring nuts

- Install the spring nuts M5 into the groove of the rear pillars (see circles) as described in section "Inserting Spring Nuts" on page 34.

Figure 37: Installed PDU bracket

- Mount the PDU brackets into the groove of the rear pillars using two spring nuts M5 and two screws M5x10 mm (see circles).

7.2 Mounting socket strips onto PDU kit 3HU

Horizontal mounting is the only way to mount socket strips into a 600 mm rack.

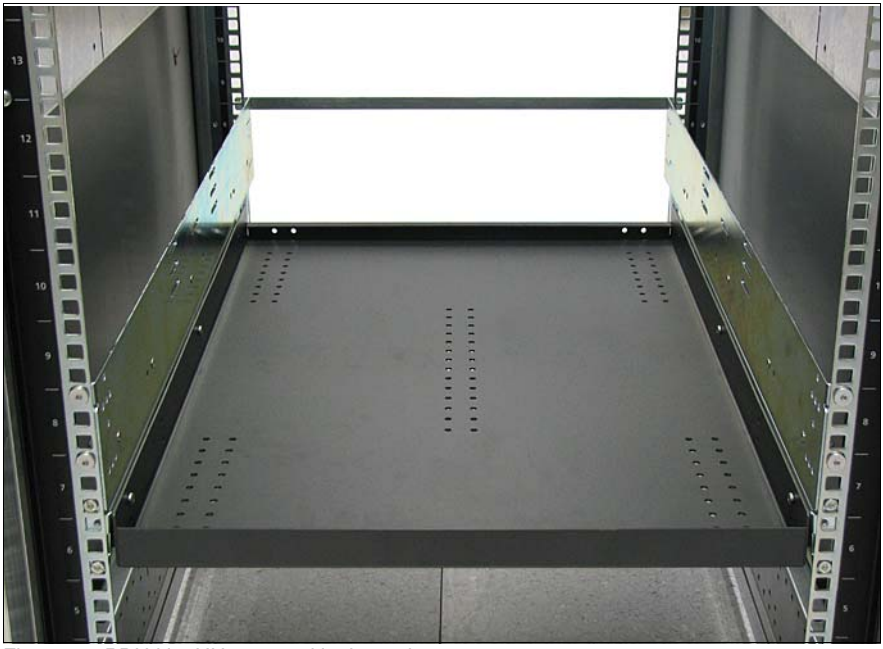


Figure 38: PDU kit 3HU mounted in the rack

Required tools

The following tools are required to perform this task:

– Torx screwdriver

Performing the task

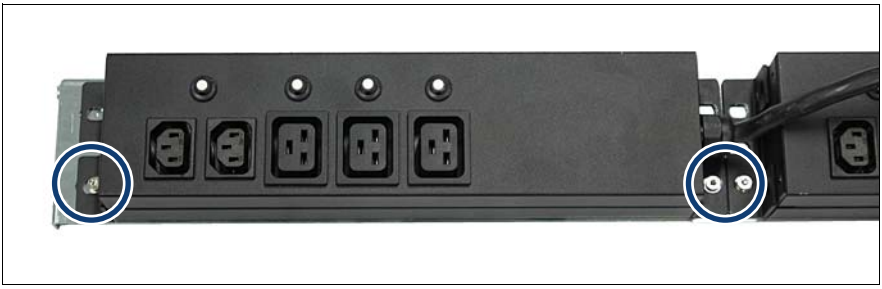


Figure 39: Mounting socket strips onto the PDU kit 3HU

- First of all screw the desired socket strip(s) onto each holder extension lead of the PDU kit 3HU as shown in figure above (see circles).

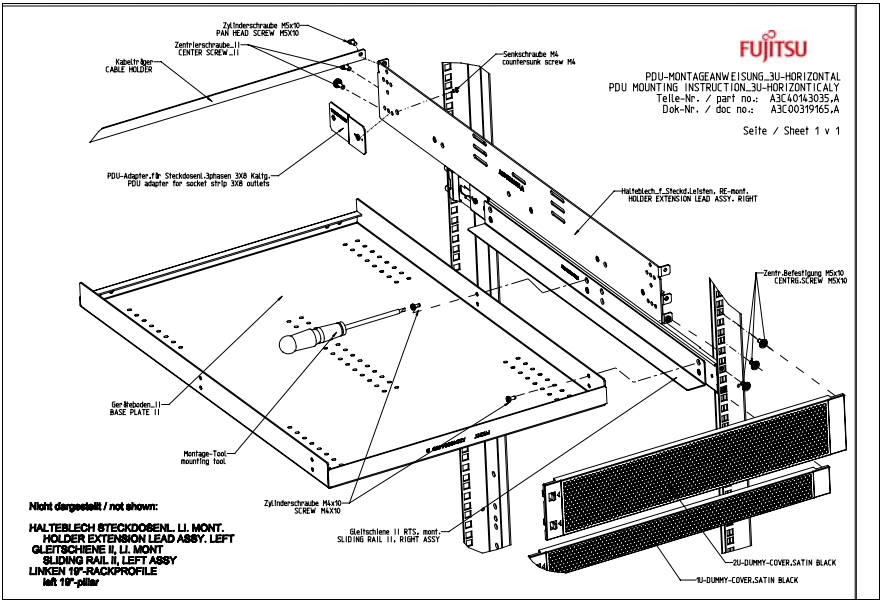


Figure 40: Installation description of the PDU kit 3HU (

- Install the PDU kit 3HU into the rack as described in the provided installation sheet (see figure above).

The PDU kit 3HU may only be mounted from HU 7 upwards.

7.3 Installing the socket strips

7.3.1 32 A single-phase 5-way socket strip

Introduction

No. of sockets 10 A	No. of sockets 16 A	Type of plug	Max. current
2x IEC 60320 C13	3x IEC 60320 C19	blue 32 A IEC 60309 (1-phase)	32 A

For more information, see the configurator:
https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx

Figure 41: 32 A single-phase 5-way socket strip

Required tools

The following tools are required to perform this task:

– Torx screwdriver

7.3.1.1 Installation options for 700 mm wide asymmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	conditionally possible[1]	Max. 4x with PDU kit 3 HU
24 HU	conditionally possible[1]	Max. 4x with PDU kit 3 HU

Table 2: Installation options for 700 mm wide asymmetrical racks

[1] Installation only possible on the left rear side (front side view). Cable routing is restricted.

Performing the task

► Install the PDU brackets as described in section "Installing PDU brackets" on page 69.

Figure 42: 5-way socket strip mounted vertically in a 700 mm wide asymmetrical rack

► Screw the socket strip with 2 screws onto the PDU brackets.

7.3.1.2 Installation options for 700 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	conditionally possible[1]	Max. 4x with PDU kit 3 HU
24 HU	conditionally possible[1]	Max. 4x with PDU kit 3 HU

Table 3: Installation options for 700 mm wide symmetrical racks

[1] Installation is only possible on the rear side. Cable routing is restricted. Installation of cable arms at the same height is not possible.

Performing the task

► Install the PDU brackets as described on page 69.

Figure 43: 5-way socket strip mounted horizontally in a 700 mm wide symmetrical rack

► Screw the socket strips with 2 screws each onto the PDU brackets.

Installation is possible on both sides.

7.3.1.3 Installation options for 600 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	Not possible	Max. 4x with PDU kit 3 HU
24 HU	Not possible	Max. 4x with PDU kit 3 HU
16 HU	Not possible	Max. 4x with PDU kit 3 HU

Table 4: Installation options for 600 mm wide symmetrical racks

Performing the task

► Install the socket strips onto the PDU kit 3 HU as described on page 71.

Figure 44: 5-way socket strip mounted horizontally in a 600 mm wide symmetrical rack

► Install the PDU kit 3 HU in the required height into the rack.

The PDU kit 3 HU may only be mounted from HU 7 upwards.

7.3.2 Single-phase 10-way socket strip w/o plug

Introduction

No. of sockets 10 A	No. of sockets 16 A	Type of plug	Max. current
4x IEC 60320 C13	6x IEC 60320 C19	none	50 A

For more information, see the configurator:
https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx

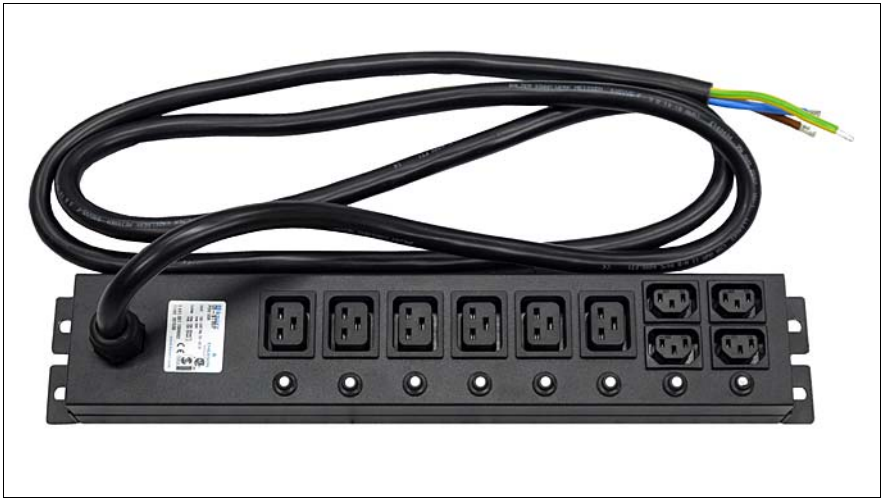


Figure 45: Single-phase 10-way socket strip without plug

Required tools

The following tools are required to perform this task:

– Torx screwdriver

7.3.2.1 Installation options for 700 mm wide asymmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	conditionally possible[1]	Max. 2x with PDU kit 3 HU
24 HU	conditionally possible[1]	Max. 2x with PDU kit 3 HU

Table 5: Installation options for asymmetrical racks

[1] Installation only possible on the left rear side (front side view). Cable routing is restricted.

Performing the task

► Install the PDU brackets as described on page 69.

Figure 46: Single-phase 10-way socket strip w/o plug mounted in a 700 mm wide asymm. rack

► Screw the socket strip with 2 screws onto the PDU brackets.

7.3.2.2 Installation options for 700 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	conditionally possible [1]	Max. 2x with PDU kit 3 HU
24 HU	conditionally possible [1]	Max. 2x with PDU kit 3 HU

Table 6: Installation options for asymmetrical racks

[1] Installation is only possible on the rear side. Cable routing is restricted. Installation of cable arms at the same height is not possible.

Performing the task

► Install the PDU brackets as described on page 69.

Figure 47: 10-way socket strip "Blade PDU" mounted in a 700 mm wide symmetrical rack

► Screw the socket strip with 2 screws onto the PDU brackets.

Installation is possible on both sides.

7.3.2.3 Installation options for 600 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	Not possible	Max. 2x with PDU kit 3 HU
24 HU	Not possible	Max. 2x with PDU kit 3 HU
16 HU	Not possible	Max. 2x with PDU kit 3 HU

Table 7: Installation options for 600 mm wide symmetrical racks

Performing the task

► Install the socket strip onto the PDU kit 3 HU as described on page 71.

Figure 48: 10-way socket strip "Blade PDU" mounted in a 600 mm wide symmetrical rack

► Install the PDU kit 3 HU in the required height into the rack.

The PDU kit 3 HU may only be mounted from HU 7 upwards.

7.3.3 32 A three-phase 15-way socket strip

Introduction

No. of sockets 10 A	No. of sockets 16 A	Type of plug	Max. current
6x IEC 60320 C13	9x IEC 60320 C19	red 32 A IEC 60309 (3-phase)	3x 32 A

For more information, see the configurator:
https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx

Figure 49: 32 A three-phase socket strip

Required tools

The following tools are required to perform this task:

– Torx screwdriver

7.3.3.1 Installation options for 700 mm wide asymmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	conditionally possible[1]	Max. 2x with PDU kit 3 HU
24 HU	conditionally possible[1]	Max. 2x with PDU kit 3 HU

Table 8: Installation options for asymmetrical racks

[1] Installation only possible on the left rear side (front side view). Cable routing is restricted.

Performing the task

► Install two PDU brackets as described on page 69.

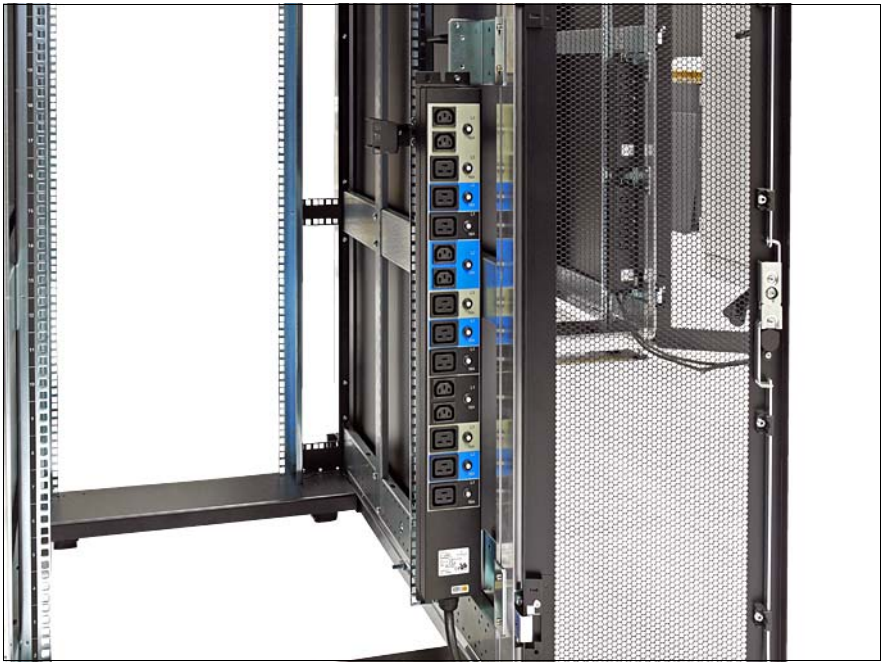


Figure 50: 32 A three-phase socket strip mounted in a 700 mm wide asymmetrical rack

► Screw the socket strip with 2 screws onto the PDU brackets.

7.3.3.2 Installation options for 700 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	conditionally possible[1]	Max. 2x with PDU kit 3 HU
24 HU	conditionally possible[1]	Max. 2x with PDU kit 3 HU

Table 9: Installation options for asymmetrical racks

[1] Installation is only possible on the rear side. Cable routing is restricted. Installation of cable arms at the same height is not possible.

Performing the task

► Install two PDU brackets as described on page 69.

Figure 51: 32 A three-phase 15-way socket strip mounted in a 700 mm wide symmetrical rack

► Install the socket strip with 2 screws onto the PDU brackets.

Installation is possible on both sides.

7.3.3.3 Installation options for 600 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	Not possible	Max. 2x with PDU kit 3 HU
24 HU	Not possible	Max. 2x with PDU kit 3 HU
16 HU	Not possible	Max. 2x with PDU kit 3 HU

Table 10: Installation options for 600 mm wide symmetrical racks

Performing the task

► Install the socket strip onto the socket strip RMK 2U horizontal as described on page 71.

Figure 52: 32 A three-phase 15-way socket strip mounted in a 600 mm wide symmetrical rack

► Install the PDU kit 3 HU in the required height into the rack.

The PDU kit 3 HU may only be mounted from HU 7 upwards.

7.3.4 Three-phase 24-way socket strip

Introduction

No. of sockets 10 A	No. of sockets 16 A	Type of plug	Max. current
24x IEC 60320 C13	none	red 16 A IEC 60309 (3-phase)	3x16 A

For more information, see the configurator:
https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx

Figure 53: Three-phase socket strip with 3x8 sockets

Required tools

The following tools are required to perform this task:

– Torx screwdriver

7.3.4.1 Installation options for 700 mm wide asymmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	2x	Not possible
24 HU	1x	Not possible

Table 11: Installation options for 700 mm wide asymmetrical racks

Performing the task

► Install two PDU brackets as described on page 69.

Figure 54: 3-phase socket strip w/ 3x8 sockets mounted 2x in a 700 mm wide asymmetrical rack

► Screw the socket strip with 2 screws onto the PDU brackets.

7.3.4.2 Installation options for 700 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	2x	Not possible
24 HU	1x	Not possible

Table 12: Installation options for 700 mm wide asymmetrical racks

Performing the task

► Install two PDU brackets as described on page 69.

Figure 55: 3-phase socket strip w/ 3x8 sockets mounted 2x in a 700 mm wide symmetrical rack

► Screw the socket strip with 2 screws each onto the PDU brackets.

Installation is possible on both sides.

7.3.4.3 Installation options for 600 mm wide symmetrical racks

The installation of this socket strip is not possible within this type of rack.

7.3.5 Single-phase 8-way socket strip and assembly

Introduction

No. of sockets 10 A	No. of sockets 16 A	Type of plug	Max. current
8x IEC 60320 C13	none	blue 32 A IEC 60309	32 A

For more information, see the configurator:
https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx

Figure 56: Single-phase 8-way socket strip with 32 A IEC 60309 plug

Required tools

The following tools are required to perform this task:

– Torx screwdriver

7.3.5.1 Installation options for 700 mm wide asymmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	ok	Max. 4x with PDU kit 3 HU
24 HU	ok	Max. 4x with PDU kit 3 HU

Table 13: Installation options for 700 mm wide asymmetrical racks

Performing the task

► Install two PDU brackets as described on page 69.

Figure 57: Single-phase 8-way 10 A socket strip mounted in a 700 mm wide asymmetrical rack

► Screw the socket strip with 2 screws onto the PDU brackets.

7.3.5.2 Installation options for 700 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	ok	Max. 4x with PDU kit 3 HU
24 HU	ok	Max. 4x with PDU kit 3 HU

Table 14: Installation options for 700 mm wide asymmetrical racks

Performing the task

► Install two PDU brackets as described on page 69.

Figure 58: Single-phase 8-way socket strip mounted 2x in a 700 mm wide symmetrical rack

► Screw the socket strip with 2 screws onto the PDU brackets.

Installation is possible on both sides.

7.3.5.3 Installation options for 600 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	Not possible	Max. 4x with PDU kit 3 HU
24 HU	Not possible	Max. 4x with PDU kit 3 HU
16 HU	Not possible	Max. 4x with PDU kit 3 HU

Table 15: Installation options for 600 mm wide symmetrical racks

Performing the task

► Install the socket strips onto the PDU kit 3 HU as described on page 71.

Figure 59: Single-phase 8-way 10 A socket strip mounted in a 600 mm wide symmetrical rack

► Install the PDU kit 3 HU into the rack on the desired height.

The PDU kit 3 HU has to be installed from HU 7 upwards.

7.3.6 Single-phase 10-way socket strip and assembly

Introduction

No. of sockets 10 A	No. of sockets 16 A	Type of plug	Max. current
10x IEC 60320 C13	none	blue 16 A IEC 60309	16 A
10x IEC 60320 C13	none	16 A NEMA L 6-30	16 A
10x IEC 60320 C13	none	16 A IEC 60320 C20 for UPS units	16 A

For more information, see the configurator:
https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx

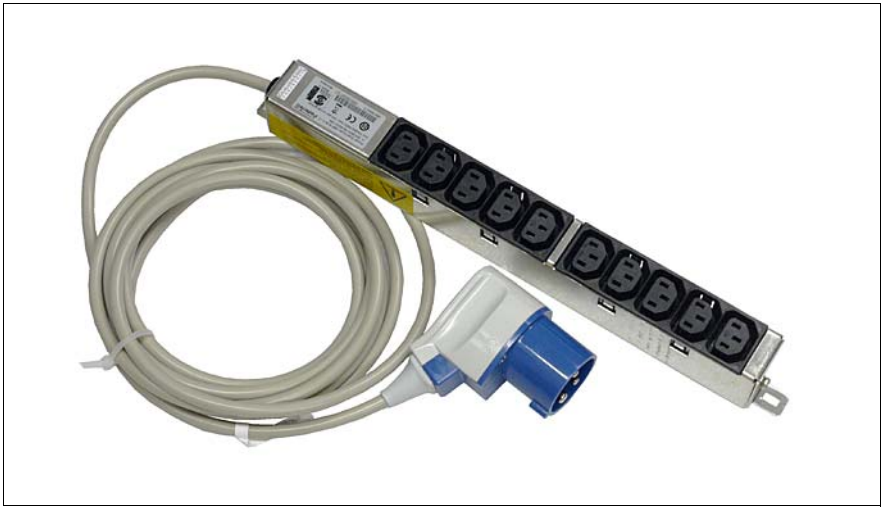


Figure 60: Single-phase 10-way socket strip with IEC 60309 plug

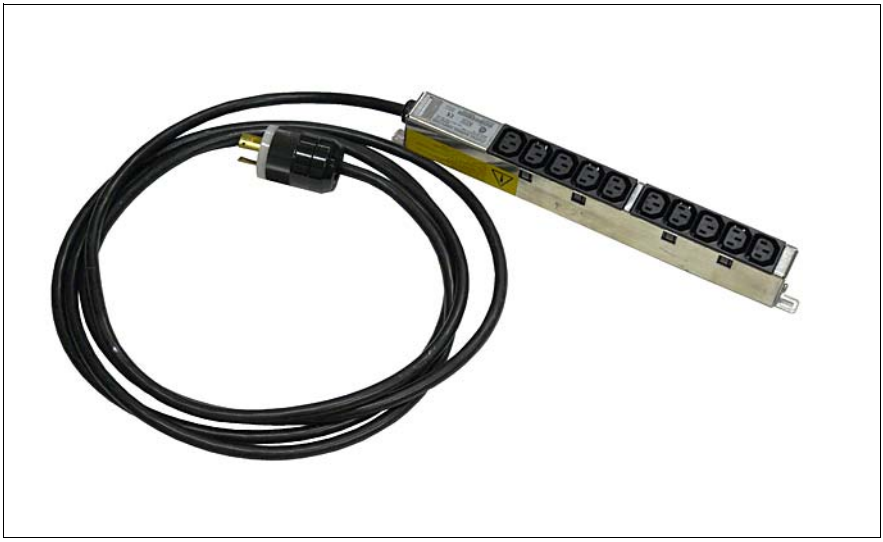


Figure 61: Single-phase 10-way socket strip with NEMA L6-30 plug

Figure 62: Single-phase 10-way socket strip with C20 plug for UPS units

7.3.6.1 Installation options for 700 mm wide asymmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	ok	ok
24 HU	ok	ok

Table 16: Installation options for 700 mm wide asymmetrical racks

Performing the task

► Install the PDU brackets as described on page 69.

Figure 63: Single-phase 10-way socket strip mounted in a 700 mm wide asymmetrical rack

► Screw each socket strip with 2 screws onto the PDU brackets.

7.3.6.2 Installation options for 700 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	2x	ok
24 HU	ok	ok

Table 17: Installation options for 700 mm wide symmetrical racks

Performing the task

► Install the PDU brackets as described on page 69.

Figure 64: Single-phase 10-way socket strip mounted in a 700 mm wide symmetrical rack

► Screw each socket strip with 2 screws onto the PDU brackets.

Installation is possible on both sides.

7.3.6.3 Installation options for 600 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	Not possible	Max. 4x with PDU kit 3 HU
24 HU	Not possible	Max. 4x with PDU kit 3 HU
16 HU	Not possible	Max. 4x with PDU kit 3 HU

Table 18: Installation options for 600 mm wide symmetrical racks

Performing the task

► Install the socket strips onto the PDU kit 3 HU as described on page 71.

Figure 65: Single-phase 10-way socket strip mounted in a 600 mm wide symmetrical rack

► Install the PDU kit 3 HU into the rack on the desired height.

The PDU kit 3 HU has to be installed from HU 7 upwards.

7.3.7 Socket strip extension 3 safety plugs and assembly

Introduction

No. of C13-type sockets	No. of safety sockets	Type of plug	Max. current
None	3	Safety socket (C13)	10 A

For more information, see the configurator:
https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx

Figure 66: Socket strip extension 3 safety plugs and assembly

Required tools

The following tools are required to perform this task:

– Torx screwdriver

7.3.7.1 Installation options for 700 mm wide asymmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	ok	Max. 4x with PDU kit 3 HU
24 HU	ok	Max. 4x with PDU kit 3 HU

Table 19: Installation options for 700 mm wide asymmetrical racks

Performing the task

► Install the PDU brackets as described on page 69.

Figure 67: Socket strip extension 3 safety plugs and assembly mounted 2x in a 700 mm wide asymmetrical rack

► Screw the socket strips with 2 screws each onto the PDU brackets.

7.3.7.2 Installation options for 700 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	ok	Max. 4x with PDU kit 3 HU
24 HU	ok	Max. 4x with PDU kit 3 HU

Table 20: Installation options for 700 mm wide symmetrical racks

Performing the task

► Install the PDU brackets as described on page 69.

Figure 68: Socket strip extension 3 safety plugs and assembly mounted in a 700 mm wide symmetrical rack

► Screw the socket strips with 2 screws each onto the PDU brackets.

7.3.7.3 Installation options for 600 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	Not possible	Max. 4x with PDU kit 3 HU
24 HU	Not possible	Max. 4x with PDU kit 3 HU
16 HU	Not possible	Max. 4x with PDU kit 3 HU

Table 21: Installation options for 600 mm wide symmetrical racks

Performing the task

► Install the socket strips onto the PDU kit 3 HU as described on page 71.

Figure 69: Socket strip extension 3 safety plugs and assembly mounted in a 600 mm wide symmetrical rack

► Install the PDU kit 3 HU into the rack on the desired height.

The PDU kit 3 HU has to be installed from HU 7 upwards.

7.3.8 Single-phase 4+1-way socket strip and assembly

Introduction

No. of C13-type sockets	No. of safety sockets	Type of plug	Max. current
4x	1x	safety plug	10 A

For more information, see the configurator:
https://partners.ts.fujitsu.com/com/order-supply/configurators/primergy_config/Pages/Currentconfigurators.aspx

Figure 70: Single-phase socket strip with 5 plugs and assembly

Required tools

The following tools are required to perform this task:

– Torx screwdriver

7.3.8.1 Installation options for 700 mm wide asymmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	ok	Not mountable with PDU kit 3 HU
24 HU	ok	Not mountable with PDU kit 3 HU

Table 22: Installation options for 700 mm wide asymmetrical racks

Performing the task

► Install the PDU brackets as described on page 69.

Figure 71: Single-phase socket strip with 4+1plugs and assembly mounted in a 700 mm wide asymmetrical rack

► Screw the socket strip with 2 screws onto the PDU brackets.

7.3.8.2 Installation options for 700 mm wide symmetrical racks

Rack height	Installation direction vertically	Installation direction horizontally
42 HU	ok	Not mountable with PDU kit 3 HU
24 HU	ok	Not mountable with PDU kit 3 HU

Table 23: Installation options for 700 mm wide symmetrical racks

Performing the task

► Install the PDU brackets as described on page 69.

Figure 72: Socket strip with 4+1plugs and assembly mounted 2x in a 700 mm wide symm. rack

► Screw the socket strip with 2 screws onto the PDU brackets.

7.3.8.3 Installation options for 600 mm wide symmetrical racks

The installation of this socket strip is not possible within this type of rack.

7.4 Connecting to the potential compensating system

If required by local regulations, the PRIMECENTER M1 19-inch rack can be connected to the indoor potential-compensating system via the grounding screw located at the lower left side of the rack chassis (see photo below). This grounding only protects from external parasitic voltages and does not replace the protective conductor in the mains feeders.

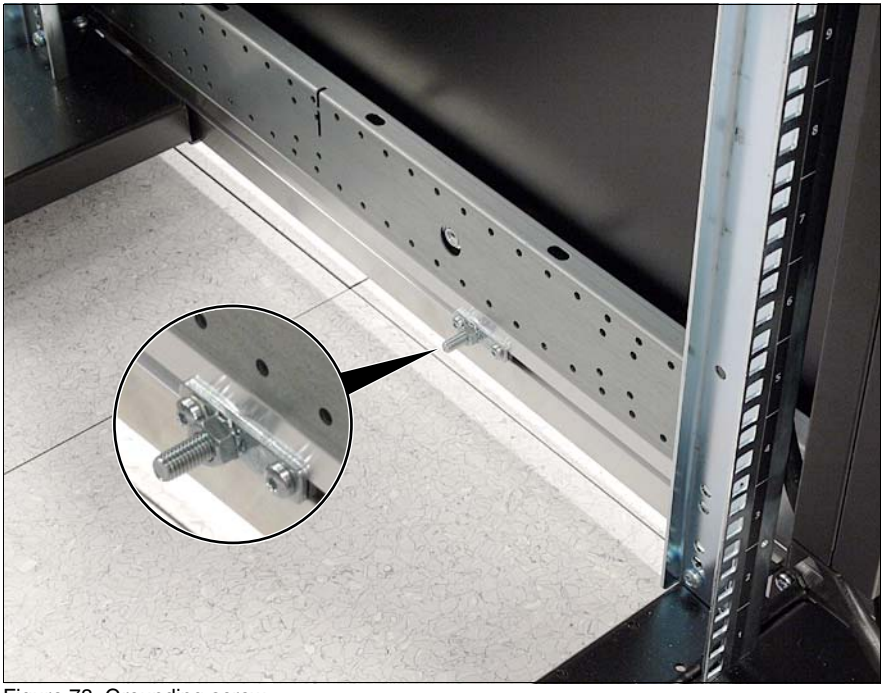


Figure 73: Grounding screw

7.5 Power Supply via UPS

If uninterruptible power supply (UPS) units are involved in supplying energy to the rack and its components, the connection conditions described in the relevant manuals for the integrated rack components should be complied with in all cases. There are many possible combinations:

- The rack is supplied completely via the UPS:

  In this case the UPS should be connected directly to the mains. In the rack the rack components are connected directly or optionally via a socket strip to the UPS.

- The rack is partly supplied via a UPS:

  This gives a choice of connecting the UPS via the socket strip in the rack or directly to the power supply network. This process also applies if a number of UPSs are used in the rack.

- High-power UPSs above 3000 VA:

  UPSs above 3000 VA need their own mains connection because of the large amount of current that they draw. Both fixed connections and connections using IEC 309-complaint connectors can be used here. The technical requirements can be taken from EN60950 and from the specifications of the local utility company.

Online UPSs and line-interactive UPSs are available in different performance classes. Different UPS types are used preferentially by the various server lines for the PRIMECENTER M1 19-inch rack. Please refer to the configuration information for the individual severs.

The power supply can be configured freely depending on the UPSs used. The input power connector of the respective UPS can be connected either directly to the mains or to the protective contact socket of the main socket strip in the rack by using the connection cable supplied with the respective UPS. The rack components or additional socket strips should be connected to the power outlets of the respective UPS.

Note that the increased leakage currents >3.5mA can also flow over UPS connection cables. The connection cables therefore have to be assigned uniquely to the device and the strain on the UPS relieved, either using appropriate strain relief facilities or by routing with suitable cabling, which requires the assistance of tools to change the cabling.

8 Optional accessories

Various accessories are optionally available with the PRIMECENTER M1 19-inch rack, including:

- Anti-tilt protection
- Rack connectors
- Rack installation kits
- Cable management systems
- Dummy panels
- Brush strips
- Cable holders
- Installation flooring
- Multiple socket outlets
- Uninterruptable power supply
- Rack console (monitor, keyboard and mouse)
- Console switches
- Earthquake protection kits (on request)

More information can be found at:

- *http://partners.ts.fujitsu.com/primergy* (PRIMERGY information on the Extranet)
- *http://www.primergy.com* (PRIMERGY information on the Internet)
- For further questions use the following e-mail address: *PRIMERGY-PM@ts.fujitsu.com*

9 Appendix

In this chapter you can find additional information on special tasks:

– Door conversion

More information can be found at:

9.1 Door conversion

On the following pages you will find the description for door conversion.

Fujitsu PRIMECENTER M1 Türumbau

Fujitsu PRIMECENTER M1 Door Conversion

DEUTSCH

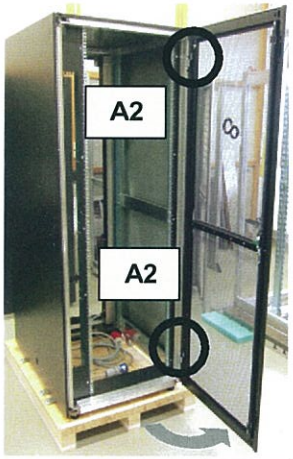
1 Allgemeine Hinweise

Diese Montageanleitung enthält detaillierte Informationen über einen richtigen Türumbau bei Fujitsu PRIMECENTER M1 Schrank.

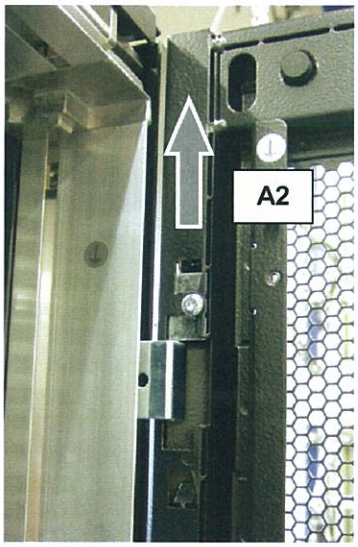
2 Montieren

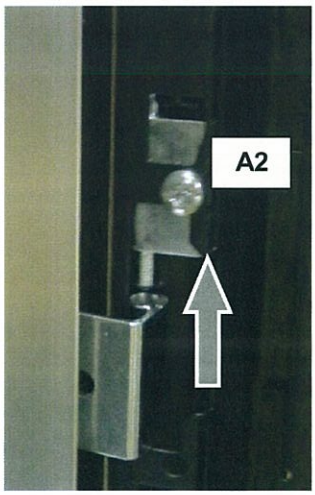
Notwendiges Werkzeug
– Torx-Schraubendreher TX25, TX30
– Phillips-Schraubendreher

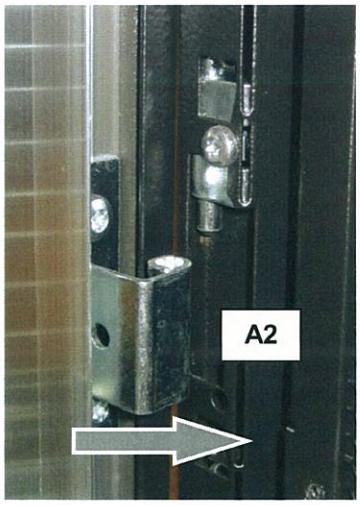
Arbeitsablauf
1. Tür aushängen
   - Tür um ca. 90° öffnen (A1)
   - Türblatt aus den Scharnieren heben, in Richtung Schrank bewegen und nach rechts wegheben. (A2)



A1







ENGLISH

General information

These assembly instructions contain detailed information about a correct door conversion at Fujitsu PRIMECENTER M1 rack.

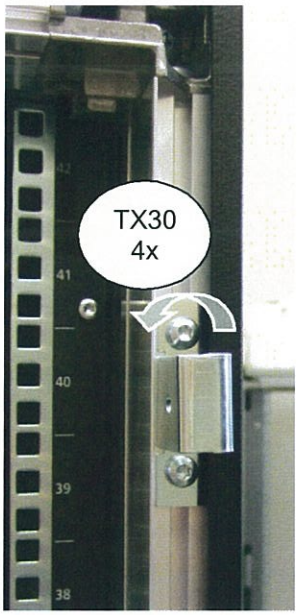
Installation

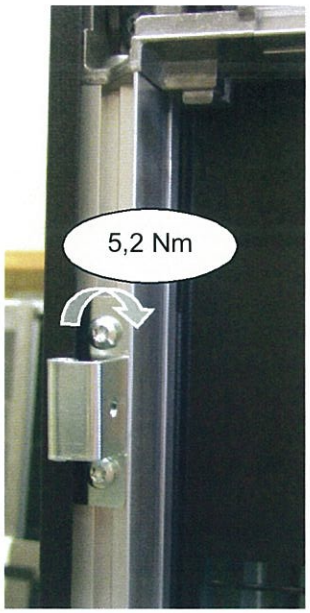
Tools required
– Torx screwdriver TX25, TX30
– Phillips screwdriver

Working procedure
1. Unhinge the door
   - Open the door by approx. 90° (A1)
   - Lift the door leaf out of the hinges, move toward rack and to the right away-lift. (A2)

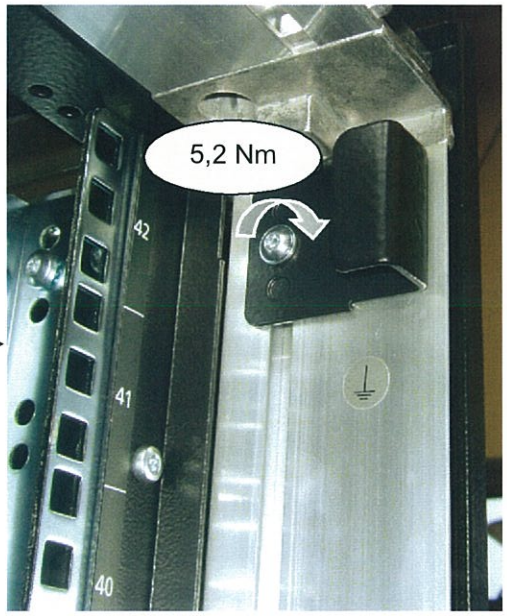
DEUTSCH

2. Scharniere am Grundgestell umbauen
   - Scharniere um 180° drehen und auf der anderen Schrankseite wieder montieren





3. Verschlusswinkel am Grundgestell umbauen
   - Verschlusswinkel um 180° drehen und auf der gegenüberliegenden Schrankseite wieder montieren



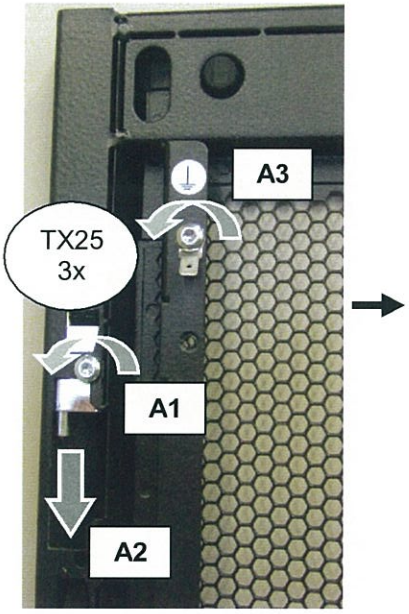
ENGLISH

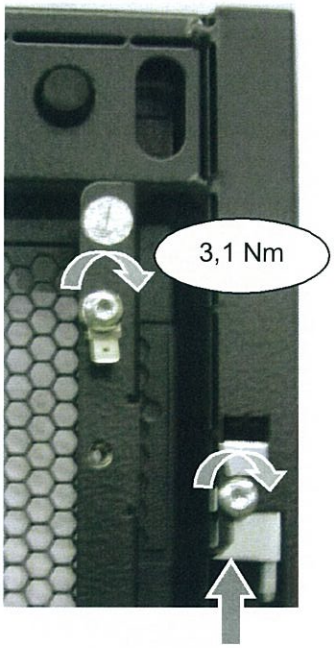
2. Reverse the hinges on the base frame
   - Turn the hinges by 180° and remount them on the other side of the rack

3. Reverse the locking bracket on the base frame
   - Turn the locking bracket by 180° and remount it on the opposite side of the rack

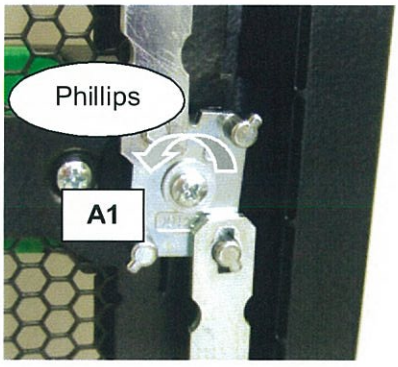
DEUTSCH

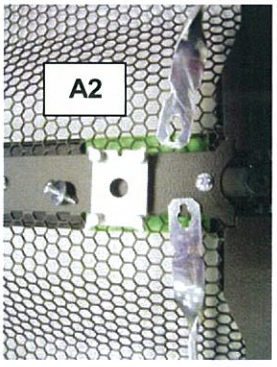
4. Scharniere und Erdungsstecker am Türblatt umbauen
   - Scharnierteil um 180° drehen und auf der anderen Türseite wieder montieren (A1, A2)
   - Erdungsstecker auf der gegenüberliegenden Schrankseite wieder montieren (A3)





5. Stangenführungen und Stangen umbauen
   - Wendekreuz abschrauben (A1)
   - Gestänge aushängen, dabei Wendekreuz leicht verdrehen, dass die Zapfen frei liegen (A2)
   - Stangenführungen und Stangen um 180° drehen und auf der anderen Türseite wieder montieren (A3)

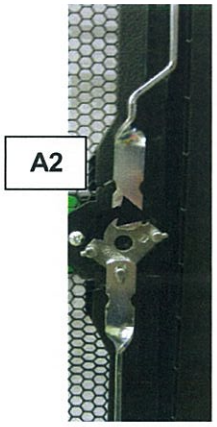




ENGLISH

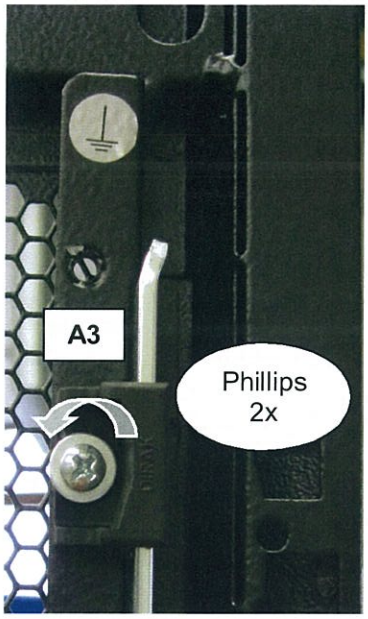
4. Reverse the hinges and earth plug on the door leaf
   - Turn the hinge by 180° and remount it on the other side of the door (A1, A2)
   - Remount the earth plug on the opposite side of the rack (A3)

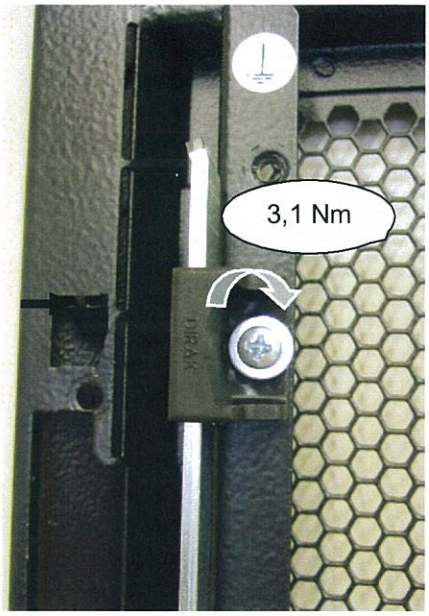
5. Reverse the rod guides and rods
   - Unscrew the reversing cross (A1)
   - Unhook the rods, while slightly turning the reversing cross, so that the pins lie freely (A2)
   - Turn the rod guides and rods by 180° and remount them on the other side of the door (A3)



DEUTSCH

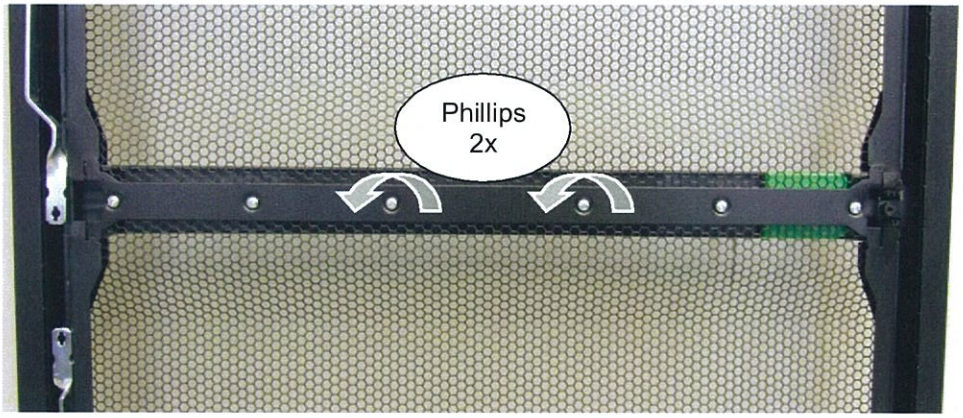
ENGLISH

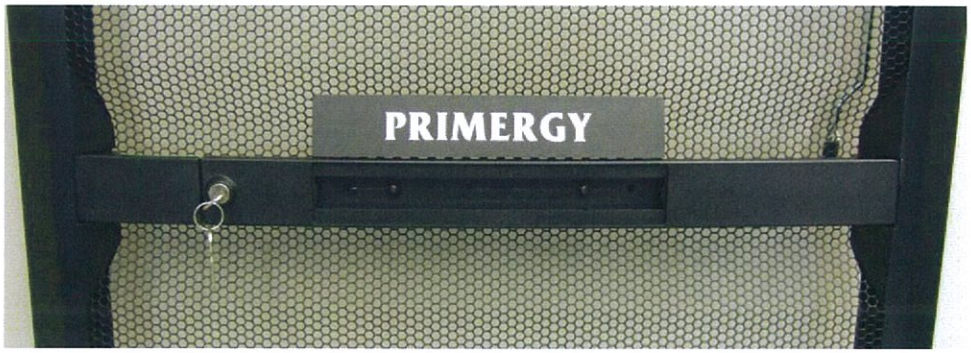




6. Logoblende abschrauben

6. Screw off the logo panel

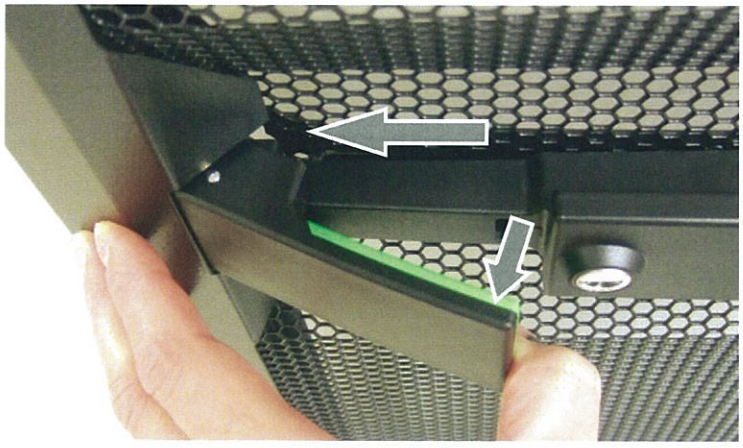




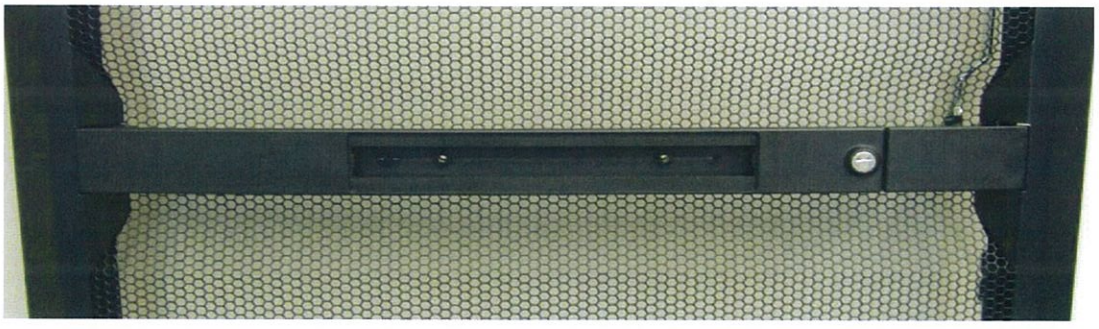
DEUTSCH

7. Befestigungsschrauben des Griffs lösen

8. Griff entnehmen
   - Handle bar nach links schieben, dabei Klappgriff anheben
   - Griff wird auf rechter Seite frei
   - Griff herausnehmen



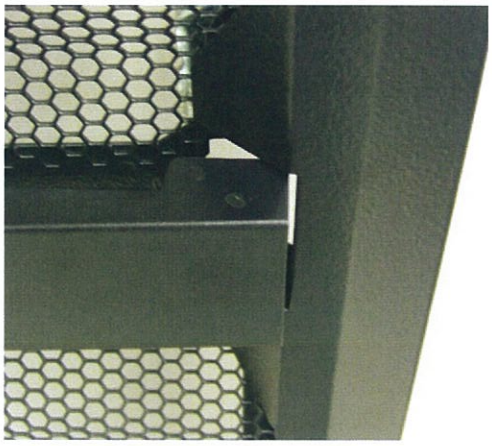
9. Griff um 180° drehen und wieder montieren



ENGLISH

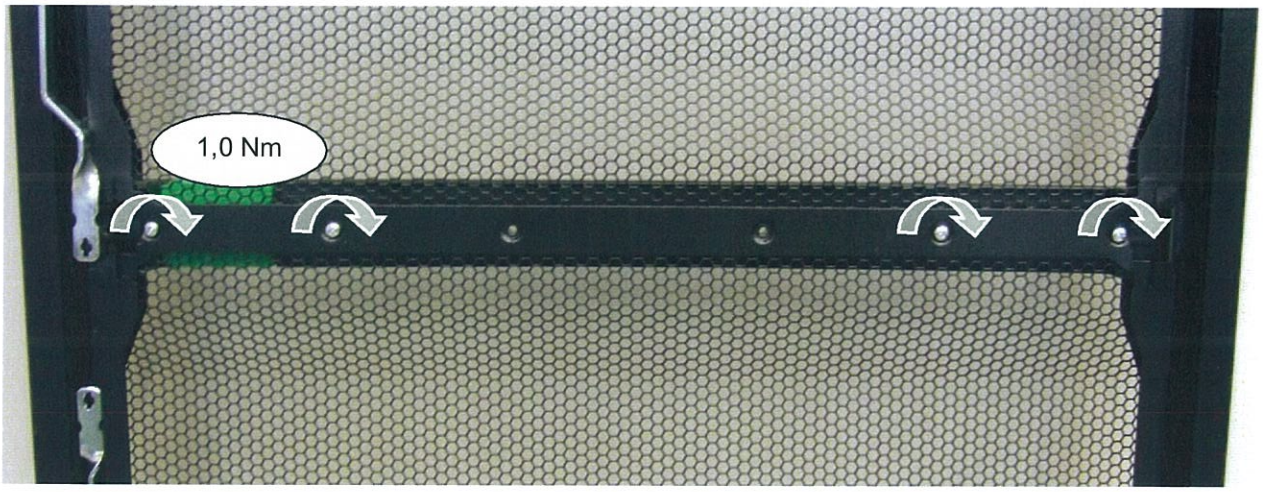
7. Loosen the screws of the handle

8. Remove the handle
   - Push the handle bar to the left, while lifting the hinged handle
   - Handle is released on the right side
   - Take out the handle

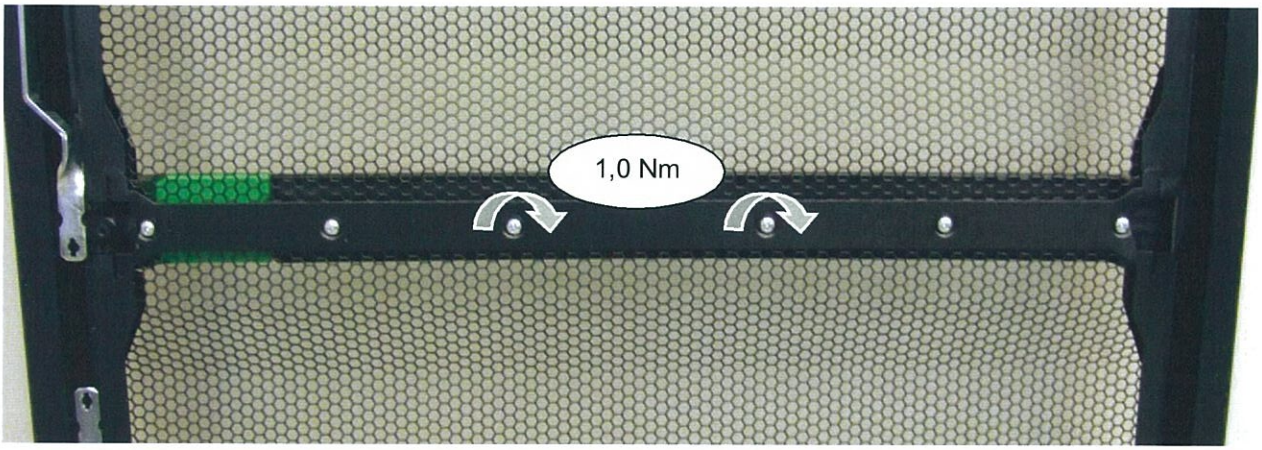


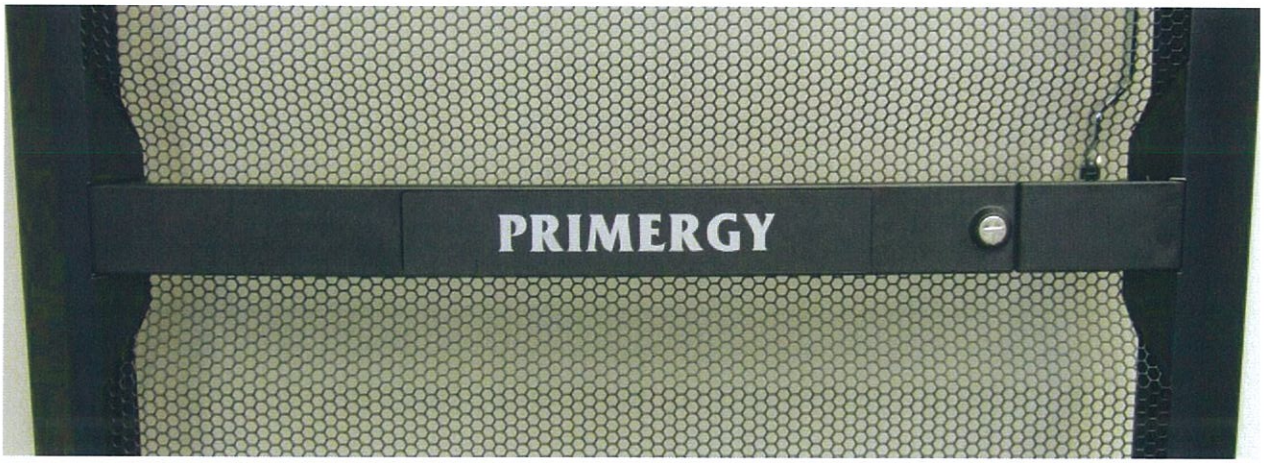
9. Turn the handle by 180° and remount it

DEUTSCH



10. Logoblende montieren





Bei der Montage der Logoblende auf gleichmässiges Spaltmaß links / rechts achten.

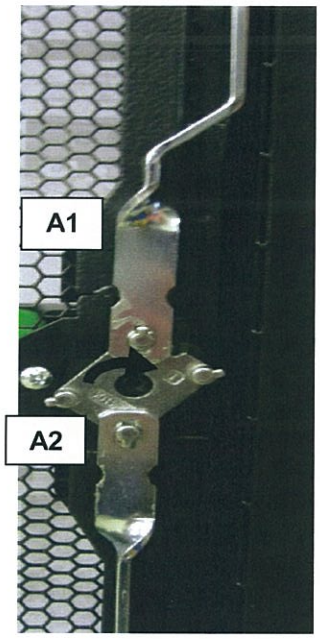
ENGLISH

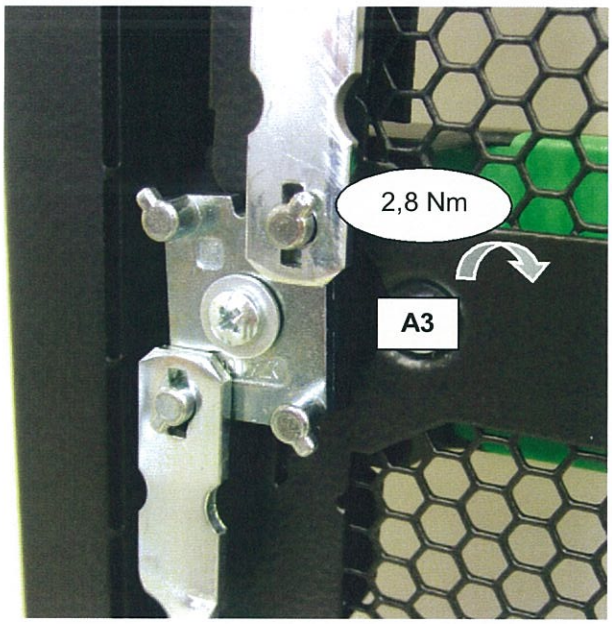
10. Install the logo panel

Respect the uniform gap widths left / right during istallation of the logo panel.

DEUTSCH

11. Wendekreuz wieder montieren
    - Wendekreuz leicht verdreht montieren und Gestänge einhängen (A1)
    - Wendekreuz in senkrechte Lage drehen (A2)
    - Wendekreuz anschrauben (A3)





12. Tür einhängen
    - Tür in umgekehrter Reihenfolge (siehe Punkt 1) einhängen

ENGLISH

11. Remount the reversing cross
    - Mount the reversing cross in a slightly rotated position and hook the rods (A1)
    - Turn the reversing cross to the upright position (A2)
    - Screw on the reversing cross (A3)

12. Hang the door
    - Hang the door in reverse order (see point 1)