



Annex B:

Requirements to be met by IT cabinets

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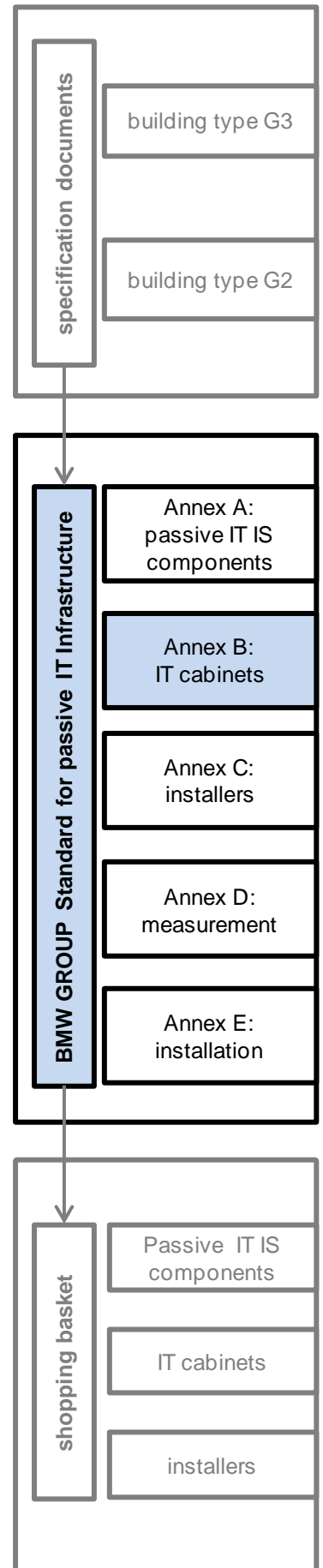


Table of Revisions

Version	Date	Modified chapters	Comments
1.0	June 1, 2006		Creation of document
1.1	May 31, 2008	3.8	Addition of new chapter
		All	Update
2.0	April 1, 2012		Modification of department designation at client side, document designation and of annex letters
		All	Update / Revision
4.0	April 30, 2016	All	Comprehensive update and revision of the standard and its annexes

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1 IT cabinets

For the structured IT cabling to meet the stringent availability and quality requirements in this area, too, only closed and open IT cabinets may be installed that are approved by the **BMW Group IT IS Function Datacenter Technology (Rechenzentrumstechnik)** at the time of implementation.

Please refer to the B2B portal of the BMW Group or the BMW Group IT intranet for a list of currently approved IT cabinets; you may request said information from these BMW units.

A distinction is made between the following areas of application and IT cabinets:

- IT cabinet for FD or BD rooms
 - o IT cabinet active-open
 - o IT cabinet passive-open
- IT cabinet EMC for BD room
- IT cabinet as FD for production environment (IP54)
 - o IT cabinet active-closed with fitted cooling unit
 - o IT cabinet passive-closed (assembled side by side with IT cabinet active-closed)
- IT cabinet for data centre
 - o IT cabinet for server
 - o IT cabinet active SFE (SFE = Scalability Flexibility Economy)
 - o IT cabinet passive SFE
- IT cabinet for NCC
 - o Active-open IT cabinet for NCC
 - o Passive-open IT cabinet for NCC

Comment:

The configurations for the various IT cabinets are listed as excerpts in the following chapters; for example, only one version is listed for "IT cabinet for data centre". Please refer to the "shopping basket for IT cabinets" for detailed requirements and all configurations, incl. the part numbers for all IT cabinets.

If an IT cabinet is prohibited for use during project implementation, approved back-up products are to be used in consultation with the BMW Group IT IS Function Datacenter Technology (Rechenzentrumstechnik).

If special solutions that deviate from the specifications laid down by BMW Group need to be installed, this must be coordinated in advance with the BMW Group IT IS Function Datacenter Technology (Rechenzentrumstechnik).



2 General requirements

The following requirements have to be met by the IT cabinets:

- Dimensions of IT cabinets (active, passive and EMC):
 - o Cabinet frame (HxWxD): (2,000x800x800) mm (excluding base)
 - o Base (HxWxD): 2x(100x800x800) mm incl. levelling screws (0-25 mm)
- Dimensions IT cabinets (data centre and NCC):
 - o Cabinet frame (HxWxD): (2,000x800x1,200) mm (excluding base)
 - o Alternative cabinet frame (HxWxD): (2,200x800x1,200) mm (excluding base)
 - o Optional base (HxWxD): (2x100x800x1,200) mm incl. levelling screws (0-25 mm)
- Material:
 - o sheet steel, all edges deburred properly
- Material thickness:
 - o Cabinet frame, roof panel, walls, base plate: ≥ 1.5 mm
 - o Door: ≥ 1.0 mm
 - o Side parts: ≥ 0.7 mm
 - o Mounting plate: ≥ 3.0 mm
- Surface:
 - o Cabinet frame: dip-primed or blank aluminium
 - o Door, roof, backplate (all visible surfaces): powder-coated
 - o Mounting plate and base plates: galvanized
 - o Resistant to oils, benzenes, alcoholic solvents
- Colour:
 - o General: RAL 7035
 - o Leipzig plant: RAL 9001
- Profile rails:

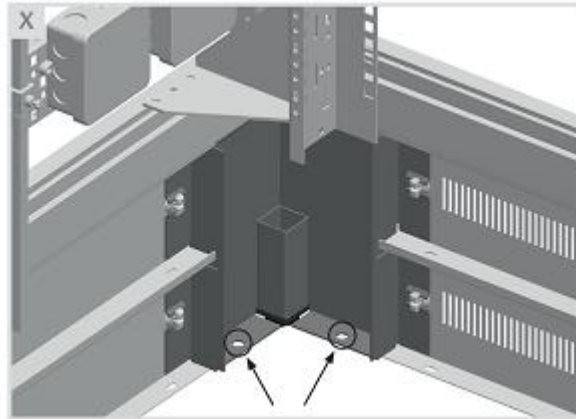
19" / 41 U at front and rear, variable-depth design, with chamfered edges; surface finish with continuous system perforation (hole spacing 25 mm according to DIN standard), for accommodating 19" mounting components, U(nit) designation
- All sections have chamfered edges.
- Possibility to mount components side by side in all directions
- All electrically conductive flat parts are earthed (incl. components for connecting all electrically conductive parts and mounting components to the equipotential bonding network); compliance with protective measures according to DIN VDE 0100-600
- Static load-bearing capacity of interior fittings: $\geq 1,500$ kg
- Roof panel, suited for customized cable entry, equipped with sliding panels for cable entry, cable entry sealing by means of rubber cable clamp strips or brush strips (for EMC IT cabinet with EMC roof panel)
- Lateral support (left and right) of horizontal cabling through the use of 4 x cable support rails (C profile) made of sheet steel and angle brackets (including plastic shims).
- 16 x shunting rings (300 x 80), 8 rings each fitted at the front left and right, distributed at regular intervals along the 19" profile rail.
- 1 x alignment bracket set for side-by-side assembly, incl. 6 m of sponge rubber to seal the cabinets when mounted side by side.

2.1 Additional requirements active IT cabinets

- IT cabinets that are positioned next to each other must be connected and aligned flush with alignment brackets.
- **All IT cabinets must be** particularly secured against tipping since there is pull-out shelving and they must be suitable for accommodating heavy-duty rails to secure heavy components, for example cooling units, (for instance, by fastening them to the floor properly).

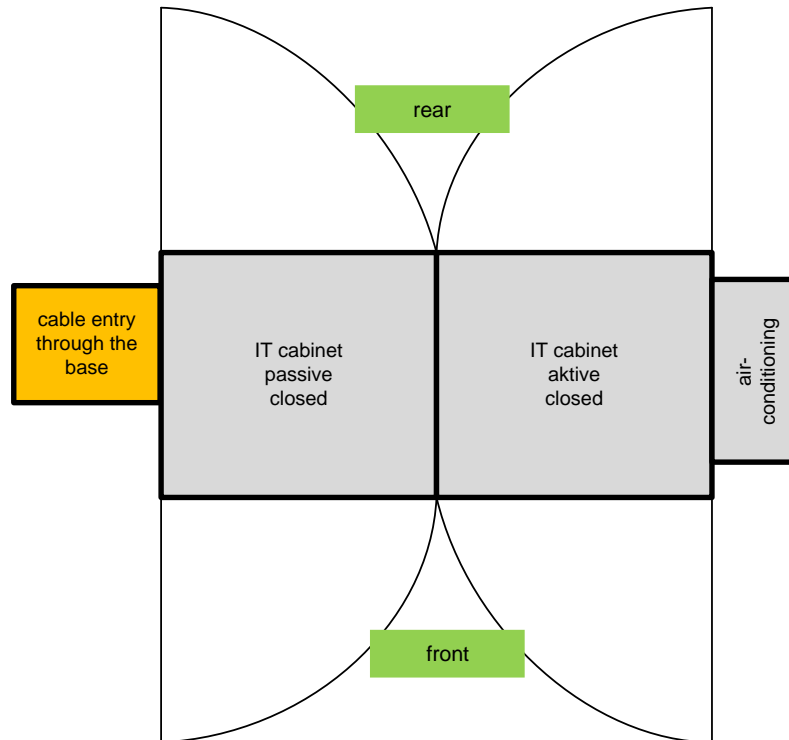
Comment:

IT cabinets must be secured in place in accordance with the instructions laid down in "**Annex E: Requirements installation**".



2.2 Additional requirements closed IT cabinets

- The "IT cabinets active-closed" and "IT cabinets passive-closed" have been prepared for air-conditioning. This requires at least the protection rating IP54. Care must be taken to ensure that the IT cabinets are sealed carefully and completely (in particular when several cabinets are mounted side by side).
- **Please make sure that this rating is complied with by means of small, flat cable entry glands (no bundling) for routing any horizontal and electrical connection cabling. (Please refer to "Annex E: Requirements installation")**
- Single-leaf front door, closed, 180° hinged; door must be hinged as shown in the following figure.
- Handle with toggle fastener suited for accommodating single-profile cylinders.
- 2 x door contact switches per IT cabinet fitted and prewired at the front and rear
- Cabling is routed into the IT cabinet from the left through the base (passive-closed IT cabinet).
- Base plate with three cable entry glands of a width of c. 3 cm, sealed with clamping profiles.
- Roof plate closed.



2.3 Equipotential bonding

- Every active IT cabinet must be equipped with two vertical equipotential bonding bars (earthing bars) for connecting the active IT IS components to the equipotential bonding network.
- Every passive IT cabinet must be equipped with at least one or two vertical earthing bars for connecting the passive IT IS components to the equipotential bonding network.
- In order to facilitate a short and low-impedance connection to the mounting components, this bar must allow for direct mounting to freely selectable 19" profile rails.

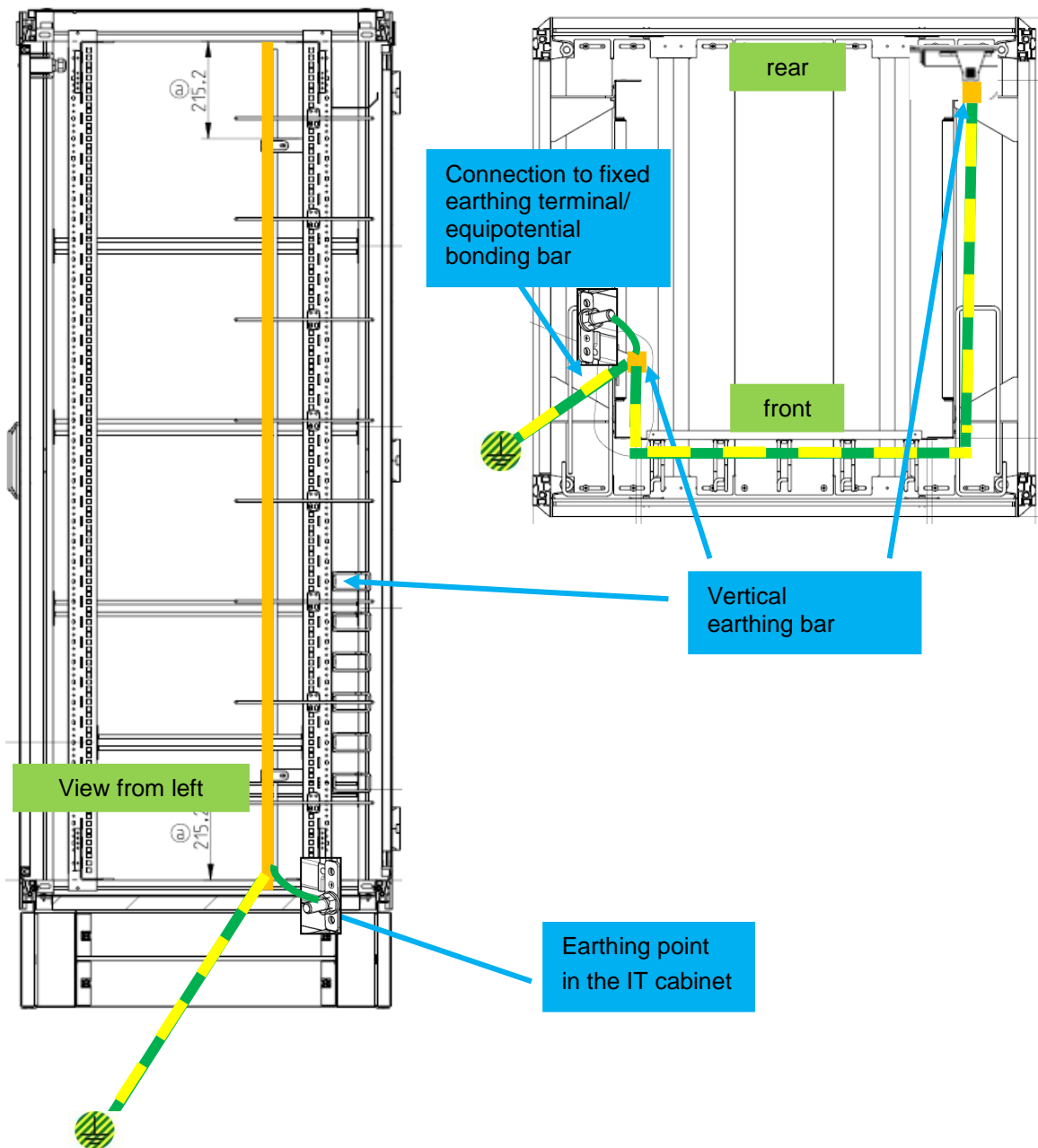
Technical data:

- o Material: copper
- o Length: $\geq 1,800$ mm
- o Cross-section: $\geq (15 \times 5)$ mm
- o Current-carrying capacity: ≥ 150 A
- o Suited for accommodating conductor connecting terminals 2.5-25 mm²
- The earthing point in the IT cabinet must be connected to the vertical earthing bar at the front left (Minimum area $A_{\min} = 25 \text{ mm}^2$, stranded wire design according to IEC 60228: at least fine-strand wire, class 5), which must be as short as possible.
- All metal parts must be connected to the basic frame to ensure electrical conductivity.
- IT cabinets and the relevant fixtures must be connected to the equipotential bonding network in accordance with the instructions laid down in "**Annex E: Requirements installation**".

Standard connection to the equipotential bonding network in IT cabinets:

Side view:

Top view:



Comment:

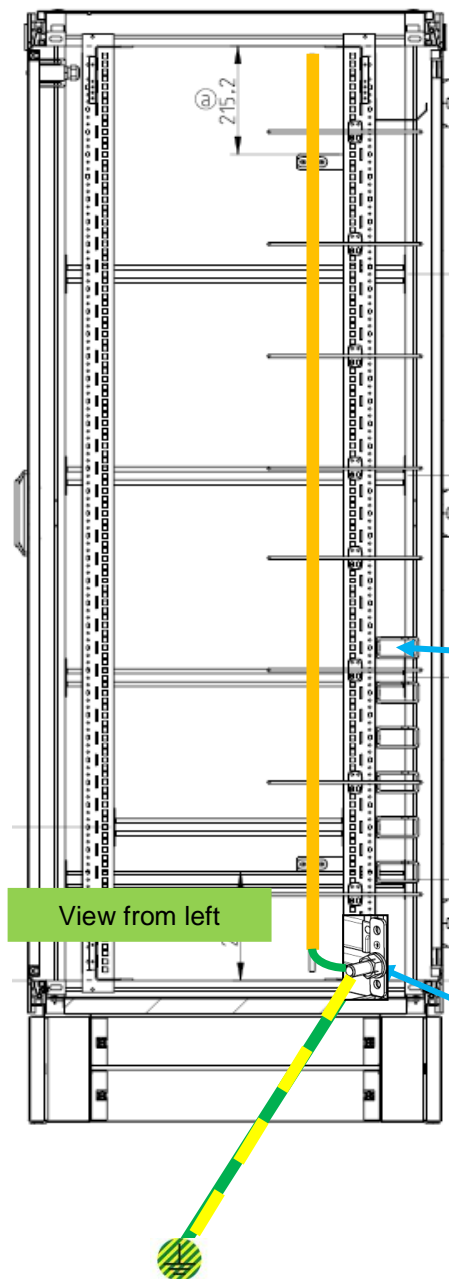
The vertical earthing bar at the front left must be connected to the fixed earthing terminal or equipotential bonding bar in the IT room, with $A_{\min} = 25 \text{ mm}^2$ (stranded wire design according to IEC 60228: at least fine-strand wire, class 5) and L being as short as necessary but with a maximum length of 5.0 m.

The second vertical earthing bar must be connected to the first vertical earthing bar, with $A_{\min} = 25 \text{ mm}^2$ (stranded wire design according to IEC 60228: at least fine-strand wire, class 5) and L being as short as necessary but with a maximum length of 2.0 m.

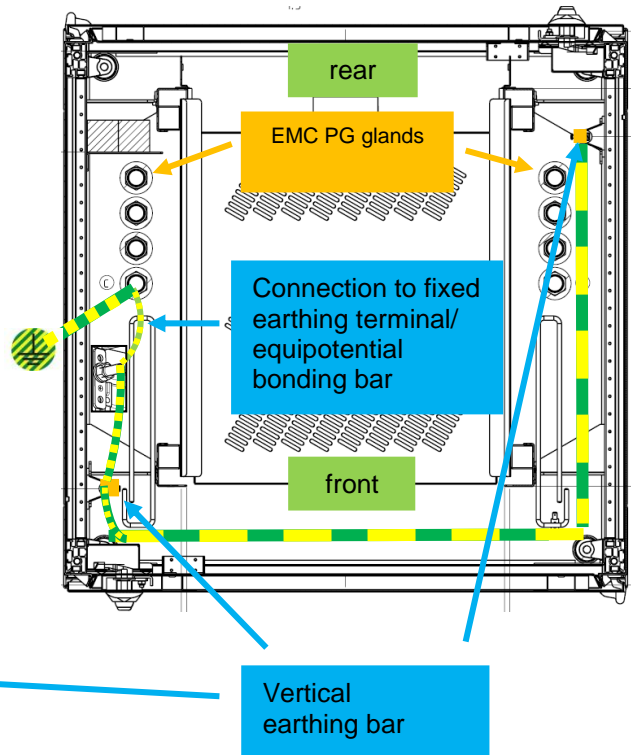
The fixed earthing terminal of the IT cabinet is connected directly to the vertical earthing bar at the front left, with $A_{\min} = 25 \text{ mm}^2$ (stranded wire design according to IEC 60228: at least fine-strand wire, class 5).

Connection to the equipotential bonding network in the "IT cabinet EMC for BD room":

Side view:



Top view:



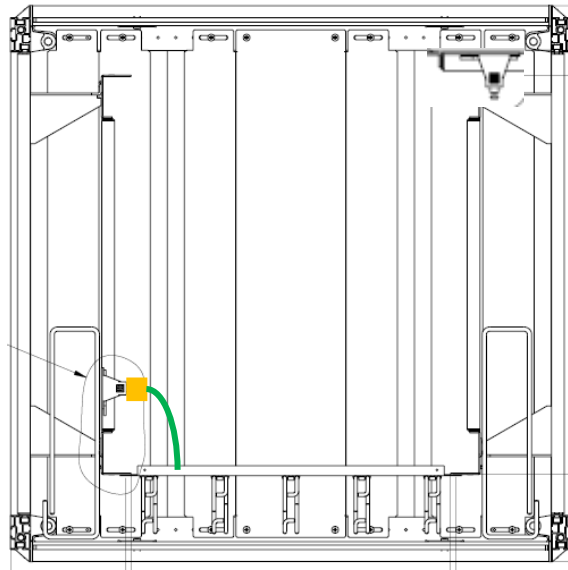
Comment:

The "earthing point in the IT cabinet" at the front left must be connected to the fixed earthing terminal or equipotential bonding bar in the IT room, with $A_{\min} = 25 \text{ mm}^2$ (stranded wire design according to IEC 60228: at least fine-strand wire, class 5) and L being as short as necessary but with a maximum length of 5.0 m. Entry is via the PG EMC gland without a conductive connection.

The vertical earthing bar at the front left must be connected directly to the earthing terminal, with $A_{\min} = 25 \text{ mm}^2$ (stranded wire design according to IEC 60228: at least fine-strand wire, class 5).

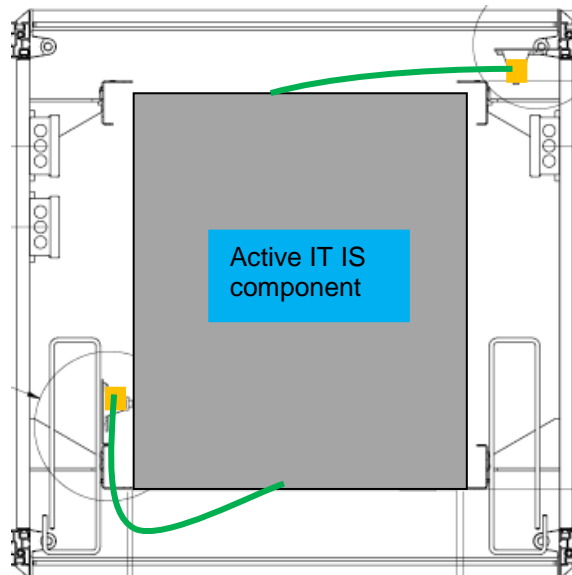
The second vertical earthing bar must be connected to the first vertical earthing bar, with $A_{\min} = 25 \text{ mm}^2$ (stranded wire design according to IEC 60228: at least fine-strand wire, class 5) and L being as short as necessary but with a maximum length of 2.0 m.

Connection of patch panels for passive Cu IT IS components to the vertical earthing bar:



Specifications:
A = min. 6 mm²
L = max. 15 cm

Connecting the active IT IS component to the vertical earthing bar:



Specifications:
A = min. 6 mm²
**L = as short as necessary, depending on the connection options
(front or rear to the active IT IS component)**

3 IT cabinet for FD or BD rooms (Depth: 800mm)

3.1 IT cabinet active-open (Depth: 800 mm)

Application:

- "IT cabinet active-open" for accommodating active IT IS components, including the fibre optic patch panels (active design) required for connection and, if required, additional passive IT IS components (combined version)
- Use in floor distributors (FD), building distributors (BD)
- Open version for installation within IT rooms
- For accommodating active and, if required, additional passive IT IS components

Mounting:

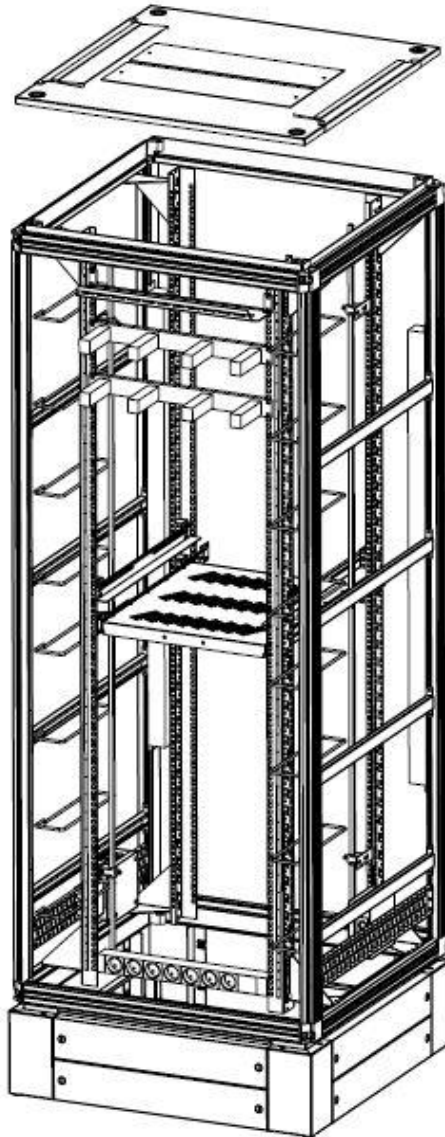
In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- 1 x mounting rail, mounted at 22U from underneath
- 1 x 19" intermediate shelf, pull-out design, mounted at 20U from underneath
- 1 x 19" cable trough, 1U, mounted at U40
- 2 x fibre-optic patch cable management, mounted at U37 and U34
- 2 x multifunctional braces, mounted deep to provide support and universal mounting 100 mm above the lower basic frame
- 2 x cable socket 140x140x79mm XA/XB for PDUs
- 2 x pieces on the left-hand multifunctional brace at the rear
- 1 x piece mounted on the right-hand multifunctional brace at the rear
- 1 x service outlet block (c. 7 outlets) on 1U, mounted from underneath and wired to cable outlet XC
- 2 x C profile rail L430, 1 rail each on the left and right between the front and the rear 19" profile
- 8 x C profile rail L655, 4 rails each on the left and right

Additional requirements:

- This version must be suited for accommodating heavy-duty rails for supporting heavy components (server, UPS). (Anti-tipper!)
- 2 x earthing bars, 41U, front left and rear right, fitted behind the 19" profile with 20 contact terminals each
- Installation of socket blocks
2 x PDU 3 x16A C20 / 3 x C19 + 9 x C13 + 9 x Schuko safety sockets

Assembly drawing for "IT cabinet active-open":



(Source: Emerson Network Power)

3.2 IT cabinet passive-open (Depth: 800 mm)

Application:

- "IT cabinet passive-open" for accommodating exclusively passive IT IS components (in particular copper and fibre optic patch panels)
- Use in floor distributors (FD), building distributors (BD)
- Open version for installation within IT rooms

Mounting:

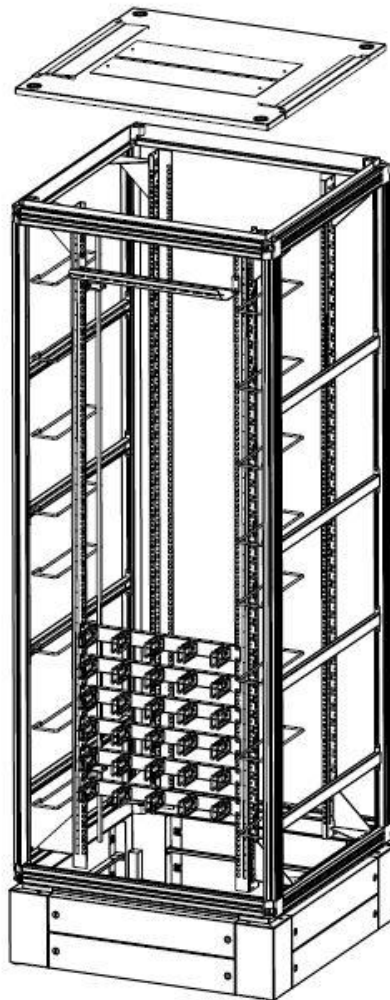
In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- 1 x 19" cable trough, 1U mounted at U40
- 6 x 19" cable management panels, 1U, mounted at U5, 7, 9, 11, 13 and U15 from underneath
- 8 x C profile rail L655, 4 rails each on the left and right
- 2 x C profile rail L430, 1 rail each on the left and right between the front and the rear 19" profile

Additional requirements:

- 1 x earthing bar, 41U, front left, fitted behind the 19" profile with 20 contact terminals
- 1 x alignment bracket set

Assembly drawing for "IT cabinet passive-open":



(Source: Emerson Network Power)

4 IT cabinet EMC for BD room (Depth: 800mm)

Application:

- "IT cabinet EMC for BD room" for accommodating active IT IS components (if required, including the fibre-optic patch panels necessary for connection)
- Used exclusively in building distributors (BD) that do not have any room shielding

EMC requirements

- The "EMC IT cabinet for BD room" has to have a shield attenuation value of ≥ 40 dB against the magnetic field in the frequency range from 25 kHz to 4 MHz .
- Proof of shielding effectiveness according to IEC 61587-3, VG95373/T15 has to be furnished through an accredited test laboratory in accordance with DIN EN ISO/IEC 17025.
- Current-carrying lines must be shielded. The shield must be installed in contact with the EMC PG gland upon entry into the "IT cabinet EMC for BD room" for ensuring electrical conductivity (**please refer to "Annex E: Requirements installation"**)
- In a normal application scenario, we proceed from the assumption that the second power supply is provided through UPS and that there is therefore no need for a second surge protection box (ÜSS-Box). If this does not apply, a second surge protection box (ÜSS-Box) is required.

Mounting:

In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- 1 x mounting rail, mounted at 22U from underneath
- 1 x 19" intermediate shelf, pull-out design, mounted at 20U from underneath
- 1 x 19" cable trough, 1U mounted at U40
- 2 x fibre optic patch cable management, mounted at U37 and U34
- 2 x base covers for the front and rear, with ventilation slots and holders for filter mats
- 8 x multifunctional rails T800 L655, 4 pieces each on the left and right
lowermost multifunctional braces mounted deep for cable support and universal mounting, fitted 100 mm above the lower basic frame

Requirements to be met by triple fan unit:

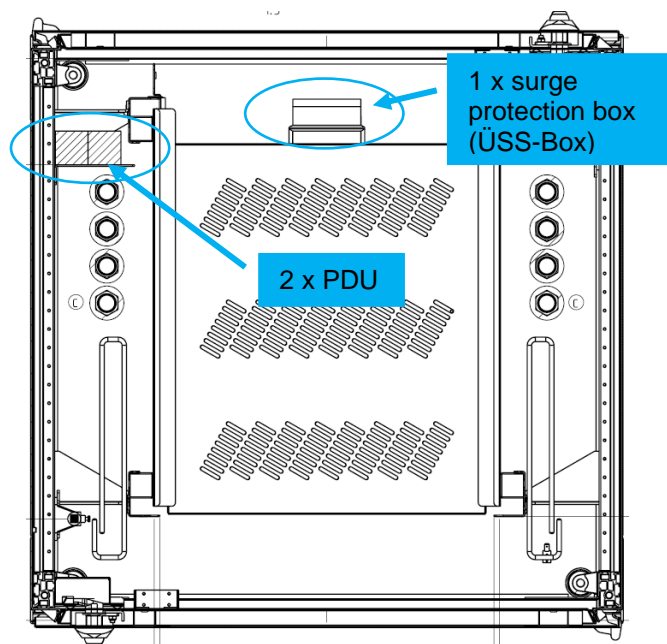
- Noise level: ≤ 50 dB(A) at maximum speed control
- Speed regulation 30 to 100 %, when sensor breaks, 100 % speed
- Monitoring of individual fans
- Zero-potential collective alarm output for overtemperature and fan failure



(Source: Emerson Network Power)

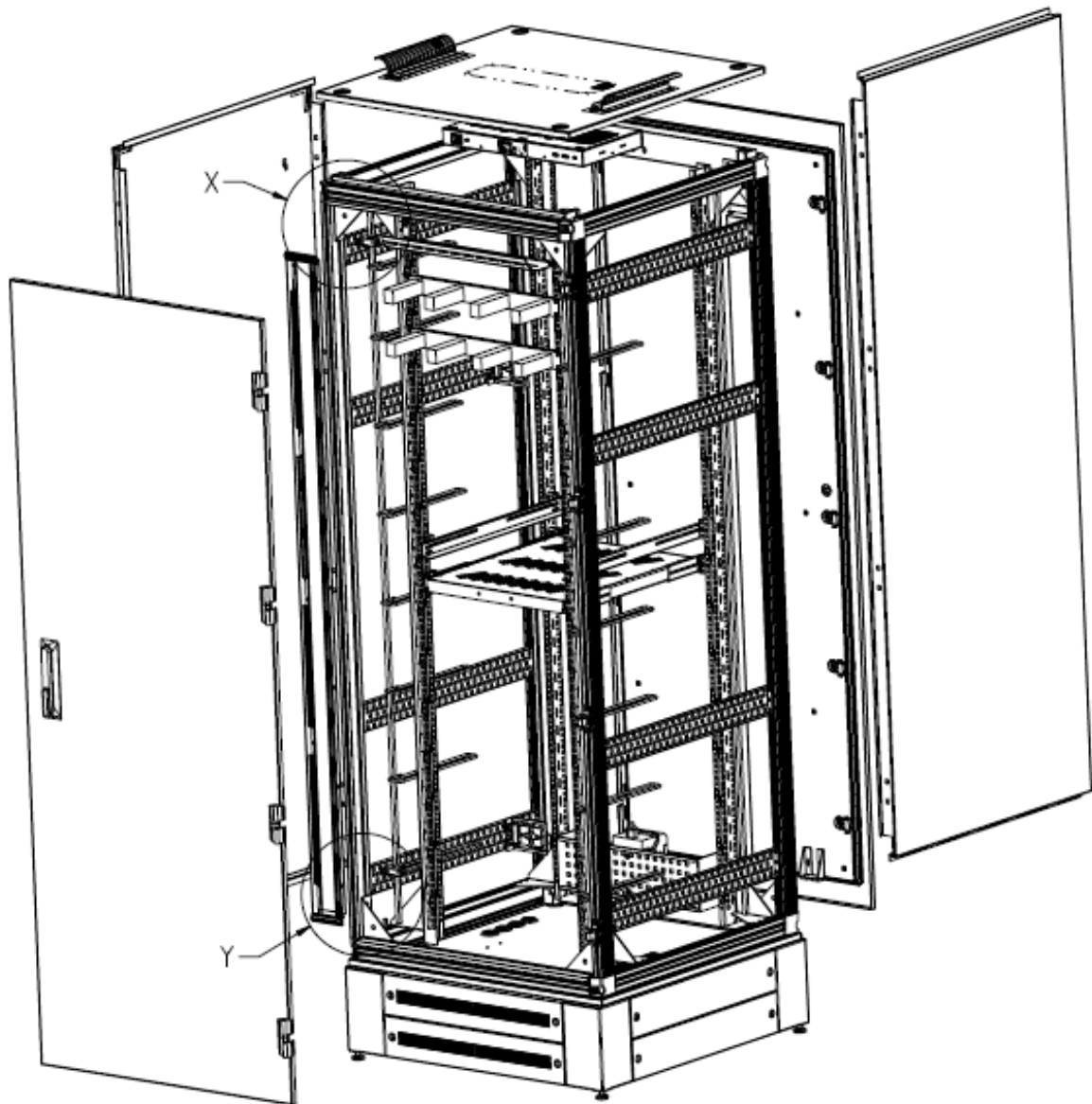
Additional requirements:

- This version must be suited for accommodating heavy-duty rails for supporting heavy components (server, UPS). (Anti-tipper!)
- 2 x earthing bars, 41U, front left and rear right, fitted behind the 19" profile with 20 contact terminals each
- Installation of outlet blocks at the rear left
2 x PDU 3 x 16A C20 / 3 x C19 + 9 x C13 + 9 x Schuko safety sockets, only 2 x 230V connected in each case
- 1 x surge protection box (ÜSS-Box) equipped with 3 x surge protection box modules at the rear 19" profile, fitted at U1-3 to ensure that it does not protrude beyond the 19" level, incl. three connection cables from the surge protection module (ÜSS-Modul) to the PDU (standard power supply)
- Optional second surge protection box (ÜSS-Box) if there is no power supply via UPS or the distance to the UPS is overly large.
- Base panel with ventilation grid and filter mat at the front centre
- 6x EMC PG glands for feeding power cables
- 1x EMC PG gland as back-up
- 1x PG gland for connection to equipotential bonding (left)
- Roof panel with an EMC-proof cable entry gland 60 x 150 mm, including 2 mounting brackets



(Source: Emerson Network Power)

Assembly drawing for "IT cabinet EMC for BD room":



(Source: Emerson Network Power)

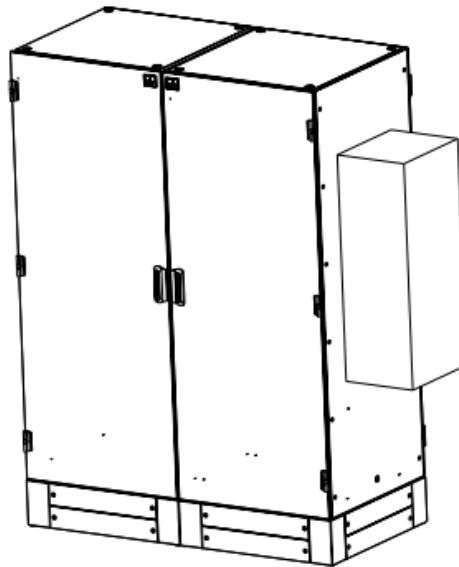
Comment:

As far as the power supply of the "EMC IT cabinet for BD room" is concerned, the type III surge arresters must be used in combination with type II and type I arresters within the framework of the energy-coordinated overall concept so as to ensure optimum protection. In addition, please ensure that the thermostat of the triple fan unit is set to 27.0°C.

5 IT cabinet as FD for production environment (IP54) (Depth: 800 mm)

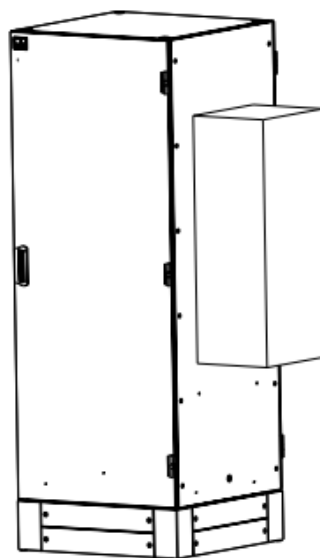
Normal scenario (80 - 240 data cables):

- Use as floor distributor (FD) in production environment
- The "IT cabinet active-closed with integrated cooling unit" and the "IT cabinet passive-closed" must always be planned and used as a pair.



Exception (< 80 data cables):

- One "IT cabinet active-closed with integrated cooling unit" will be sufficient for a maximum number of 79 copper data cables.
- Potential subsequent cabling should be taken into account when IT cabinets are selected.



5.1 IT cabinet active-closed with integrated cooling unit (Depth: 800mm)

Mounting:

In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- Lockable from the front and the rear
- Side panels can only opened from the inside, or side panels can be locked
- 1 x mounting rail, mounted at 22U from underneath
- 1 x 19" intermediate shelf, pull-out design, mounted at 20U from underneath
- 1 x 19" cable trough, 1U, mounted at U40
- 2 x fibre optic patch cable management, mounted at U37 and U34
- 2 x multifunctional braces, mounted deep to provide support and universal mounting 100 mm above the lower basic frame
- 2 x cable socket 140x140x79mm XA/XB for PDUs
- 1x cable outlet 94x94x57mm XC for cooling unit and service outlet block
- 2 x pieces on the left-hand multifunctional brace at the rear
- 1 x piece mounted on the right-hand multifunctional brace at the rear
- 1 x service outlet block (c. 7 outlets) on 1U, mounted from underneath and wired to cable outlet XC
- 2 x C profile rail L430, 1 rail each on the left and right between the front and the rear 19" profile
- 8 x C profile rail L655, 4 rails each on the left and right

Additional requirements:

- This version must be suited for accommodating heavy-duty rails for supporting heavy components (server, UPS). (Anti-tipper!)
- 2 x earthing bars, 41U, front left and rear right, fitted behind the 19" profile with 20 contact terminals each
- Installation of outlet blocks
2 x PDU 3 x16A C20 / 3 x C19 + 9 x C13 + 9 x Schuko safety sockets prewired to XA and XB

Requirements cooling unit:

- Mounted on the right of the "IT cabinet active-closed"
- The power supply cables and the control cables (door contacts) of the cooling unit must be delivered with commercial connectors.
No clamping connection!!
- Remote control via cabinet management system
- Switching off when doors are opened
- Effective cooling power depending on the heat losses of active technology, ambient temperature, and the maximum permissible operating temperature of active technology and the passive IT IS components:
 - o Cooling unit 1: 3 kW / 230 V
- Integrated electrical condensate evaporation including safety overflow (comment: a stationary drain must be provided in order to drain the condensate in case the electrical condensate evaporation fails).
- Integrated fine filter mat (possibility to fit an additional coarse and metal filter)
- Electronic filter mat monitoring



(Source: Emerson Network Power)

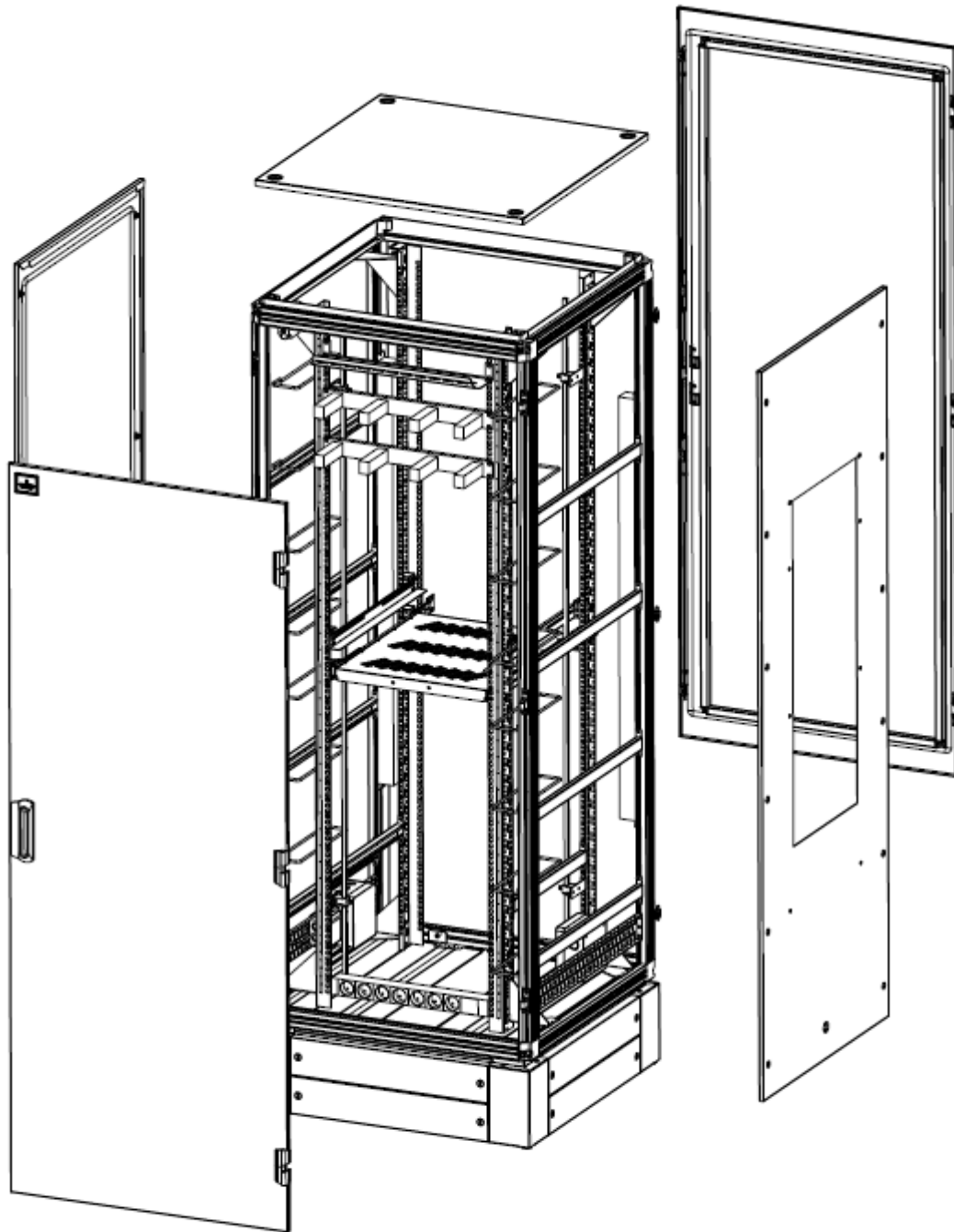
Comment:

It is the planner's responsibility to provide for sufficient heat dissipation.

The power supply lines of the cooling unit must be disconnected in the event of a disruption without the use of tools. In addition, please ensure that the temperature of the cooling unit is set to 27.0°C and that data input is protected by a code.

The IT cabinet active-closed with add-on cooling unit must be particularly secured against tipping (for example, by fastening it to the floor properly). Moreover, the binding instructions provided by the cabinet manufacturer regarding the securing of IT cabinets must be taken into account. (Please refer to Annex E: Requirements installation)

Assembly drawing for IT cabinet active-closed with integrated cooling unit":



(Source: Emerson Network Power)

5.2 IT cabinet passive-closed (mounted side by side to active-closed IT cabinet) (Depth: 800mm)

Application:

- "IT cabinet passive-closed" for accommodating exclusively passive IT IS components (in particular copper and fibre optic patch panels)
- Closed version (without side walls due to mounting side by side of "active-closed IT cabinet") for installation outside IT rooms

Mounting:

In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- 1 x 19" cable trough, 1U mounted at U40
- 6 x 19" cable management panels, 1U, mounted at U5, 7, 9, 11, 13 and U15 from underneath
- 8 x C profile rail L655, 4 rails each on the left and right
- 2 x C profile rail L430, 1 rail each on the left and right between the front and the rear 19" profile

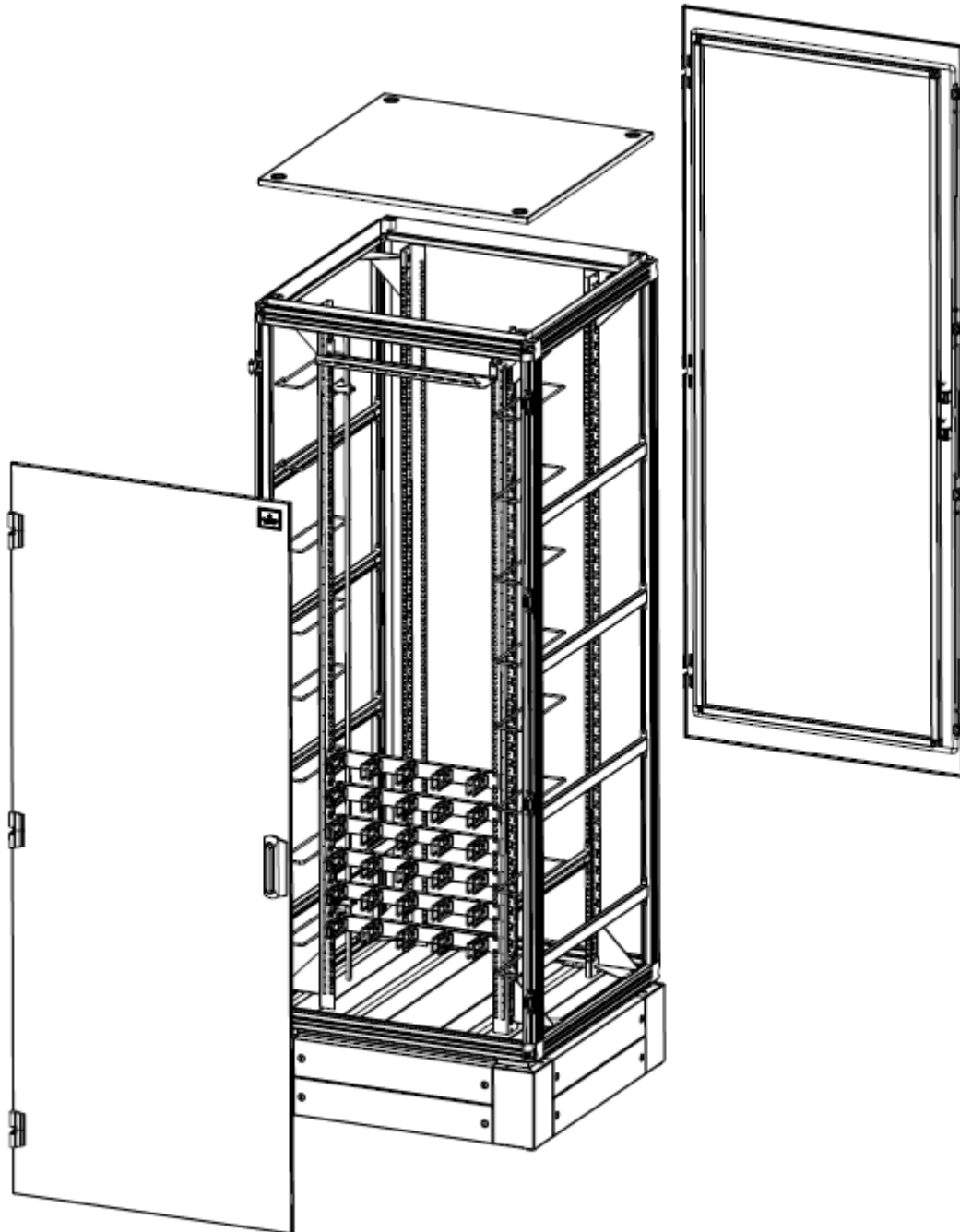
Additional requirements:

- 1 x earthing bar, 41U, front left, fitted behind the 19" profile with 20 contact terminals
- 1 x alignment wheel bracket set, incl. sealing material (IP54)

Comment on the application:

When a "IT cabinet passive-closed" and an "IT cabinet active-closed" are mounted side by side, the left side wall of the "IT cabinet active-closed" is attached to the left side of the "IT cabinet passive-closed".

Assembly drawing for "IT cabinet passive-closed":



(Source: Emerson Network Power)

6 IT cabinet for server (Depth: 1,200 mm)

Application:

- IT cabinet for accommodating active IT IS components (if required, including the fibre optic patch panels necessary for connection)
- For use in data centres and server rooms

Mounting:

In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- Lateral and horizontal air separation with additional vertical 3x2U per side
- 41/46x 1U blind covers for tool-free mounting fitted at the front 19" profile
- 4 multifunctional braces, deep to provide cable support and universal mounting
- 4 x C profile rail T1200, 2 pieces each mounted on the left and right on the topmost and third multifunctional brace from the top
- 6 x shunting rings 300x80/280x58, three per side, mounted on the rear 19" profile
- 6 x shunting rings 86x86/76x76, three per side, mounted on the rear 19" profile

Additional requirements:

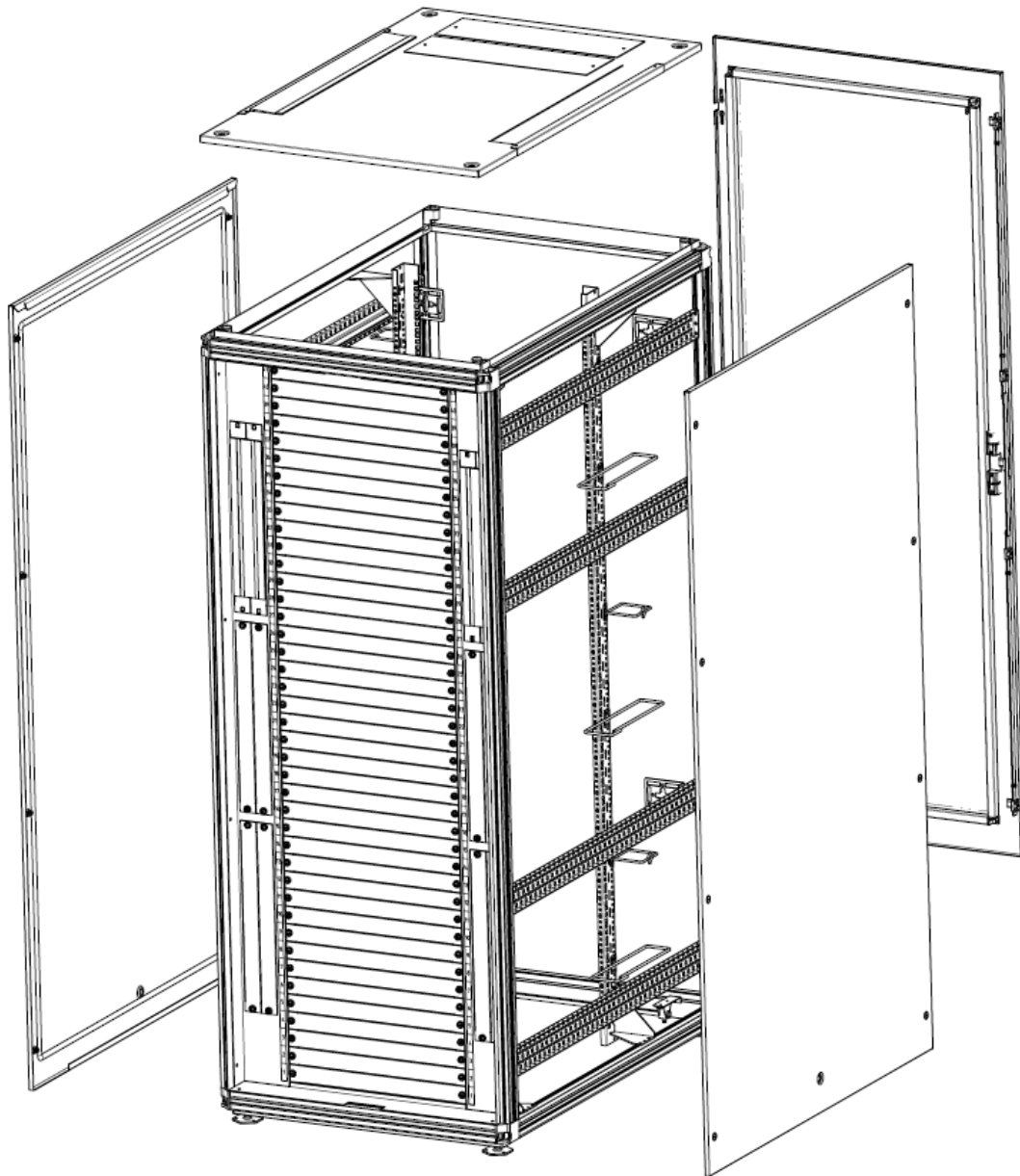
- This version must be suited for accommodating heavy-duty rails for supporting heavy components (server, UPS). (Anti-tipper!)
- 2 x earthing bars, 41U, front left and rear right, fitted behind the 19" profile with 20 contact terminals each
- Cover with cable entry gland
- 1 x alignment bracket set
- Installation of 19" socket blocks:
 - o as passive cabinet without socket block
 - o For data centres, the installation of the following socket blocks is standard:
2x PDU 3x16A C20 / 27xC13
 - o Alternatively, data centres can also be equipped with socket blocks with remote managed Ampere meters.

Comment:

If there is no raised floor in a NCC / server room, the following base must be provided in addition for the "IT cabinet for servers":

- **Base H200, with levelling screws (0-25 mm):**
2 x base covers on the side, closed
2 x base covers for the front and rear, closed

Assembly drawing for "IT cabinet for servers":



(Source: Emerson Network Power)

7 IT cabinet for NCC (Depth: 1,200 mm)

7.1 IT cabinet active-open for NCC (Depth: 1,200 mm)

Application:

- "IT cabinet active open for NCC" for accommodating active IT IS components, including the fibre optic patch panels (active design) required for connection and, if required, additional passive IT IS components (combined version)
- Use in network control centre (NCC)
- **Open design without base!**
- For accommodating active and, if required, additional passive IT IS components

Mounting:

In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- 1 x mounting rail, mounted at 22U from underneath
- 1 x 19" intermediate shelf, pull-out design, mounted at 20U from underneath
- 1 x 19" cable trough, 1U, mounted at U40
- 2 x fibre optic patch cable management, mounted at U37 and U34
- 2 x multifunctional braces, mounted deep to provide support and universal mounting 100 mm above the lower basic frame
- 2 x cable socket 140x140x79mm XA/XB for PDUs
- 2 x pieces on the left-hand multifunctional brace at the rear
- 1 x piece mounted on the right-hand multifunctional brace at the rear
- 1 x service outlet block (c. 7 outlets) on 1U, mounted from underneath and wired to cable outlet XC
- 2 x C profile rail L430, 1 piece each left and right between the front and the rear 19" profile
- 8 x C profile rail L655, 4 rails each on the left and right

Additional requirements:

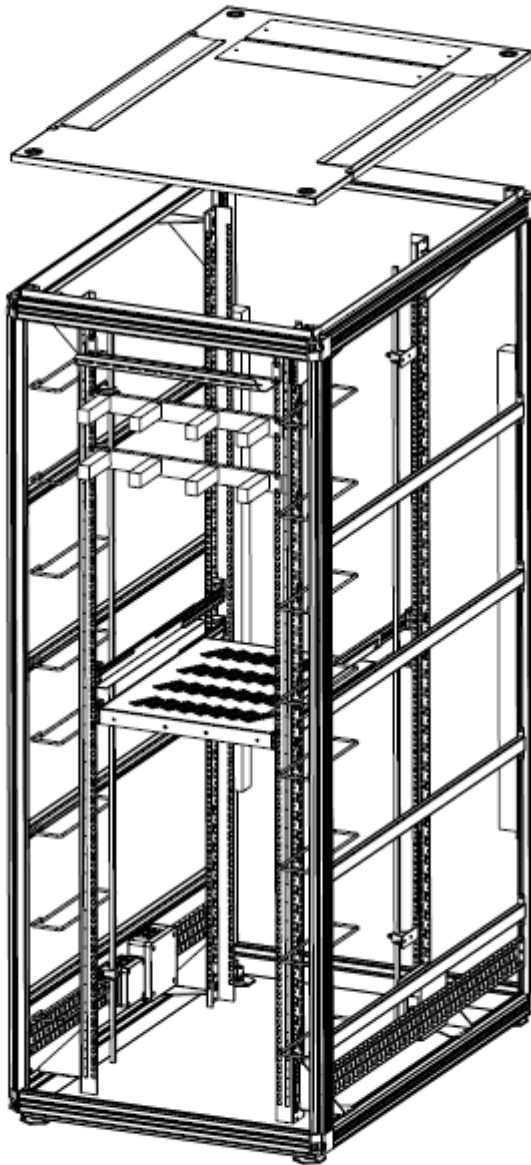
- This version must be suited for accommodating heavy-duty rails for supporting heavy components (server, UPS). (Anti-tipper!)
- 2 x earthing bars, 41U, front left and rear right, fitted behind the 19" profile with 20 contact terminals each
- Installation of socket blocks
2 x PDU 3 x16A C20 / 3 x C19 + 9 x C13 + 9 x Schuko safety sockets

Comment:

If there is no raised floor in a NCC / server room, the following base must be provided in addition for the "IT cabinet active-open for NCC":

- **Base H200, with levelling screws (0-25 mm):**
 2 x base covers on the side, closed
 2 x base covers for the front and rear, closed

Assembly drawing for "IT cabinet active-open for NCC"



(Source: Emerson Network Power)

7.2 IT cabinet passive-open for NCC (Depth: 1,200 mm)

Application:

- "IT cabinet passive-open for NCC" for accommodating exclusively passive IT IS components (in particular copper and fibre optic patch panels)
- Use in network control centre (NCC)
- **Open design without base**

Mounting:

In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- 1 x 19" cable trough, 1U mounted at U40
- 6 x 19" cable management panels, 1U, mounted at U5, 7, 9, 11, 13 and U15 from underneath
- 8 x C profile rail L655, 4 rails each on the left and right
- 2 x C profile rail L430, 1 rail each on the left and right between the front and the rear 19" profile

Additional requirements:

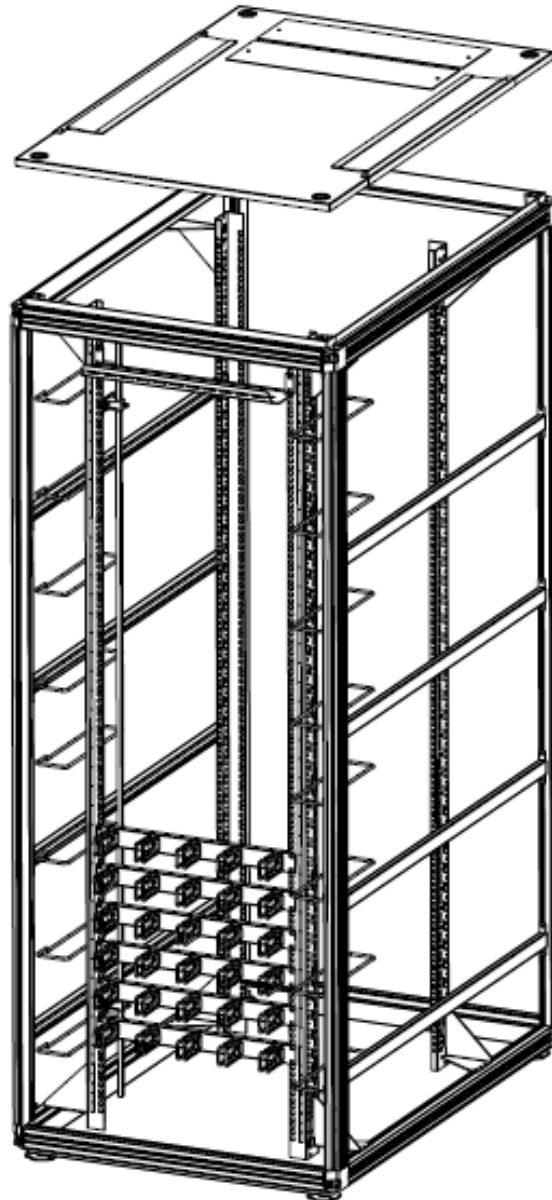
- 1 x earthing bar, 41U, front left, fitted behind the 19" profile with 20 contact terminals
- 1 x alignment bracket set

Comment:

If there is no raised floor in a NCC / server room, the following base must be provided in addition for the "IT cabinet passive-open for NCC":

- **Base H200, with levelling screws (0-25 mm):**
 - 2 x base covers on the side, closed**
 - 2 x base covers for the front and rear, closed**

Assembly drawing for "IT cabinet passive-open for NCC"



(Source: Emerson Network Power)

8 IT cabinet special structures

8.1 IT cabinet with roof fan unit (Depth: 800mm)

Comment:

This IT cabinet is not permitted for general use. The use of the "IT cabinet with roof fan unit" is only permitted after a written approval has been obtained from the BMW Group IT IS Function Datacenter Technology (Rechenzentrumstechnik).

Application:

- "IT cabinet with roof fan unit" that uses fan systems for cooling purposes. (for example, special ventilation panels in the roof area with speed-controlled DC fans)
- Used as floor distributor (FD) in central areas (for example, office or laboratory environments) in which only low noise levels can be tolerated

Mounting:

In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- without any integrated base plates (so that air can be taken in through the base)
- Lockable from the front and the rear
- Side panels can only opened from the inside, or side panels can be locked
- 1 x mounting rail, mounted at 22U from underneath
- 1 x 19" intermediate shelf, pull-out design, mounted at 20U from underneath
- 1 x 19" cable trough, 1U, mounted at U40
- 2 x fibre optic patch cable management, mounted at U37 and U34
- 2 x multifunctional braces, mounted deep to provide support and universal mounting 100 mm above the lower basic frame
- 2 x cable socket 140x140x79mm XA/XB for PDUs
- 1 x cable socket 94x94x57mm XC for service outlet block
- 2 x pieces on the left-hand multifunctional brace at the rear
- 1 x piece mounted on the right-hand multifunctional brace at the rear
- 1 x service outlet block (c. 7 outlets) on 1U, mounted from underneath and wired to cable outlet XC
- 2 x C profile rail L430, 1 rail each on the left and right between the front and the rear 19" profile
- 8 x C profile rail L655, 4 rails each on the left and right

Additional requirements:

- This version must be suited for accommodating heavy-duty rails for supporting heavy components (server, UPS). (Anti-tipper!)
- 2 x earthing bars, 41U, front left and rear right, fitted behind the 19" profile with 20 contact terminals each
- Installation of outlet blocks
2 x PDU 3 x16A C20 / 3 x C19 + 9 x C13 + 9 x Schuko safety sockets prewired to XA and XB

Requirements to be met by the roof fan unit:

- Noise level: ≤ 50 dB(A) at maximum speed control
- Speed regulation 30 to 100 %, when sensor breaks, 100 % speed
- Monitoring of individual fans
- Zero-potential collective alarm output for overtemperature and fan failure

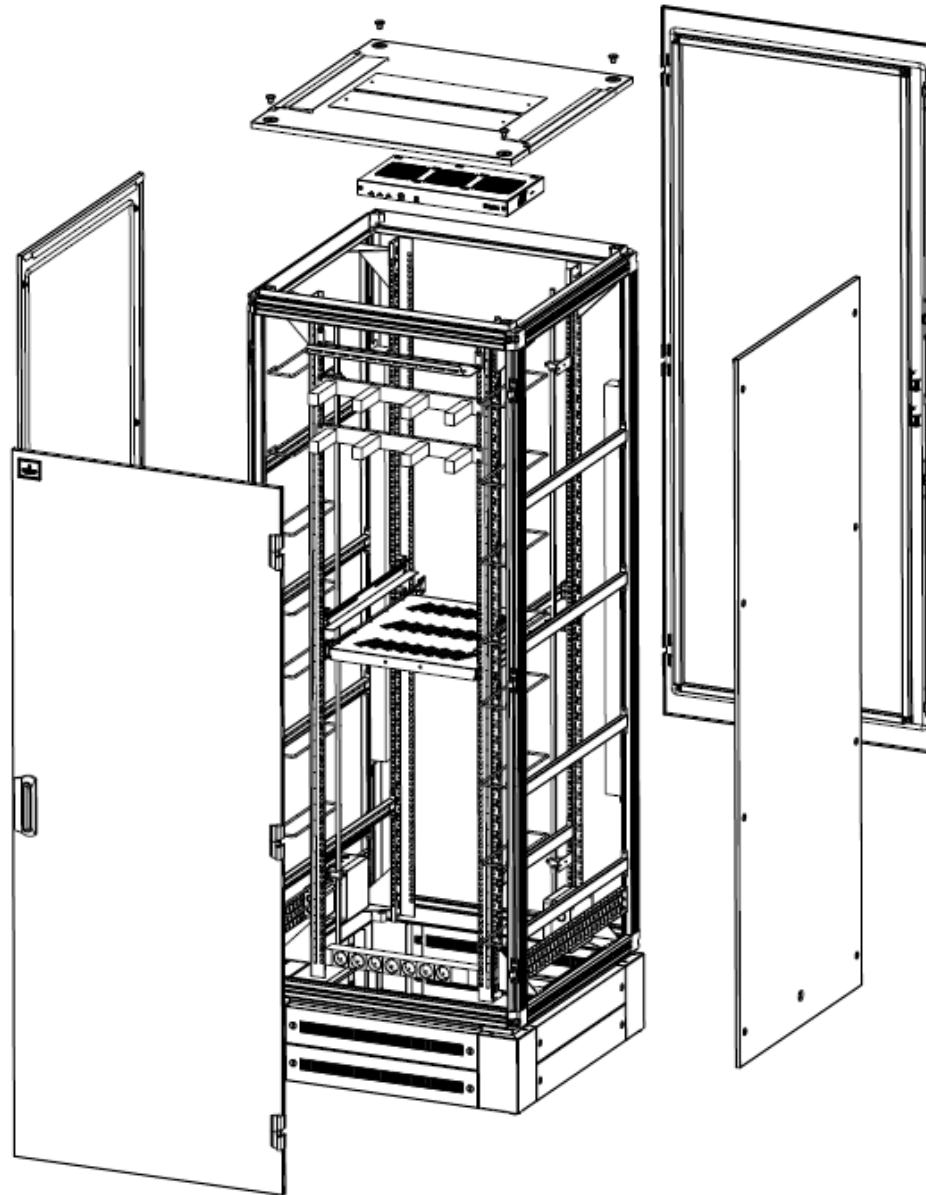


(Source: Emerson Network Power)

Comment:

It is the planner's responsibility to provide for sufficient heat dissipation.

Assembly drawing for "IT cabinet with roof fan unit":



(Source: Emerson Network Power)

8.2 Wall-mounted IT housing (Depth: 600mm)

Comment:

This wall-mounted IT housing is not permitted for general use. The use of the "IT cabinet with roof fan unit" is only permitted after a written approval has been obtained from the BMW Group IT IS Function Datacenter Technology (Rechenzentrumstechnik).

Please note that this "wall-mounted IT housing" does not offer active ventilation and does not allow for the installation of a roof-mounted fan unit.

Application (optional):

- Used as floor distributor (FD) for low outlet density (≤ 24 pieces) and if no resources are available for a floor-mounted floor distributor (for example guard house/access control)

Mounting:

In addition to the requirements specified in chapter 2, the basic equipment of this design comprises the following components:

- Design:
 - o Width: 600 mm
 - o Installation depth: 600 mm
 - o Installation height: 15U (H 752 mm)
- Closed wall-mounted housing with sufficient ventilation for an active component
- Protection rating of at least IP54
- Swivelling part with 19" profile rails and 25 mm perforation in the front and rear frame
- Front door designed as sheet metal door
- Vertical equipotential bonding bar (earthing bar), mounted directly to 19" profile rails
- Cable clamp rails (C profile) mounted horizontally
- Cable entry sealed by brush insert
- 1 x service outlet block (c. 7 outlets) on 1U, mounted from underneath



(Source: Emerson Network Power)

9 Rack Monitoring System (RMS)

Application (optional):

- Use as cabinet monitoring system for recording the following parameters:
 - o Temperature
 - o Humidity
 - o Door contact(s)
- Transmission of environment conditions data to higher-level management systems.

General requirements:

- 19" installation with adapter bracket
- Safe support of all connected cables by means of integrated cable support bracket
- TCP/IP connection through Ethernet (10/100 Base T)
- Configuration via SNMP and web browser
- Freely programmable filter system (Boolean logic) for detecting any alerting conditions
- Compatible with common network management systems (HP OpenView, Cabletron Spectrum, Castlerock, IBM Netview, IBM Tivoli, MG-Soft, Compaq Insight Manager, SUN NetManager, etc.)
- Internal voltage supply for sensors (no additional power pack required)
- Alerting via LED, relay, network management or e-mail (SMTP)
- Support of Syslog for continuous external data storage
- System time synchronisation with NTP servers
- Dimensions
 - o Width: 280 mm; height: 40 mm; depth: 140 mm
- Technical data
 - o 12x universally usable sensor input ports for temperature sensors, humidity sensors, digital (on/off) or analogue sensors (0..10 V)
 - o 3x digital output ports (2 x relay, max. 3 A at 230 VAC, 1 x 750 mA at 48 VDC)
 - o Voltage supply: 100 - 240 VAC
 - o Operating voltage: 12 VDC

Requirements temperature sensor:

- insensitive to failures
- Temperature measuring range: 0–60 °C
- Precision: +/-5%
- 1x sensor with 4 m connecting cable
- 1x mounting set



(Source: Emerson Network Power)

Additional requirements humidity sensor:

- insensitive to failures
- Humidity measuring range: 30 - 90% rel. humidity
- Precision: +/-5%
- 1x mounting set



(Source: Emerson Network Power)

Additional requirements smoke detectors:

- Optical smoke sensor with VdS approval
- for the early detection of fires with smoke development
- For use from -20° C to +75° C and at 10 - 85% rel. humidity
- 1x sensor with 4 m connecting cable
- 1x mounting set



(Source: Emerson Network Power)

Additional requirements door contact sensors:

- Magnetic bridge sensor responds to any magnetically conductive material (no special counterpart required)
- Monitoring of side parts and roof
- For use from -20° C to +70° C
- Switching voltage: max. 200 VDC
- Switching current: max. 500 mA
- 1x sensor with 4 m connecting cable
- 1x mounting set



(Source: Emerson Network Power)

10 Energy supply in IT cabinets

10.1 Socket block PDU 3 x 16 A C20 / 3x C19 + 9x C13 + 9x Schuko safety sockets

The following requirements are binding for installation in "IT cabinets active-open", "IT cabinets active-closed", "IT cabinets for NCC" and "IT cabinets EMC".

Requirements:

- 3x power input ports:
3x 230V, individually protected with automatic circuit breakers in subdistribution unit

Per network:

- 1x IEC320 C20 input (16 A)
- 1x IEC320 sheet J (C19) output (16 A)
- 3x IEC320 sheet F (C13) output (10 A)
- 3x SCHUKO safety sockets (16 A)
- L and N are routed completely separately
- All protective conductors are terminated on the housing
- Overall length: 1,183 mm including angle bracket

Colour

- Housing: RAL7035
- All plastic parts: RAL7021
- Apart from: network 1: RAL7021
Network 2: RAL7035
Network 3: RAL5015



(Source: Emerson Network Power)

10.2 Socket block PDU 3 x 16 A C20 / 27x C13

The following requirements are binding for installation in "IT cabinets for data centres".

Requirements:

- 3x power input ports:
3x 230V, individually protected with automatic circuit breakers in subdistribution unit

Per network:

- 9x IEC320 sheet F (C13) output (10 A)
- L and N are routed completely separately
- All protective conductors are terminated on the housing
- Overall length: 1,183 mm including angle bracket

Colour

- Housing: RAL7035
- All plastic parts RAL7021
- Apart from: Network 1: RAL7021
Network 2: RAL7035
Network 3: RAL5015



(Source: Emerson Network Power)

10.3 Socket block PDU 3 x 16 A C20 / 27x C13 RM

The following requirements are optional for installation in "IT cabinets for data centres".

Requirements:

- 3x power input ports:
3x 230V, individually protected with automatic circuit breakers in subdistribution unit

Per network:

- 6x IEC320 sheet F (C13) output (10 A)
- L and N are routed completely separately
- All protective conductors are terminated on the housing
- Overall length: 1,383 mm including angle bracket
- Measurement module (RM = Remote Metering) with network interface

Colour

- Housing: RAL7035
- All plastic parts: RAL7021
- Apart from: Network 1: RAL7021
 Network 2: RAL7035
 Network 3: RAL5015



(Source: Emerson Network Power)

10.4 Socket block, 7-way, Schuko safety sockets

The following requirements are binding for installation in the "IT cabinet for wall mounting".

Requirements:

- Suited both for installation in 19" mounting frames and at the side of enclosure frames
- Rated voltage: 250 V AC; rated current: 16 A
- 7x SCHUKO safety sockets, with the sockets being arranged at an angle of 45° for the unlimited use of angle plugs
- Version with overvoltage protection and interference suppression filter
- Power supply cord: 2.5 m
- Version without switch



(Source: Emerson Network Power)