

Rittal – The System.

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Micro Data Center Level E
Micro Data Centre Level E

7999.009

Bedienungsanleitung
Operating instructions

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



Foreword

Dear Customer!

We thank you for choosing our Micro Data Centre Level E.

We wish you every success!

Your,
Rittal GmbH & Co. KG

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We are always happy to answer any technical questions regarding our entire range of products.

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1 Notes on documentation

1.1 Manufacturer's statement

Rittal GmbH & Co. KG confirms that the applicable safety standards for the Micro Data Centre Level E are observed.

1.2 Storing the documents

The operating instructions as well as all applicable documents are integral components of the product. They must be handed out to those persons who are engaged with the unit and must always be available and on hand for operating and maintenance personnel.

1.3 Symbols in these operating instructions

The following symbols are used in this documentation:



Danger!

This warning symbol is used to indicate great dangers caused by the product which may result in injury and even death if the preventative measures indicated are not followed.



Warning!

This warning symbol is used to indicate procedures which may cause risk of equipment damage or personal injury.



Note:

This instruction symbol indicates information concerning individual procedures, explanations, or tips for simplified approaches.

- This symbol indicates an "Action Point" and shows that you should perform an operation/procedure.

1.4 Other applicable documents

- Manufacturer's statement
- Operating instructions of all components sold and installed by Rittal

2 Safety instructions

The Micro Data Centre Level E produced by Rittal GmbH & Co. KG is developed and produced with due regard to all safety precautions. Nevertheless, the unit still causes a number of unavoidable dangers and risks. The safety instructions provide you with an overview of these dangers and the necessary safety precautions.

In the interests of your safety and the safety of others,

please read these safety instructions carefully before assembly and commissioning of the Micro Data Centre Level E.

Follow the user information found in these instructions and on the unit carefully.

2.1 Safety notes for personnel protection



Danger! Electric shock!

Work performed unprofessionally on the electrical equipment of the Micro Data Centre can cause serious injuries and death.

Work on the electrical equipment of the Micro Data Centre may be performed only by an electrician or by trained personnel guided and supervised by an electrician. All work must be performed in accordance with electrical engineering regulations.

The mains connection data cited on the rating plate must be adhered to.

Prior to performing any maintenance work, the Micro Data Centre must be disconnected from the mains power.



Danger! Electric shock!

Contact to live parts can cause severe injuries or death.

Ensure that the customer-supplied potential equalisation has been performed professionally and connected with the central earthing point in the Micro Data Centre.

Also ensure the reliable protective earthing of all built-in components.

Ensure the adequately dimensioned current carrying capacity of the potential equalisation.



Explosion hazard

If UPSs with integrated or separate battery packs are installed in the Micro Data Centre without ventilation, this can lead to an explosion.

UPSs with integrated batteries or separate battery packs may be installed in the Micro Data Centre only with adequate ventilation in accordance with EN 50272-2.



Danger of collapse

The failure of the building structure can cause severe injuries and death.

Prior to the assembly of the Micro Data Centre, check the requirements placed on the building statics.

The Micro Data Centre may be positioned only where the building structure is dimensioned adequately.



Danger of becoming trapped

Injuries can occur when the safety doors are opened or closed.

Ensure that you do not reach between the door and frame while opening and closing the doors. Maintain an adequate safety clearance.



Blocked escape routes

In case of an emergency, blocked escape routes can lead to injuries or death. Ensure for the choice of the Micro Data Centre installation location that adequately-wide escape routes are present. Do not place any objects in the area of the Micro Data Centre's safety doors.

The customer must earth the built-in components.

**Caution!**

There is the danger of tipping when the doors are opened 180° and the housing is empty!

If necessary, secure the Micro Data Centre to a solid surface.

**Caution!**

There is the danger of tipping when more than one component is pulled-out from the 482.6 mm (19") level.

Pull-out only one component from the 482.6 mm (19") level at a time.

**Caution!**

There is danger caused by falling devices. No devices may be installed on the internal mounting rails when they are adjusted. The failure to adhere to this rule can lead to severe injuries and/or damage to devices.

Also observe the following safety notes:

- Any mains power connection or mains power wiring required as part of the Micro Data Centre Level E wiring may only be performed by an experienced electrician.
- Do not modify the unit!
- Use only original spare parts!
- The Micro Data Centre does not provide any protection against standing or rising water.
- During normal operation, the Micro Data Centre must not come in contact with water, aggressive or inflammable gases and vapours.
- The Micro Data Centre may only be operated within the specified environmental conditions (see section 10 "Technical specifications").
- Observe any national regulations for accident prevention.
- Observe any company-internal regulations.
- Observe all special safety notes associated with the individual tasks in the appropriate sections.

2.2 Safety notes for the prevention of damage to the Micro Data Centre

**Note:**

The Micro Data Centre may only be installed vertically on a flat floor with max. 2° deviation to guarantee the correct function of the safety doors.

**Note:**

Do not change the location of the Micro Data Centre yourself and do not disassemble it yourself.

Contact the manufacturer or a service company authorised by the manufacturer to perform this work.

**Note:**

Prior to the assembly of the Micro Data Centre, check the requirements placed on the operational environment.

The Micro Data Centre may be used only for the approved indoor application.

With this regard, also observe the manufacturer's details for the components to be installed. In particular, the permitted environmental parameters, such as temperature, air humidity and the requirements placed on the ambient air, must be observed.

Do not obstruct or adjust the air inlets and outlets of the cooling system on the inside and the outside of the Micro Data Centre.

The heat load inside the Micro Data Centre must not exceed the rated power specified on the rating plate of the cooling system.

The ambient temperature at the installation site of the Micro Data Centre must lie within the temperature limits of +10°C and +35°C. Ensure adequate ventilation or climate control of the installation site.

**Note:**

Use only original spare parts. Should spare parts be required, contact customer service at Rittal.

**Note:**

Store the keys for opening the safety doors only at a location that cannot be accessed by unauthorised persons. Never save the keys in the Micro Data Centre.

**Note:**

After completion of the cooling unit installation, wait at least two hours before placing the unit into operation. The commissioning must be performed by authorised personnel. The customer is responsible for the correct operation of the condensate discharge routed through the cable duct.

otherwise the warranty is voided.



Note:

The safety doors of the Micro Data Centre can be opened only to a limited extent. Do not attempt to force the doors open further because this would damage the Micro Data Centre.



Note:

Before you close the doors, the safety bolts must be retracted. Otherwise the Micro Data Centre will be damaged.



Note:

Never drill any holes in the side panels, top or floor elements or the safety doors without consulting the manufacturer. This can cause damage to the insulation materials of the Micro Data Centre walls.
Any warranty claim is void in this case!

2.4 RoHS compliance

The unit fulfils the requirements of EU directive 2002/95/EC on the Restriction of Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) of 13 February, 2003.



Note:

Corresponding information about the RoHS Directive may be found on our website at www.rittal.com/RoHS.

2.3 Operating and technical staff

- The mounting, installation, commissioning, maintenance and repair of this unit may be performed only by qualified mechanical and electro-technical trained personnel.
- Only properly instructed personnel may work on a unit while in operation.



Note:

After the commissioning of the Micro Data Centre, do not have any keys duplicated by a key service. If you require additional keys, please contact the Rittal service department.
If keys get lost, the lock must be replaced without delay.



Note:

After incursions, attempted incursions, improper intrusions in the design and function as well as cases of water ingress and fires within and in the immediate vicinity of the Micro Data Centre, the validity of the recognition of the test ratings is voided. In such cases, please contact Rittal without delay

3 Product Description

3.1 Functional description

The Rittal Micro Data Centre Level E is a modularly extendible IT security safe. It provides physical safety and protects against fire, water, acid gases and unauthorised access.

Components that characterise a data centre can be integrated in various variants. Starting with energy-efficient climate control matched to the requirements, including energy distribution, through to early fire protection and extinguisher systems.

The Micro Data Centre provides physical protection against:



Fire: Fire resistance F 90 in accordance with DIN 4102 as well as the observance of the maximum temperature increase of 50 K and a relative humidity of maximum 85% for 30 minutes¹⁾



Extinguishing-water resistance in accordance with IEC 60529 IP X6³⁾



Smoke protection based on DIN 18095³⁾



Intrusion protection RC 2, tool attack similar to DIN EN 1630³⁾, optionally selectable resistance class 3 or 4²⁾



Dust-proofing in accordance with IEC 60529 IP 5X³⁾



Unauthorised access



Smoke protection based on DIN 18 095-2: 1991-03³⁾

¹⁾ The Micro Data Centre was tested as a system.

²⁾ The Single Micro Data Centre was tested as a system with single-leaf doors and a mechanical lock.

³⁾ The Single Micro Data Centre was tested as a system with a single-leaf door and a double-leaf door, each with a mechanical lock.

3.2 Components of the Micro Data Centre

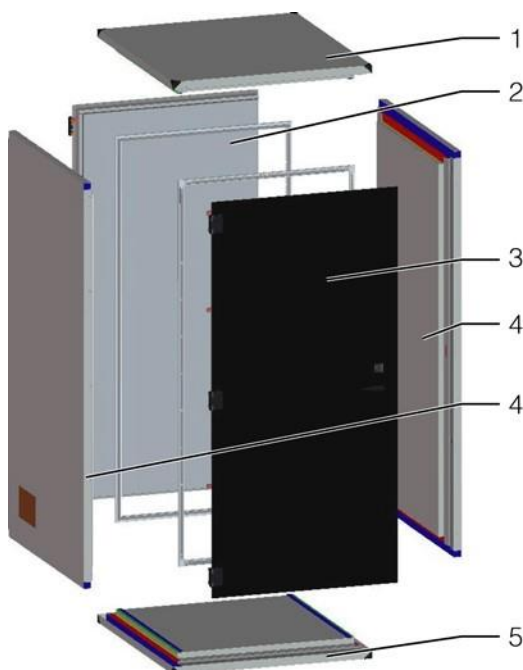


Abb. 1: Components of the Micro Data Centre

- 1 Top element
- 2 Service door
- 3 Operator door
- 4 Side elements
- 5 Floor element

The Rittal Micro Data Centre Level E consists of individual elements that are combined with a positive-engagement connection system. The special connection system permits a subsequent dismantling and so also an expansion of the system or its installation at a different location.

High-temperature, expansion and water-resistant seals are provided between the joints of the cell elements.

The cell elements themselves consist of a heat-insulating special insulation with steam diffusion barriers mounted in sheet steel modules.

In its standard variant, the modular safety cell consists of a top and a floor element, two side elements, operator and service door as well as two mounting frames. As standard, different locks are installed in both doors. The two side elements are equipped with a cable duct.

The Micro Data Centre is equipped with a potential equalisation rail that the customer must earth to a central earthing point.

The customer must connect the frame correctly with the potential equalisation rail. If a Rittal IT frame is

used, the scope of supply includes a central earthing point that should be used for this purpose.

The split unit used for the cooling prevents dust and corrosive combustion gases from entering the Micro Data Centre. Several variants and power ranges adapted to the heat loss and the customer conditions can be chosen.

The CMC can optionally be used as network-compatible monitoring system for monitoring the interior.

An early fire detection as well as fire alarm and extinguishing system can also be integrated as 482.6 mm (19") components and offer a high degree of safety.

Various busbars adapted to the power distribution requirements are available.

3.3 Standard system components

3.3.1 Cable duct



Note:

The connection of the cable ducts and also expansions in a previously closed cable duct may only be performed by authorised service personnel otherwise the warranty will be voided! If further lines or cables should be inserted in a cable duct, the manufacturer must be informed.

Soft duct

The soft duct consists of flexible material that can be installed around the data and supply lines to be introduced into the Micro Data Centre. The cables to be introduced must be distributed separately to the individual positions. To ensure the guaranteed characteristics against external danger potentials, no bundled cables may be introduced into the Micro Data Centre. After introduction of all cables, the complete area of the cable duct is sealed externally and internally.

The soft duct has the dimension W x H 165 x 267 mm and may be occupied with cables to the maximum level of 60%.

The following cables and supply lines may be inserted through the duct:

- Copper / steel tubes to max. 18 mm diameter (min. 1 mm wall thickness)
- Cables to max. 15 mm diameter

When steel tubes are inserted, an additional cable duct protection box must be placed in front of the soft duct.

Cable box

The cable box for the introduction of data and supply cables consists of a sheet steel enclosure lined on all sides with alkaline-silicate blocks. In case of fire or

temperatures above 100°C, this material swells and closes the cable opening.

On the face side, the cable box is closed smoke-tight with plastic end caps. After the introduction of all cables and supply lines, the cable entrance must be sprayed to become smoke tight.

The cable box is divided into two areas:

The dimension of each area is W x H: 214 x 33 mm

To permit the passage of larger connector plugs, the centre bar can be removed but must be replaced before being sealed.

The cable box can be occupied 100%.

The cable box may be occupied with cables with maximum 15 mm diameter. The cable box may be occupied with 3311.040 water supply and return hoses for the LCP. No steel tubes may be fed through the cable box.

Hard duct

To guarantee large manipulation assurance in the cable duct area, a hard duct can be deployed optionally. Each cable is laid with a filler piece matched to the cable diameter. An end seal ensures the pressing-in of the complete system.

For stabilisation, the duct system is inserted in a construction frame that absorbs the pressure.

The following cables and supply lines may be inserted through the duct:

- Copper / steel tubes to max. 18 mm diameter (min. 1 mm wall thickness)
- Cables to max. 15 mm diameter

When copper or steel tubes are inserted, an additional cable duct protection box must be placed in front of the soft duct and the tubes have to be insulated with ArmaFlex Protect outside of the Micro Data Center.

3.4 Proper use, foreseeable misuse

The unit may be used only for the acceptance of IT components while also providing protection against dangers, such as fire, water or unauthorised access. Any other use is not permitted.

The unit is state of the art and built according to recognised safety regulations. Nevertheless, improper use can present a hazard to life and limb of the user or third parties, or result in possible damage to the system and other property.

Consequently, the unit must only be used properly and in a technically sound condition! Any malfunctions which impair safety should be rectified immediately! Observe the operating instructions!

The intended use also includes the observance of the provided documentation and fulfilling the inspection and maintenance conditions.

Rittal GmbH & Co. KG is not responsible for any damage which may result from failure to comply with the documentation provided. The same applies to failure to comply with the valid documentation for accessories used.

Inappropriate use may result in danger. Inappropriate use includes:

- Use of impermissible tools.
- Improper operation.
- Improper rectification of malfunctions.
- Use of accessories not approved by Rittal GmbH & Co. KG.

3.5 Dimensions and clearances

Information about the dimensions can be found on the dimensioned drawings in the Appendix.

Clearances to be observed for the erection of the Micro Data Centre are listed in section 4.1 "Installation site requirements".

3.6 Scope of supply

- Micro Data Centre Level E
- Accessories provided (in accordance with the order confirmation)
- Operating instructions

4 Assembly and siting

4.1 Installation site requirements

Customer requirements:

The items listed below are the standard requirements placed on the siting of the Micro Data Centre Level E and must be satisfied by the customer.

1. Transport path
An adequately dimensioned transport path for components as large as 1300 x 2400 mm as well as adequate storage and mounting area in the immediate vicinity of the installation site area.
2. Fire-resistance class of the installation site surface
Fire-resistance class of the floor F 90 in accordance with DIN 4102 for carrying or solid components.
3. Floor flatness
The installation site of the safety safe must be constructed level in accordance with DIN 18203 (smooth surface).
4. Room height
The clear height at the installation site of the Micro Data Centre must be at least 15 cm higher than the height of the Micro Data Centre. If the Micro Data Centre is equipped with cable entry in the top element, appropriate additional space must be provided for the bending radiuses of the cables to be introduced.
5. Traffic area / escape and rescue routes
The traffic area at the installation site of the Micro Data Centre must be adequately dimensioned not only for the service and maintenance work and for connecting the required cables. Accessibility from all sides must be ensured. The escape and rescue routes must remain free.
6. Room ventilation / climate control of the installation site
The temperature at the installation site of the Micro Data Centre must lie in the range +10°C to +35°C. If the external unit of the air-conditioner is mounted directly on the Micro Data Centre, the installation site must be ventilated or air-conditioned appropriately.
7. Power supply / fuse for cooling according to the installation manual / user manual of the used cooling unit.
Consider the number of needed connections especially when redundant systems are used.

8. Cut outs
The customer is responsible for creating and closing of the drilled tapped holes and cut-outs as well as the opening and closing of the existing intermediate floors and floors.
9. The customer must ensure that the protective conductor is fed from outside and connected correctly with the potential equalisation rail in the Micro Data Centre. This connection must be labelled (symbol 60417-ICE-5019). Always ensure that the protective conductor has an adequate current-carrying capacity.
The customer must connect the frame correctly with the potential equalisation rail. If Rittal's IT frame is used, the scope of supply includes a central earthing point that should be used for this purpose.
10. Built-in components
Note that the selected built-in components (e.g. CMC III monitoring system, DET-AC Plus fire alarm and extinguishing system, etc.) require height units in the 482.6 mm (19") level.
The fire alarm and extinguishing system must be installed at the top in the 482.6 mm (19") level.
11. Requirements placed on the customer building weight loadings
The floor at the installation site of the Micro Data Centre must be adequately dimensioned to accept the static load of the Micro Data Centre, including all components.

The Micro Data Centre must be installed on a level and load-bearing bare reinforced-concrete floor in accordance with Eurocode 2 [1] as well as the associated German national Appendix [2] for Eurocode 2. The floor must be able to carry the uniformly distributed characteristic live load of $q_k \geq 5.0 \text{ kN/m}^2$ (corresponds to $\geq 500 \text{ kg/m}^2$) in the area of the Micro Data Centre installation area at least with a two-axis construction.

If the floor construction does not conform to the specified European regulations or the Micro Data Centre is initially positioned on a floor covering or a floating floor, a static calculation must be made prior to installation of the Micro Data Centre to check whether the floor-covering construction can handle the special loading for the overall Micro Data Centre load, also when it is fully equipped.

If the floor construction conforms to the specified European regulations for a bare reinforced-concrete floor and a uniformly distributed live load of $q_k \geq 5.0 \text{ kN/m}^2$ is involved, the Micro Data Centre may also be installed without static calculation in the following rooms in accordance with Eurocode 1 [3]. The bare floor loadings of $q_k \geq 5.0 \text{ kN/m}^2$ in accordance with [3] Table 6.1 DE

category B, line 6
category C, lines 9 to 12,
category D, lines 14 to 15, and
category E, lines 16 to 18 must be able to be applied.

In particular, in accordance with [3], the following utilisation categories for floors with vertical live loads are listed:

Category B3, line 6:
office areas, work areas and corridors and kitchens in hospitals, hotels, retirement homes, corridors in boarding schools, treatment rooms in hospitals, including operating rooms, with loading caused by heavy devices with adequate lateral distribution in accordance with [2] and with permitted uniformly distributed characteristic live loads of $q_k \geq 5.0 \text{ kN/m}^2$.

Category C3, line 9:
meeting rooms and areas used for groups of persons, including museum areas, exhibition areas, reception areas in public buildings, hotels, cellar ceilings not suitable for traffic, with adequate lateral distribution in accordance with [2] and permitted uniformly distributed characteristic live loads of $q_k \geq 5.0 \text{ kN/m}^2$.

Category C4, line 10:
sport and playing areas, such as dance halls, sport halls, theatre stages, with adequate lateral distribution in accordance with [2] and permitted uniformly distributed characteristic live loads of $q_k \geq 5.0 \text{ kN/m}^2$.

Category C5, line 11:
areas for large groups of people, such as concert halls, terraces and entrance areas as well as grandstands with fixed seating, with adequate lateral distribution in accordance with [2] and permitted uniformly distributed characteristic live loads of $q_k \geq 5.0 \text{ kN/m}^2$.

Category C6, line 12:
areas for regular use by large groups of persons, grandstands without fixed seating, with adequate lateral distribution in accordance with [2] and permitted uniformly distributed characteristic live loads of $q_k \geq 7.5 \text{ kN/m}^2$.

Category D2, line 14:

salesrooms in retail outlets and department stores with salesrooms $> 50 \text{ m}^2$ with adequate lateral distribution in accordance with [2] and permitted uniformly distributed characteristic live loads of $q_k \geq 5.0 \text{ kN/m}^2$.

Category D3, line 15:

salesrooms in retail outlets and department stores with salesrooms $> 50 \text{ m}^2$ and high storage shelves with adequate lateral distribution in accordance with [2] and permitted uniformly distributed characteristic live loads of $q_k \geq 5.0 \text{ kN/m}^2$.

Category E1.1, line 16:

light-duty areas in factories and workshops as well as areas in large animal barns with adequate lateral distribution in accordance with [2] and characteristic live loads of $q_k \geq 5.0 \text{ kN/m}^2$.

Category E1.2, line 17:

general storage areas, including libraries, with adequate lateral distribution in accordance with [2] and permitted uniformly distributed characteristic live loads of $q_k \geq 6.0 \text{ kN/m}^2$.

Category E2.1, line 18:

mid- and heavy-duty areas in factories and workshops with adequate lateral distribution in accordance with [2] and permitted uniformly distributed characteristic live loads of $q_k \geq 7.5 \text{ kN/m}^2$.

European standards listed in text:

[1] Eurocode 2:

DIN EN 1992-1-1 edition 01/2011:

dimensioning and design of reinforced-concrete and pre-stressed-control structures, part 1-1: general dimensioning rules and structural engineering rules

[2] National Appendix for Eurocode 2:

DIN EN 1992 1-1 NA edition 01/2011:

dimensioning and design of reinforced-concrete and pre-stressed-control structures, part 1-1: general dimensioning rules and structural engineering rules

[3] National Appendix for Eurocode 1:

DIN EN 1991-1-1 NA edition 12/2010:

effects on structures, part 1-1: general effects on structures – weights, net weight and live loads in the structural engineering sector

Requirements:

- The floor at the customer site conforms to the requirements in accordance with Eurocode 2 [1] and the German national Appendix [2].
- The average surface load of the Micro Data Centre Level E is $< 500 \text{ kg/m}^2$.
- A maximum load of 100 kg/m^2 must not be exceeded in the area of the Micro Data Centre's opened doors [3].
- The Micro Data Centre must not initially be installed on a floating floor or a surface covering. It must be checked whether the surface load in accordance with line b.) can be accepted by the floor construction directly below the Micro Data Centre surface.

4.1.1 Average surface load of the Micro Data Centre Level E

Example calculations

For the calculation of the average surface load line a.), the surface in front and behind the safe that results from the opening area of the doors has been included in the load distribution surface.

This requires, however, that the above-mentioned prerequisites are satisfied.

The calculation of the average surface load line b.) applies only to the surface directly under the Micro Data Centre Level E.

Rittal Micro Data Centre Level E, 47 U, 1000 mm interior depth with two single-leaf doors		
Components	Weight [kg]	Average surface load assuming a total weight of 1230 kg (based on one Micro Data Centre)
Micro Data Centre Level E	700	Line a.) 433 kg/m^2 on a bare floor
IT rack frame	80	
Cooling unit (LCP is not considered)	150	
Live load	300	Line b.) 929 kg/m^2 directly below the Micro Data Centre surface for floating floors or surface coverings, etc.
Total weight	1230	

Rittal Micro Data Centre Level E, 47 U, 1000 mm interior depth with two double-leaf doors		
Components	Weight [kg]	Average surface load assuming a total weight of 1230 kg (based on one Micro Data Centre)
Micro Data Centre Level E	700	Line a.) 527 kg/m^2 on a bare floor
IT rack frame	80	
Cooling unit (LCP is not considered)	150	
Live load	300	Line b.) 929 kg/m^2 directly below the Micro Data Centre surface for floating floors or surface coverings, etc.
Total weight	1230	

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Rittal Micro Data Centre Level E, 47 U, 1200 mm interior depth with two single-leaf doors		
Components	Weight [kg]	Average surface load assuming a total weight of 1340 kg (based on one Micro Data Centre)
Mico Data Centre Level E	800	Line a.) 437 kg/m ² on a bare floor
IT rack frame	90	
Cooling unit (LCP is not considered)	150	
Live load	300	Line b.) 868 kg/m ² directly below the Micro Data Centre surface for floating floors or surface coverings, etc.
Total weight	1340	

Rittal Micro Data Centre Level E, 47 U, 1200 mm interior depth with two double-leaf doors		
Components	Weight [kg]	Average surface load assuming a total weight of 1340 kg (based on one Micro Data Centre)
Micro Data Centre Level E	800	Line a.) 566 kg/m ² on a bare floor
IT rack frame	90	
Cooling unit (LCP is not considered)	150	
Live load	300	Line b.) 868 kg/m ² directly below the Micro Data Centre surface for floating floors or surface coverings, etc.
Total weight	1340	



Danger of collapse

The failure of the building structure can cause severe injuries and death.

Prior to the assembly of the Micro Data Centre, check the requirements placed on the building statics.

The Micro Data Centre may be positioned only where the building structure is dimensioned adequately.

5 Transport



Note:

The Micro Data Centre may be transported only by trained specialists certified by Rittal GmbH & Co. KG.

6 Installation and commissioning



Note:

The Micro Data Centre may be installed and commissioned only by trained specialists certified by Rittal GmbH & Co. KG.



Note:

The installation and commissioning of the Micro Data Centre is described in a separate installation user's guide.



Caution:

482.6 mm (19") adjustment

There is danger caused by falling devices. No devices may be installed on the internal mounting rails when they are adjusted. The failure to adhere to this rule can lead to severe injuries and/or damage to devices.

Components of the Micro Data Centre



Note:

The Rittal Micro Data Centre is designed only for use with officially approved units. The safety of the configuration must be checked for the installation of units without official approval. The installation of the units must conform with the associated provisions for the installation of electrical units and data-processing units.

The installation may be performed only by trained specialists with the appropriate approval.

Prior to equipping the Micro Data Centre, you should specify the placement of all components.

The factors of the associated components, such as weight, accessibility as well as the requirements placed on the power supply, temperature and air circulation, affect the order and the location where you place components in the rack.

Always place the heaviest components at the bottom of the Micro Data Centre. At least two persons are required for the assembly and disassembly of assemblies or components that weigh more than 22.5 kg. A correct fastening and the safe positioning of all components and rack assemblies must always be assured.

7 Operation

7.1 Handling the doors

Observe the following notes when you open and close the doors of the Micro Data Centre:



Danger of becoming trapped
Injuries can occur when the safety doors are opened or closed.
Ensure that you do not reach between the door and frame while opening and closing the doors. Maintain an adequate safety clearance.



Confinement of persons
The confinement of persons in the not-fully equipped Micro Data Centre can lead to injuries.
Before closing the not-fully equipped Micro Data Centre, ensure that no persons are still present inside it.



Caution!
There is the danger of tipping when the doors are opened 180° and the housing is empty!
Ensure that the Micro Data Centre does not tip. If necessary, secure it to a solid surface.



Note:
The safety doors of the Micro Data Centre can be opened only to a limited extent. Do not attempt to force the doors open further because this would damage the Micro Data Centre.



Note:
Before you close the doors, the safety bolts must be retracted.
Otherwise the Micro Data Centre will be damaged.



Note:
Before you lock the Micro Data Centre, ensure that no key is still contained within it (not even an emergency key)!
The interior of the Micro Data Centre must not be entered! The safety doors do not have any panic unlocking on the inside.

7.1.1 Mechanical key lock



Note:
Two keys are supplied as standard. All keys must be retained at a safe place not accessible to unauthorised persons. If a key is lost, the lock must be replaced!
Protect the key from dirt accumulation. The lock must not be oiled or greased.

Opening the Micro Data Centre (DIN right-hand side)

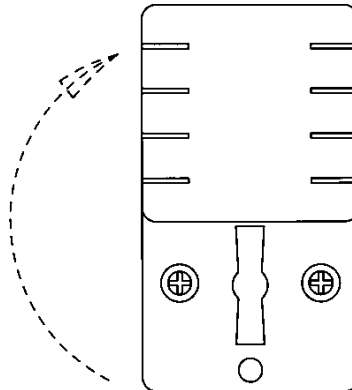


Fig. 2: Door lock

- Turn the lock cover upwards.
- Insert the key in the key guide and turn it clockwise.
- Turn the handle down until the limit is reached and open the Micro Data Centre door.

Closing the Micro Data Centre

- Slowly close the Micro Data Centre door by pressing at the side opposite of the hinges.
- Turn the door handle until it is in the horizontal position.
If the Micro Data Centre door is closed too fast, this produces an air buffer that prevents the Micro Data Centre door from closing.
- Turn the inserted key counter-clockwise until the limit is reached.
- Remove the key.
- Close the lock cover downwards.



Note:
After the commissioning of the Micro Data Centre, do not have any keys duplicated by a key service. If you require additional keys, please contact the Rittal service department.
If keys get lost, the lock must be replaced without delay.

7.1.2 Electronic combination lock Combi B 90

The Combi B 90 electronic combination lock is equipped with a inspection key (for opening in an emergency).

Read the operating instructions carefully before you commission the lock and observe the safety instructions.



Fig. 3: Operator unit with key lock (optional)

Key lock (option)

Scope of supply / properties:

- Electronic lock
- Max. 90 six-digit codes can be programmed
- Battery operation with 2x AAA / LR03 1.5 V batteries (batteries not included in the scope of supply)
- Lock with integral battery compartment
- Acoustic and optical operator support
- Input unit: Die cast chrome plated
- Only for RC 2

The following information is taken from the operating instructions of the Combi B lock. We reserve the right to make technical and functional changes.

In case of doubt, the operating instructions of the Combi B lock is valid.

Notes

After closing the lock by turning the actuation knob counter clockwise, it has to be checked by turning the knob clockwise to the stop, that the lock is correct locked. The knob has to turn maximally 45°!

The enclosed inspection key allows full access to the lock and its configurations even in case of code loss. Thus, it is at the highest hierarchy level of the lock. Therefore, it must be stored in a safe place, but not in the secure storage unit.

For security reasons programming and battery replacement should always be performed and then tested with the secure storage unit open.

Every correct key stroke recognized by the lock is confirmed by an acoustic signal.

You have max. 10 sec. for each individual key stroke. If no key is pressed during these 10 seconds, the electronics shuts down automatically. Uncompleted operations must be restarted after that. The only exceptions to this are the code status query and the programming mode with 30 seconds response time until automatic shutdown.

Code inputs resp. all further functions (e.g. programming operations) can be cancelled until the last key stroke by pressing the "P" key twice.

Do not use for your code personal or similar known data which are easy to find out.

If the set code(s) is(are) not available, the lock can be opened or reset using the enclosed inspection key.

The lock is designed for use in the temperature range from +10° C to +50° C and with humidity of 30% to 80% (non-condensing).

The lock must never be greased with or contact other lubricants or aggressive liquids, it must be cleaned only with a moist cloth only (no aggressive cleaning agents).

Never open the lock housing. Dismount the fitting only for battery replacement and perform it strictly according to the specifications of these operating instructions. Avoid touching electronic components. Otherwise, you endanger the functions of the lock and loose the right for the warranty claims.

During start-up the serial number of the input unit is saved in the audit memory of the lock. Replacement of the input unit is also registered by means of an entry in the audit memory of the lock.








For every description of operation or programming processes hereafter it is assumed that the lock and the input unit are in the basic state.

Basic state means that the lock is closed (the bolt lock is extended) and the lock electronics is switched off. If you are not sure, whether the lock is closed, check if the rotary knob can be turned counterclockwise. To ensure that the lock is not in a running programming process, you can press the "P" key twice to cancel it.

















Upon delivery the lock is set by the manufacturer to the factory code "1". For security reasons activate the master code with your individual code immediately in order to deactivate the factory code. The factory code is meant only for lock mounting, it is not suitable for further permanent use.

All pre-configured codes have to be changed by the end user immediately after start-up.






















Main signals

✓	Action performed		Short signal LED green		Short signal LED red
✗	Action not performed		Continuous signal LED green		Continuous signal LED red
	Buzzer signal		LED green off		LED red off

















Activating master

Description		✓		✗	
1.	Press „P“ and „  “		2x 	3x 	3x 
2.	Enter the new master code 00XXXXXX and „  “ (00 = ID, X = freely selected 6-digit combination [0..9])		2x 	3x 	3x 
3.	Confirm the master code with 00XXXXXX and „  “	2x 	2x 	3x 	3x 
 Activate the master code <u>only with opened doors</u> , to have ever time access to the MDC Level E and the lock.					







Activating user codes

Description		✓		✗	
1.	Press „P“ and enter the master code 00XXXXXX and „  “ (00 = ID, XX = valid 6-digit combination [0..9])		2x 	3x 	3x 
2.	Press „P“, „3“ and „  “		2x 	3x 	3x 
3.	Enter the new code IDXXXXXX and „  “ (ID= 01 - 90 for user, X = freely selected 6-digit combination [0..9])		2x 	3x 	3x 
4.	Confirm the new code with IDXXXXXX and „  “	2x 	2x 	3x 	3x 
 Code can be used only after it has been activated. When activating a new operator, it is useful if the new code (starting from item 3 of the above description) is entered directly by the respective operator on site.					

Changing codes


Description		✓	✗
1.	Press „P“ and enter the old code IDXXXXXX and „  “ (ID= 00 - 90, XX = programmed 6-digit combination [0..9] for corr. ID number)	 2x 	3x  3x 
2.	Enter the new code IDYYYYYY and „  “ (ID= 00 - 90 for user, Y = new 6-digit combination [0..9 for this ID number])	 2x 	3x  3x 
3.	Confirm the new code with IDYYYYYY and „  “	2x  2x 	3x  3x 
 <p>Everyone is authorized to change his/her own code any time. After changing the previous code is no longer valid and the new code must be used. The function of the new code must be tested by opening the lock with the secure storage unit open.</p> <p>The entire procedure has to be repeated in case of the following errors:</p> <p>If the Incorrect code signal is displayed according to 1. after the entry of the code to be changed, the code has been entered incorrectly or not assigned and, thus, cannot be changed.</p> <p>If the Incorrect code signal is displayed after the first new code input as described in 2., the ID does not match the ID in step 1. The ID must always be kept, even in case of code modification.</p> <p>If the Incorrect code signal is displayed after the second attempt to enter the new code as shown in 3., then the two codes entered in 2. resp. 3 do not match.</p>			

Opening the lock

Description		✓	✗
1.	Enter a valid opening code IDXXXXXX and „  “ (ID= 00 - 90, X = programmed 6-digit combination for reso. ID number)	2x  2x 	3x  3x 
2.	Turn the actuating knob within 4 seconds through 90° clockwise to the stop.		
3.	Turn the handle downwards and pull the door of the Micro Data Center until it is open.		
 <p>Every key stroke is confirmed by a key tone. The input can be canceled any time by pressing “P” twice. Alternatively, the input can be canceled if no input is performed within 10 seconds.</p> <p>If the Incorrect code signal is output after the code input, the entry must be repeated completely. After 3 incorrect inputs the lock switches to the lockout period.</p> <p>The lock has a function which hinders spying out of codes by means of user observation during code input: During all opening procedures the operator can add as many further digits as necessary before completing the input by pressing “8”. All inputs starting from the 9th position will be ignored.</p> <p>Notice: This function supports only the code input for opening and is not available for the programming procedures.</p>			

Closing the lock

Description		✓	✗
1.	Slowly close the Micro Data Centre door by pressing at the side opposite of the hinges. If the Micro Data Centre door is closed too fast, this produces an air buffer that prevents the Micro Data Centre door from closing. Turn the door handle until it is in the horizontal position.		
2.	Turn the actuating knob counter-clockwise through 90° to the stop. Code input is not required.		

 <p>Further functions such as the use of double codes, opening delay, blocking or unblocking of user codes can be found in the enclosed operating instructions for the lock.</p>

Low battery

If the operator receives the undervoltage signal (10x) after the code entry, then the battery capacity is low and the battery must be replaced promptly.

As soon as the low battery is displayed, the lock can still be opened, but no reprogramming is possible until after the battery replacement. Furthermore, an audit entry is performed. As soon as the battery is almost completely exhausted, no opening can be performed and every key stroke is acknowledged with an undervoltage signal.

Battery replacement



Caution!

Do not apply force and avoid touching electronic components! You could destroy the lock.

For battery replacement the rotary handle of the lock must be dismounted. Since the rotary handle can be inserted in steps of 90°, first, always note the position of the rotary handle for the assembly later (e.g. using an adhesive tape on the input unit to mark the position of the mark on the rotary handle).

Insert the enclosed Allen wrench up to the stop into the hole on the lateral wall of the input unit as shown in Fig. 4.1. Pull out the rotary handle to the front from the input unit (see fig. 4.2) and remove the Allen wrench. Then unscrew the screw in the handle recess (see fig. 4.3). After that the top part of the input unit can be moved as shown in fig. 4.4 and then it can be removed to the front (see fig. 4.5). The 2 batteries are located on the base part of the input unit and can be replaced now as shown in fig. 4.6. Only batteries of type AAA can be used. It is highly recommended to use high-quality brand batteries and replace them as a precaution every 24 months at the latest. After the battery replacement mount the input unit on the base part from the front in the order reverse to the one described above and move it laterally until it engages and the red LED turns off. Then attach the screw to secure the top part. Now attach the rotary handle in the position in which it has been mounted before dismounting (to do so, use the marking mentioned above). If the mounting is correct, the rotary handle can no longer be removed. Remove the marking (in this way). Finally, the tamper switch message must be neutralized (Press "P" + enter master code, then press "P", "9" and „←").

Battery replacement (example above: the input unit keyboard is located to the right of the rotary handle. For other mounting positions proceed correspondingly):

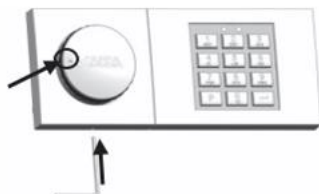


Fig. 4.1: Note the position of the rotary handle (marking). Insert the Allen wrench into the small hole on the bottom side and press it in to the stop.

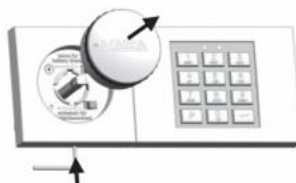


Fig. 4.2: Remove the rotary handle to the front, while keeping the Allen wrench pressed.

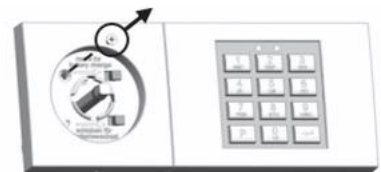


Fig. 4.3: Loosen and remove the screw.



Fig. 4.4: Move the top part of the input unit in the direction of the arrow to the stop.

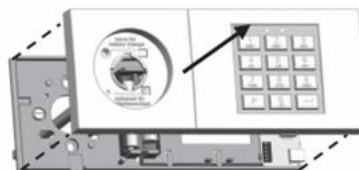


Fig. 4.5: Remove the top part of the input unit carefully.



Fig. 4.6: Replacing the batteries. Mounting in the reverse order.

Key opening



Caution!
Opening of the lock using the inspection key is intended only for the emergency situation and not for permanent use.
Do not apply force when opening the lock using the key! You could destroy the lock.

For opening by means of the key the rotary handle must be dismounted. Since the rotary handle can be inserted in steps of 90°, first, always note the position of the rotary handle for the assembly later (e.g. using an adhesive tape on the input unit to mark the position of the mark on the rotary handle).

Insert the enclosed Allen wrench up to the stop into the small hole on the lateral wall of the input unit (see fig. 5.1) Pull out the rotary handle to the front from the input unit (see fig. 5.2) and remove the Allen wrench. Then pull out the square shaft out of the lock (see fig. 5.3). Now the key can be inserted into the lock as shown in fig. 5.4 (lock housing horizontally with the bolt on the left). If the installation position of the lock is not known, determine the correct direction of the key by testing in 90° steps. Alternatively, you can ask the service technician or the cabinet manufacturer. After correct insertion for lock opening turn the key through approx. 150° to the right to the stop (see fig. 5.5). The lock is open now. After opening by means of the key mount the input unit again in the reverse order as described above and place the key to a safe place, however, do not keep it in the Micro Data Center.

After correct insertion for lock opening turn the key through approx. 150° to the right to the stop (see fig. 5.5). The lock is open now. After opening by means of the key mount the input unit again in the reverse order as described above and place the key to a safe place, however, do not keep it in the Micro Data Center.

Closing with the key

Turn the key to the stop counterclockwise through approx. 150°, remove it and secure against unauthorized access (not inside the Micro Data Center). Then insert the square shaft with the end of the bore forwards into the lock and attach the rotary knob again in the same way as it has been positioned before dismounting (the marking mentioned under “key opening” is foreseen for this purpose). In case of correct mounting the rotary knob cannot be removed now. The marking can be removed now.



Fig. 5.1: Note the position of the rotary handle (marking). Insert the Allen wrench into the small hole on the bottom side and press it in to the stop.

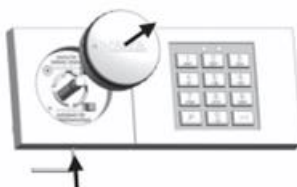


Fig. 5.2: Remove the rotary handle to the front, while keeping the Allen wrench pressed.



Fig. 5.3: Removing the Allen wrench and square shaft.

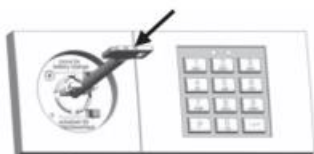


Fig. 5.4: Inserting the key.

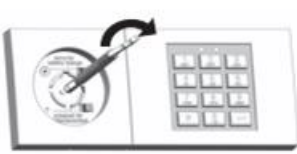


Fig. 5.5: Turning the key clockwise to the stop.

7.1.3 Electronic lock for activation by an access control system



Fig. 6: Operating unit with electronic lock (optional)

Electronic lock (optional)

Scope of delivery / properties:

- Electronic lock with operating unit
- Input unit: Die cast chrome plated
- Electronic release function for access control reader units or similar peripheral release unit
- Only for RC 2
- Interfaces: 1 x modular jack 4-pin (power), 1 x modular jack 8-pin (in/out) and 1 x modular jack 6-pin (input unit)

The electronic lock for activation by an access control system provided by the customer is installed in the Micro Data Centre door. The cable for the connection to the system is made available inside the Micro Data Centre. The power supply for releasing the lock must be provided by the customer.

Interface	Function element		Specification	Duty cycle
Power	Release magnet	1 = positive trigger voltage 2 = negative trigger voltage 3 4	475 ohm, $U_{min} = 5 \text{ V DC}$	12 V: max. 180 sec. 18 V: max. 180 sec. (U_{max}) 24 V: max. 72 sec.
In/out	Revision bolt switch contact (key position)	1 = normally closed 2 = normally open 3 = common	Change-over contact, 50 mA, 30 V DC	
	Bolt switch contact (key position)	4 = normally closed 5 = normally open 6 = common	Change-over contact, 50 mA, 30 V DC	
	Release magnet	7 = positive trigger voltage 8 = negative trigger voltage	See above	See above
Input unit	-	Not assigned	-	

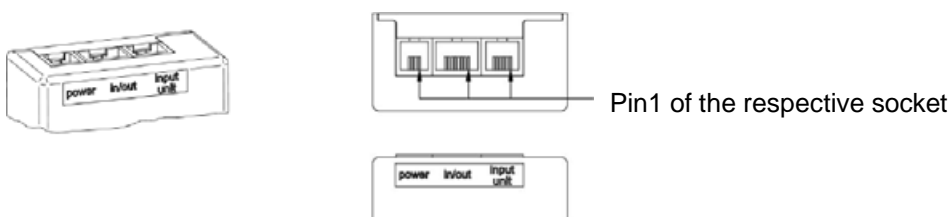


Fig. 7: Interfaces



Fig. 8: Pin assignment

1	White	5	Grey
2	Brown	6	Pink
3	Green	7	Blue
4	Yellow	8	Red

8 Inspection and maintenance

8.1 Safety instructions

Prior to performing any work on the Micro Data Centre, the unit must be disconnected from the power supply and protected against being switched on again.

8.2 Maintenance of the safety cell

The user/customer should check or perform a visual inspection of all mechanical components roughly every 12 months. If damage has occurred, e.g. a worn lip seal at the doors, you should inform the manufacturer service department without delay:

RITTAL GmbH & Co. KG

Auf dem Stützelberg

D-35745 Herborn, Germany

8.3 Maintenance contract

We recommend that you have a maintenance contract for an annual inspection. These safety inspections guarantee the full operability of the Micro Data Centre Level E.

For questions concerning service and maintenance contracts, please contact our service operation:
Tel.: +49(0)2772 505-1717

9 Storage and disposal

9.1 Storage

If the device is not used for a long period, Rittal recommends that it is disconnected from the mains power supply and protected from dampness and dust.

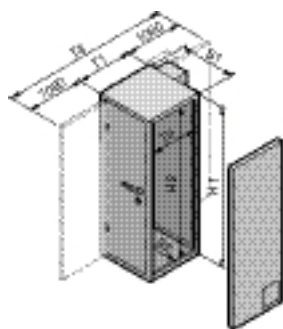
9.2 Disposal

The materials of the Micro Data Centre should be handled as household refuse.

They are not hazardous waste!

This, however, applies only to the Micro Data Centre, not for built-in components, such as the cooling unit, the fire-extinguishing system, etc.

10 Technical specifications



U		42	47	42	47
External dimensions [mm]	Width (B1)	1100	1100	1100	1100
	Height (H1)	2210	2410	2210	2410
	Depth (T1)	1200	1200	1400	1400
Internal dimensions [mm]	Width (B2)	920	920	920	920
	Height (H2)	2030	2230	2030	2230
	Depth (T2)	1000	1000	1200	1200
Model No. (the Micro Data Centre is configured on a project-specific basis)	7999.009	7999.009	7999.009	7999.009	7999.009
Empty weight excluding cooling unit and excluding rack approx. [kg]		660	700	730	800

Tab. 1: Technical specifications

11 Accessories

The Micro Data Center Level E IT rack frame can be equipped with various accessory components, including:

- CMC monitoring system
- Fire alarm and extinguishing system
- Busbars
- Rack accessories

You can find the corresponding components on the Rittal homepage or get in touch with your contact at Rittal.

12 Appendixes

12.1 Cooling the Micro Data Centre

High temperatures, hot spots or conducting dust in the Micro Data Centre increase the risk of failure and reduce the service life of modern electronic components. To provide an appropriate climate environment for the hardware included in the Micro Data Centre, the Micro Data Centre interior must be cooled. Systems in various variants and power levels are available. The Micro Data Centre is always equipped with a split climate control unit. The evaporator unit is placed inside the Micro Data Centre; the compressor (provided as indoor or outdoor version) and the condenser are located outside the Micro Data Centre.

To achieve the optimum performance of the cooling unit, several requirements must be satisfied:

Leak-tightness of the Micro Data Centre

Ensure that all seals are undamaged. If this is not the case, the associated seals must be replaced on-site (spare parts list).

Air circulation inside the Micro Data Centre



Note:

It is important to ensure a uniform air circulation inside the Micro Data Centre.

Under no circumstances, may air inlet and outlet openings in the internal circuit be obstructed (clearance > 150 mm) because this would hinder the air circulation in the enclosure and so prevent the cooling capacity of the device from being used adequately. The users of the Micro Data Centre must be informed accordingly!

Unoccupied height units in the 482.6 mm (19") rack must be closed with blanking plates on the operating side.

The "cold" and "hot" sides must be separated from each other.

Condensate discharge in accordance with DIN 3168

The condensate water that can accumulate at the evaporator is fed out of the housing through a discharge tube at the evaporator divider panel (ideal conditions for the formation of condensate water are high humidity and low internal temperatures in the Micro Data Centre). A hose with the size 12 x 2 mm must be connected to this discharge tube so that the condensate water can flow down without problem. The siphon installed in the drainage system must be filled with water so that an ingress of flue gases via the condensate discharge is prevented.

The condensate discharge is routed through the cable ducts of the Micro Data Centre by the assembling

team. A trouble-free discharge of the condensate must be provided by the customer at the installation site.

Function principle of the split units

The evaporator in the interior of the Micro Data Centre consists essentially of a heat exchanger and a fan group that circulates the air within the Micro Data Centre, i.e. the cooled air is blown out in front of the 482.6 mm (19") level, the hot air is extracted at the back of the servers. The heat is delivered to the refrigerant in the direct evaporator.

To maintain the cooling circuit, the external condenser cools the refrigerant back to a suitable temperature level.

The split construction, i.e. the hermetic separation between the internal and external circuit, ensures the smoke-tightness of the cooling unit. The internal and external circuits must be connected with each other using coolant pipes and control cables introduced into the Micro Data Centre through a fire-proof cable inlet. This function principle applies to all device configurations.

Choice of the cooling capacity

The refrigeration systems for the Micro Data Centre must be designed so that the cooling capacity roughly matches the power loss in the Micro Data Centre.

Outage of the cooling system

To avoid damage to the IT and data loss due to overheating, the IT should be shut down as quickly as possible in the event of a total outage of the cooling system.

Conditions at the installation site

For installation sites subject to extreme conditions (aggressive media in the ambient air, high humidity, etc.), the installation of a cooled Micro Data Centre must be checked beforehand.

12.1.1 Cooling

Depending on the installation situation of the Micro Data Centre and the heat quantity to be dissipated, various variants can be chosen.



Note:

Please observe the operating instructions for the cooling unit.

13 Warranty



Note:

After incursions, attempted incursions, improper intrusions in the design and function as well as cases of water ingress and fires within and in the immediate vicinity of the Micro Data Centre, the validity of the recognition of the test ratings is voided. In such cases, please contact the manufacturer without delay otherwise the warranty is voided.

14 Customer service addresses

For technical questions, please contact:

Tel.: +49(0)2772 505-9052

E-mail: info@rittal.de

Homepage: www.rittal.com

For complaints or service requests, please contact:

Tel.: +49(0)2772 505-1855

E-mail: service@rittal.de

Notes

Rittal – The System.

Faster – better – everywhere.

- Enclosures
- Power Distribution
- Climate Control
- IT Infrastructure
- Software & Services

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Phone +49(0)2772 505-0 · Fax +49(0)2772 505-2319
E-mail: info@rittal.de · www.rittal.com

02.2023/D-0000-00002164-01

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

