Data Centers

DATA CENTERS - OVERVIEW

Data centers

Introduction ❯

Modern methods of centralising servers and other active elements necessitated changes in the way these devices are cooled and protected. The solution is the data centre.

WHAT IS A DATA CENTRE

Modern data centres are significantly different from early versions of this method of installing servers and other equipment. Original data centres were founded on the backbone of Internet connections from the 1990s. Large data halls were built primarily as a space perfectly protected in terms of security, uninterrupted power supply and with adequate capacity of communication lines, mostly optical. The individual cabinets were then leased to users for their technical and Internet applications. These centres almost always had raised floors with high loading, beneath which were located all cabling and cooling systems. Cooling was mostly centralised so the entire room was air conditioned regardless of the distribution of the thermal load and without the ability to effectively regulate cooling for each cabinet or the data hall.

With the development of telecommunications, with new protocols and an increase in the transmission line capacity high-speed connections have become available without the need to place the device directly onto the backbone connections. As well, another revolution took place on another front - processing power and storage capacity. Processor performance grew dramatically, multi-core processors began to appear along with new operating systems. Hard drives and other storage media multiplied in their capacity.

Server operating systems began to use available resources for sharing multiple, simultaneously running applications and it was then only a small step to sharing one physical computer for running multiple operating systems simultaneously - to virtualisation. The majority of companies now run their applications either on their own servers dedicated to specific applications or using the services of the ever popular virtualisation and cloud-hosting. Both of these methods require a high density of installed computing power. Because running businesses and institutions is a critical application, it requires power-fail safety, physical protection and also controlled cooling. All these aspects are covered by the concept of a data centre. Over time the standard was set for the design and construction of data centres. Cabinets are placed in groups, usually in the form of two rows spaced 1,200 mm apart (two standard raised floor tiles). The aisle between the cabinets is then roofed and closed at the ends by sliding doors. For really large data centres, dividing doors can also be found within these units, which split them down into smaller sections. The main product of our company's data centre solution is the RDA cabinet with a load capacity of 1,500 kg in a version adapted for the construction of data centres. Other necessary components such as ceiling panels of various types, including sliding doors, as alternative self-closing etc., make a complete modular system. We also offer a complete range of raised floors for installations that allow their use. Floor loading is particularly critical in the rooms of future data centre. In cases where it is not possible to use the raised floor (low room height, low permissible floor loading and so on) we can offer an alternative, in the form of In-Row cooling units with top media inlet and condensate pump. This advanced solution offers extra large installed cooling capacity in a small footprint. Combining multiple cabinets in a data centre will create the need to optimise cooling. Uncontrolled air flows are costly and inefficient.
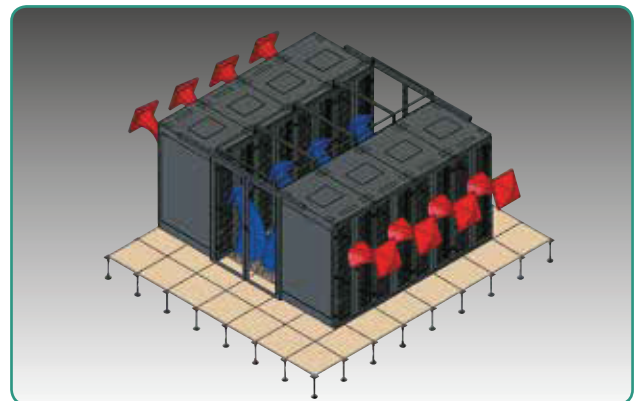
Using RDA cabinets and components designed for data centres, a complete data centre can easily and efficiently be built. The most commonly used solution in terms of cooling:
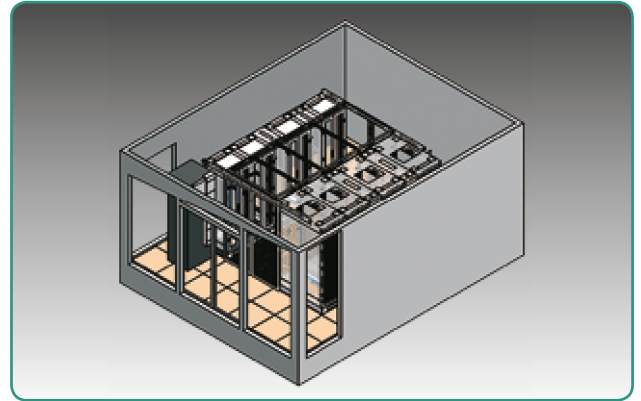
Reference data center TRITÓN
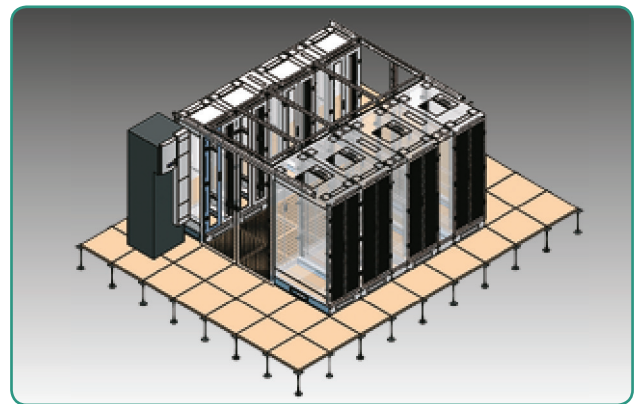
Data center with centralized air conditioning

Scheme of data center cooling

DATACENTER COOLING PRINCIPLES

Hot / cold aisle

Arranging cabinets into hot / cold aisles is a standard solution for data centres. Cabinets are oriented face to face, while cold air is supplied through perforated tiles in a raised double floor. Standard ANSI/TIA/EIA-942-A recommends a cold aisle width of 1.2 metres. This is generally the size of two double floor tiles. Cold air is supplied via perforated tiles at the front of the cabinets which is delivered to each of them by fans. Cold air is supplied to active elements through doors with 80 % perforation. In this case, the double floor is used to deliver cold air and it is necessary that all other openings in the floor, such as the cable entries are covered. The reason is to maintain static air pressure in the double floor and to minimise cold air loss.
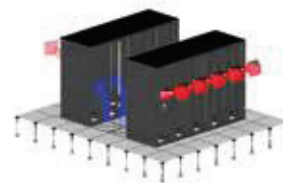
Contained cold aisle

The solution of open hot / cold aisles presents possible shortages in the recirculation of heated air and therefore the risk of creating so called hot-spots - locally overheated areas. The solution is a contained cold aisle. This is a closed modular expandable system which physically separates the cold air from the exhalation of hot air. Actually, it creates a separate area for hot and cold air and prevents them from mixing. Cool air is fed into the closed aisle through perforated tiles of the raised floors or locally using the side cooling units, which are mounted directly in line between the cabinet. Standard width of the contained cold aisle is 1.2 metres (two floor tiles) or 1.8 m (three floor tiles). At the ends, the aisle also has a glass sliding door. The use of this solution is becoming standardised and is especially recommended for its cooling capacity and efficiency in achieving the lowest energy consumption of the data centre.
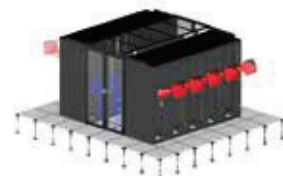
Closed modular solution

A closed modular solution enables maximum energy efficiency and scalability of focus for long-term development of a data centre. This solution can be designed and manufactured tailored to customer needs. In one room there can be zones not only with different operating temperatures, but also with different density of the thermal load. The solution is characterised by a high-IP cabinet. This also protects the installed components from dust and moisture.

Side cooling units are attached directly with the racks to make a closed module with an internal cold zone at the front part of the cabinet and hot zone at the rear of the cabinet. This solution allows you to combine any number of racks and cooling units in the module. Our specialists will prepare a proposal for the project to ensure the space capacity required for installation of the equipment and the corresponding power conditioning, including any needed redundancy.

Floor feed

This method increases the efficiency of the cold air through the delivery from double floor to the installed equipment. The cabinet is installed on the opening in the double floor. A deflector, located at the bottom of the cabinet, directs cool air to its front section. Cold air in this case is further directed in the front section of the cabinet by the door without perforations, these may be of glass or metal. The hot air is extracted from the rack either by doors with 80 % perforation or the cabinet ceiling.

By installing a cool air supply regulator to the bottom of the cabinet the amount of air may be adjusted, or delivery can be completely discontinued when the cabinet is not in use. The advantage of this cooling method is great flexibility in planning of the room usage. Cabinets installed in hot and cold aisle is not required if the hot and cold air is separated inside the cabinet. To achieve this it is necessary to install a separating frame inside the cabinets for a strict separation of cold and hot air.

Floor feed with plenum return

A possible disadvantage of cold aisle and cooling supply from the floor and return to the room is that the hot air is brought into the surroundings of the installed equipment. This does not cause a complication when it is already considered in the data centre design stage. In certain cases a possible solution is to completely separate the warm air in areas with high thermal loads due to the concentration of the installed equipment.

The solution is to supply cooling air from the room or raised floors and return it to the ceiling. This is the solution when the hot air does not return into the hall, but is fed to the ceiling or double ceiling. A rear deflector located in the upper part of the cabinet helps to optimise the flow of hot air into the outlet extension. A large adapter allows the passage of large quantities of air at a relatively low speed.

A cold air intake is on the front door of the cabinet, and hot air is discharged through the outlet extensions to the ceiling / double ceiling above the devices. Air conditioning units take the hot air from the ceiling, cool it and deliver it back under the raised floor. The air cooling circuit is closed. This solution provides high efficiency cooling for very large volumes of hot air. Research indicates that this solution can be used to cool up to 30 kW per cabinet.
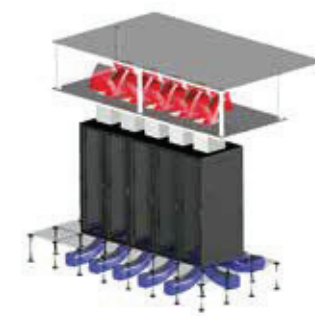
Our specialists will be glad to help you to choose the optimum solution for your needs.
Selecting the right type of cabinet and accessories, you can save significant money spent on the operation of your equipment.

DATA CENTRE DESIGN

This critical stage of the data centre building has an indefinite solution. It depends on the cabinet arrangement, distribution of heat load and its size, the choice of thermal scheme (hot / cold aisle, zonal distribution of cold etc.) and many other aspects.

When selecting the most suitable arrangement it is necessary to take into account the type of cooling system (under-floor cooling, In-Row cooling units ...) and with regard to the coolant used, also selecting the outer part of the system.

Choice of the cooling medium must be done with respect to outdoor climatic conditions, the distance of the data centre from the external units and the elevation between them. Depending on conditions, we can choose water cooling with appropriate addition of antifreeze, or system operating with liquid refrigerant gas.

With regard to safety and redundancy required for service operations it is necessary to design the complete system properly, meaning inside the data centre and on the side of radiators or condensers.

Furthermore, it is necessary to think about the requirements of humidity control. Humidity less than 30 % carries a risk of damage to the installed equipment by static electricity surge; high humidity can lead to condensation.

In our portfolio you will find the cooling systems of leading manufacturers active in this highly specialized field of data centres and telecommunication equipment cooling for many years. Thanks to the close cooperation and support of their development teams, we can offer proven and guaranteed solutions.

Designing functional, reliable, financially and operationally economical cooling systems for the data centre is not an easy matter and specialists, who will recommend the optimum solution in terms of investment and operating costs, are fully available.
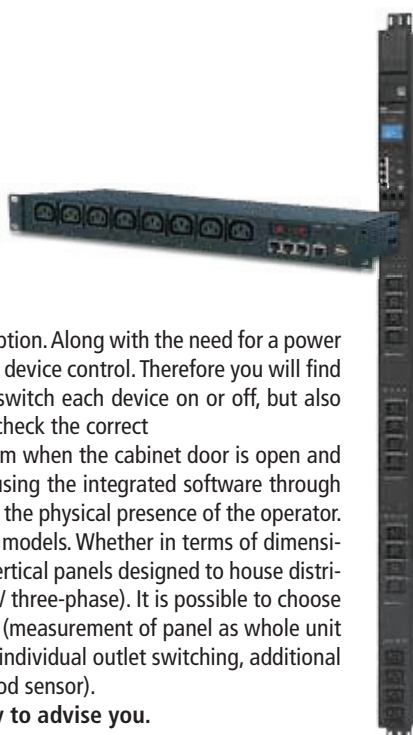
POWER DISTRIBUTION UNITS

Equipment installed in data centres often has very high power consumption. Along with the need for a power supply, it also brings the question of the need for metering and remote device control. Therefore you will find power distribution panels in our range, which not only allow you to switch each device on or off, but also provide information on the temperature and humidity in the cabinet, check the correct
functioning of the condensate drain of the cooling unit, signal an alarm when the cabinet door is open and other conditions that you define. Any changes can then be reported using the integrated software through a computer network and allow you to oversee the data centre without the physical presence of the operator. Distribution panels with management systems exist in many different models. Whether in terms of dimensions, where we offer solutions from the standard 19″ panels to large vertical panels designed to house distribution systems, or in terms of different inputs (16A-64A, single-phase / three-phase). It is possible to choose from many product lines according to the required panel functionality (measurement of panel as whole unit or measurement of individual outlets, the control panel as a whole or individual outlet switching, additional monitoring functions temperature/ humidity / door contact / water flood sensor).
When choosing the most appropriate solution we will be happy to advise you.

RDA for data center

Datacenter version of RDA cabinets combines high loading capacity with the requirements specific to this type of installation. Cabinets are ready for assembly into larger units and to install roofing to made hot / cold aisles.

■ READY FOR ROOF INSTALATION

For mounting the hot or cold aisle roof has datacenter version of RDA modified front side without skew typical for Triton cabinets. Models designed for data centers are labeled A3 and A7. Model A7 also has cable entries in the frame for patching cables between racks secured by blanking panels on screws.
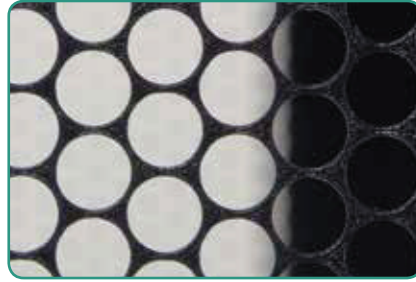
■ 80 % DOOR PERFORATION

RDA is a cabinet designed for mounting servers and other active elements that requires good cooling. Therefore, it is most often supplied with a perforated front door. The rear doors are usually also perforated and double wing. Their withdrawal from its hinges obtain comfortable access for installation and maintenance of installed equipment. PATENT: PUV 2012-26481.

■ CABLE ENTRIES
AT THE VERTICALS IN THE ROOF

The additional cable entry to the installed equipment is available over each of the outer vertical. Openings are covered with panels on screws.

RDA 800 x 1000 mm

■ HOOK-ON HINGES

Our standard door hinges can be replaced by its new put-in alternative. Door can be taken off, which allow an easy installation and configuration of all installed equipment. These hinges are fully compatible with previous versions. Please refer to section „Accessories".

■ MULTIPOINT LOCKS

Multi-point lock mechanisms Triton together with side panels fixed by screws increase safety of installed equipment.

■ LOADING CAPACITY 1500 kg

The RDA data cabinet has a reinforced construction and it is made of thicker material. Also 19" vertical rails are designed for a higher loading capacity. A version with depth over 800 mm has a central pair of vertical rails as a standard solution.

■ JOINING OF CABINETS

RDA cabinet is equipped with mounting holes for easy joining. Can be combined with standard rack Triton (RMA, RZA).

■ **POWER DISTRIBUTION UNIT INSIDE OF CABINET FRAME**

19" power distribution units Triton can be mounted using the supplied brackets into the space inside the frame, so does not occupy valuable space for equipment.

■ **COOLING AIR INTAKE**

In the bottom of the cabinet is large opening for cable entry and the cooling air from beneath the raised floor. These models RDA (A3 and A7) are built directly on the floor without nivelation feets.
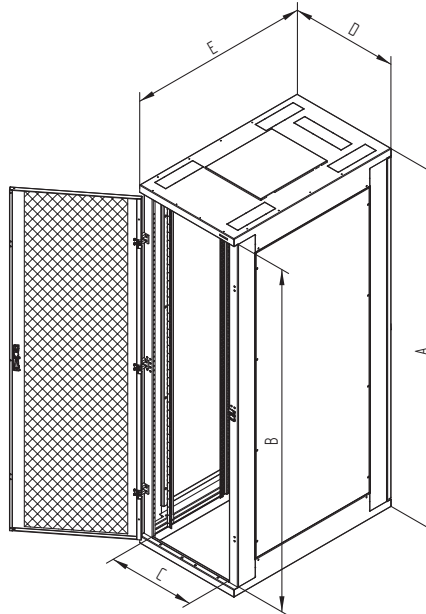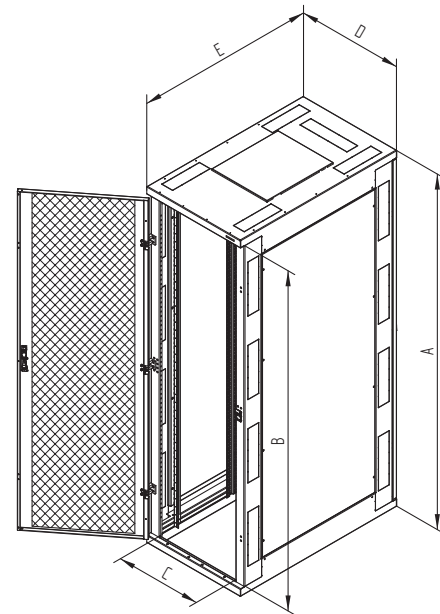

■ **19" VERTICAL RAILS**

19" vertical rails designed for equipment installation are freely adjustable in whole depth of cabinet. A cabinets deeper than 800 mm has a additional central pair of vertical rails as a standard solution.

RDA 600 x 1000 mm

RDA-42-X61-CAX-**A3**-GDA

RDA-42-X61-CAX-**A7**-GDA

RDA FOR DATA CENTRES

TYPE	A	B	C	D	E	Weight gross (kg)	Weight net (kg)	Maximum recommended load (kg)
	(mm)							
RDA-42-L68-CAX-Ax-GDA	1970	1868	487	600	800	116,3	110,2	
RDA-45-L68-CAX-Ax-GDA	2105	2003	487	600	800	122,4	116,3	
RDA-47-L68-CAX-Ax-GDA	2194	2092	487	600	800	125,8	119,6	
RDA-42-L61-CAX-Ax-GDA	1970	1868	487	600	1000	131,3	124,8	
RDA-45-L61-CAX-Ax-GDA	2105	2003	487	600	1000	138,1	131,6	
RDA-47-L61-CAX-Ax-GDA	2194	2092	487	600	1000	141,9	135,4	
RDA-42-L60-CAX-Ax-GDA	1970	1868	487	600	1100	137,9	130,6	
RDA-45-L60-CAX-Ax-GDA	2105	2003	487	600	1100	144,9	137,6	
RDA-47-L60-CAX-Ax-GDA	2194	2092	487	600	1100	149,1	141,5	
RDA-42-L62-CAX-Ax-GDA	1970	1868	487	600	1200	144,0	136,4	
RDA-45-L62-CAX-Ax-GDA	2105	2003	487	600	1200	151,2	143,6	
RDA-47-L62-CAX-Ax-GDA	2194	2092	487	600	1200	155,3	147,6	1500
RDA-42-L88-CAX-Ax-GDA	1970	1868	687	800	800	131,5	124,4	
RDA-45-L88-CAX-Ax-GDA	2105	2003	687	800	800	137,8	130,6	
RDA-47-L88-CAX-Ax-GDA	2194	2092	687	800	800	141,3	134,1	
RDA-42-L81-CAX-Ax-GDA	1970	1868	687	800	1000	147,8	139,8	
RDA-45-L81-CAX-Ax-GDA	2105	2003	687	800	1000	154,8	146,7	
RDA-47-L81-CAX-Ax-GDA	2194	2092	687	800	1000	158,7	150,6	
RDA-42-L80-CAX-Ax-GDA	1970	1868	687	800	1100	153,8	146,1	
RDA-45-L80-CAX-Ax-GDA	2105	2003	687	800	1100	161,0	153,3	
RDA-47-L80-CAX-Ax-GDA	2194	2092	687	800	1100	165,2	157,3	
RDA-42-L82-CAX-Ax-GDA	1970	1868	687	800	1200	160,0	152,3	
RDA-45-L82-CAX-Ax-GDA	2105	2003	687	800	1200	167,4	159,5	
RDA-47-L82-CAX-Ax-GDA	2194	2092	687	800	1200	171,7	163,7	

RDA - Datacenter models A3 and A7

DESCRIPTION, PURPOSE OF USE

- 19" free-standing cabinet with IP20 protection
- Cabinet includes 4 sliding vertical rails for device mounting (6 rails for cabinets deeper than 800 mm).
- Cabinet construction:
  – Welded steel frame with removable side panels fixed by screws
  – Single or double doors in all metal versions, perforated (80 % air permeability) or glazed with safety tempered glass 4 mm. They can be on the front or back of the cabinet.
  – Preparation for installation of 19" power distribution units to the frame
  – Preparation for joining the cabinets together
  – Preparation for hot / cold aisle roof and sliding door installation
- The maximum recommended load of cabinet is 1500 kg, maximum load of the door is 20 kg.
- Finishing of polyester powder coating, min. coating thickness of 65 μm.
- The racks are designed for installation of data and telecommunication equipment and distribution systems.
- Frame of the cabinet and all detachable parts are connected by grounding cables that must be properly fitted and inserted into the connectors when using the cabinet.
- At the bottom of the rack is positioned a screw M8 as major earthing point.
- Cable entries covered by blanking panels secured by screws are located in the uppper cabinet part. There are also cable entries (with breakout panels) in the cabinet frame of the model A7.

OPERATING CONDITIONS

- Operating environment:
  – Office
  – The cabinet is not intended for outdoor installations and for installations in environment that can influence negatively the functionality of the cabinet and the mounted devices (e.g. environment with danger of explosion)
- Must be protected against:
  – Mechanical damage
  – Improper handling
  – A different usage than the cabinet is intended for
- Improper handling is especially:
  – Overloading (exceeding the maximum recommended load)
  – Installing devices which may negatively influence the operation and function of the cabinet or the installed equipment.
  – Change of the construction or design of the cabinet

INSTALLATION OF THE CABINET

- To ensure the maximum recommended load, it is necessary to distribute the load equally.
- The cabinet must be placed straight on the flat floor without nivelation feets.
- To avoid dust penetration in the case where cables lead through some of the cable openings, it may be sealed with a blanking panel with a brush or secured by a plastic frame (both are included in the delivery).
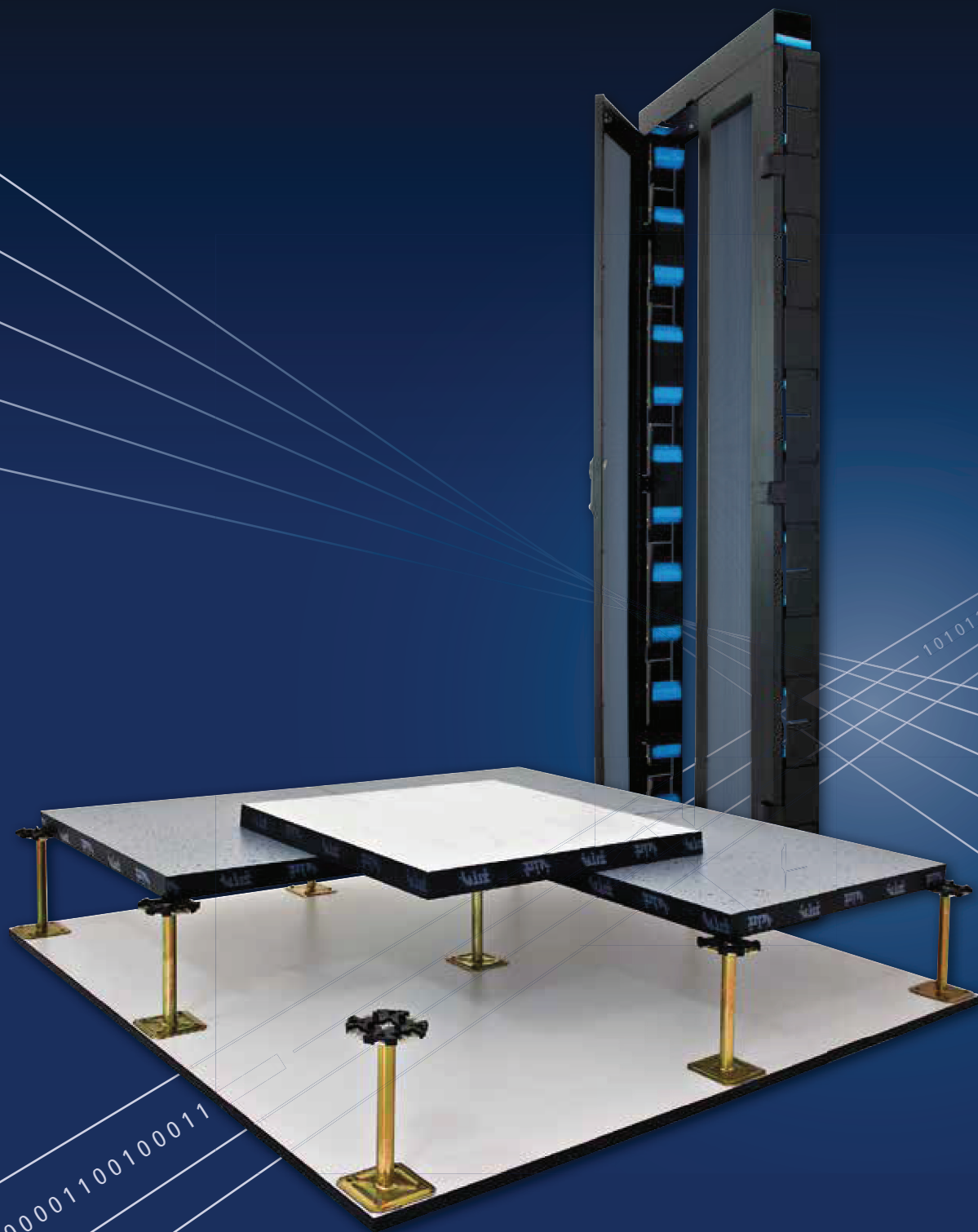
ENVIRONMENTAL PROTECTION

- All parts are made of recyclable materials and after decommissioning the cabinet, it must be disposed of according to relevant regulations.

CERTIFICATE AND CONFORMITY

- This product is certified with ITI TÜV, number of certificate 06.033.157, date 23/08/2012 and is fully in accordance with ČSN EN 62208 ed.2:2012(EN 62208:2011).

Data center - accessories ❯

Specifics of data center requires unique equipment that ensures maximum efficiency in installation, ease of operation and particular control of equipment cooling.

PATCH FRAME

How to connect devices in two adjacent cabinets? The usual method, the cable pulling through entry holes in the roof or in the base of each rack, is laborious, time-consuming and capacity of these passages is often insufficient. Triton has developed for their cabinets unique patented solutions - the patch frame. After installing on the adjacent cabinet it replace the doors and greatly increases the capacity and convenience for cable patching between cabinets.

■ CABLE TRAY

Need to connect equipment in cabinets, that are not directly adjacent? Nor is this a problem with patch frame. Just install on top the cable tray and you can easily bypass several cabinets exactly as needed. After closing the covers and doors and lock all of them the cables are protected from unauthorized access.

■ LARGE CAPACITY

We supply patch frames for the selected cabinets heights in two versions. 75 mm deep version offers cable entries with dimensions 109 x 40 mm, 150 mm version then even 109 x 80 mm. The most common patch frame for 42U high cabinet has on each side 6 of these cable entries.

■ EASY ADMINISTRATION

The cabinet is supplied as standard with double wingdoors of all types - glazed, fully metal and perforated. After after removing the door from its hinges, the re-cabling between cabinets almost becomes fun, only inserting cables into the prepared openings without pulling.

Patch frame
PATENT: PUV 2012-26482.

Cable tray	Width (mm)	Depth (mm)
RAX-RA-X06-X1	600	75
RAX-RA-X06-Y1	600	115
RAX-RA-X08-X1	800	75
RAX-RA-X08-Y1	800	115

■ SOLUTION FOR CABINETS ON DUTY

Patch frame can be installed on cabinet already crowded by equipment on the front and back of the cabinet, and thus greatly simplify their administration.

■ CABLE ENTRIES

Cable entries are covered with break-out plugs. At the point where you need to pull cables, plugs can be easily removed and frame construction guarantee the protection of cables, including compliance with the bending radius of optical cables.

| Patch frame	Height (U)	Width (mm)	Depth (mm)	Double wing door
RAX-RA-426-X1	42	600	75	Glazed
RAX-RA-426-X2	42	600	75	Fully metal
RAX-RA-426-X3	42	600	75	Perforated (air permeability 80 %)
RAX-RA-426-Y1	42	600	115	Glazed
RAX-RA-426-Y2	42	600	115	Fully metal
RAX-RA-426-Y3	42	600	115	Perforated (air permeability 80 %)
RAX-RA-428-X1	42	800	75	Glazed
RAX-RA-428-X2	42	800	75	Fully metal
RAX-RA-428-X3	42	800	75	Perforated (air permeability 80 %)
RAX-RA-428-Y1	42	800	115	Glazed
RAX-RA-428-Y2	42	800	115	Fully metal
RAX-RA-428-Y3	42	800	115	Perforated (air permeability 80 %)
RAX-RA-456-X1	45	600	75	Glazed
RAX-RA-456-X2	45	600	75	Fully metal
RAX-RA-456-X3	45	600	75	Perforated (air permeability 80 %)
RAX-RA-456-Y1	45	600	115	Glazed
RAX-RA-456-Y2	45	600	115	Fully metal
RAX-RA-456-Y3	45	600	115	Perforated (air permeability 80 %)
RAX-RA-458-X1	45	800	75	Glazed
RAX-RA-458-X2	45	800	75	Fully metal
RAX-RA-458-X3	45	800	75	Perforated (air permeability 80 %)
RAX-RA-458-Y1	45	800	115	Glazed
RAX-RA-458-Y2	45	800	115	Fully metal
RAX-RA-458-Y3	45	800	115	Perforated (air permeability 80 %)

SEPARATION FRAME

◾ SEPARATION FRAME WITHOUT OPENINGS

Especially for 800 mm wide cabinets is important to point cooling air efficiently through the door to the installed equipment. The flow between side panels and the vertical rails prevents separation frame. Mounted between the rails and the frame of the cabinet of cabinet secure perfectly this area thanks used brush seal. Frame is moving with vertical, which still can be attached in any depth of cabinet, so usage of frame do not restrict the user in selecting equipment.
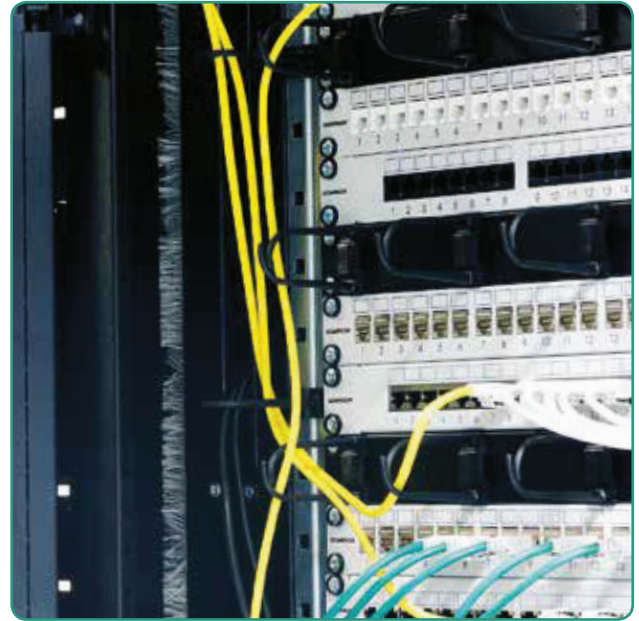
◾ SEPARATION FRAME WITH OPENINGS

Version with additional 19" positions increases the cabinet installation capacity by 6 positions 1U and allows passage of cabling through the separation frame to the back of cabinet.

◾ DELIVERY AND INSTALLATION

Set of separation frame contains all the necessary components and assembly materials. Individual parts of the frame are mounted on the outside of the vertical rails using thread forming Tap-Tite screws. Frame with additional 19" positions is supplied with easy to install blanking panels fixed by plastic locks.

Type	Width (mm)	Heights (U)	19" positions
RAX-DT-R42-X6	600	42	NO
RAX-DT-R45-X6	600	45	NO
RAX-DT-R47-X6	600	47	NO
RAX-DT-R42-X8	800	42	NO
RAX-DT-R45-X8	800	45	NO
RAX-DT-R47-X8	800	47	NO
RAX-DT-R42-A8	800	42	YES
RAX-DT-R45-A8	800	45	YES
RAX-DT-R47-A8	800	47	YES

■ **POWER DISTRIBUTION PANELS**

Power distribution panels can be installed directly into the cabinet frame, saving valuable installation space. Distribution panels thanks to thoughtful cabinet design do not disturb slide out servers even in cabinets 600 mm wide.
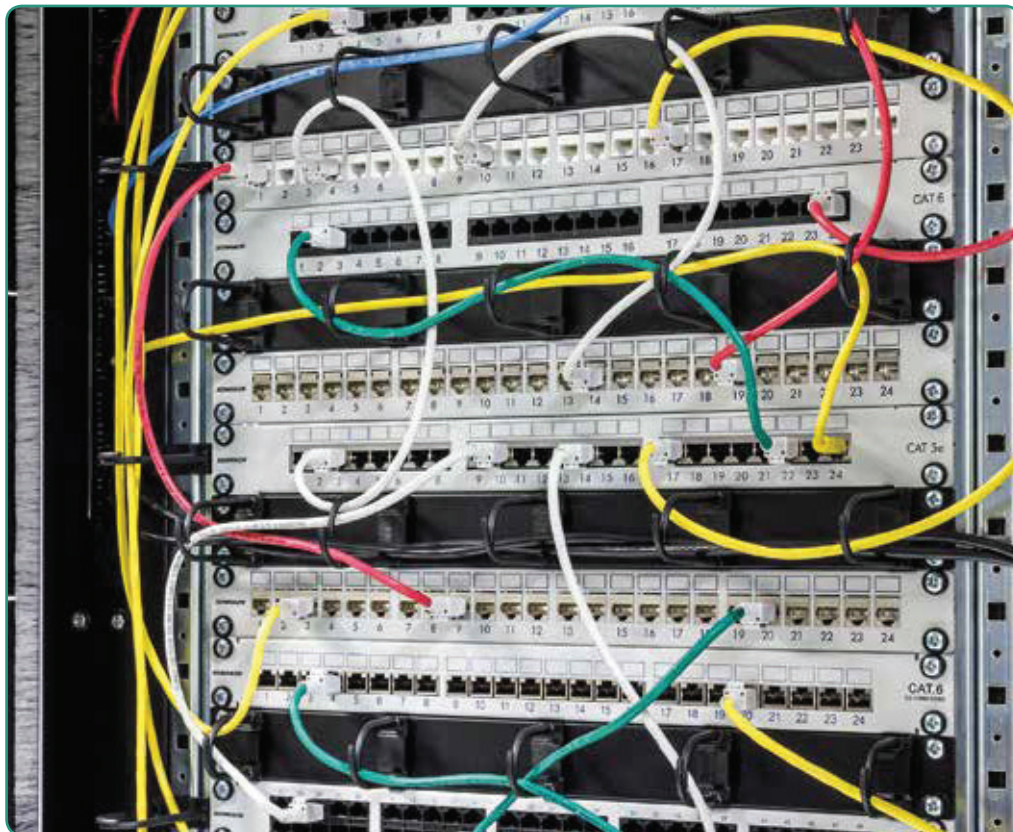
RAX-ZV-X03-X1

RAB-UP-X23-A1

■ **RAX-ZV-X03-X1**

Connector for wire cable trays

■ **RAB-UP-X23-A1, RAC-UP-X23-A1**

19" base station for 3U servers, 750 mm, 45 kg load capacity.

RAX-ZV-X02-X1

■ **ADAPTER 23"/21" A 21"/19"**

Cabinets Triton 800 mm wide allows to install vertical rails not only in 19" span but also in 21" and even 23". In this case for use of conventional 19" equipment is required this adapter (see Shelves).

■ **RAX-ZV-X02-X1**

Cabling between data center cabinets - this is another part of the complete solution. We offer a proven system of wire cable trays. Their high capacity, easy installation and large shape variability predetermine it for such applications. (RAX-ZV-X02-X1)

■ RAX-ZV-X04-X1

For attaching wire cable tray on cabinet is designed this holder. Screwed to the roof of the cabinet it provides not only the necessary load for cable trays but also the distance from the roof of cabinet to ensure needed cable bending radius. (RAX-ZV-X04-X1)

■ PLASTIC MANAGEMENT RING

Verticals of RDA cabinets are designed for installation of plastic rings. These are in the area next to the vertical and do not affect the 19" installation. Their installation and removal is easy and fast and allows you to adjust the organization of cables each time you change the installation (see Cable organization systems).

RAX-DR-X11-X1

■ RAX-DR-X11-X1

Holder of PDU 1U (pair). The holders are designed only for RDA cabinets.

RAX-DR-X12-X1

■ RAX-DR-X12-X1

Holder of PDU 2U (pair). The holders are designed only for RDA cabinets.

■ EASY-CLIP BLANKING PANEL

Blanking panel is frequently detached accessory in data centers for access to installed equipment. Therefore we offer a version with tool-less plastic locks, which can be quickly removed as well as installed to its place (see Blanking panels, cable entry panels).

■ RAX-NZ-X30-X1

Adhesive foil for perforated door 80%-6 mm (690 x 2090 mm), 47 U - free standing cabinets

RAB-VP-H10-X1

■ RAB-VP-H10-X1

Cable management vertical panel 10U - comb, for cabinets 800 mm width, RAL9005

■ REMOVABLE COVER

Swing, removable cover for cable management vertical panel RAB-VP-H10-X1

DATA CENTER – HOT / COLD AISLE

Once several cabinets are connected together, it is necessary to optimize cooling of all installed equipment. Uncontrolled air flow is very expensive and inefficient. There is a concept of „cold and hot aisles" to prevent from such situations, which leads to controling over the cold air flow and also which leads to prevention from mixing cold and hot air together. It is one of the most popular solution to cover all cabinets and separate them from outside with a sliding door system. Such solution will allow cold air input in between cabinet rows and all hot air goes away into the surrounding (hot air is cooled down with an A/C unit and returns back in cold aisle among cabinets). This solutin is called „a cold aisle". The hot aisle solution has an opposite system of the air flow. All cold air is around data cabinets and the hot air is collected in between cabinet rows. For both „aisle" solutions we can provide you with standard components. Atypical solutions are subject to an individual offer.
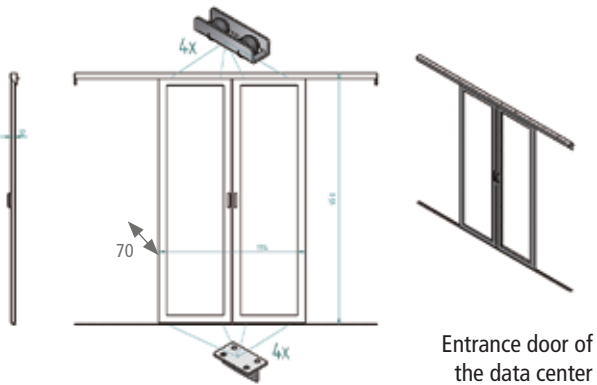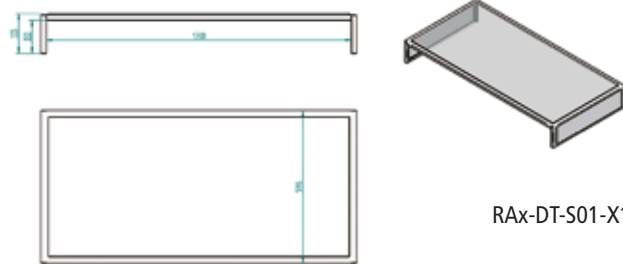

Entrance door of
the data center

RAx-DT-S01-X1

Data center`s
roof panel

■ RAx-DT-Dxx-Xx

Sliding double-wing doors which are intended for data centers have a safety clear glass filling. A standard version is suitable for 1200 mm wide aisle for 42, 45 and 47 Units.

There is also a version of the self-closing (with gas spring), electrical (opens by motion sensor) and other solutions. Request a quote as per your needs.

| Type	Height (U)
RAx-DT-D42-X1	42
RAx-DT-D45-X1	45
RAx-DT-D47-X1	47
RAx-DT-D42-X3 - self-closing (gas spring)	42
RAx-DT-D45-X3 - self-closing (gas spring)	45
RAx-DT-D47-X3 - self-closing (gas spring)	47

■ RAx-DT-Sxx-X1

An aisle roof is made of a clear safety glass in a metallic frame. A ceiling shape allows an air to flow easily. Macrolon filling of the metallic frame is a subject to an individual offer.

We offer 1200 mm roofing of an aisle as a standard for cabinet width from 300 mm to 800 mm.

News in our offer are sliding roofs, providing access to cable trays and self-opening roofs, which in case of a fire in a flash expose extinguishing gas access to datacenter aisle.

Type	Width of roof panel
RAx-DT-S04-X1	300 mm
RAx-DT-S03-X1	400 mm
RAx-DT-S01-X1	600 mm
RAx-DT-S02-X1	800 mm
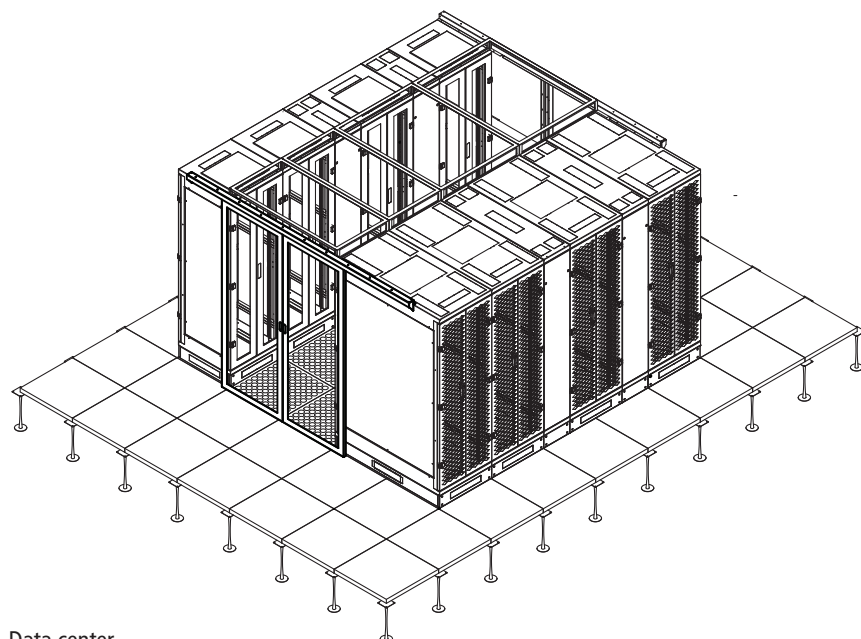
Data center
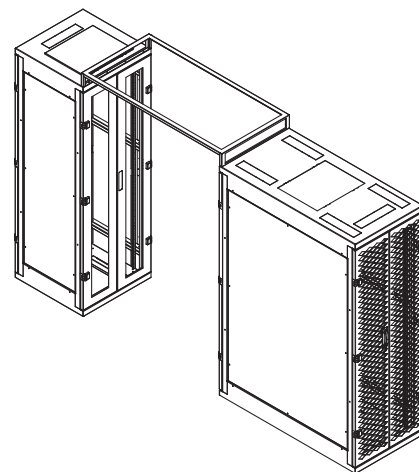
Data center`s
roof panel

RAISED FLOORS

Raised floors are in most cases an integral part of the data center. Suppliers of materials for raised floors in our range are ATIZ Company and MERO. We work closely with the manufacturer or, in the case of floors Mero, with the exclusive distributor for the Czech Republic. We therefore offer a complete delivery of both materials and installation.

Raised floor is made from stepping plates size 600 x 600 mm made of special chipboard with high density and thickness of 38 mm. The side edges are covered with a plastic strip to protect against damage and moisture. To achieve a seamless surface plates have edges angled by 4°.

The bottom side is provided with aluminum foil or galvanized steel sheet. The plates are carried by steel, height-adjustable struts with anti-corrosion finish yellow chromate that sticks elastic sealant on a primer soaked concrete floor. Contact of plates with struts is made by electrostatically conductive plastic washer which works also as sound insulation. On request, electrostatically conductive plate may be supplied include certification of electrical inspection.

ATIZ	
Type	**Tile (finishing)**
ADS 40	ADS 40/T-500 600 x 600 PVC Dynamic
ADS 40	ADS 40/T-500 600 x 600 without finishing
ADS 40	ADS 40/T-500 600 x 600 PVC Dynamic electrostatic
ADS 40	ADS 40/T-1000 600 x 600 PVC Dynamic
ADS 40	ADS 40/T-1000 600 x 600 without finishing
ADS 40	ADS 40/T-1000 600 x 600 PVC Dynamic electrostatic

■ Raised floor ATIZ

The manufacturer of this type of floor is a Czech company using materials from proven suppliers. Preferred supplier of surfaces in this case is a traditional Czech manufacturer Fatra. Indisputable benefit is a very good price / performance ratio.
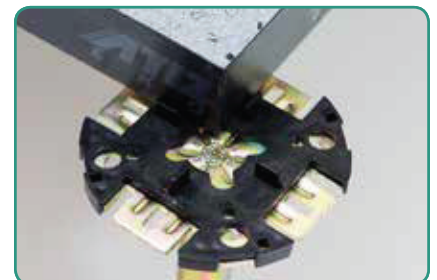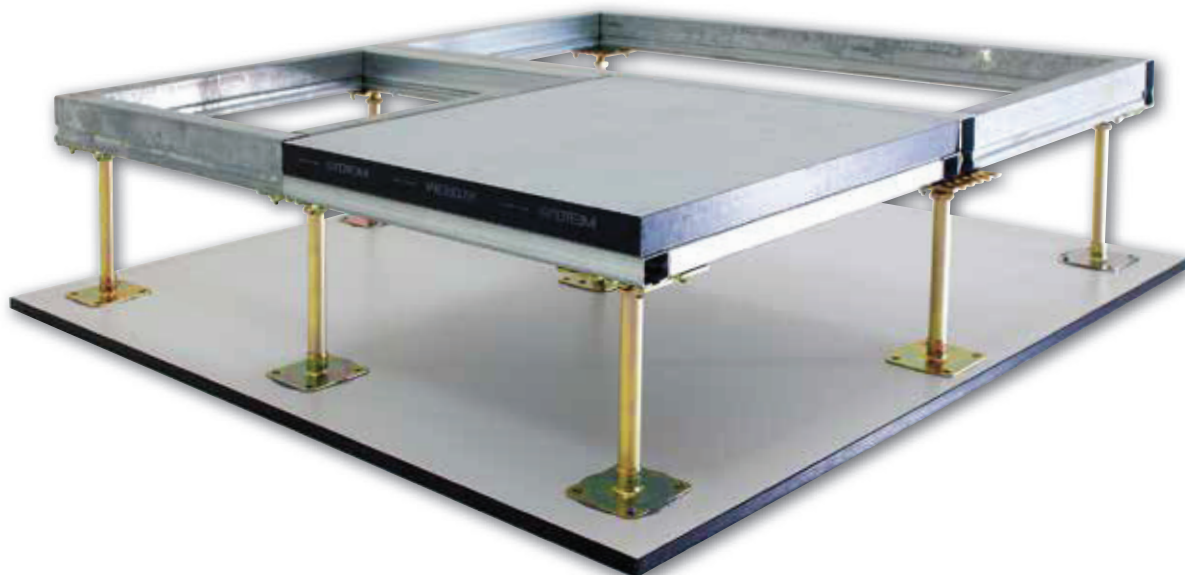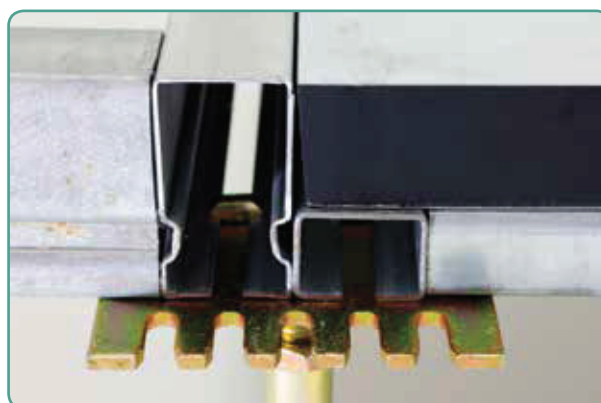
■ Raised floor MERO

One of the best systems of the rised floors from point of view of quality and portfolio range are products of the German company MERO Systeme GmbH. Our company offers types of rised floors designed for installation in data ceters also as in the energo and technological centers.

Raised floor MERO typ 5

The panel is made of high density chipboard. The facing surface can be selected by the customer (PVC, linoleum, aluminum foil, etc.), back side is covered with galvanized sheet 0.5 mm. Sides of panels are covered with plastic tape, which ensures maximum dimensional tolerance, moisture protection and tightness of the system. Panels are freely placed on adjustable struts, glued to the building structure.

Raised floor MERO typ 2

Special technological frame based raised floor suitable for electro distribution rooms and similar technological centers. Panels (depending on desired fire protection of system) are freely placed on the frame substructure of C-profiles, bolted to adjustable struts. Span of struts can be made in multiples of panel sizes 600 x 600 mm or 600 x 1200 mm. Anywhere in floor area can create free or covered, dimensionally adjustable, reinforced frames under the equipment (cabinets, distributors etc.).

MERO	
Type	Tile (finishing)
5	5GB 38 600x600 PVC MERO ELAST 3000 steel
5	5GA 38 600x600 PVC MERO ELAST 2000 ALU foil
5	5GAA 38 600x600 ALU foil 3000 ALU foil
5	5GBA 38 600x600 without finishing 3000 ALU foil

Building height of the raised floor can be achieved in the range from 65 to 2500 mm, this parameter must be adapted to the type of flooring and struts design.

For design and calculation of raised floor the **project documentation** is needed, this will be **free of charge** prepared by our specialists.

■ Instructions for Operation and Maintenance

1. Environment Parameters

Standard – according to individual types.

2. Panel Lifting Handles

In order to lift the panels, a panel lifting handle must ALWAYS be used. This is delivered as an accessory with raised floors:

- Handle for "hard" covers – smooth surfaces (vacuum handle)
- Handle forglued textile surfaces (needle handle)
- Special handle for "studded" rubber covers

PANELS MUST NOT BE REMOVED WITH A SCREWDRIVER OR OTHER UNSUITABLE TOOL WHICH MAY DAMAGE THE PANEL.
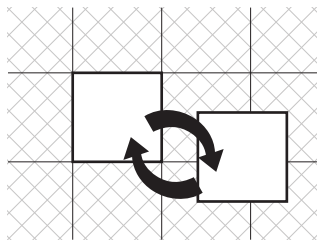
3. Removing the Panels

Attach the handle at a point about 1/3 of the panel, at the same distance from the edges and lift the panel. Lay it face up, do not lay it on its edge. We recommend putting the panels as close as possible to the area where they were removed and in the same position as they were removed, in order to replace them correctly.
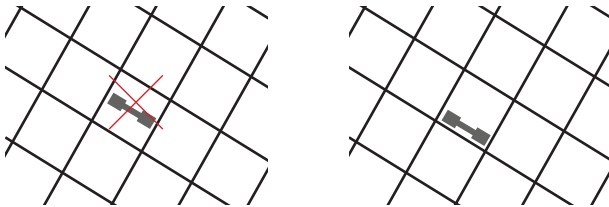
4. Laying the Panels

Remove any dirt from the stand heads, attach the handle to the panel surface, set the panel on the edge of the two stands and "slide" it in place. For edge panels (mostly shortened panels) extreme care must be taken during reinstallation – first "slide in" the panel sideways with the attached rubber on the edge stands by the wall, press against the wall and "snap" the edge towards the room into place.

It is important to ensure that the panel is inserted AT THE SAME PLACE from which it was removed (avoid swapping the panels) and IN THE SAME POSITION (avoid turning the panels).

If a panel "clicks" during this process, the distancing projection on the pedestal head must be checked (if it is deformed and cannot be straightened, it may, in extreme cases, be cut off).

5. Removing and replacing Rows of Panels

It is not recommended to uncover an area larger than one row of panels without the assistance of someone from a specialised company.

When removing a long line of panels, we recommend leaving every 5th or 6th panel as a spacer.

Under no circumstances should you uncover an area which would leave a pedestal remaining separately.

After the first panel is removed using the original lifting handle, you can remove the other panels without the handle in the same direction. Returning the panels should be done by "zip" way, using the system of **1-3-5-7-.... / 2-4-6-8-.... .**

It is important to ensure that the panel is inserted **AT THE SAME PLACE** from which it was removed (avoid swapping the panels) and IN THE SAME POSITION (avoid turning the panels).

For raised floors type 2 (bolted frame construction), a larger surface can be uncovered (panels have to be returned at the same place and in the same position) – in this case however, it is important to protect the distancing pads on the profiles from damage.

6. Cutouts in the Panels

Additional panel cutouts must be at least 100 mm from the edge of the panel. With a greater load, the carrying capacity of the panel must be increased by using additional pedestals. If the panels are divided or the corners are cut off because of the cutouts, it is also necessary to use additional pedestals. On divided panels, the remaining pedestals have to be bolted down.

7. Disassembly

Disassembling and reassembling larger areas may be done only by trained experts.

8. Installing Wiring

- Do not pull wires over the edges of the panels.
- When laying wires under a raised floor, be careful not to damage the wires on the sharp ends of the construction.

We recommend laying the wire by unrolling it directly from the roll.

9. Moving Heavy Objects or Equipment across the Raised Floor

Moving heavy objects or equipment near an open row of panels must be avoided. When moving heavy loads, it is necessary to ensure that the allowable stress is not exceeded. When shifting heavy loads on a raised floor by the use of a forklift, then decisive is declared point load value.

10. Special constructions

- Raster profiles of U, M or C type – common profiles are set only loosely on stands secured against horizontal movement. During installation or when modifying installations under a raised floor, profiles can be removed for easier accessibility.

  Make sure that, particularly for raised floors higher than about 50 cm, a raster of more than one row is not removed and freely standing pedestals do not remain without being secured horizontally by the raster.

- Type C raster profiles (raised floor type 2) are secured by bolts with special heads. For modifying this construction, it is recommended too contact the professional company which installed the raised floor, or other specialised company.

11. Carrying Capacity of Raised Floors

- The maximum carrying capacity of the raised floor construction is declared during the delivery.
- If a heavy load is moved across the raised floor, the increased dynamic stress must be considered.
- Do not move heavy objects near to uncovered parts of the raised floor with panels removed.
- Install equipment only after you make sure that its weight will not exceed the declared maximum carrying capacity of the raised floor.
- Example method for additional removing parts of the floor panels (especially in the area of heavy equipment) for the installation of wiring, etc. – it must be ensured that not too long a line of panels is removed without leaving a few spacing panels in their possition:

technology
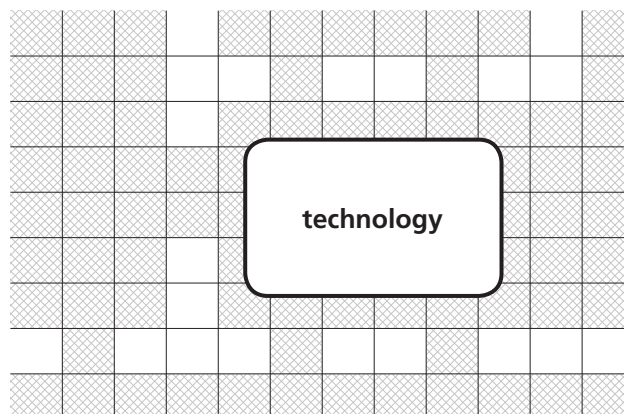
■ Instructions for Maintaining Surfaces

Care of elastic surfaces of raised floors made of PVC, linoleum and rubber includes three basic operations:
- Cleaning (damp cloths wiping and cleaning products)
- Creating a protective coating
- Disinfection (in facilities where this is required)

When selecting cleaning and maintenance products, you should thoroughly read the manufacturer's instructions for use and exclude those that could:
- Cause swelling, shrinkage or leaching flooring;
- Adversely affect surface properties, especially colour, slip resistance, elasticity, or electrophysical properties of the covering.

General Maintenance Rules
- If a raised floor with elastic surface is particularly dirty, it is recommended that first you gently sweep away the loose coarse dirt (caution should be exercised with sharp impurities to prevent scratching the surface).
- **Damp cloths wiping** easily removes stubborn dirt from the floor (a suitable broom covered with a moist cloth). When caring for a raised floor, due to the nature of the material supporting the panels, you should consistently ensure that maintenance is actually carried out only with a DAMP, not wet, cloth. Particular care should be taken especially for end panels around the periphery of raised floors and passages where the material supporting the panels (mostly particleboard) is not protected and could come into direct contact with water.

  Common suitable cleaning products can be added to the water used for cleaning, or combined products - maintenance - which also create a protective film on the floor covering. Using these types of products will combine cleaning and creating a protective coating in one operation. For maintaining the floor we recommend always using the same type of cleaning products.

  When selecting cleaners for linoleum, it must be taken into account that highly alkaline compositions may attack the natural raw material and cause unwanted discolouration. When in doubt, test the cleaner on a sample beforehand.

- **ELECTROSTATICALLY CONDUCTIVE AND ANTI-STATIC SURFACES.** Only manufacturers recommended maintenance materials can be applied on PVC, LINOLEUM AND RUBBER FLOORS, in order to not adversely affect the electrophysical properties of the flooring . In measuring out dosages, you should generally follow the instructions of the manufacturers of the cleaning maintenance products.
- **Cleaning products** - used when it is necessary to remove tough stains or footprints/scuffs, which cannot not be removed by wiping with a damp cloth. Stains and footprints are sprayed with a combination of maintenance and cleaning products (cleaners) or a suitable multi-purpose emulsion and left to work.

  The cleaners are applied by hand or pressure sprayer. If the dirt is severe, a rotary cleaning machine with polyamide cleaning discs (Nylpads) can be used – on linoleum only a soft disc can be used.

Initial Treatment:
- Initial treatment (especially for linoleum) should be done after construction is finished using a suitable glossy emulsion or dispersion, as recommended by the flooring manufacturer. Ordinary maintenance products can also be used, which are added to the cleaning water. To create a protective film, it is necessary to use higher concentrations of the product (be careful not to use too much, as a sticky coating may result)..
- For electrostatically conductive and antistatic surfaces, the same principle applies when selecting products for the initial treatment, as for selecting products for routine maintenance (see previous section).

  When selecting the proper cleaning and maintenance products, flooring manufacturers recommend the range of products of companies such as:
  - HENKEL
  - JOHNSON WAX
  - CHEMA - CHEMIE
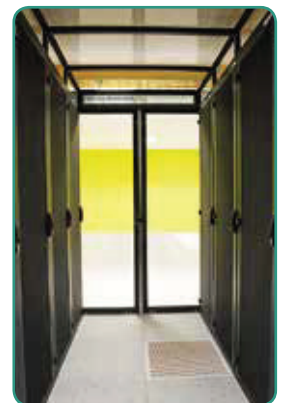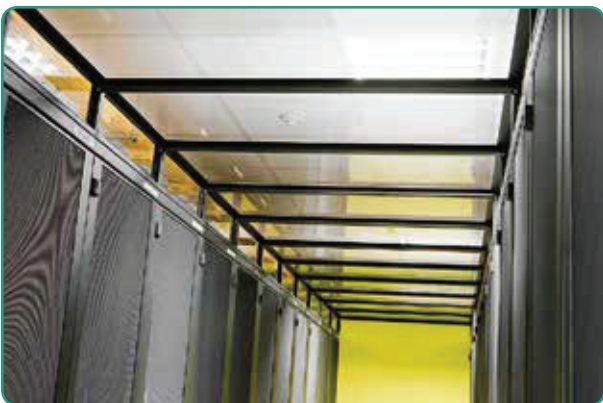 - LEVER SUTTER and other well known brands.
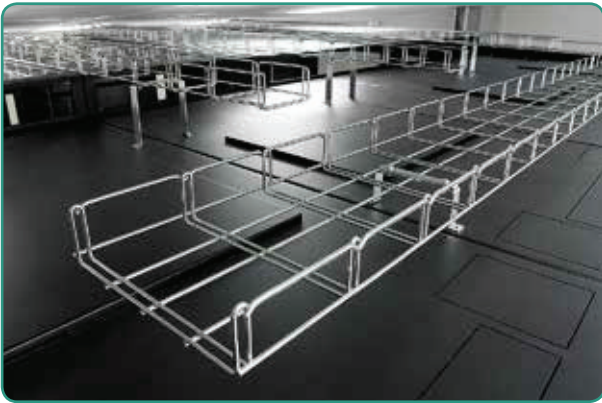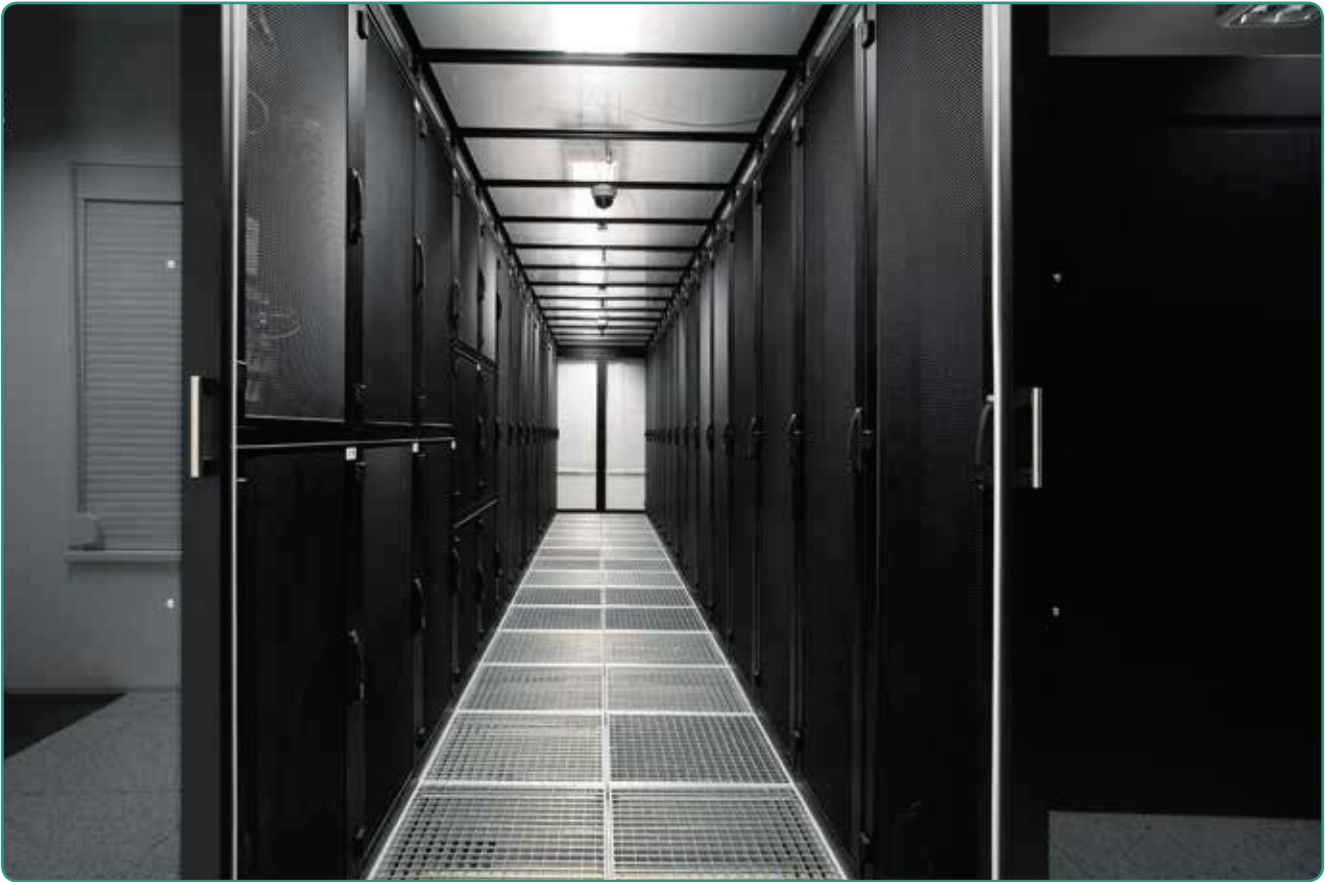
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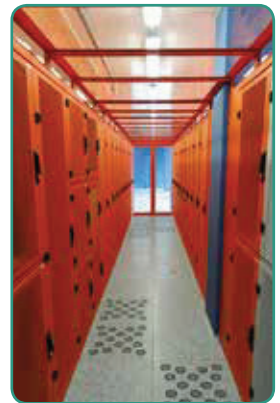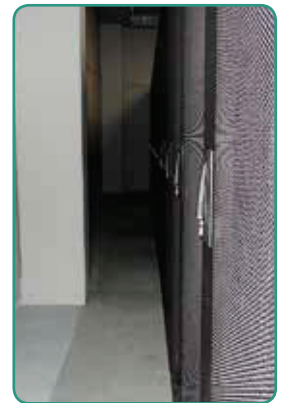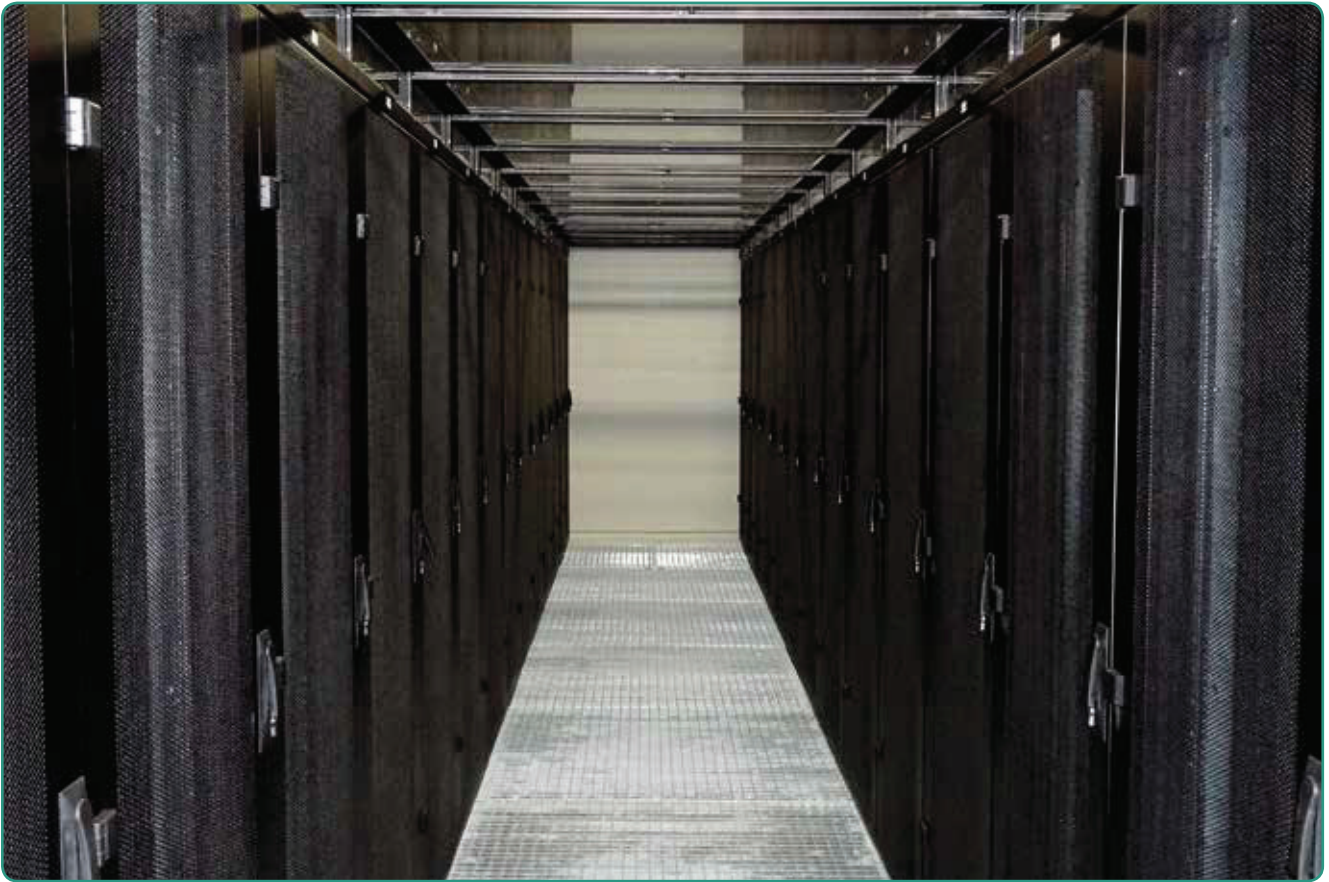# REFERENCES

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