Rittal – The System.

Faster – better – everywhere.

Rittal IT Competence Center

Engineered Excellence

ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL | IT INFRASTRUCTURE | SOFTWARE & SERVICES

FRIEDHELM LOH GROUP

Unique
in every dimension

Data centres are the backbone of the digital revolution, and as part of the digital infrastructure ecosystem, they are helping to digitalize the economy, administration and society. Topics such as energy efficiency, cloud computing, security, scalability, IoT and IIoT, video streaming and big data are just some of the themes driving the entire data centre sector. Rittal IT Competence Centers can help you to tackle these and other issues. Our qualified experts and highly specialised designers boast comprehensive expertise and many years of experience working on countless international IT projects. They will support you with every aspect of data centre design, detailed planning and execution.

Rittal is represented with IT Competence Centers in principal regions worldwide.

Worldwide, there are more than **200** **standards** to consider when **designing and specifying** data centres.

IT Competence Center – Services

- Clarification of customer requirements
- Site inspections/local checks and feasibility studies
- Development of suitable data centre solutions, including alternative options
- Preparation of power supply, cooling and monitoring plans
- Drafting of project descriptions with detailed technical information
- Presentation to partners/end clients and consultants
- Project tool box (total cost of ownership (TCO), computational fluid dynamics (CFD), 2D/3D drawings, walk-throughs, training courses)
- Project management

A flexible approach: Customer satisfaction is our priority

Long after the initial setup, data centres continue to need specialist support. All components should be of a modular design so that they can grow flexibly over many years, while maintaining maximum efficiency. The expert teams at the Rittal IT Competence Centers support our clients' data projects throughout their entire lifecycle. Our specialists can assist with all issues relating to concept development and detailed planning of data centres, calculation of TCO, security aspects, and monitoring and maintenance planning. Based on the client's specific requirements and those of the project itself, we prepare a range of options incorporating the data centre's principal elements, which are then presented visually using tools such as 3D models and CFD.

The expert teams at the Rittal Competence Centers support clients at every phase of the project.

Rittal has planned and executed more than

10,000

projects worldwide

Customer requirement:

- Scalable, modular solutions
- Space requirements for the IT racks
- Tier classification
- Power usage effectiveness (PUE) requirements
- Building specs/physical protection
- Low-/mid-/high-density requirements
- Specific requirements

Competence Center services:

- Layout of the server room (buildings/security rooms/containers)
- Layout and design of the IT infrastructure (racks, power distribution, cooling, monitoring and security, services)

Data centre commissioning:
Commissioning the data centre

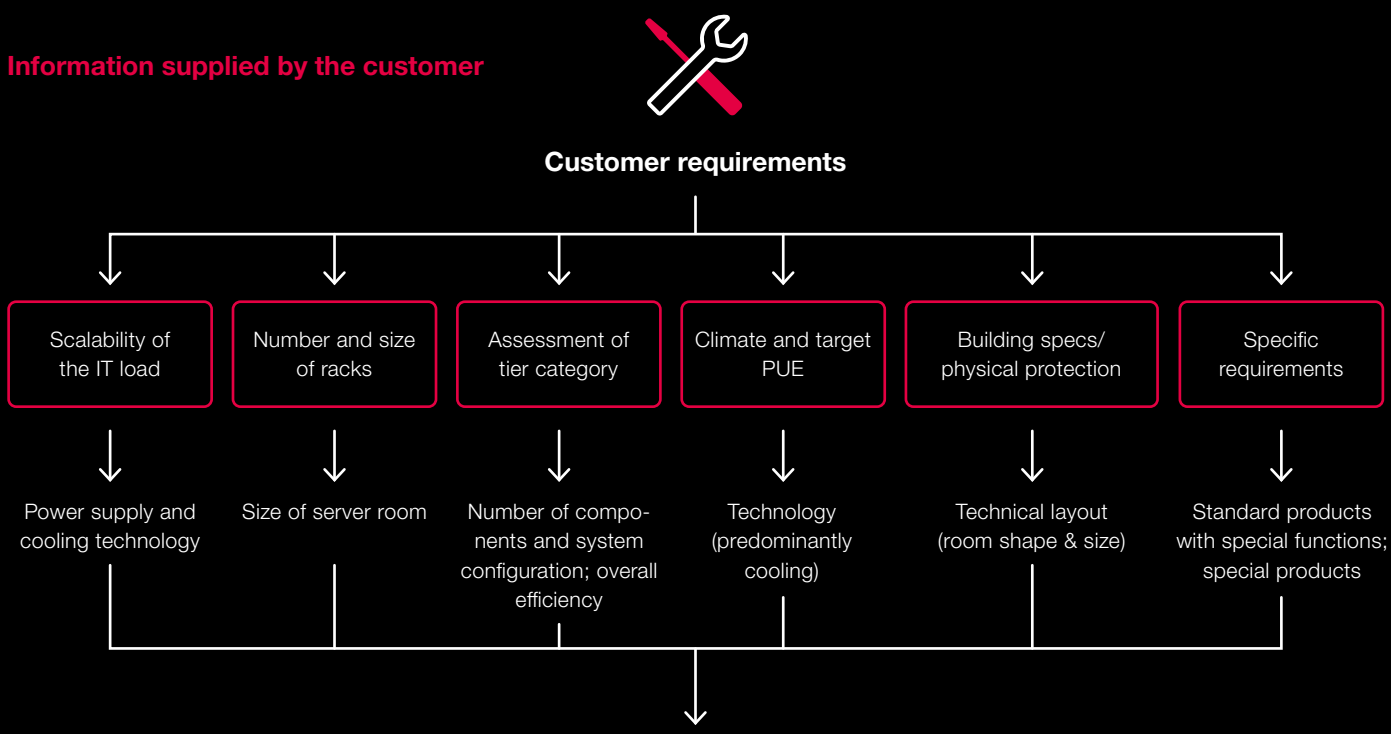
Data centre facility assessment:
Infrastructure health-check

Data centre design peer review:
Review of the customer's design

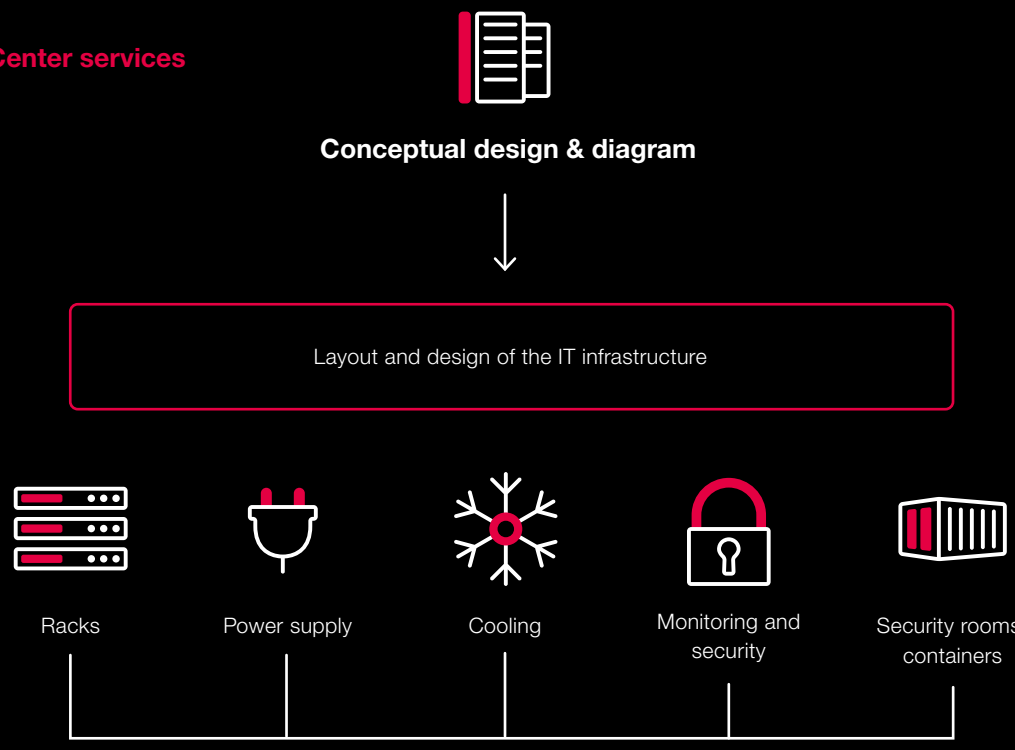
Data centre design & implementation:
Concept design and implementation of the data centre

Working process

Information supplied by the customer



Competence Center services



After documenting the customer's requirements, we prepare a diagram of the data centre based on the RiMatrix Next Generation system platform, including all solution components (racks, power distribution, cooling, security, services).

Comprehensive support at every stage of your project

The 5 phases of project implementation

The availability, performance and security of any IT infrastructure is determined to a significant degree by the interactions between individual components. With Rittal's approach, each new project phase builds on the previous phase, working closely with the customer to formulate bespoke solutions.

The Rittal IT Competence Centers support customers at every stage of the project. This includes consultation, assessment, the preparation of technical concepts, budgeting, installation, commissioning, maintenance and repair, encompassing every phase from the initial strategy through to the after-sales process. The Competence Centers apply their project management expertise and related services to every project in line with the customer's requirements.

Creating a bespoke solution, one step at a time

Transparent planning of bespoke solutions throughout all project phases, in line with your requirements

IT Competence Center – International guidelines and standards

IT Competence Center
Engineered Excellence

Quality seal for high standards of quality

Rittal attaches great importance to the quality and safety of its solutions and observes all the relevant international guidelines, standards and certifications. These ensure exceptional reliability, efficient quality management and high safety standards for the Competence Centers.

- Uptime Institute
- BICSI: Building Industry Consulting Services International
- ASHRAE: American Society of Heating, Refrigerating & Air Conditioning Engineers
- The Green Grid: Non-profit industry consortium of end users, policy makers, technology providers, facility architects and utility companies collaborating to improve the resource efficiency of data centres.
- TIA: Telecommunications Industry Association
- BITKOM: Federal Association for Information Technology, Telecommunications and New Media
- EN 50600: European-wide standard for data centre facilities and infrastructures
- TÜViT: Certification of data centres to a tried-and-trusted standard

ATD Accredited Tier Designer UPTIME INSTITUTE

IPMA international project management association

CDCP Certified Data Centre Professional

Qualified engineers
Consulting – Design – Execution – Training

Qualified engineers guide you through each individual step in the project. Throughout the design process, we devise solutions incorporating multiple criteria. At the execution stage, qualified project managers accept responsibility for deadlines, costs and quality. Your employees, partners and customers are given individual training at our IT training centres to equip them for future challenges.

Reliable, uninterruptible power supply

The more powerful a data centre is, the more energy-intensive it becomes. An energy supply must ensure maximum reliability of supply and consistently high levels of transparency. In addition, a low fire load and low level of interference from electromagnetic fields are crucial to reliable IT operation.

Power supply includes the following:

- Depending on the customer's availability requirements, one or more independent infeeds (e.g. corresponding to Uptime Institute Tier Level I–IV)
- Modular, user-friendly switchgear with a clear energy structure from the main distributor, via the sub-distributors, to the rack socket
- Power backup with an uninterruptible power supply (UPS system); DC circuit back-up with batteries and (emergency) power generation, where possible from alternative energy sources, such as photovoltaics or wind power
- Smart socket systems to measure and manage the IT load

These points must be taken into account and carefully considered at the planning phase.

Optimum energy and cost efficiency combined with maximum performance and security

IT power: Topology based on RiMatrix NG

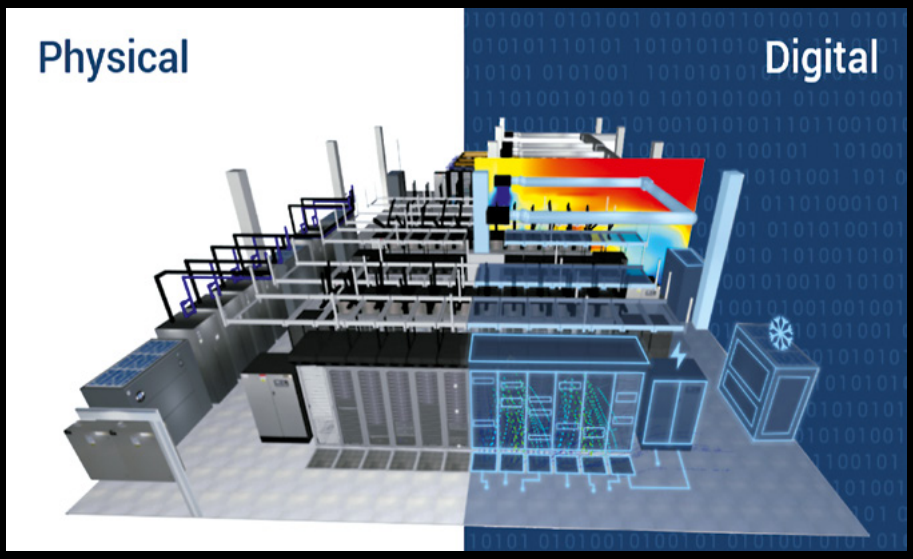
Highly efficient climate control solutions

Up to **1/3** **of a data centre's energy costs** are attributable to **heat dissipation.**

The operational reliability and availability of an IT system is very dependent on heat dissipation from the data centre. Rittal offers a range of cooling solutions using ambient air, as well as water- and refrigerant-based cooling units. CFD (Computational Fluid Dynamics) software can be used to simulate the airflows in the data centre for additional planning confidence.

A good, energy-efficient climate control and cooling concept for data centres should incorporate all requirements and peripheral conditions to optimum effect. Cooling is tailored to the requirements using innovative free-cooling concepts where possible, fed into the data centre by a user-friendly, low-maintenance network of cooling pipes and distributed selectively among individual components. At the same time, waste heat is absorbed and removed from the data centre. A smart control system regulates the IT infrastructure according to the server load, to minimise the amount of energy needed to cool the data centre.

For optimum thermal processes inside data centres, smart climate control concepts must allow for temperature, humidity, airflow rates and air pressure, as well as the direction of airflow and heat losses. The thermal processes in the data centre can be predicted at the planning stage using CFD analysis, and targeted measures taken to improve the energy footprint.

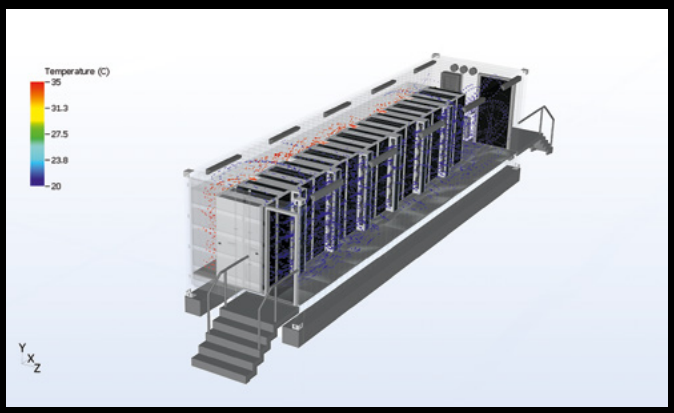


CFD simulation for maximum energy efficiency

Climate control accounts for a significant proportion of energy use in data centres. Modern computer technology can be used to boost effectiveness at every lifecycle phase. Computational Fluid Dynamics (CFD) is a form of fluid mechanics which uses specially developed software to analyse, model and visualise complex thermal transfer processes and flows. A sophisticated software package developed especially for data centre applications can analyse the plant's availability, capacity and efficiency.

CFD creates a three-dimensional image of the air flows in a data centre, making it easier to decide on the best climate control solution. The IT Competence Centers use CFD both at the data centre design phase and during the operating phase. Predictive analysis using CFD simulation helps to ensure a long service life at the lowest possible cost.

Airflow in a non-redundant enclosure with installed cold aisle containment.



Airflow in a non-redundant enclosure without cold aisle containment.

Benefits of CFD simulation:

- Development and operating costs are reduced
- Availability, capacity and efficiency are continuously optimised
- Preventive analyses help to minimise the risk of failure

Another benefit of CFD simulations is that any problems or damage to equipment can be rapidly determined and cost-effective solutions found. Every planned measure can be checked with CFD simulation, eliminating the risk of any operational interruptions.

Using CFD in operational data centres helps to solve a number of typical problems:

- Hotspots are eliminated
- The cooling system capacity performance is improved
- Energy efficiency is boosted

Qualified engineering and project management at every phase

Rittal's qualified teams of experts are on hand to assist customers at every project phase depending on their specific requirements, and ensure professional solutions, support during the execution phase, safe commissioning, testing, training and instruction of the end users.

Engineering:

- Calculation of the required cooling output and cooling demand for data centres
- Draft layout of the pipeline system
- Selection of the type and number of power and cooling units required (from Rittal or third-party providers)
- Design and calculation

Project management:

- Acting as a central point of contact for the customer
- Coordinating everyday tasks
- Liaising with subcontractors
- Delivering timetables, status reports and concluding documentation

Installation service:

- Installation of condensers and the relevant pipework
- Installation of a power supply for racks, cooling units and the UPS
- Installation of hot/cold aisle solutions
- Structural accommodation for data centre solutions
- Installation of the access control system

Testing and commissioning:

- Review of the start-up report
- Review of the function and interfaces throughout the entire system
- Preparation of the concluding report and testing in collaboration with the customer

End user training:

- Instruction and on-site training of the customer/end user

Service level agreements – Individual and combinable

Your top priority is being fail-safe
Rittal service agreements allow you to tailor the scope of services to your specific requirements and pick and mix individual modules – based on fixed, transparent terms and conditions. This ensures the best possible protection for your IT solution while always having an eye on the costs, both now as well as in the longer term future.

Your benefits
- Control of maintenance measures
- Visualisation of device data via the Web portal (condition monitoring)
- Access to operating and temperature characteristics
- Overview of energy consumption & efficiency analyses
- Situational recommendations based on manufacturer expertise

Your benefits
- Enhanced system availability
- Requirement-driven maintenance means more efficient servicing
- Fast problem analysis and troubleshooting with remote diagnosis

Maintenance

Next week day (Mon – Sat), 7 am – 5 pm	Within 4 hours

Availability

Next working day (Mon – Fri), 7 am – 5 pm	Working days (Mon – Fri), 24 hours	Every day of the week (Mon – Sun), 24 hours

On-site service

Next working day (Mon – Fri), 7 am – 5 pm	Next week day (Mon – Sat), 7 am – 5 pm	Within 8 hours	Within 4 hours

Warranty extension

No contractual commitment, separate agreement	Contract extension +12/+24/+36 months	Preventive replacement of worn parts +12/+24/+36 months

Stocking of spare parts

Stocked at Rittal	Stocked at Rittal and delivered within 24 hours	Stocking of spares based on specific agreement

Inspection

1× per year	4× per year	12× per year

Standard agreement
Optional contract modules

RiMatrix Next Generation – Future-proofed IT infrastructure

Rittal's RiMatrix NG system platform offers a flexible, powerful, future-proof data centre solution. As an open system platform with exceptional modularity, it provides the basis for an IT infrastructure tailored to the individual demands of almost every industry. Bespoke solutions are available for all IT requirements: from individual rack installation, to edge, enterprise and colocation data centres, through to hyperscale data centres.

Your benefits at a glance:

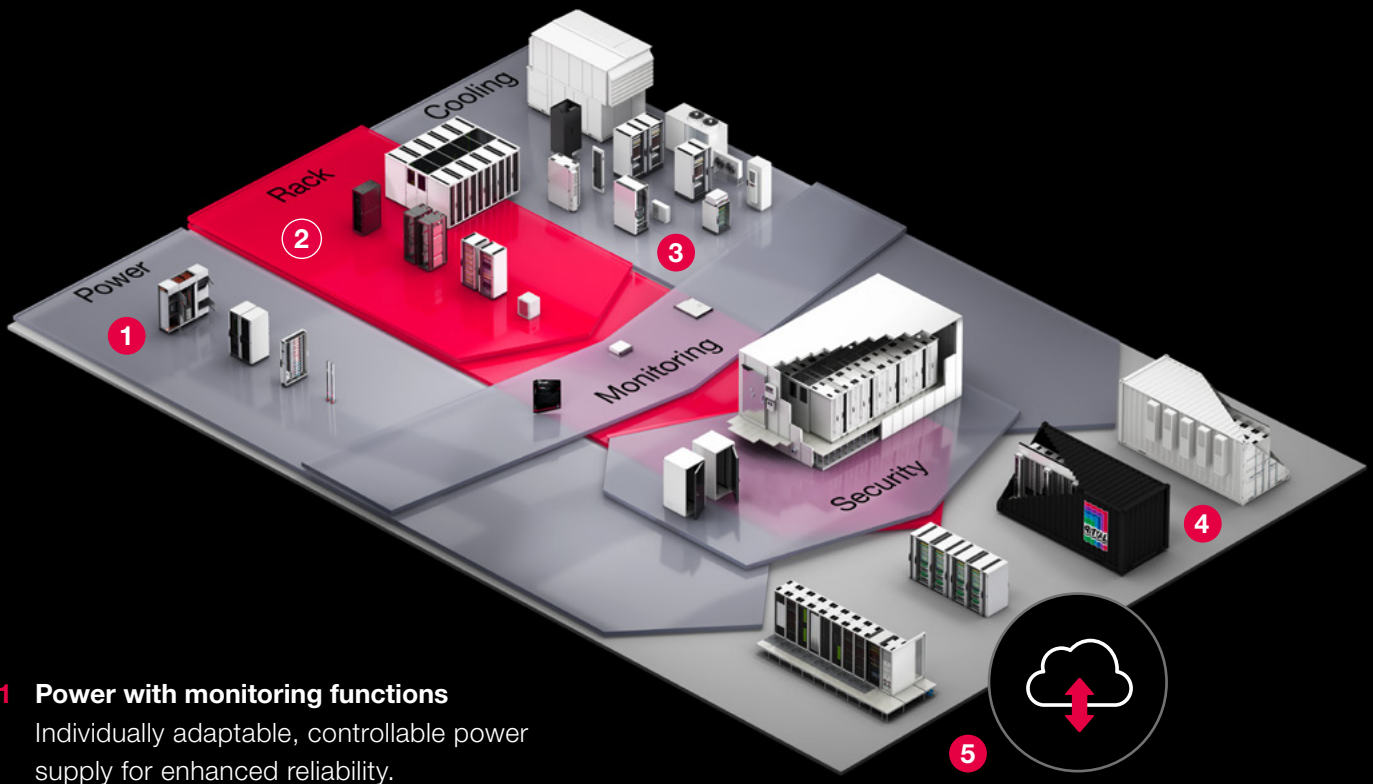
Maximum flexibility
- RiMatrix NG offers maximum scalability for exceptional efficiency
- Variable financing options
- Highly adaptable to any future technology changes due to continuous updates and developments
- Energy-efficient components create sustainable, cost-cutting modularity

Reliable solutions
- Tried-and-tested Rittal quality compliant with international standards
- Compatible with existing systems, with guaranteed scalability
- International approvals ensure global use
- Customer support includes full documentation, training and a comprehensive service package

Rapid use
- Predefined system solutions and OCP integration reduce planning and procurement work
- Precisely tailored to components, management systems and applications
- Fast, simple configuration and commissioning
- Optimised on-demand delivery

Bespoke solutions for all IT scenarios

RiMatrix NG allows data centres to be custom configured and assembled from standard components. This high level of standardisation helps to boost your profitability while facilitating bespoke solutions for all IT scenarios: from individual rack installation, to edge, enterprise and colocation data centres, through to hyperscale data centres.



1 **Power with monitoring functions**
Individually adaptable, controllable power supply for enhanced reliability.

2 **Racks tailored to your requirements**
Rittal offers a comprehensive range of racks and accessories for every individual IT application.

3 **Cooling: from racks to rooms**
Scalable climate control solutions such as the Liquid Cooling Package (LCP) enable the temperature-neutral expansion of data centres.

4 **Rittal edge data centres: Comprehensive solutions for large data volumes**
Depending on the planned location, edge data centres may be used either as compact rack combinations, as larger data centres in containers, or as self-contained, large-scale data centres.

5 **Cloud solutions**
In association with our partners, Rittal also offers flexible infrastructure and cloud solutions in the form of “IT as a service” models:

- DCaaS
- ITaaS
- CaaS

IT with 99.982 percent availability: National Bank of Kuwait

99.982%

availability

of the data centre

1.6 hours of downtime per annum or 99.982% availability – these are the Uptime Institute's requirements for Tier III certification of a data centre. The National Bank of Kuwait faced the challenge of setting up a new data centre in an existing building that would meet these stringent requirements. Founded in 1952, it is Kuwait's first national bank and is therefore reliant onfast, high-MTBF business processes and a fail-safe IT environment. Together with Rittal, the Bank of Kuwait developed a concept for a new high-MTBF, fail-safe data centre. In the event of a power failure in the main data centre, a modular UPS can bridge the power supply for up to 72 hours. Cooling and power distribution are delivered by Rittal products designed with Tier III certification in mind. Temperature, access and humidity in the data centre are constantly monitored by the Rittal Computer Multi Control III (CMC III) monitoring system which collates all the data and feeds it into the RiZone DCIM solution, that activates an alarm if necessary.

The IT chillers provide fail-safe cooling of the IT system up to an external temperature of 52 °C. The solution also incorporates a back-up data centre with IT racks, room cooling and aisle containment.

Twice as secure: Backup solution for Haberkorn

When planning its first data centre, Haberkorn, a technical distributor for the industrial, civil engineering, construction and building material sectors with over 200,000 products, opted for a RiMtraix S container solution from Rittal which would be sited on land behind the building. RiMatrix S comprises a fixed number of server and network racks (in this instance, one Single-6 option with six server racks), climate control, power supply and monitoring. IT manager Martin Rainer describes it as a cohesive IT solution. When planning the new backup data centre, he once again opted for the modular Rittal offering but as an indoor option.

The backup data centre, operating with identical hardware, would be exactly the same size as the first data centre, and with the same future-proof design. A second Single-6 RiMatrix S was constructed at Haberkorn in a section of the Harberkorn warehouse, monitored by cameras and protected by an access control system. The safety package is complemented by fire protection systems, for complete structural safety at all times.

> This system has been carefully thought-out to deliver everything we need.

Martin Rainer,
Head of IT at Haberkorn

A standardised IT infrastructure for a smart city: Songdo City in South Korea

So-called smart cities – high-tech, interconnected living spaces – are for better, more sustainable living and working. City planners achieve this, for example, by analysing traffic flows and air quality data and adjusting the traffic light settings accordingly. Collating and analysing data such as daily temperatures and traffic situations calls for a highly efficient, reliable infrastructure, such as that found in Songdo City, a suburb of the South Korean city of Incheon with one million inhabitants. Rittal designed the data centre for this forward-looking city.

Using measurement data to improve quality of life

When evaluating data, one of the basic requirements is a stable infrastructure with powerful servers, networks and computers capable of responding rapidly to changing events and variances. With this in mind, IT expert Sangho Lee, Head of the IFEZ Smart City Control Centre, opted for a separate, fail-safe cloud data centre which collates data from the many different sensors in the areas of transport, environment, crime prevention, fire protection and facility management. “When searching for a suitable solution, the idea of a cloud computing-based data centre won me over,” Lee recalls. “Rittal already had solutions for all the components of this data centre, and thanks to the standardised IT infrastructure, we were able to configure them within a very short time.” As well as TS IT racks from Rittal, the data centre is also fully equipped with the necessary elements for climate control, power distribution, an uninterruptible power supply, fire protection, monitoring and access protection.

As well as supplying the hardware, Rittal Korea also helped the IFEZ Smart City Integrated Operator Center devise a concept for the data centre. “Using 3D designs, we were able to show the customer the perfect solution for their particular requirements,” explains Brian Moon, Head of IT Sales at Rittal. With its low ceilings and raised floors, the building did not lend itself to a conventional data centre, so the rooms had to be specially insulated and cooled. The customer had also requested scalable expansion of the infrastructure to allow the technology to grow as the city expanded.

The Rittal data centre meets the needs of the Smart City to perfection, and has the capability to process and evaluate future data from the edge data centres located around the city.

Sangho Lee,
Head of the IFEZ Smart City Control Centre

Turnkey solutions

Energy-efficient climate control of the IT system is achieved by cold aisle containment and inline cooling. Cooling is provided by Rittal Liquid Cooling Packages (LCP) in a redundant design. The customer has a single partner for all their needs, from racks to power distribution. Once the cables had been laid, the data centre was fully assembled in just under three months. “Our progress with this project ranks among the fastest in the world,” says Lee proudly.

Only few years ago, steel manufacturers used time-consuming testing processes at research laboratories to develop new products. Today, powerful computer systems take care of the complex calculations, making product development faster and more efficient. Yet only the most cutting-edge IT systems are capable of efficiently evaluating the huge volume of data and shortening the time-to-market to give companies a competitive edge. thyssenkrupp Steel uses edge data centres from Rittal to quickly and flexibly build the required IT capacity directly at the point of production, driving the digitalisation of multiple steel production processes. Rittal IT containers have been installed right on the company's grounds as edge data centres with a cloud connection.

More computing power for IoT scenarios: thyssenkrupp Steel

Digitalisation plays a vital role in thyssenkrupp Steel's corporate strategy. The data from digital processes provides the basis for decision-making, analysis and forecasting. With the ever-increasing amount of data to be analysed, the company had to adapt its IT infrastructure to keep pace. It opted for edge data centres developed by Rittal for their additional computing power, low data supply latencies, uninterrupted data availability and system-wide security. The edge systems are assembled in robust steel containers, equipped with security doors, and provide in-depth monitoring of critical information including access control, fire protection and fail-safeness. The Data Center Cubes are fitted with pre-configured components for cooling and power supply to ensure rapid, risk-free infrastructure assembly.

The Rittal Data Center Cubes are an essential element of our integrated security approach and meet our demands for the highest security standards. The edge data centres created in partnership with Rittal are assembled directly at our production sites, providing efficient, reliable support to IoT scenarios.

Dr. Michael Kranz,
CIO & Head of Digital Solutions at thyssenkrupp Steel

A collaborative partnership

At the start of the project, we collaborated closely with thyssenkrupp Steel to analyse what they wanted to achieve with our Rittal edge data centres, and from this, formulated the required specifications. The modular Rittal edge data centres give thyssenkrupp Steel the flexibility to rapidly adapt its IT environment in line with future requirements. Reliable, standardised, high-MTBF IT infrastructures in the production environment provide the basis for ever more comprehensive automation of production IT and state-of-the-art data centre technology.

A data centre in just seven months: Chindata

Chindata already operates nine large data centres at strategic locations in China including Beijing, Shenzhen, Shanghi, Shanxi and Hebei, together with 220 smaller data centres. Covering an area of 130,000 m^2 and with an IT capacity of up to 16 megawatts, the “Guanting Lake New Media Big Data Industry Base” is one of the largest data centres in China.

Precise planning and coordination between the building’s construction management team and the Rittal experts were instrumental to the success of this project, enabling them to work in parallel on the data centre components even at the construction phase. Preconfigured, modular components were gradually implemented by Rittal as construction of the data centre progressed. Thanks to this closely coordinated approach and modular concept, the company managed to build a fully functional data centre in record time: just seven months.

In collaboration with Rittal, we have managed to build a brand new hyperscale data centre in record time: just seven months from start to finish. The Rittal experts impressed us with their innovative cooling concepts and modular layout of the IT racks.

Jessica Song, Vice President, Director of Planning and Design Academy at Chindata

Rittal installed a modified variant of the Rittal TS 8 enclosure system in the new hyperscale data centre. In this variant, the IT racks have 52 height units (U). An intelligent rack power distribution system allows Chindata to selectively activate individual items of slide-in equipment and precisely log energy consumption with the monitoring system. More than 8,000 service TS 8 IT racks and over 250 hot aisle containments were installed. Chindata is already planning to build further cloud data centres and will continue to work with Rittal as its preferred solution partner for concept design and implementation.

The Chinese economy continues to grow, and with it, the demand for IT systems and large data centres. However, rather than building their own data centres, many companies prefer to use IT services in the cloud. This saves them having to invest in their own IT hardware and provides fast, flexible access to the required IT capacity. Chindata Co. Ltd., one of China's largest cloud and colocation providers, had the challenging task of implementing a new data centre as quickly as possible, and chose Rittal as its concept development and implementation partner.

A data centre that meets Industry 4.0 requirements in a flash: B. Braun

With Rittal's Micro Data Center we have found a solution with which we can operate a secure and redundant data centre without any complicated construction projects.

Werner Mielenbrink,
Head of Media Supply at B. Braun

The IT experts at B. Braun, a leading manufacturer of medical technology and pharmaceutical products, were faced with a challenge – their new, state-of-the-art production facility site demanded the rapid expansion of the infrastructure. This had to be done without any major construction work or upgrading rooms. In addition, the company needed that project to be implemented quickly and safely. It had to be decided in advance where the systems for the new production line should be installed: In the end, management decided to expand the information technology facilities at the Glandorf site.

Reliable, compact and safe

The IT experts at B. Braun therefore began doing some serious thinking about how to expand their IT environment and, at the same time, make it fail-safe. At the IT component level, greater virtualisation would help to consolidate applications and systems, so making it possible to use IT resources more flexibly. It was necessary to find a suitable site for the server, to secure it against unauthorised access and to achieve a high level of availability for the solution.

The IT infrastructure alone needs about half a dozen server racks. The space now employed as an IT room had previously been not equipped with the necessary infrastructure for a data centre or with any security technology. Originally, simple server enclosures were to be used to construct the infrastructure, though this did not fully achieve the required level of physical protection for the IT system.

The solution: Rittal Micro Data Center
Finally, Rittal was able to provide the solution with its Micro Data Center, a data safe for IT systems. This creates a specially secured environment at rack level for the operation of business-critical IT systems. For automated production in line with Industry 4.0 (the Internet of Things) the concept provides the necessary reliability and modularity.

The Micro Data Center is available with different levels of security. IT components such as servers, storage or networks in a protective room and at resistance classes as high as four. Depending on individual requirements, the solution can be expanded into a compact data centre. B. Braun finally opted for two installations based on the Micro Data Center for the Glandorf site. Three-fold and four-fold suites each contain a complete and redundant IT environment consisting of three or four IT racks, including cooling, power distribution, monitoring and fire protection. The server racks are cooled by means of the integrated LCU DX (Liquid Cooling Unit) split cooling system from Rittal.

Central monitoring
B. Braun uses the Rittal CMC III monitoring solution to monitor the whole system. Important parameters related to IT operations can be centrally monitored with this application. At B. Braun, the system monitors, among other things, the door handles of the IT racks, the UPS, as well as the temperature and humidity within the Micro Data Center. The DET AC fire detection and extinguishing system, which is also integrated, detects even the smallest smoke particles in the air and emits a warning so that technicians can react in good time, before the fire actually breaks out. In the event of a fire, the DET AC floods the IT rack with Novec 1230 extinguisher gas, which does not damage the IT components.

Rittal – The System.

Faster – better – everywhere.

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

Rittal is represented with IT Competence Centers in principal regions worldwide.

Germany: datacenter-engineering@rittal.de
USA: datacenter-engineering@rittal.us
China: datacenter-engineering@rittal.cn
India: datacenter-engineering@rittal-india.com
Lithuania: datacenter-engineering@rittal.lt

You can find the contact details of all
Rittal companies throughout the world here.

www.rittal.com/contact

XWW00205EN2211