Rittal – The System.

Faster – better – everywhere.

The energy that powers us

Rittal Energy & Power Solutions

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

FRIEDHELM LOH GROUP

One for all. Especially for you! “Rittal – The System.”

With tailor-made products, modern IT architectures and comprehensive service, Rittal offers individual solutions for every industry – for improved efficiency, greater added value and more security.

Table of contents

In the context of the energy transition, solutions are needed that will meet high demands in terms of quality, performance and reliability. Rittal is supporting the energy industry with a tailor-made product range for energy generation, transmission, storage and consumption. Which resilient products can be used to generate energy in all kinds of environmental condition? How can costs be reduced? Which solutions are available for charging cars and buses? In this brochure, we would like to introduce you to our energy and power solutions.

Rittal – The System.
At home in every industry

Rittal is a leading worldwide system supplier for enclosures, power distribution, climate control, IT infrastructure, software and service. Rittal is active worldwide with around 10,000 employees and 58 subsidiaries.

For over 50 years, Rittal has been offering trend-setting systems with perfectly coordinated enclosures. The company's broad product range includes the infrastructure for modular and energy-efficient data centres with proven concepts for the security of physical data and systems. Leading software providers Eplan and Cideon complement the value chain, providing interdisciplinary engineering solutions. The range of products is rounded off by automation solutions for switchgear manufacturing from Rittal Automation Systems.

System solutions from Rittal are used in almost every industry, especially where there are particularly high demands on materials, energy efficiency and high-performance IT structures.

There are made-to-measure solutions for the individual requirements of the energy industry.

Every industry has its own specific needs. Knowing just what these are is the only way to offer a system that fits. A system that combines both universal and individual aspects and which is both cost-efficient and customised. It not only does justice to one industry, but also meets a very special requirement – **Yours.**

Custom-made solutions

Aviation industry

Safe solutions for the aviation industry

Automotive industry

Standardised system solutions that ensure operational reliability and efficiency

Process industry

Integrating innovative technologies into demanding processes

Energy sector

Making modern energy supply efficient and flexible

Infrastructure / Telecommunications

Optimising bandwidth and availability

Railway technology

Setting the points for the future with Rittal

Electrical engineering and automation

Automating panel building and switchgear manufacturing, increasing productivity

Mechanical engineering

Controlling machines safely and efficiently

Maritime industry

Flexible on land and on the high seas

Food and beverage industry

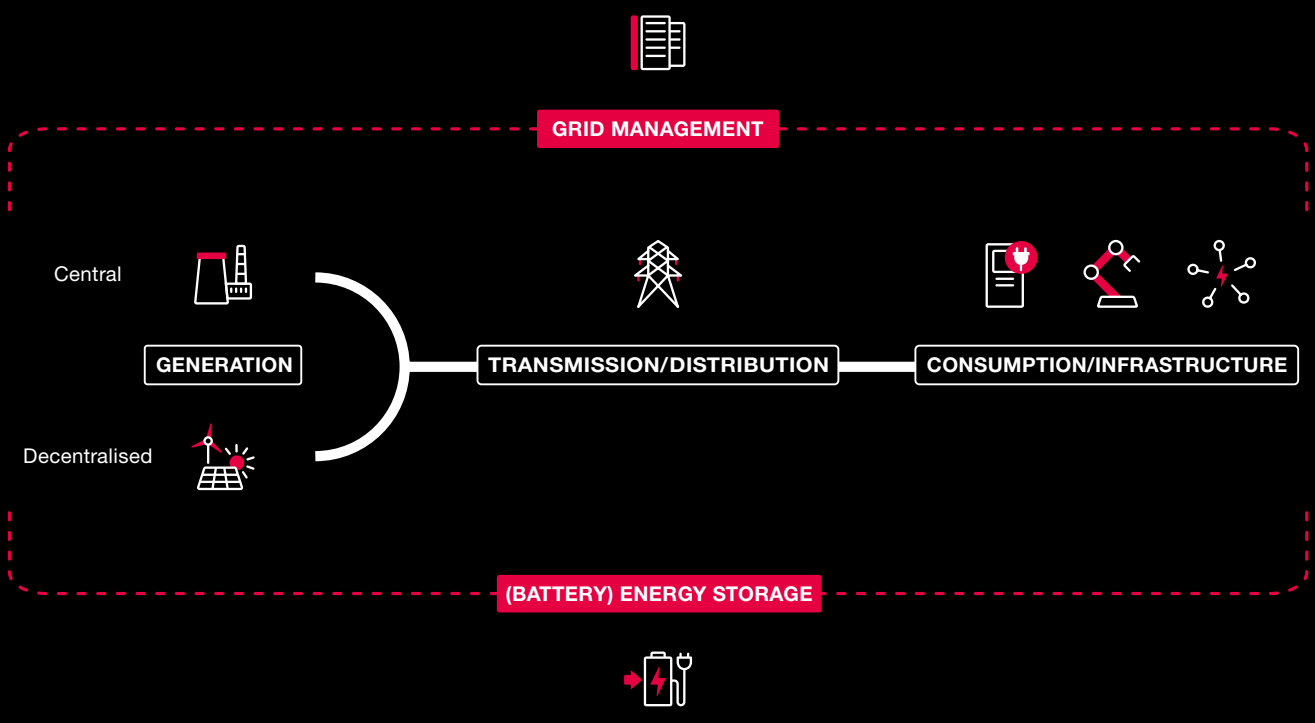
Producing food hygienically and safely

A highly charged industry
Challenges in the energy sector

The energy sector is undergoing major changes. Reducing CO_2 emissions, protecting the climate and abandoning fossil fuels – with electricity-based products and services increasing at the same time – are more important than ever. The security and quality of supply must be ensured by expanding the grid, while energy consumption must be optimised. Moreover, digitalisation and decentralisation (keyword: smart grids) as well as high cost pressure all demand new solutions.

Rittal offers an optimal product range that covers the entire energy landscape. It also includes modular, standardised solutions for sector-specific challenges:

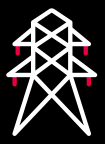
The energy landscape at a glance



Energy generation, transmission, storage and consumption: new solutions are needed in the context of the energy transition.

New requirements in energy generation
The need to depend on a sustainable energy supply is leading to the rapid expansion of many decentralised generation plants. These must ensure the reliable supply of power and at the same time be cost-efficient.

Intelligently regulated energy transmission
Smart grids are becoming reality when it comes to energy transmission. In the course of the digital transformation, intelligent control procedures regulate the balance between generation and consumption in the grid.

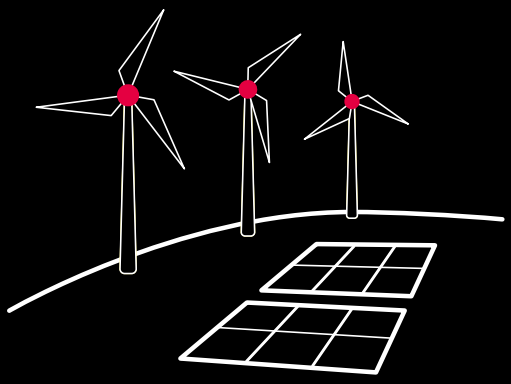


New standards in energy consumption
Integrated energy systems, climate-neutral production and energy efficiency are resulting in new benchmarks in terms of energy consumption. One important factor here is the growing market for electric mobility and, consequently, the expansion of the charging infrastructure. This is calling for standardised solutions that can be produced in large quantities.

Key factor: energy storage
Energy storage is crucial in keeping the grid in balance and in making use of excess capacity.

From energy generation to storage and charging infrastructure, future-proof concepts are in demand, a challenge for which Rittal, as a partner with a great deal of industry experience, offers the right products and solutions.

Energy generation



Solutions for wind and solar energy
Rittal is supporting energy generation from renewables with secure, high-performance, cost-optimised system solutions for wind energy and photovoltaic.

- Flexible and reliable enclosure solutions for demanding site conditions
- International approvals such as UL, highly protective properties in a wide range of environmental conditions
- Solutions for plant engineering that save time and costs
- Energy-efficient system engineering

1.2 TW

globally installed
hydropower output in 2018[1]

Solutions for hydropower
Low-maintenance and compact solutions for control and low-voltage systems ensure the long-term operational reliability of small and large power plants. Systems can be set up in a short time with standardised, modular components. The availability of our solutions around the world also makes sure that your platforms have a uniform basis.

- Digital integration and data consistency throughout the whole value chain with the help of Eplan and Rittal tools
- Adherence to internationally required standards
- International service network for minimising downtime and increasing efficiency

1 https://de.statista.com/statistik/daten/studie/200732/umfrage/wasserkraft-und-er-neuerbare-energien-weltweit/

Energy transmission

More than **100 GW**
of **renewably generated power**
must be integrated into
the german power grid.[2]

2 https://www.bundesnetzagentur.de/EN/Areas/Energy/Companies/SecurityOfSupply/GeneratingCapacity/PowerPlantList/PubliPowerPlantList_node.html

Existing energy systems are changing due to new players that are bringing further complexity into the game. In order to control existing systems efficiently and to guarantee the supply of energy, data must be logged and evaluated around the clock and with the shortest possible reaction times. Rittals edge solutions deliver just that. They let you securely and precisely save, process and share large quantities of data in real time, wherever it is needed. Comprehensive planning, flexible project management and reliable commissioning allow us to implement your customised edge solutions quickly, anywhere in the world.

Reaction without any loss of time

The sensors in the IoT devices deliver data that needs to be collected, processed, evaluated and saved – with the lowest possible latency times. Long distances to and from processing centres in the cloud take up too much time when transmitting data. But with the in-house edge computing solutions from Rittal, latency times remain low.

Standards with scalability

In order to keep up with the fast pace of the market and to meet demands for efficiency, businesses must install standardised and modular IT architecture solutions. These are scalable systems that can adapt or increase performance, based on demand. Standardisation also allows existing systems to be incorporated.

A future with security

Unauthorised access to confidential data may have political, economic, and even health implications. It must be possible to ensure digital data security and protect the data centre and IT racks from physical access at all times.

Uninterrupted availability

An uninterrupted data connection between the application and the data supplier is the most important prerequisite for the availability of data. Unlike data security, the availability of data depends on technical functions: Even small errors may have far-reaching effects, especially with devices that operate in the single-digit millisecond range.

Power distribution

The requirements placed on modern power distribution systems are constantly growing ever higher. Increasingly, safe, internationally recognised and approved power distribution components are needed. Rittal offers innovative enclosure and busbar systems that meet the specifications. They have been examined by independent experts and have been tried and tested millions of times.

- Modular system for power distribution components
- Maximum personal safety and reliability through tested system technology
- Greater efficiency through standardised assemblies
- Design verification in accordance with IEC 61439 helps to accelerate processes
- Significant time savings in engineering and machining
- Flexibility thanks to approval by all well-known manufacturers

We have many customers from large corporations. They are often forced to prescribe specific products. However, we have been able to determine that Rittal products enjoy a very high level of acceptance world-wide. Of course, this is an advantage for us, because this way custom-made products are minimised.

Thomas Pichler,
Technical Director, NGR GmbH

Battery energy storage solutions

Rittal makes it easier to set up energy storage systems with a flexible, scalable modular system that offers greater flexibility.

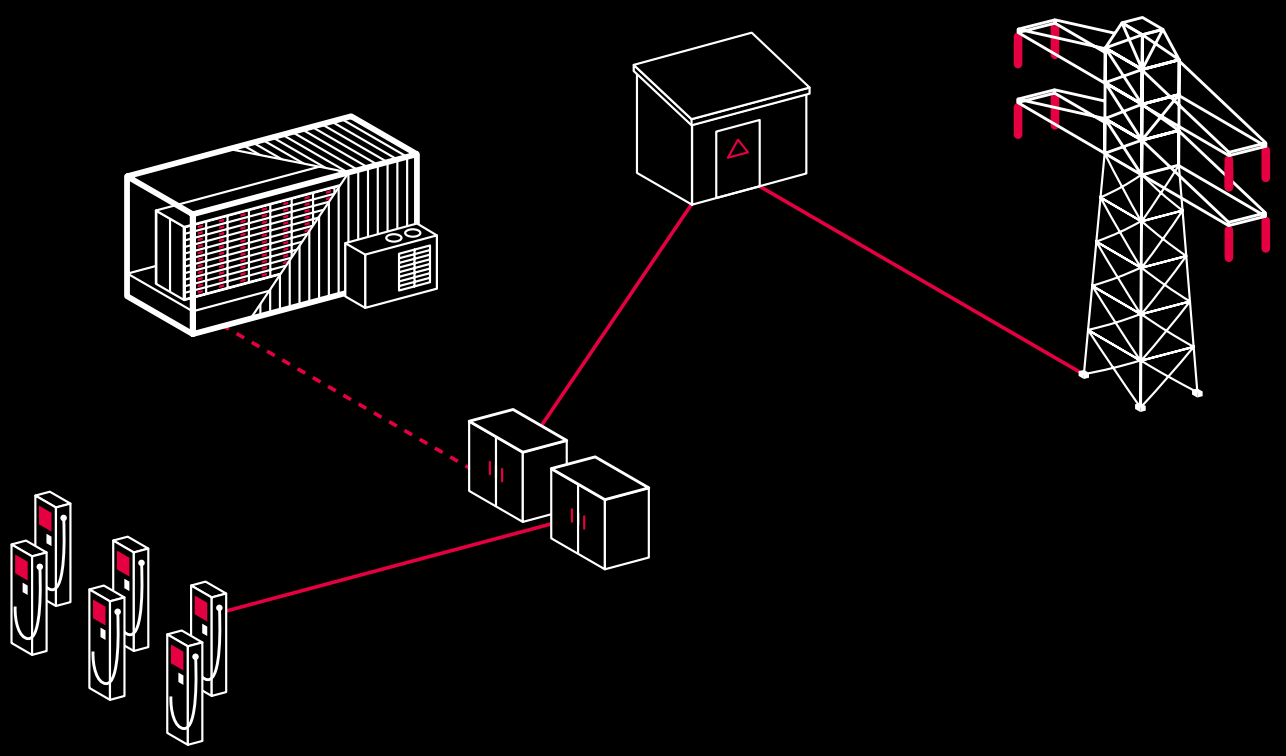
- Standardised modular system for 19" battery shapes, rails and heavy-duty shelves for other battery variants
- Various indoor and outdoor solutions up to the completely pre-assembled, bayable battery storage containers to hold the entire energy storage infrastructure
- Greatly reduced planning and production costs thanks to customisable products

Between 2010 and 2019, the **kWh battery prices** for **lithium-ion** fell by approx. **87%.**[3]

Rittals bayable battery energy storage solutions use the entire infrastructure for energy storage.

3 https://about.bnef.com/blog/battery-pack-prices-fall-as-market-ramps-up-with-market-average-at-156-kwh-in-2019/

Charging infrastructure



Solutions for the charging infrastructure
A charging park for electric vehicles usually consists of a transformer station and then – depending on the design – an outdoor battery storage unit, a low-voltage main distribution system, infrastructure housings for the power electronics and the charging stations themselves. Rittal can provide the solution for every component.

- Efficient accessories thanks to the frame section and the Rittal modular system – from mechanical components to power distribution and climate control
- Double-walled outdoor enclosure for ideal weather protection
- Well designed climate control concepts for optimum temperature and a constant, weather-independent heat distribution for high-performance rapid charging stations with 350 kW

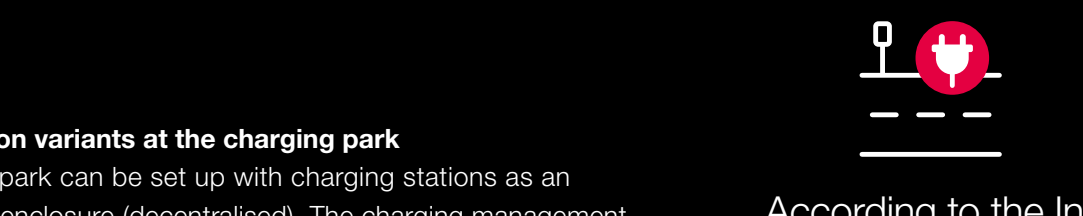
Thanks to the comprehensive range of system accessories, all Rittal enclosures offer the advantages of the Rittal modular system. The entire interior installation, ranging from mechanical components to the power distribution through to climate control can be implemented inside.

Construction variants at the charging park
A charging park can be set up with charging stations as an "all-in-one" enclosure (decentralised). The charging management feature is located directly in the charging station. Alternatively, the charging points can be executed as a purely front-end enclosure. In such a case, at least one back-end enclosure (centralised) will be needed for the power supply.

The stand-alone solution includes:

- The standardised enclosure solution
- A feature for accommodating the power electronics
- Climate control
- Power distribution

This typical charging park structure can be used for charging buses and coaches. One difference here is that charging takes place at bus stops. As a rule, charging is usually performed via a pantograph system. In the bus depot, on the other hand, electric buses are charged overnight on charging stations.



According to the International Energy Agency (IEA), there were around

1 million

public charging points worldwide at the end of 2019. [4]

4 https://de.reuters.com/article/deutschland-elektromobiit-t-idDEKBN23M0VO

Strong and smart in all weathers

Typical application
Wind turbines

In the forests of Canada, in remote Australian villages or in the North Sea: Wind turbines are expected to provide a reliable supply of electricity for well over twenty years. That is why the internal electronics inside these gigantic structures must be protected from cold, overheating and dust. They must also operate dependably.

The climate places extreme demands on wind turbines
Each system must be adapted to the climatic conditions that are typical for the respective location. For example, at Canada's Lac Alfred, the site of wind turbines, the temperature often falls below –30 °C in winter. Heating systems prevent any ice forming on the rotor blades and causing imbalances. The electronic components also have to be protected from the cold. Consequently, a heater is used to keep the temperature within the enclosures at around five degrees above zero Celsius.
In contrast, heat is the challenge at Mount Mercer in the Australian state of Victoria. Currents of several thousand amperes can flow through the power electronics inside the enclosures at times. At summer temperatures, a large amount of waste heat needs to be reliably and efficiently dissipated from the enclosures using fan-and-filter units.
In regions where agriculture is of major importance, the enclosures must also protect the electronics particularly well from dust. Operational reliability is the be-all and end-all with wind turbines. To ensure that turbines operate reliably in remote and less hospitable regions, wind energy companies rely on professional protection from Rittal for the electronics and on preventive maintenance through Industry 4.0.

Operational reliability is the be-all and end-all with wind turbines. To ensure that turbines operate reliably in remote and less hospitable regions, companies operating wind turbines rely on professional protection from Rittal for the electronics and on preventive maintenance through Industry 4.0.

Quality control is essential

Every single component in the wind turbine must function optimally. In typical installations, ten to fifteen enclosures are used in each wind turbine. One of the most important enclosures is the so-called “top box” at the top of the nacelle. The drivetrain is monitored and the rotation of the nacelle regulated from there. This makes it even more important to protect the enclosure from shock. For this reason, Rittal has developed a variant of the VX25 enclosure in which the mounting plate is mechanically reinforced. The bottom box, the counterpart to the top box takes over the control and monitoring functions. In most installations, this is also where the inverter is located; it is installed inside a suite of bayed enclosures. It gives the wind-generated current the correct frequency for it to be fed into the grid. For this purpose, it is especially convenient that the Rittal VX25 enclosures can also be extended very flexibly as in a modular system and then arranged in rows (bayed) in all directions. They are also extremely robust, for instance in terms of resistance to corrosion and damage.

The development towards Industry 4.0

In some installations the wind turbines are already regularly sending their most important operating data to the central database of the wind turbine operator: This information is not only important in order to assess how well the plants are working at any given moment. The objective is for wear parts to be replaced exactly when needed. This also applies to the fan-and-filter units on the enclosures, for example. The more precisely the time is selected, the more effectively the maintenance costs can be reduced. One solution offered by Rittal is the use of fan-and-filter units using EC technology. Besides consuming less power, they also allow the fan to be controlled via the standard, integrated control interface. They also allow the fan speed and function to be monitored. Besides this, the speed of the Rittal fan-and-filter units can also be regulated. This increases the fans’ energy efficiency and service life.

Rittal is also the right partner when it comes to cooling the enclosures; active cooling units from the Blue e+ range can be assigned their own IP addresses. This way, the measured values from all the sensors are displayed in the cooling unit. The RiDiag software application can be used to communicate with the cooling units via either USB or a network. With this diagnostic software, cooling devices are now integral parts of Industry 4.0 concepts. The diagnostic software optimises operation, which in turn results in other major savings.

Leading with hydropower: H&W Control GmbH

Reference
Energy generation

In Austria, 2,800 small hydroelectric power plants currently feed electrical power into the public supply grid. To perform this task, functioning electrotechnical equipment is also needed. One supplier, for example, is H&W Control GmbH from Austria. With an export share of 75 percent, the majority of the power plants are delivered abroad.

European quality counts

A plant on Panama's highest mountain, the Volcán Barú, went on line in November 2015. In South America, the reputation of European equipment is very high, as is confidence in its standards. H&W Control therefore put its trust in the German quality of Rittal enclosures. Five fields – three for energy management with the RiLine 1600 A busbar system and two fields for the controlling the plant – were delivered to Panama.

Rapid system configuration

"At Ennstal, the task was to overhaul the electrical equipment of the small hydroelectric power plant, which has been in existence since the 1980s," says Christian Wieland, one of the managing directors of H&W Control GmbH, describing a local project. H&W Control used the new Rittal 185 mm busbar system to keep the power plant's downtime to a minimum. Rainer Huber, another of H&W Control's managing directors, particularly appreciates its compact design and its big advantage over the competition in terms of space and cost.

Rittal offers support for switchgear manufacturers in planning and realising enclosures and we gladly make use of this.

Rainer Huber,
Managing Director, H&W Control GmbH


KONTAKTE
CONTACTS
BEREIT
READY
SPEICHER
SPRING
CLOSE
PUSH TO
OPEN
SIEMENS

Fail-safe green electricity: WEMAG AG

Reference
Energy transmission

We wanted a solution from a single source. We are suppliers of electricity and not data centre manufacturers. For us, a complete offer meant greater planning security and fewer interfaces to other manufacturers.

Jens Sperling,
Team Leader for Data Processing at WEMAG AG

Commitment to the region, environmental protection and sustainability are defining characteristics of WEMAG AG's activities. For example, the company not only supplies green electricity from renewable sources with the brand name "wemio" to every household, as well as to special contract customers from all industrial sectors and agriculture. The power utility's previous data centre was no longer able to cope with the mounting demands for capacity, reliability, and availability in the existing premises. High availability, energy efficiency and sustainability played a major role in the quest for the IT infrastructure needed for two new data centres. Rittal won the contract for the construction of the two data centres as general contractor.

Everything from a single source
Rittal's concept, in conjunction with the price, was what convinced us. The time frame for completion was also crucial for us at WEMAG because we had to construct the two data centres quickly.

Energy-efficient cooling
The data centre achieves the desired low PUE value of approx. 1.5, not least through the indirect cooling with air from outside. With an outside temperature of 5 °C, climate control is performed solely by free cooling. Between 5 and 18 °C, the refrigerating machines are partially cooled by compressor. The data centre must only be operated with direct cooling at temperatures above 18 °C. Enormous savings can be achieved through the consistent implementation of this cooling principle and the use of energy-efficient, coordinated devices.

Blackout inconceivable
The IT equipment in the data centre is exclusively powered by two redundant UPS systems and a separate power supply. In the event of a complete power failure, an emergency power system with a diesel generator will start up automatically within a few seconds and guarantee an uninterruptible power supply. The diesel supply is large enough for the data centre to run independently for several days and thus also supply the public.

Hot water on the mountain: TESVOLT GmbH

Reference
Energy storage

With Rittal, we can meet all the requirements of the energy storage market. Thanks to the system, we are price-competitive and deliver consistently high quality.

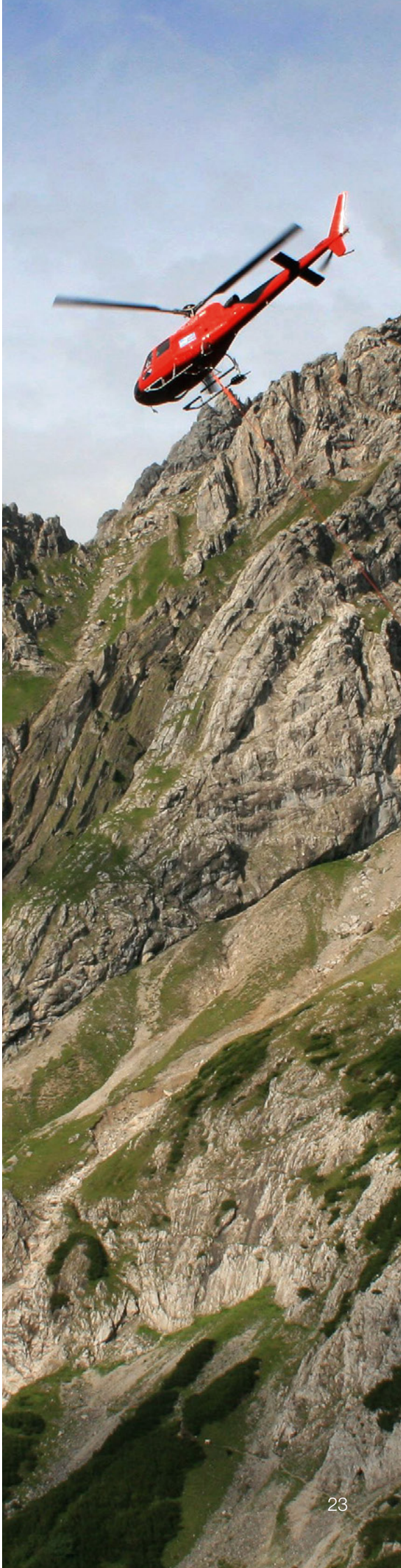
Daniel Hannemann,
Managing Director, TESVOLT GmbH

Storing electrical energy is often indispensable for a secure energy supply. For example, at the Alpine Club hut in the Coburg section, which is 1,900 metres above sea level in the Mieming range in Tyrol. The electrical energy that the hut needs is generated with a photovoltaic system and a CO_2-neutral cogeneration (CHP) unit run on vegetable oil. So that the energy produced from the photovoltaic system can also be used when it is dark, electricity storage system manufacturer TESVOLT installed a lithium-ion battery storage solution with a capacity of 77 kilowatt hours in the homely hut. The mountaineers and hikers who stay at the hut benefit from hot showers, a drying room and even the internet. Here, standardised components from Rittal are making an important contribution.

Flexibility in supplying energy
TESVOLT supplies electricity storage systems with extremely powerful battery cells. In conjunction with a wind, solar, hydro, biogas or a cogeneration plant, the energy storage solutions offer the greatest possible flexibility in energy supply. The storage systems have not only proven themselves in commercial applications, they also ensure a power supply in difficult and remote areas all over the world.

Components of the highest quality
The interaction of a number of components is crucial for a reliable electricity storage system. In addition to battery cells, it also includes power distribution, climate control and the monitoring of the system. Everything must function perfectly so that the storage unit can attain its maximum service life of around 30 years and operate with high level of efficiency. For this reason too, TESVOLT only uses top quality components such as system components from Rittal. The extremely large, standardised range of products permits a high degree of technical flexibility. The short delivery times are also an advantage. The components meet all necessary standards and satisfy the highest quality requirements.

Stable and flexible
Up to eight battery modules, each weighing 50 kilograms, can be safely integrated in the sturdy enclosure. The enclosures can be arranged flexibly and withstand even extreme environmental requirements such as heat, cold or wet conditions. In addition to enclosures, TESVOLT also uses Rittal components for power distribution, climate control and monitoring. It is important for the company to be able to react quickly to new market needs. With its component diversity, Rittal offers precisely the flexibility that TESVOLT needs. TESVOLT not only supplies electricity storage systems, but also provides advice on planning the entire energy system. Today, TESVOLT ships its flexible electricity storage systems all over the world and has been able to gain highly competitive market shares.

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CHARGEHERE

The heart of the charging park: VX25 ChargeHere

ChargeHere, founded in 2017 and owned by the German electricity supplier EnBW offers a charging park concept for electric vehicles. While, in other systems, a stand-alone solution is installed for each parking space, ChargeHere uses a centralised charging solution for multi-storey car parks, company parking spaces or apartment blocks. This saves a lot of technology and one “ChargeBase” supplies as many as 20 charging points, controlling each charging point individually. One charging point has a type 2 charging cable. The connector version allows one, two or three-phase charging with a maximum charging capacity of 11 kW. This represents the standard in Europe.

Reference
Energy consumption

The ChargeBase technology is housed in a Rittal VX25 enclosure and forms the heart of the ChargeHere charging solution.
In addition to the power distribution, the central enclosure contains all the important components needed to implement a central charging management system. The demands on this enclosure are high: Protection against unauthorised access and corrosion must be guaranteed. Power distribution and back-up is provided via Rittal’s RiLine Compact busbar system. This universal system is installed in a particularly space-saving manner. Since it also meets the requirements of the IEC (International Electrotechnical Commission) and the UL standard, it can also be used used anywhere and at any time.

The automotive industry intends to build **100,000** **charging points** in Germany alone on its own company premises and on those of affiliated businesses by 2030.[5]

5 https://www.bundesregierung.de/breg-de/aktuelles/ladeinfrakstruktur-1692644

E-mobility for everybody: Tritium

Tritium, the Australian manufacturer of charging stations for electric vehicles, is building rapid charging points for electric vehicles across Europe (including Germany, France, the UK and Sweden) in the context of the IONITY corporate cooperation, a joint venture of automobile manufacturers BMW, Daimler, Ford, VW, Audi and Porsche. Tritium received the order to set up 100 charging parks in Germany, France, Great Britain and Sweden and elsewhere. The international availability and quality of Rittal products were decisive factors in winning the order. The Rittal solution is also used, among other things, to protect the sensitive electrical components of the charging stations from environmental influences.

Tritium has grown from a start-up to become one of Australia's fastest growing companies. Due to the initially small number of electric vehicles in Australia, the company decided to expand into Europe and support the faster development of e-mobility there. Following the guiding idea of "energy freedom", Tritium is pursuing the goal of getting the electricity into the car at any time and inexpensively, if desired also from home and without the need for any change in habits. This is a prerequisite for making electric mobility accessible to the broad mass market and making it more attractive in general. Confidence in electric mobility grows along with the number and capacity of the charging stations, because this is the only way to ensure the desired range.

The rapid charging stations now planned represent an important milestone on the way to "unlimited charging freedom" for the public. The Rittal enclosures that have been specially developed for this application and which have particularly proven themselves in the demanding conditions of outdoor use and which offer maximum flexibility thanks to the wide range of available accessories, are making an important contribution to the success of the project. Through its integration in the Tritium IONITY project, Rittal is consolidating its competence in the field of e-mobility and is greatly involved in promoting the sale of electric vehicles by expanding the charging infrastructure – in the spirit of "energy freedom".

Reference
Energy consumption

When we started producing for an IONITY order, we needed a supplier for enclosures. Rapid availability was one of the most important criteria, since we also wanted to deliver our large order quickly. The other key point was Rittal's service and accessibility. That's what convinced us.

David Finn,
Tritium founder and CEO


VAG

Protected against rain and the sun: SBRS GmbH

Freiburg im Breisgau has one more attraction: climate-friendly electric buses. The buses are optimally charged thanks to an ingenious charging infrastructure with components from Rittal that offer ideal protection, not only against the wind and the weather but also against personal access.

The e-buses can be “refuelled” in only five to eight minutes, then the next passengers are already waiting at the bus stop so that they can be taken from A to B. This intermediate charging at bus stops is performed by automated contacting via a pantograph. In most cases, this is usually supplied with power from an infrastructure enclosure designed for outdoor installation. This means that the enclosure must withstand all weather conditions and must not pose a risk to people, e.g. from electric shock. The safety requirements of this type of charging infrastructure are high, as the charging stations sometimes have a charging capacity of 450 kW and rated voltages of up to 800 volts. SBRS from Dinslaken, Germany, which has already managed similar projects in Brussels, Münster, Kiel and Venice, was commissioned to create the charging infrastructure in Freiburg. This system integrator develops, plans and supplies the complete charging infrastructure – from the charger to the lightning protection. It also takes care of the civil engineering and cabling work. SBRS chose a Toptec bayed suite from Rittal for the enclosure technology.

The e-bus charging stations are located both in the depot and at Freiburg’s “Europaplatz” bus stop. They feature IP55 protection category, meaning they offer protection against physical contact, dust and penetrating water. For system integrator SBRS, it was clear from the outset that Rittal would be chosen to provide the enclosure technology.

The base point at Freiburg’s Europaplatz bus terminal is a Toptec outdoor enclosure in EMC design, offering shielding from electromagnetic waves. This bayed enclosure suite is accessible at three different points. Rittal installed fan-and-filter units for climate control with the help of the ambient temperature so that ventilation was tailored to requirements. A double-walled enclosure concept creates a “chimney effect”, which prevents overheating from solar radiation. This means that the flows of hot air are led upwards and outwards via the ventilated roof projection. A high level of protection from corrosion is also achieved by using top-quality materials such as stainless steel and aluminium.

Reference
Energy consumption

We appreciate the modular system used by Rittal enclosures. Rittal products have made it possible to develop the charging infrastructure quickly and easily. The products are also available worldwide, which helps us in our international projects.

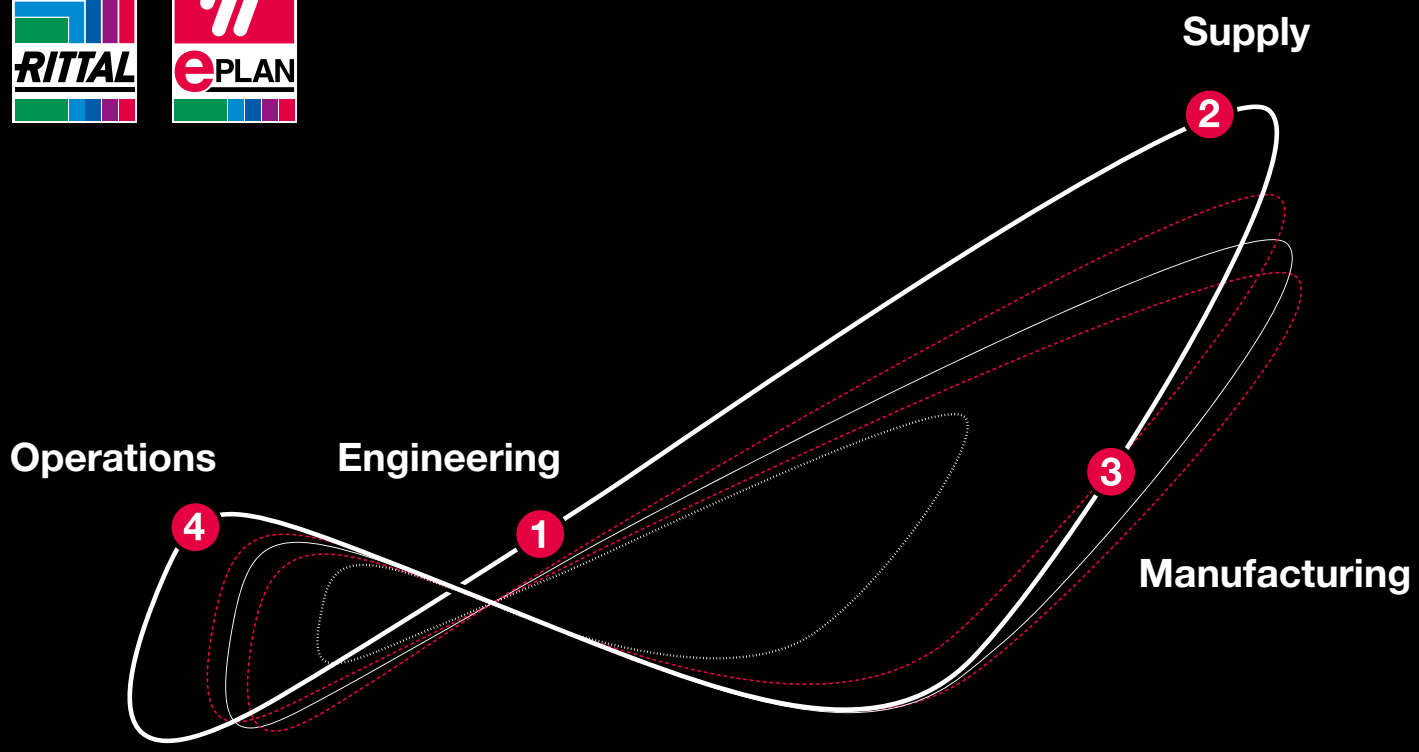
Dr. Stephan Nahmer,
Member of the Management Board and
Head of Project Management at SBRS GmbH

Strong partners for future-proof panel building and switchgear manufacturing

You save time on system expansions, updates or retrofits and at the same time increase your production.

Digitalised and integrated.
The clear plus in efficiency

The expansion of the energy system is progressing rapidly, and huge time and cost pressures are now the norm. The efficient process and a high system availability – in addition to a high-quality product – provide the key competitive advantage. The central element is the digital twin, which is created during the engineering process, and links together all the downstream process steps – from supply and manufacturing through to operation – and contains information on the properties and operational behaviour of an enclosure. For planning switchgear, Eplan supplies high-performance engineering solutions linked by the EPLAN Platform. The Rittal range of solutions supports all those stages of the production process where data generated in the digital twin at the engineering stage can be put to further use. The data can also be accessed in commercial processes and during ongoing operation, when monitoring, servicing or developing the next generation of a switchgear system.



Engineering
- Consistent standard-compliant engineering
- Create pre-planning for your suppliers easily and quickly
- Use standardised planning tools together with your suppliers in order to optimise interfaces

Supply
- 24h delivery service
- Automatic generation of parts lists
- Preparing the data for import into the ERP system

Manufacturing
- Accelerated switchgear construction
- Fast exchange of information and rapid processing between end customers, mechanical engineers and switchgear manufacturers
- Shortened delivery times thanks to the integrated value chain

Operations
- Access to data and parts lists via cloud solutions
- High product availability – from stock
- Maintenance and servicing of the system
- Redlining the workflow support in order to document changes and report them to the technology

95%

of companies have been able to **increase** their **productivity** and **improve products and services** through digitisation. [6]

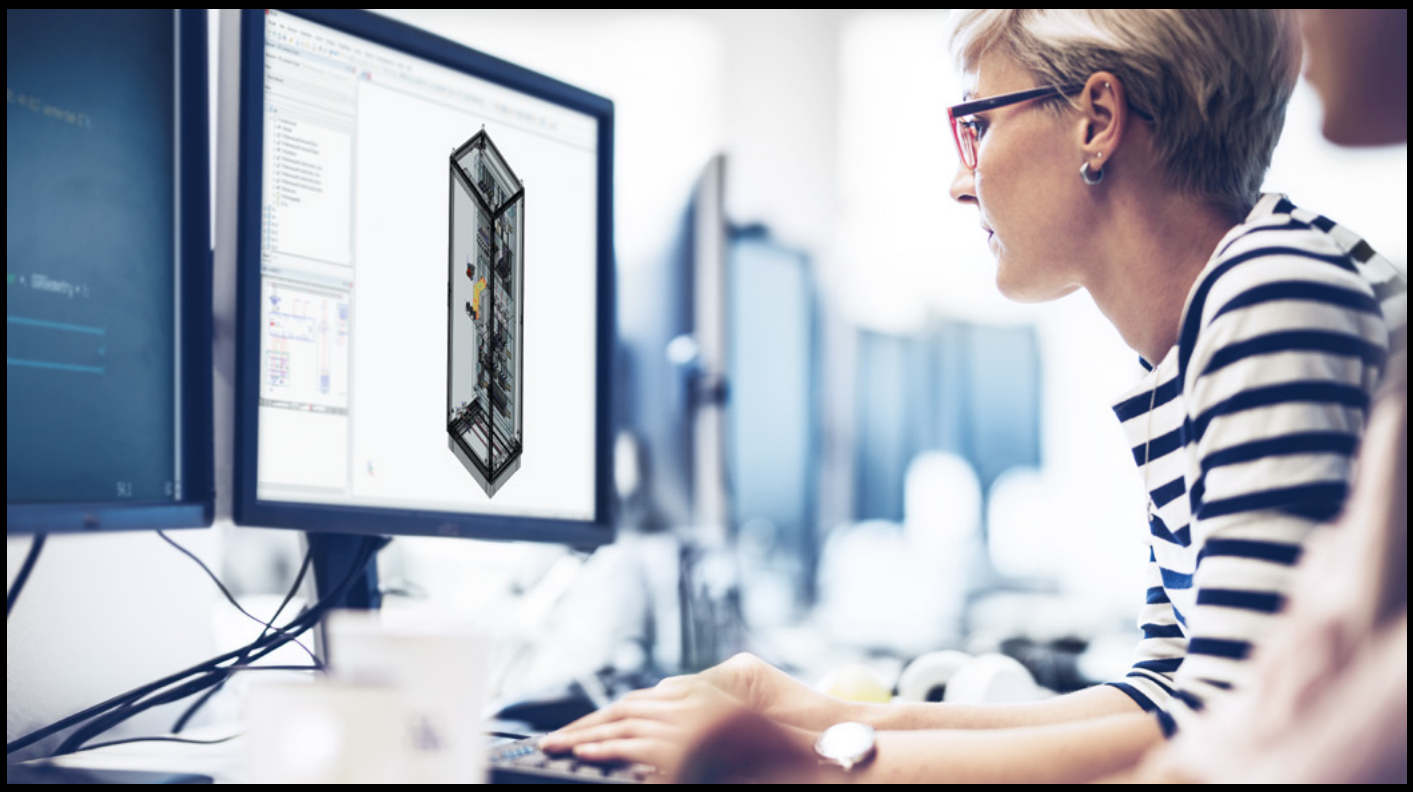
6 According to the Digital Value 2018 survey of 200 decision-makers from a variety of sectors in Germany, Austria and Switzerland.

EPLAN Solutions – Your Gateway to greater efficiency

You will be able to retain a long-term competitive edge by digitalising your processes and standardising your data. We can support you with open systems and professional advice to safeguard your efficient engineering for the future.

Bernd Schewior,
Senior Vice President, Professional Services Eplan

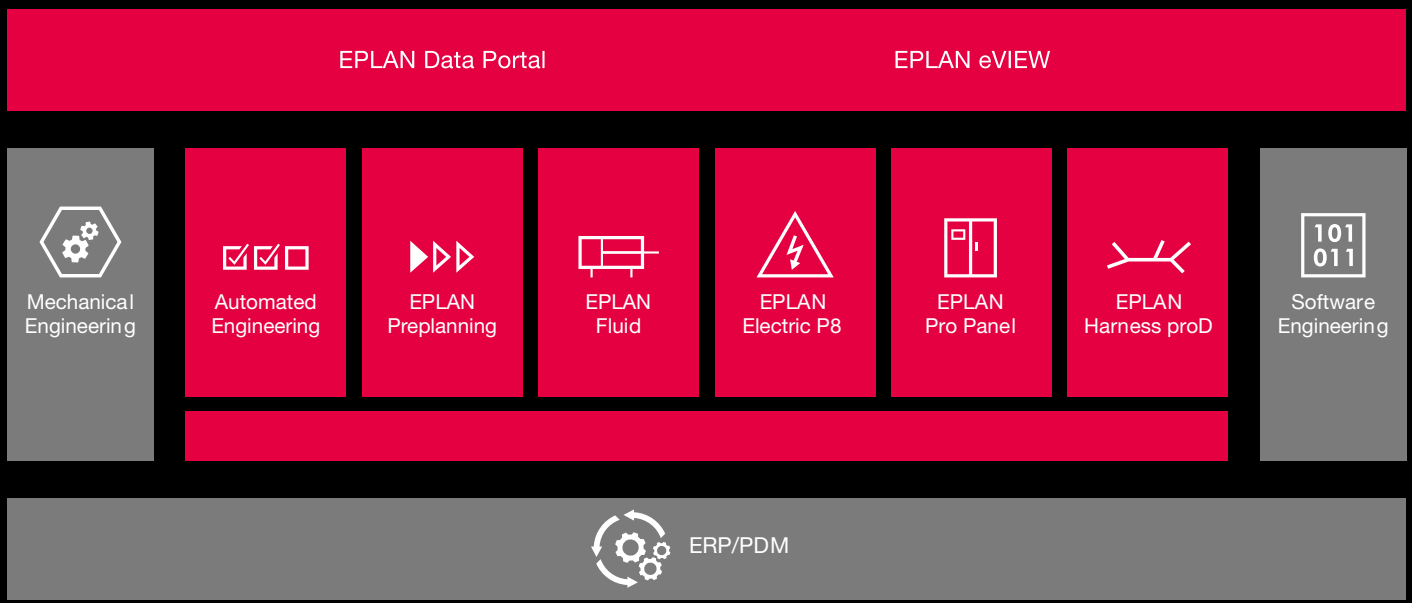
Eplan helps you to develop a cross-disciplinary approach to your engineering. The EPLAN platform provides the basis for this, by linking our software solutions together. For you, this translates into significant efficiency gains when working on your EPLAN project, because your digital data flows seamlessly from solution to solution, becoming further augmented with every process step. EPLAN ePULSE additionally provides access to an innovative cloud system, genuinely adding value to multi-location projects, for example. The EPLAN platform and EPLAN ePULSE combine to create EPLAN Solutions, your key to cutting-edge advanced engineering.



EPLAN platform
The EPLAN platform combines software solutions for every engineering discipline, from pre-planning, to project management, through to the construction of switchgear and cable harnesses. It comprises:

- **Automated Engineering:** EPLAN Engineering Configuration (EEC) provides you with a versatile tool for the design and use of configuration interfaces. EPLAN Cogineer provides you with the basis for automated generation of wiring schematics.
- **EPLAN Preplanning** helps you record engineering data, even at the pre-planning stage.
- **EPLAN Fluid** is your engineering tool, specifically designed for the project management and automated documentation of circuits for fluid engineering systems.
- **EPLAN Electric P8** helps you project-plan your electrical design for machinery and equipment in an engineering solution at the heart of the EPLAN platform.
- With **EPLAN Pro Panel** you devise and design control cabinets, switchgear and power distribution systems for energy supply in 3D.
- Use **EPLAN Harness proD** for efficient design and documentation of cables and cable harnesses in 3D and 2D.

EPLAN platform



Rittal Smart Service: maximum availability and top efficiency

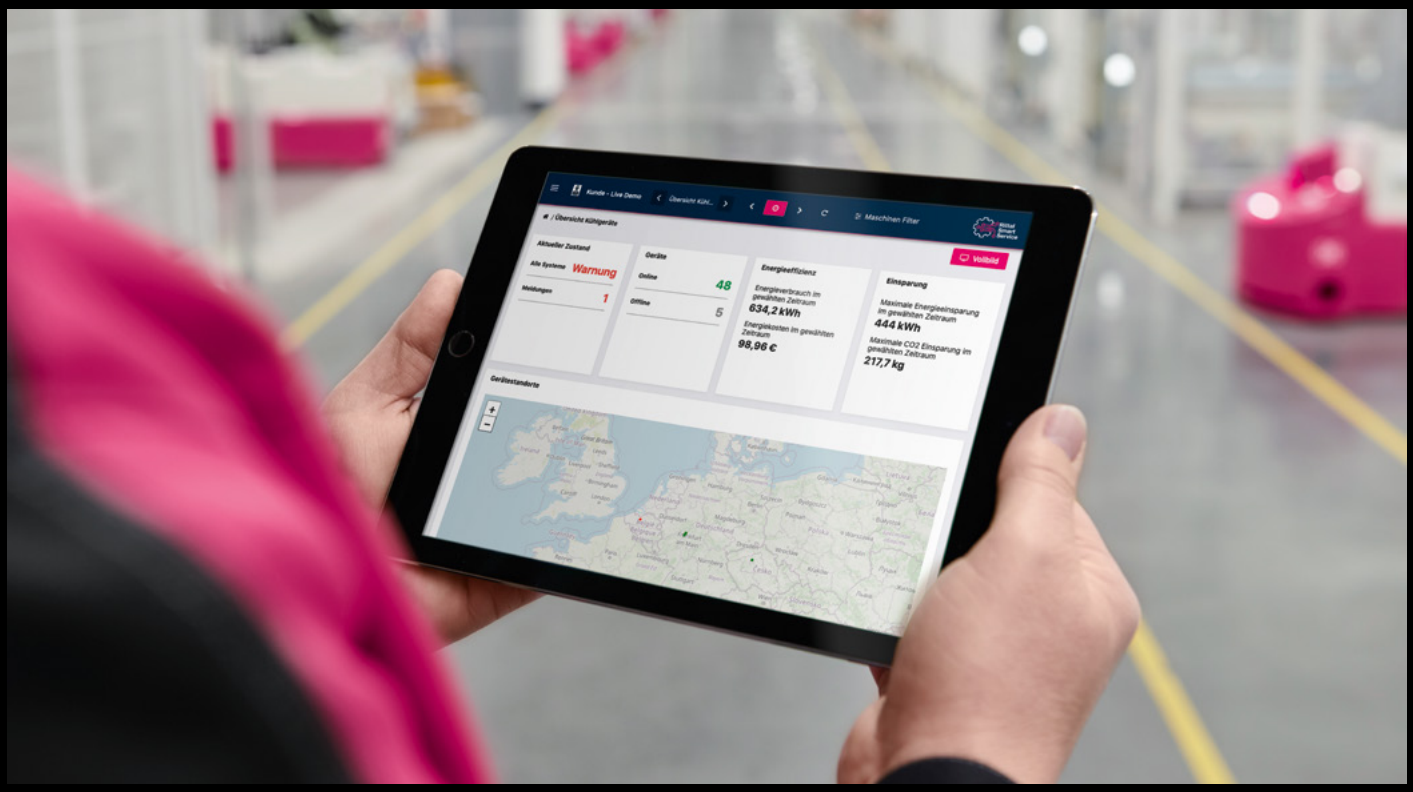
The **Rittal Service** works **24/7** for its **customers.**

Increasing system availability and optimising service processes
Rittal Smart Service visualises and monitors the operating behaviour of Blue e+ cooling devices. By transmitting data in real time, it ensures that maintenance requirements are determined and anomalies are detected early on. The automated processing of device data permits fast and efficient troubleshooting.

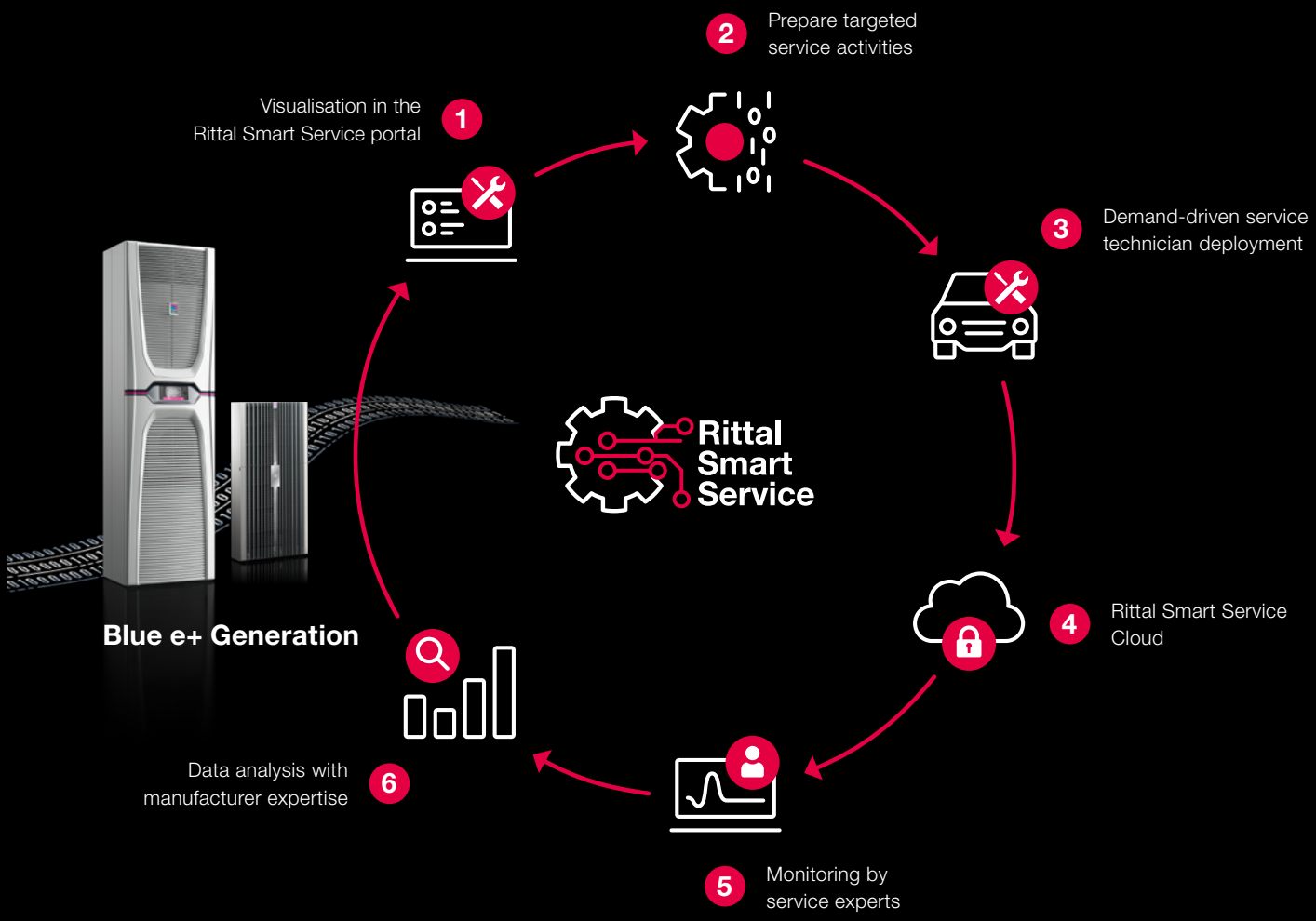
In the event of a malfunction, you receive situation-specific recommendations and energy efficiency analyses via the Rittal Smart Service portal. You also benefit from remote diagnosis and advice from the Rittal service experts.

The availability and analysis of the device data forms the basis for the predictive maintenance of the Rittal components. The forecast of the remaining service life of components supports the predictive detection of essential maintenance, so that maintenance can be carried out cost-efficiently as and when needed.

Professionally conducted service work ensures that the machines and technical systems function properly.



Rittal Smart Service



Your advantages

- Control of maintenance measures
- Visualisation of device data via the Web portal (condition monitoring)
- Access to operating and temperature characteristics
- Overview of energy consumption and efficiency analyses
- Situation-based recommendations for action with manufacturer expertise

Your benefits

- Enhanced system availability
- Increased service efficiency through on-demand maintenance
- Fast problem analysis and troubleshooting with remote diagnosis

Power for the future
Energy and power solutions from Rittal

Energy and power solutions from Rittal: future-oriented solutions for the energy industry. As demonstrated by the sub-sectors of energy generation, energy transmission and energy storage, as well as power distribution and the charging infrastructure, Rittal supports the entire path of value creation in the energy industry with the following components:

- Enclosure solutions
- Power distribution
- Climate control solutions
- Automation solutions for panel building and switchgear manufacturing
- Service

Working together with partners and customers, the central infrastructure elements that are needed to set up an energy system are designed and standardised. In this brochure, the following areas have been presented as examples:

- Wind and solar power
- Hydropower
- Battery energy storage solutions
- Charging infrastructure
- Data centres

Many other applications are also possible. The products presented on the following pages can be combined according to your needs. This is how solutions are created for the future.

A **24%**

increase in **solar energy generation**
in the G20 countries in 2018[7]

7 https://www.enerdata.net/publications/reports-presentations/world-energy-trends.html

Renewable energies

Application			Enclosures	
System solution			Rittal enclosure solutions offer optimum protection for your components. ■ Enclosure technology tested to IP, IK and RC protection categories ■ In-house accredited laboratory ■ Three-phase surface treatment for maximum corrosion protection ■ Material selection depending on the climate and requirements profile: aluminium, stainless steel and sheet steel ■ EMC protection ■ Static load capacity of up to 14,000 N	
		Requirement		
Wind energy	Hub	■ Dynamic loads ■ Accessibility ■ Easy access	■ Small and compact enclosure Material: Sheet steel, stainless steel, Cat. 36, from page 43	
	Nacelle	■ Dynamic loads ■ Thermal management ■ Preventing condensation	■ Large enclosure Material: Sheet steel, Cat. 36, from page 116	
	Tower	■ Restricted space ■ Thermal management	■ Large enclosure Material: Sheet steel, Cat. 36, from page 116	
Photovoltaics	Central inverter	■ Weather influences ■ Environmental conditions	■ Large enclosure, outdoor Material: Stainless steel, aluminium, Cat. 36, from page 262	
	Solar panel		■ Small enclosures/PK Material: Plastic and sheet steel, Cat. 36, from page 43	

	Climate control	Power distribution	Accessories	Quality management
	Efficient and innovative climate control solutions ensure reliable protection for your power electronics. ■ Fans, cooling units and heaters for controlling the temperature of the installed components ■ Individual design of the required climate control system with the help of our Therm software application	Rittal offers a modular system for demand-responsive power distribution, Cat. 36, from page 277 ■ Distribution and security of the power supply with the focus on standardisation and availability ■ Planning and design of the low-voltage switchgear in accordance with IEC 61 439, with design verification with Power Engineering Software	For maximum flexibility – Rittal has the solutions for optimum system configuration ■ Components and sensors for intelligent connectivity and monitoring ■ Interior installation for protection against electromagnetic interference fields ■ Upgrade kit for areas at risk from earthquakes as per Telcordia GR-63-CORE zone 4	Rittal offers support right from the outset: ■ Project planning of the technical specifications ■ Prototype construction, tests and simulations ■ Manufacturing and assembly ■ Warehousing service and on-time delivery ■ Your own personal point of contact throughout the entire project
	■ Fan-and-filter units with protection class IP 54 as standard Further products Cat. 36, from page 456	■ Modular system for low-voltage systems with design verification in accordance with IEC 61 439, up to 1600 A for DC and AC applications, Cat. 36, from page 446 ■ Rated current < 125 A RiLine Compact, Cat. 36, from page 285 ■ Rated current < 250 A Mini-PLS, Cat. 36, from page 294 ■ Rated current < 1600 A RiLine PLS, Cat. 36, from page 300 ■ Rated current < 6300 A Ri4Power, Cat. 36, from page 314	■ Earthquake kit, Cat. 36, from page 1032 ■ EMC, Cat. 36, from page 1028 ■ Monitoring, Cat. 36, from page 799 ■ IoT Interface, Cat. 36, from page 554 ■ Base/foundation, Cat. 36, from page 880 ■ Locking systems, Cat. 36, from page 933 ■ Rain canopies, Cat. 36, from page 958 ■ Interior installation, mounting plates and rail systems, Cat. 36, from page 970 ■ Industry-specific accessories on request	Accredited Rittal test laboratory ■ Simulation of climatic conditions ■ Dynamic and static load tests ■ 3D measurement ■ Corrosion testing ■ Electrical safety and function tests ■ Software tests ■ Performance testing of chillers, cooling units and heat exchangers
	■ Fan-and-filter units (energy-efficient) Further products Cat. 36, from page 456			
	■ Roof-mounted cooling unit; doors or side panels and escape routes remain free Further products Cat. 36, from page 498			
	■ TopTherm Blue e, NEMA 4X wall-mounted cooling unit also as IIoT bundle ■ Outdoor cooling unit, Cat. 36, from page 496 Further products Cat. 36, from page 477			
	■ Fan-and-filter units ■ Thermoelectric coolers Further products Cat. 36, from page 456			

The modular lithium-ion battery energy storage solution

A battery energy storage solution consists of four functional levels:

- Mechanical integration
- Electrical management
- Thermal management
- Communication

With its range of products, Rittal offers the opportunity to develop reliable infrastructures for battery energy storage solutions. Battery modules have a variety of enclosure shapes that all need to be securely accommodated. From standard 19-inch dimensions to other, non-standard dimensions, everything is commercially available.

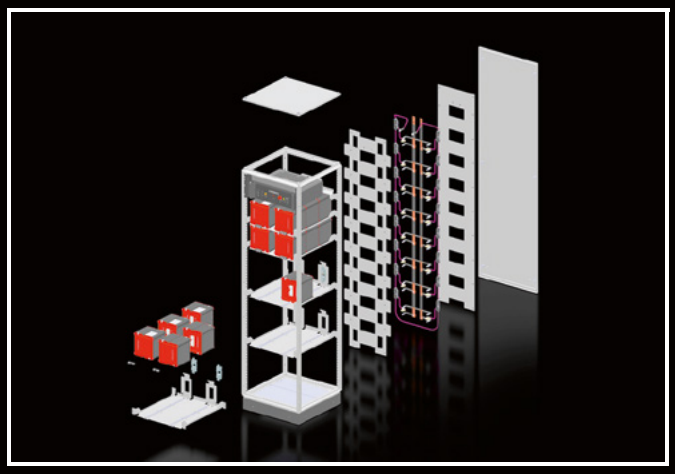
Our enclosures and enclosure systems offer a suitable environment for integrating battery modules. The accessories allow the inclusion of 19-inch standard dimensions, as well as other formats.

There is a correct solution for the power distribution within enclosure systems and across bayed systems that meets almost every requirement in the field of power distribution components. Our busbar systems, with features such as the time-saving clip-on mounting, permit fast and safe installation.

On this page, you can see an example of the structure of a modular lithium-ion battery energy storage solution (BESS) from Commeo in a Rittal VX25 standard enclosure system. The components that needed to be integrated were the higher-level control unit, the battery modules and the power distribution via busbars within the enclosure.

With construction using standardised components, you can see a basic system that can be used to react flexibly to the diverse requirements of the BESS market.

Please contact your personal sales representative to find out how you can profitably use “Rittal – The System.” for your solutions.



Energy storage enclosure and system structure

- Maximum system flexibility
- Simple and safe installation thanks to modular design
- Freely selectable voltage level
- Compatible with a variety of inverters from different manufacturers
- Safe installation thanks to connector coding
- 100% industry standard

Energy storage block

- Battery management system (BMS)
- Plug & play
- LED display: Battery mode and SoC, readable on the block
- Automatic interconnection within the blocks

Control unit

- Control and monitoring of the system
- Integrated cut-off device
- Open interface for communication with external peripherals
- Print relays: Transmission of the battery status via potential-free contact
- Deep discharge protection: Protects the battery system from exhaustive discharge
- DoD management: Controls the desired depth of discharge (DoD)
- Deep sleep: Saves energy when not in use

System monitoring

- User interface: Monitoring and setup of the battery system
- Industry 4.0 Remote monitoring, smart maintenance, machine-to-machine communication (“M2M”)

High density rack

Samsung SDI Page 43 **LG Chem** Page 43 **Baying enclosure system VX25** Catalogue 36, page 99

Material:
– Enclosure frame: Sheet steel

Surface finish:
– 1.5 mm, dipcoat-primed

Colour:
– RAL 7035

Maximum load capacity (static):
– 1000 N per level

Supply includes:
– Enclosure frame
– Mounting rails enclosed, loose

Note:
– Only combinable with Samsung SDI battery mounting rails
– Order together with battery installation frame
– For installation in an energy storage container for high-density applications

		Packs of			
Width in mm			525	525	525
Height in mm			2000	2200	2400
Depth in mm			600	600	600
Model No.		1 pc(s).	**9690.000**	**9690.002**	**9690.004**
Only combinable with a mounting rail for the Samsung SDI battery					
Mounting rail for Samsung SDI battery		2 pc(s).	9692.106	9692.106	9692.106
Dimensions max. mm	X = Attachment point to front of battery		60	60	60
	Y = Attachment point to rear of battery		486	486	486
	Z = Battery housing width		446	446	446
	H = Battery height		165	165	165
Possible installation locations			10	12	13
Accessories					
Levelling feet		4 pc(s).	4612.000	4612.000	4612.000
Side panels, screw-fastened, sheet steel		2 pc(s).	8106.245	8106.245	–
Baying bracket, internal		6 pc(s).	8617.500	8617.500	8617.500
Baying block, internal		6 pc(s).	8617.501	8617.501	8617.501
Baying bracket, external		6 pc(s).	8617.502	8617.502	8617.502

Batteries with a greater installation depth may be installed with a projection from the rack if the rack is not positioned directly against a wall.

Modular enclosure Page 42 **Baying enclosure system VX25** Catalogue 36, page 99

Material:
– Sheet steel

Surface finish:
– Galvanised (zinc-coated)

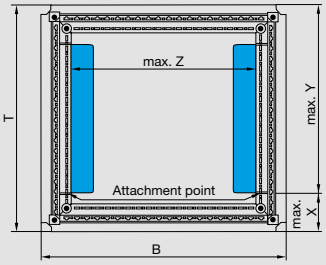
Maximum load capacity (static):
– 1000 N per level

Supply includes:
– Mounting rail for Samsung SDI and LG Chem batteries
– Holder for one battery per level
– Mountable in the metric frame structure

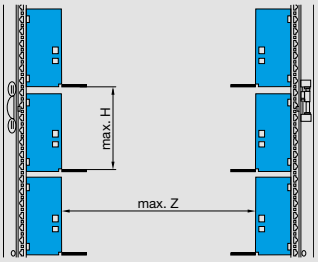
Batteries:
– Up to the total widths and total lengths indicated below
– Attached to the front using the brackets on the battery

Note:
– Can be combined with enclosures and other accessories from Catalogue 36
– Order battery integration for Samsung SDI batteries together with modular enclosure
– Order battery integration for batteries LG Chem together with frame structure
– Basic enclosures with other depths, see VX25 baying enclosure system

Top view



Front view



For Samsung SDI/LG Chem batteries

		Packs of	For batteries						
			Samsung SDI			LG Chem			
Dimensions max. mm	X = Attachment point to front of battery		60	60	100	70	70	70	70
	Y = Attachment point to rear of battery		386	486	646	276	376	476	676
	Z = Battery housing width		446	446	370	445	445	445	445
	H = Battery height		165	165	165	165	165	165	165
Suitable for enclosures	Width in mm		600	600	600	600	600	600	600
	Depth in mm		500	600	800	400	500	600	800
Model No.		2 pc(s).	**9692.105**	**9692.106**	**9692.108**	**9692.204**	**9692.205**	**9692.206**	**9692.208**
Installation in modular enclosure, height 2000 mm									
Width in mm			600	600	600	600	600	600	600
Height in mm			2000	2000	2000	2000	2000	2000	2000
Depth in mm			500	600	800	500	600	800	1000
Possible installation locations			10	10		15	15	15	15
Installation in modular enclosure, height 2200 mm									
Height in mm			2200	2200	2200	2200	2200	2200	2200
Possible installation locations			12	12	12	16	16	16	16

Energy storage containers

Containers for ESS and infrastructure Page 45

Containers:
– Container 20-ft High Cube as per DIN ISO 668

Insulation:
– Mineral wool, 50 mm
– As per DIN EN 13501-1
– Covered with zinc-plated sheet metal

Floor design:
– Sheet steel floor (steel teardrop plate)
– Enclosure foundations

Access door:
– Single-leaf
– Multi-purpose door, approx. 1000 x 2000 mm
– Insulated, with an all-round seal
– Profile cylinder lock with anti-panic function

Cut-outs:
– 4 Cut-outs, all-round, with diameters up to 100 mm
– 2 Cut-outs, all-round, with diameters up to 250 mm
– 2 Roxtec fillings

C-rails:
– For attaching the enclosures

Earthing sleeve:
– 4 pieces (2 pieces outside, 2 pieces inside)

Colour coating:
– Ambient conditions of corrosion protection class C3 (as per EN ISO 12 944-1 and 2)
– Colour: RAL 7032/7005

Electrical installation:
– RC circuit-breakers and miniature circuit-breakers
– 230 V socket
– Damp-proof luminaires

CSC acceptance:
– Optionally feasible

Refrigeration components:
– Cold/hot aisle for directional air routing
– LCP Inline DX inc. condenser with up to 24 kW cooling output
– Optimised energy efficiency
– SNMP card for LCP
– LCP-DX refrigerant line
– Condenser flat roof set inc. mounting

Rack components:
– 16 battery racks 600 x 2200 x 600 mm (W x H x D) to accommodate different batteries

preconfigured

Dimensions (W x H x D) mm	Packs of	2438 x 2896 x 6058
Model No.	1 pc(s).	**9693.100**

Energy storage containers Page 44

Containers:
– Containers: selection from 10, 20 and 40-foot and High Cube

Insulation:
– Mineral wool
– As per DIN EN 13501-1
– K value can be selected
– Covered with zinc-plated sheet metal

Floor design:
– Sheet steel floor (steel teardrop plate)
– Enclosure foundations
– Raised floor

Access door:
– Various doors inc. RC-class and fire protection
– Insulated, with an all-round seal
– Profile cylinder lock with anti-panic function
– Top door closer

Cut-outs:
– Various cut-outs, all-round, with diameters up to 100 mm
– Various cut-outs, all-round, with diameters up to 250 mm
– 2 Roxtec fillings

C-rails:
– For attaching the enclosures

Earthing sleeve:
– Selectable, on outside of the container
– Selectable, inside the container

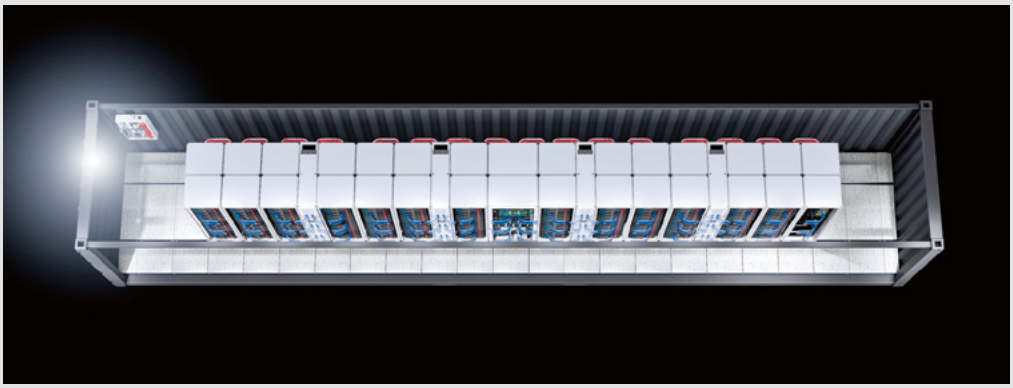
Colour coating:
– Ambient conditions of corrosion protection class C3/C4 selectable (as per EN ISO 12 944-1 and 2)
– Colour: RAL 7032/7005

Electrical installation:
– RC circuit-breakers and miniature circuit-breakers
– 230 V sockets
– Damp-proof luminaires can be selected

CSC acceptance:
– Optionally feasible

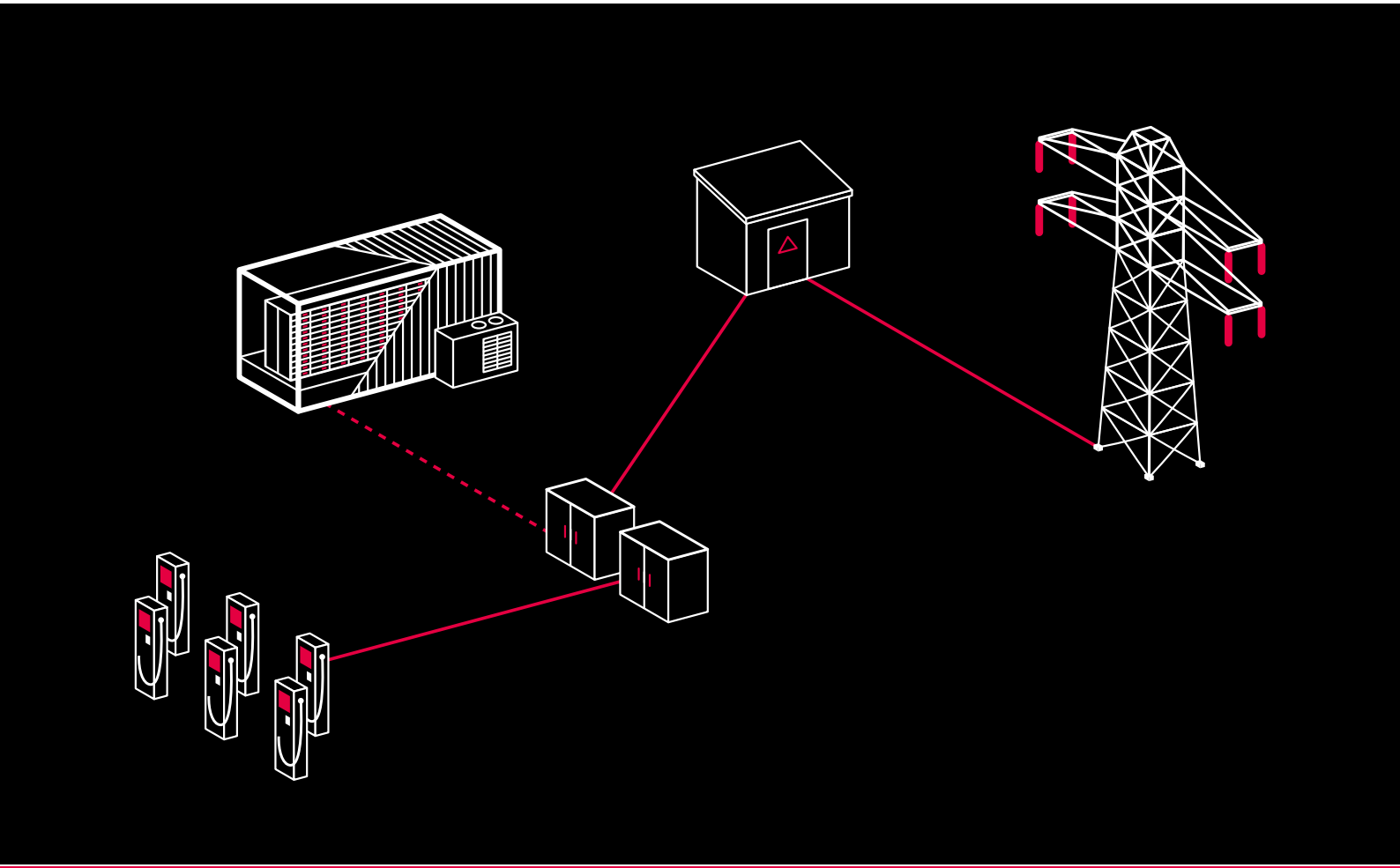
Refrigeration components:
– Cold/hot aisle for directional air routing
– CRAC-ULK, CW and DX can be selected
– LCP Inline DX, inc. condenser
– LCP CW inc. chiller
– Cooling output selectable
– Optimised energy efficiency
– SNMP card
– Heat exchangers

Rack components:
– Max. 40 battery racks 525 x 2200 x 600 mm (W x H x D)
– Battery rack selectable (variable rack spaces)



	Packs of	
Model No.	1 pc(s).	**9693.200**

Charging infrastructure installation variants



Possible installation variants

Rated current 630 – 2100 A	Rated current up to 6300 A	Custom construction
Low-voltage main distribution using the Ri4Power 185 mm system Example configuration, see page 49	**Low voltage main distribution** using the Ri4Power VX25 See Catalogue 36, from page 724.	Individual **back-end infrastructure** consisting of VX enclosures, see page 52 and RiLine power distribution components, see page 55 and with installation space for optional charging management components.
Sub-distribution using Rittal ISV (installation distributor), alternatively as back-end distributor with installation space for charge controller Example configuration, see page 51 and climate control options, see page 60		
Optional: Use of a battery energy storage solution (BESS) as a buffer for the power output. Details of the individual construction can be found on page 55.		
The front end of the charging park (charging station) can be provided optionally with an installation space for charge management components (see page 59) and climate control options (see page 60).		

Charging infrastructure installation variants

Low-voltage main distribution

- The low-voltage main distribution is used to safeguard the downstream components against the feeding grid. Furthermore, it is used for the measuring, distribution and selective protection of the connected components.
  For details, see page 49

Distribution enclosure

- The distribution enclosure is connected behind the low-voltage main distribution and is used for the demand-oriented supply and selective protection of downstream consumers.
  For details, see page 51

Back-end infrastructure

- The back-end infrastructure is used as an alternative if low-voltage main distribution boards and/or sub-distributors are set up individually and the charge controller is not located in the front-end.
  For details, see page 52

Front-end

- The front-end enclosure can provide the installation space for components for the charge management system or serve as an empty housing to accommodate the charging socket or charging cable.
  For details, see page 58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SIEMENS
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Configuration example – Main low-voltage distributor

Complete solution for central, compact power distribution
– Rated voltage up to 690 V, rated current up to 2100 A
– Short-circuit protection up to 50 kA
– Bar centre distance 185 mm
– Complete contact hazard protection up to IP 2XB (safe from finger-contact) from our system portfolio
– Precise-fit connection and component adapters for tested, safe connection at high currents
– Fuse elements to suit all situations
– Planning and design according to IEC 61 439 with design verification using Power Engineering Software, see Cat. 36 from page 446

Ri4Power 185 mm

Enclosure	Supply for up to 60 charging points @ 22 kW	Supply for up to 80 charging points @ 22 kW	**Model No.**	Catalogue 36, page
	HV_3 x NH3	HV_8 x NH2		
1 **Enclosure**	Packs of	Packs of		
Baying enclosure system VX25, 2-door, W x H x D 1200 x 2000 x 600 mm, plus VX accessories	–	1		125
Baying enclosure system VX25, 1-door, W x H x D 600 x 2000 x 600 mm, plus VX accessories	2	1		125
Fan-and-filter unit 700/770 m^3/h, 230 V 50/60	1	1	**3244.100**	458
2 **Busbars**				
Busbar E-Cu, 100 x 10 mm, L = 2400 mm	2	3	**3590.015**	342
Maxi-PLS busbar, 1600 A, 451 mm	3	3	**9640.207**	401
Sliding block M10, L = 25 mm, for Maxi-PLS busbar (Maxi-PLS 2000)	1	1	**9640.980**	403
End holder for Maxi-PLS 45 S/45 (1600/2000 A)	3	3	**9649.010**	401
Holder set (stabiliser) for connection kit	1	1	**9660.205**	405
Screw connection for connection bracket, screw M10 x 80	2	2	**9676.968**	405
Terminal stud, M10 x 55 for connection kits/connection bracket (Maxi PLS 1600/2000)	1	1	**9676.973**	404
Busbar support, 3-pole, 185 mm centre distance, for E-Cu 40 – 120 x 10 mm	2	3	**9677.500**	368
Busbar connector for E-Cu 40/60/80/100 x 10 mm, W = 40 mm	3	3	**9677.610**	380
Busbar connector for E-Cu 60/100/120 x 10 mm, W = 60 mm	3	3	**9677.620**	380
Busbars, E-Cu, with integrated punched holes, L = 585 mm	2	1	**9684.006**	396
Busbars, E-Cu, with integrated punched holes, L = 1185 mm	–	1	**9684.012**	396
Longitudinal connector, Cu 55 x 10, for 1 sub-conductor 50 x 10 mm	1	1	**9686.260**	397
Screw M10 x 55	1	1	**9686.865**	405
ACB connector kit top/bottom	1	1	**9686.912**	406
3 **Outlets**				
NH slimline fuse-switch disconnector, size 2, 400 A, bolt M12, 3-pole switchable (185 mm)	–	8	**9677.200**	375
NH slimline fuse-switch disconnector, size 3, 630 A, M12 bolt, 3 pole switchable (185 mm)	3	–	**9677.300**	375
Contact terminal for NH switch-disconnector, size 1 – 3/connection adaptor (185 mm)	3	8	**9677.460**	383
4 **Cover**				
Mounting bracket, tapped hole M6	1	1	**9660.090**	408
Perforated cover plate, W x H 1200 x 800 mm	2	2	**9674.990**	408
Contact hazard protection cover, W = 600 mm	1	–	**9677.550**	381
Contact hazard protection cover, W = 1200 mm	–	1	**9677.580**	381
End cover for SV 9677.500	1	1	**9677.600**	380
Contact hazard protection cover for busbar connector 9677.610/.620	2	2	**9677.640**	381
5 **Mechanical interior installation**				
System attachment VX25, W = 600 mm	2	1	**9677.511**	380
System attachment VX25, W = 1200 mm	–	1	**9677.541**	380
Retaining plate for Maxi-PLS busbars, W x D 375 x 543 mm, for VX, D = 600 mm	1	1	**9683.200**	410
ACB circuit-breaker support rail for VX, W = 600 mm	1	1	**9683.306**	412
Angle bracket for support rail ACB, D = 600 mm	1	1	**9683.326**	412
Angle bracket for support set (stabiliser)	1	1	**9686.495**	405


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Configuration example – Distribution enclosures

Rittal offers a modular system for demand-oriented power supply and distribution.

Distribution and safeguarding of the power supply with the focus on
– standardisation and availability
– Planning and design according to IEC 61 439 with design verification using Power Engineering Software, see Cat. 36 from page 446

Enclosure	Distribution enclosure for supplying 10 charging points with 22 kW charging capacity each	Distribution enclosure for supplying 20 charging points with 22 kW charging capacity each	Distribution enclosure for supplying 5 charging points with max. 44 kW charging capacity	**Model No.**	Catalogue 36, page
	250 A, 2 x NH 00	630 A, 4 x NH 00	630 A, 5 x NH 00		
1 **Housing**	Packs of	Packs of	Packs of		
Baying enclosure system VX25, basic enclosure, 600 x 2000 x 400 mm	1	1	–	**8604.000**	123
Baying enclosure system VX25, distribution enclosure, 850 x 2000 x 400 mm	–	1	1	**9666.956**	135
Side panels, screw-fastened, sheet steel for VX, 2000 x 400 mm	1	1	1	**8104.245**	901
Roof plate for cable entry glands, for VX, 600 x 400 mm	1	1	–	**9681.564**	961
Roof plate for cable entry glands, for VX, 850 x 400 mm	–	1	1	**9681.594**	961
Installation kit ISV, for VX, 600 x 2000 x 400/600 mm	1	1	–	**9666.902**	420
Installation kit ISV, for VX, 850 x 2000 x 400/600 mm	–	1	1	**9666.912**	420
Base/plinth corner pieces with base/plinth trim panels, front and rear, 200 mm	1	1	–	**8640.022**	881
Base/plinth corner pieces with base/plinth trim panels, front and rear, 100 mm	–	1	1	**8640.004**	881
Base/plinth trim panel, side, 200 mm	1	2	1	**8640.041**	882
2 **Busbars**					
Connection terminal, 250 A, 17 x 21 mm	1	–	–	**9666.340**	423
Connection terminal, 400 A, 25 x 21 mm	–	2	2	**9666.350**	423
Mounting set	1	2	2	**9666.310**	423
Circuit-breaker module up to 250 A, 250 x 300 mm	1	–	–	**9666.430**	425
Circuit-breaker module up to 630 A, 500 x 450 mm	–	1	1	**9666.440**	425
Support rail module, 250 x 600 mm	–	–	1	**9666.190**	422
Support rail module, 250 x 450 mm	1	1	–	**9666.180**	422
Support rail module, 500 x 300 mm	–	1	–	**9666.210**	422
Mounting plate module, 500 x 150 mm	–	–	1	**9666.120**	421
Mounting plate module, 500 x 300 mm	–	1	–	**9666.130**	421
Mounting plate module, 250 x 300 mm	1	–	–	**9666.090**	421
Busbar module, 250 x 300 mm	4	10	6	**9666.520**	427
DIN rail mounted device module, 250 x 600 mm	–	1	1	**9666.270**	422
DIN rail mounted device module, 500 x 450 mm	–	1	–	**9666.300**	422
DIN rail mounted device module, 250 x 300 mm	2	–	–	**9666.250**	422
NH measurement module, 102 x 108 x 68 mm	2	4	5	**9343.070**	333
3 **Outlets**					
D 02 fuse element, 27 x 209 mm	1	2	–	**3418.010**	323
D 02 fuse element, cover	1	2	–	**3418.020**	356
NH bus-mounting fuse-switch disconnector, size 00, electronic fuse monitoring, 106 x 194 mm	2	4	5	**9343.020**	329
4 **Cover**					
Contact hazard protection cover, 250 x 150 mm	2	5	6	**9666.000**	421
Contact hazard protection cover, 500 x 150 mm	–	1	1	**9666.040**	421

Enclosure solutions for back-end and infrastructure

Power distribution Page 55 **Climate control** Page 60

Rittal enclosure solutions offer ideal protection for your components.
- Enclosure technology tested to IP, IK and RC protection categories
- Three-phase surface treatment for maximum corrosion protection
- Material selection according to climate and requirements profile: Aluminium, stainless steel and sheet steel
- EMC protection
- Static load capacity up to 14000 N

Note:
- Further dimensions can be found in Catalogue 36 from page 99 onwards or online at www.rittal.com

Approvals:
can be found on the Internet

	Baying VX25 enclosure system basic enclosure		**Free-standing VX SE enclosure system**	**Basic outdoor enclosure[1)]**		
	Indoor version		Indoor version	Outdoor version		
Width mm	800	800	800	600	800	1200
Height mm	1200	2000	2000	1200	1200	1200
Depth mm	500	500	500	500	500	500
Material	Sheet steel	Sheet steel	Sheet steel	Aluminium	Aluminium	Aluminium
Model No.	**8815.000**	**8806.000**	**5833.600**	**9783.530**	**9783.610**	**9784.540**
Weight	92.1	130.0	134.0	38.0	49.5	66.0
Protection category	IP 55	IP 55	IP 55	IP 55	IP 55	IP 55
Product-specific scope of supply and accessories						
Door(s)	1	1	1	1	1	2
Base/plinth corner piece with trim	8640.003	8640.003	8640.003	■	■	■
Base/plinth trims	8640.032	8640.032	8640.032	■	■	■
Security lock	8611.070	8611.070	8611.070	■	■	■
Side panels	8115.245	8115.245	■	■	■	■
Mounting plate	■	■	■	9765.092	9765.095	9765.191
Mounting angles	See Cat. 36, from page 1080	See Cat. 36, from page 1080	See Cat. 36, from page 1080	7688.000	7688.000	7688.000
Punched sections with mounting flanges	8612.060/ 8612.160	See Cat. 36, from page 990	See Cat. 36, from page 990	–	See Cat. 36, from page 990	See Cat. 36, from page 990
Installation brackets	–	–	–	7696. 000	7698.000	7696.000
Concrete base/plinth	–	–	–	9765.082	9765.084	9765.086
Cable entry	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044

[1)] Other dimensions available to order on request

Power distribution Page 55 **Climate control** Page 60

Features of the CS Toptec, double-walled:
- TS 8 frame
- Weather canopy – with overhang on all sides
- Chimney effect of the double-walled structure, reducing the influence of sunlight
- Mounting benefit – Open frame structure means fast configuration, also applies to bayed variants

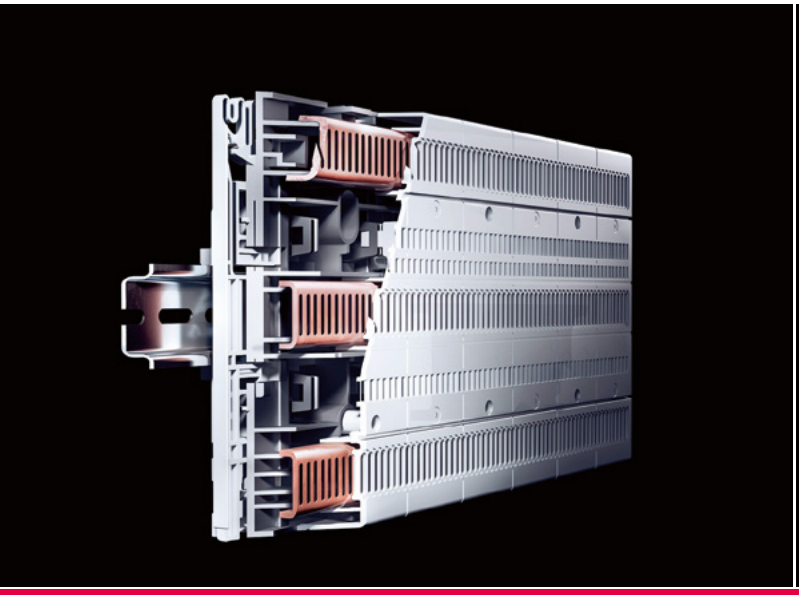
Note:
- Further dimensions can be found in Catalogue 36 from page 270 onwards or online at www.rittal.com

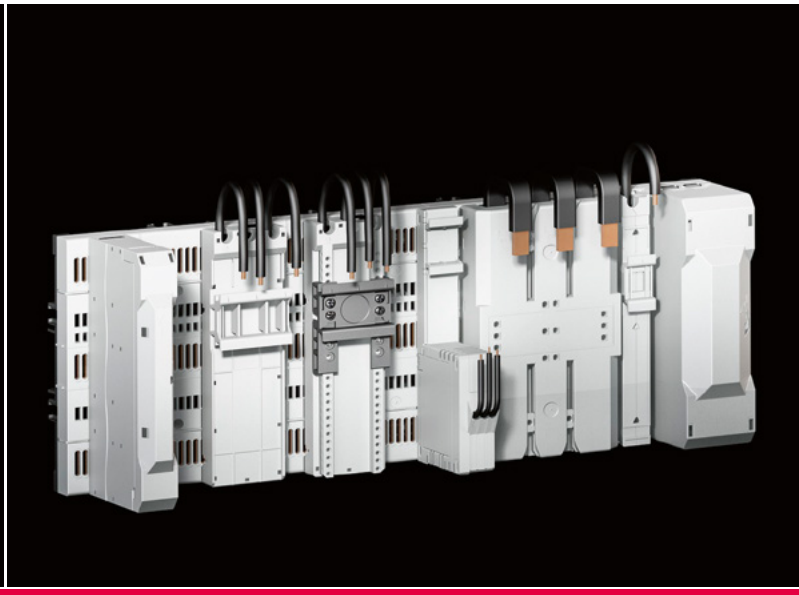
Approvals:
Available on the Internet

	CS Toptec, double-walled[1)]						
	Outdoor version						
Width mm	600	800	800	800	800	800	800
Height mm	1800	1200	1600	1800	1200	1600	1800
Depth mm	600	800	800	800	800	800	800
Material	Stainless steel/ aluminium	Stainless steel/ aluminium	Stainless steel/ aluminium	Stainless steel/ aluminium	Stainless steel/ aluminium	Stainless steel/ aluminium	Stainless steel/ aluminium
Model No.	**9774.510**	**9828.500**	**9868.500**	**9888.500**	**9828.550**	**9868.550**	**9888.550**
Weight	85.0	83.0	101.0	110.0	82.0	100.0	109.0
Protection category	IP 55	IP 55	IP 55	IP 55	–	–	–
Product-specific scope of supply and accessories							
Door(s)	1	1	1	1	1	1	1
With cut-out for Blue e+ Outdoor cooling unit	–	–	–	–	■	■	■
Base/plinth corner piece with trim	■	■	■	■	■	■	■
Base/plinth trims	■	■	■	■	■	■	■
Security lock	■	■	■	■	■	■	■
Side panels	■	■	■	■	■	■	■
Mounting plate	5051.036 + 5050.063	9765.095	5051.041 + 5050.063	5051.042 + 5050.063	9765.095	5051.041 + 5050.063	5051.042 + 5050.063
Mounting angles	7827.181	See Cat. 36, from page 1080	See Cat. 36, from page 1080	See Cat. 36, from page 1080	See Cat. 36, from page 1080	See Cat. 36, from page 1080	See Cat. 36, from page 1080
Punched sections with mounting flanges	See Cat. 36, from page 990	8612.080/ 8612.180	8612.080/ 8612.180	8612.080/ 8612.180	8612.080/ 8612.180	8612.080/ 8612.180	8612.080/ 8612.180
Concrete base/plinth	9765.009[3)]	9765.009[2)]	9765.009[2)]	9765.009[2)]	9765.009[2)]	9765.009[2)]	9765.009[2)]
Adaptor for installing fan-and-filter units	–	–	–	–	9828.100	9828.100	9828.100
Fan-and-filter units	–	–	–	–	324X.1X0	324X.1X0	324X.1X0
Outlet filters	–	–	–	–	3243.200	3243.200	3243.200
Blue e+ Outdoor cooling unit	–	–	–	–	3185.330	3185.330	3185.330
Cable entry	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044	See Cat. 36, from page 1044

[1)] Other dimensions available to order on request
[2)] As 9765.072 but D = 800 mm
[3)] As 9765.072 but W and D = 600 mm

Power distribution/RiLine Compact





Further components from the field of power distribution, see Catalogue 36 from page 276

- Shock-hazard protected busbar system, 3-pole, up to 125 A
- Pre-assembled boards with 5 or 9 horizontal pitches, 45 mm each
- Extensive system accessories, such as 1 or 3-pole component adaptors
- Motor starter with overload protection, optionally to SIL specification
- NH 000 fuse-switch disconnector with output at top or bottom
- Power supply unit for DC control voltage with redundancy/parallel switching capability
- Extensive mounting accessories especially for larger device combinations

Note:
- The complete technical data can be found on the Internet

RiLine Compact system components

	P. of	Model No.
Busbar board, 3-pole, 125 A/690 V AC, 600 V DC		
Board width 225 mm, 5 horizontal pitches	1 pc(s).	**9635.000**
Board width 405 mm, 9 horizontal pitches	1 pc(s).	**9635.010**
Connection adaptors (for power supply of the board)		
Adaptor, 80 A (1.5 – 16 mm²/AWG 6 – 16)	4 pc(s).	**9635.200**
Adaptor, 125 A (6 – 50 mm²/AWG 1 – 10)	4 pc(s).	**9635.210**
Circuit-breaker component adaptors (for circuit breakers up to 160 A from various suppliers)		
For switches with 25 mm mounting distance, e.g: ABB (XT1), Allen Bradly (140G-G) or Siemens (3VA10, 3VA11, 3VA51)	1 pc(s).	**9635.100**
For switches with 30 mm mounting distance, e.g: ABB (XT2), Allen Bradly (140G-H), Eaton (NZM1) or Schneider (NSXm)	1 pc(s).	**9635.110**
OM component adaptors, 1-pole (with connection cable and DIN support rail)		
Phase L 1, 16 A, AWG 14/100 mm	6 pc(s).	**9635.371**
Phase L 2, 16 A, AWG 14/100 mm	6 pc(s).	**9635.372**
Phase L 3, 16 A, AWG 14/100 mm	6 pc(s).	**9635.373**
Phase L 1, 63 A, AWG 8/100 mm	6 pc(s).	**9635.381**
Phase L 2, 63 A, AWG 8/100 mm	6 pc(s).	**9635.382**
Phase L 3, 63 A, AWG 8/100 mm	6 pc(s).	**9635.383**
OM component adaptors, 3-pole (with connection cable and DIN support rail)		
With fuses, basic type and with fixed support rail, 16 A, AWG 14/125 mm	1 pc(s).	**9635.300**
With fuses, basic type and with fixed support rail, 16 A, AWG 14/120 mm	4 pc(s).	**9635.310**
With fuses, basic type and with fixed support rail, 32 A, AWG 10/100 mm	4 pc(s).	**9635.320**
Comfort type, with flexibly mountable support rail, 16 A, AWG 14/160 mm	4 pc(s).	**9635.330**
Comfort type, with flexibly mountable support rail, 25 A, AWG 12/100 mm	4 pc(s).	**9635.340**
Comfort type, with flexibly mountable support rail, 32 A, AWG 10/160 mm	4 pc(s).	**9635.350**
Comfort type, with flexibly mountable support rail, 45 A, AWG 8/100 mm	4 pc(s).	**9635.360**
Fuse technology		
NH fuse-switch disconnector (NH 000, 125 A, 2.5 mm² – 50 mm²)	1 pc(s).	**9635.700**
Motor controllers, 3-pole, 500 V AC		
Max. 0.6 A current monitoring adjustable, 0.14 – 2.5 mm²	1 pc(s).	**9635.400**
Max. 2.4 A current monitoring adjustable, 0.14 – 2.5 mm²	1 pc(s).	**9635.410**
Max. 9 A current monitoring adjustable, 0.14 – 2.5 mm²	1 pc(s).	**9635.420**
SIL, max. 3 A current monitoring adjustable, 0.14 – 2.5 mm²	1 pc(s).	**9635.415**
SIL, max. 9 A current monitoring adjustable, 0.14 – 2.5 mm²	1 pc(s).	**9635.425**
Power supply		
SMPS, pri.: 2/3-phase, max. 500 V AC, sec: 24 V DC/5 A	1 pc(s).	**9635.800**

Power distribution components for individual assembly

Further components from the field of power distribution Catalogue 36, page 276

Rittal offers a modular system for demand-oriented power supply and distribution.

Distribution and safeguarding of the power supply with the focus on
- Standardisation and availability
- Planning and design according to IEC 61 439 with design verification using Power Engineering Software, see Cat. 36 from page 446

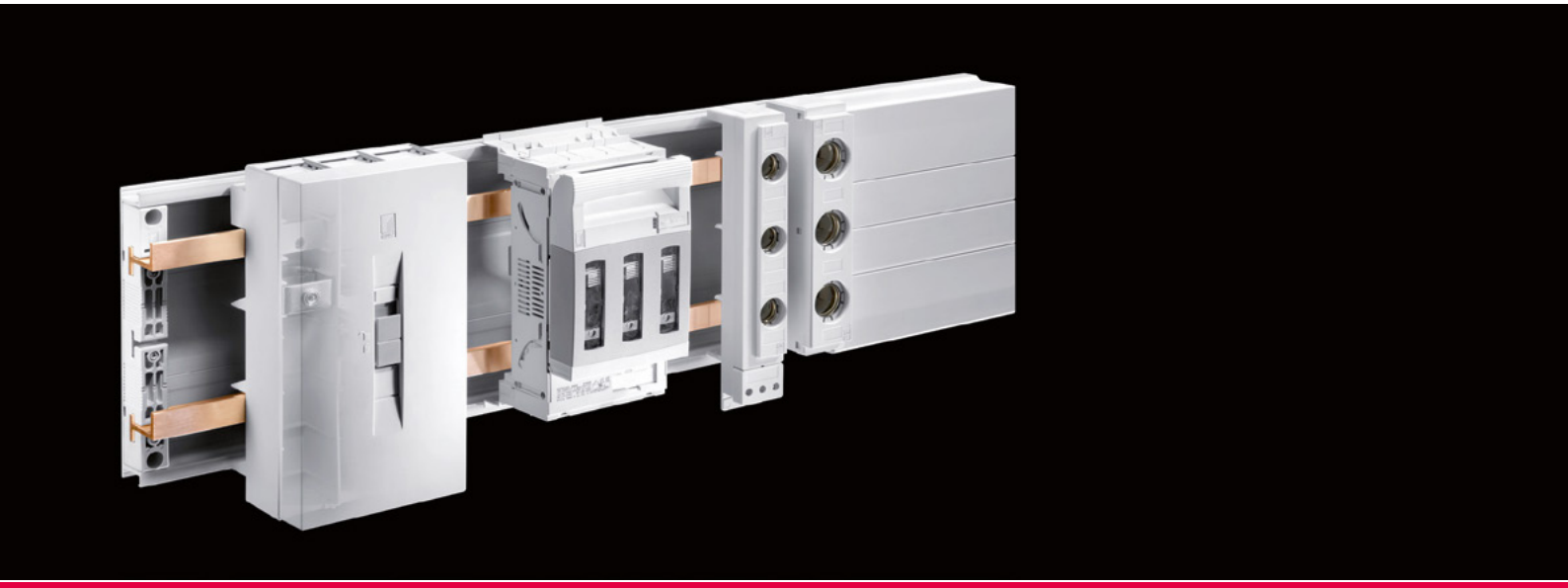
Note:
- The complete portfolio can be found in Catalogue 36.

Approvals:
Available on the Internet

RiLine system components (selection)

	Packs of	3-pole	4-pole
System assembly busbar			
Busbar supports	4 pc(s).	**9340.000**	**9340.004**
Contact hazard protection system			
End cover	2 pc(s).	**9340.070**	**9340.074**
Base tray, length 1100 mm	2 pc(s).	**9340.130**	**9340.134**
Base tray spacers, length 1100 mm	2 pc(s).	**9340.140**	**–**
Cover sections, length 1100 mm	2 pc(s).	**9340.210**	**9340.214**
Support panels, length 1100 mm	2 pc(s).	**9340.220**	**9340.224**
Cross members	2 pc(s).	**9349239**	**–**
Busbars E-Cu, length 2400 mm			
Busbar 15 x 10 mm	6 pc(s).	**3581.100**	**3581.100**
Busbar 20 x 10 mm	3 pc(s).	**3585.005**	**3585.005**
Connection adaptors			
125 A	1 pc(s).	**9342.220**	**9342.224**
250 A	1 pc(s).	**9342.250**	**9342.254**
Component adaptors			
Circuit-breaker component adaptors (for circuit breakers)			
160 A, outlet at top	1 pc(s).	**9342.500**	**9342.504**
160 A, outlet at bottom	1 pc(s).	**9342.510**	**9342.514**
250 A, outlet at top	1 pc(s).	**9345.600**	**9345.604**
250 A, outlet at bottom	1 pc(s).	**9345.610**	**9345.614**
OM adaptors (with DIN support rail)			
16 A, with connection cable	1 pc(s).	**9340.780**	**–**
32 A, with connection cable	1 pc(s).	**9340.790**	**–**
65 A, with connection cable	1 pc(s).	**9340.430**	**–**
32 A, with tension spring clamps and support frame	1 pc(s).	**9340.530**	**–**
65 A, with tension spring clamps and support frame	1 pc(s).	**9340.630**	**–**
Fuse system			
Bus-mounting fuse bases			
D01/D02 (E18)	5 pc(s).	**3418.040**	**–**
D-Switch (D01/D02)	3 pc(s).	**9340.950**	**–**
NH fuse-switch disconnectors			
Size 000, 100 A, outlet on top	1 pc(s).	**3431.020**	**–**
Size 000, 100 A, outlet at bottom	1 pc(s).	**3431.030**	**–**
Size 00, 160 A, outlet at top/bottom	1 pc(s).	**9346.000**	**–**
Size 1, 250 A, outlet top/bottom	1 pc(s).	**9343.100**	**–**

RiLine DC 60 mm busbar system



Further system accessories from the field of power distribution Catalogue 36, Page 276

RiLine60 DC
Contact-hazard-protected busbar solution for DC applications in the areas:
- Charging infrastructure, photovoltaics, electroplating and IT infrastructure
- Individual applications possible
- Based on the 1 or 3-pole RiLine 60 mm system
- DC rated operating voltage up to 1500 V DC
- Short-circuit resistance up to 40 kA
- Including design verification to IEC 61 439-1

Material:
Busbar supports
- Polyamide (PA 6.6)
- Fire protection corresponding to UL 94-V0

Connection adapters
- Chassis: Polyamide (PA 6.6), fire protection corresponding to UL 94-V0
- Cover: ABS, fire protection corresponding to UL 94-V0

NH fuse-switch disconnectors
- Polyamide (PA 6)
- Fire protection corresponding to UL 94-V0
- Contact tracks: Electrolytic copper, silver-plated

Bus-mounting fuse base
- Bus-mounting fuse base: Fibreglass-reinforced, thermoplastic polyester (PBT), fire protection corresponding to UL 94-V0
- Contact hazard protection: Polyamide (PA 6.6), fire protection corresponding to UL 94-V0

Colour:
Busbar support, connection adaptor, bus-mounting fuse element:
- RAL 7035

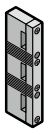
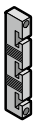
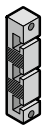
NH fuse-switch disconnector:
- Chassis: RAL 7035
- Cover: RAL 7035/7001

Note:
- Creepage distances and clearance to DIN EN 60 664-1 should be checked in the final application.

Technical information:
Available on the Internet

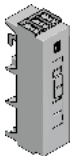
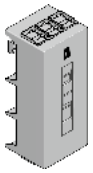
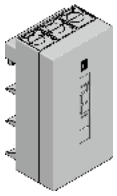
Detailed drawings:
Available on the Internet

Busbar support

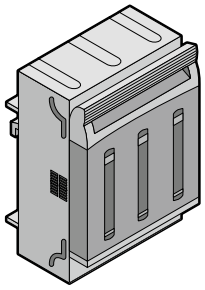
Design						
For busbars mm	15 x 5 – 30 x 10	■	–	–	■	–
	PLS 800	–	■	–	–	–
	PLS 1600	–	–	■	–	■
Rated operating voltage		1500 V DC				
Packs of		4 pc(s).	4 pc(s).	4 pc(s).	4 pc(s).	4 pc(s).
Model No.		**9340.050**	**9341.050**	**9342.050**	**9340.030**[1)]	**9342.030**[1)]

[1)] DC applications only with component mounting of phase L1 and L3 in series.

Connection adaptors

Design					
Rated current up to		63 A	125 A	250 A	800 A
Rated operating voltage[1]	L1 + L2	1000 V DC	1000 V DC	1000 V DC	1000 V DC
	L1 + L3	1500 V DC	1500 V DC	1500 V DC	1500 V DC
Cable outlet		bottom	bottom	bottom	bottom
Connection of round conductors mm² – fine wire with wire-end ferrule – multi-wire – solid		 2.5 – 10 2.5 – 10 2.5 – 10	 10 – 25 16 – 35 –	 35 – 120 35 – 120 –	 95 – 185 95 – 300 –
Clamping area for laminated copper bars W x H mm		–	10 x 7.8	18.5 x 15.5	33 x 20
Width mm		20	55	90	129
Height mm		215	210	210	246
Packs of		1 pc(s).	1 pc(s).	1 pc(s).	1 pc(s).
Model No.		**9342.210**	**9342.240**	**9342.270**	**9342.300**

NH fuse-switch disconnectors

Design									
Size		Size 00		Size 1		Size 2		Size 3	
Rated current		160 A		250 A		400 A		630 A	
Utilisation category for rated operating voltage	220 V DC[1]	DC-22B		DC-21B (DC-22B[2])		DC-21B (DC-22B[2])		DC-21B (DC-22B[2])	
	440 V DC[1]	–		DC-22B[2]		DC-22B[2]		DC-22B	
	1000 V DC[1]	DC-20B		DC-20B		DC-20B		DC-20B	
Cable outlet		Top/bottom		Top/bottom		Top/bottom		Top/bottom	
Connection type		Box terminal	Screw, M8	Box terminal	Screw, M10	Box terminal	Screw, M10	Box terminal	Screw, M10
Connection of round conductors mm²		4 – 95	up to 95	35 – 150	up to 150	95 – 300	up to 240	95 – 300	up to 300
Clamping area for laminated copper bars W x H mm		13 x 13	20 x 5	20 x 3 – 14	32 x 10	32 x 10 – 20	50 x 10	32 x 10 – 20	50 x 10
Width mm		106	106	184	184	210	210	250	250
Height mm		194	194	298	298	298	298	298	298
Packs of		1 pc(s).	1 pc(s).	1 pc(s).	1 pc(s).	1 pc(s).	1 pc(s).	1 pc(s).	1 pc(s).
Model No.		**9343.000**	**9343.010**	**9343.100**	**9343.110**	**9343.200**	**9343.210**	**9343.300**	**9343.310**

[1] DC applications only with component mounting of phase L1 and L3 in series.
[2] With arc chamber set SV 9344.680 for increased switching capacity.

Enclosure solutions for front-end/wallbox

Power distribution Page 55 **Climate control** Page 60

Rittal enclosure solutions offer ideal protection for your components.
– Enclosure technology tested to IP, IK and RC protection categories
– In-house accredited laboratory
– Three-phase surface treatment for maximum corrosion protection
– Material selection according to climate and requirements profile: Aluminium, stainless steel and sheet steel
– EMC protection
– Static load capacity up to 14000 N

Note:
– Further dimensions and suitable accessories can be found in Catalogue 36:
Compact enclosures AX, sheet steel from page 84
Compact enclosures AX, plastic from page 94
Hygienic Design, stainless steel from page 220
or online at www.rittal.com

Approvals:
Available on the Internet

	AX	AX	AX	AX	HD	HD
Width mm	300	380	400	500	390	610
Height mm	400	600	600	500	350	650
Depth mm	210	210	200	300	210	210
Material	Sheet steel	Sheet steel	Plastic	Plastic	Stainless steel	Stainless steel
Model No.	**1034.000**	**1038.000**	**1446.000**	**1453.000**	**1302.600**	**1310.600**
Suitable for outdoor use	–	–	■	■	■	■
Weight kg	8.38	14.40	11.1	13.1	6.60	27.40
Protection category	IP 66	IP 66	IP 66	IP 66	IP 66	IP 66
Product-specific scope of supply/accessories						
Door(s)	■	■	■	■	■	■
Cam lock	■	■	■	■	■	■
Security lock	2537.300	2537.300	1485.600	1485.600	–	–
Wall-mounting bracket	2508.020	2508.020	1485.400	1485.400	4000.100	4000.100
Mounting plate	■	■	■	■	■	■
Rail for interior installation	2393.210	2393.210	8617.110	8617.120	–	–
Support rail	2316.000	4599.100	–	–	–	–
Rain canopy	2361.010	2472.010	each integrated	each integrated	■	■
Cable entry	Flange plate included in the scope of supply	Flange plate included in the scope of supply	See Cat. 36, page 1044	See Cat. 36, page 1044	See Cat. 36, page 1044	See Cat. 36, page 1044

Enclosures solutions for front-end/charging station

Power distribution Page 55 **Climate control** Page 60

Rittal enclosure solutions offer ideal protection for your components.
- Enclosure technology tested to IP, IK and RC protection categories
- In-house accredited laboratory
- Three-phase surface treatment for maximum corrosion protection
- Material selection according to climate and requirements profile: Aluminium, stainless steel and sheet steel
- EMC protection
- Static load capacity up to 14000 N
- Corresponding to standard DIN EN 61 439-7

Note:
- Other dimensions than those mentioned can be found in Catalogue 36 from page 38 onwards or online at www.rittal.de
- Individual solutions available on request

Approvals:
Available on the Internet

	CS Toptec double-walled[1)]	**VX**	**AX**	**AX**
Width mm	600	600	300	300
Height mm	1800	1800	1200	1200
Depth mm	600	600	210	210
Material	Stainless steel/aluminium	Sheet steel	Stainless steel	Sheet steel
Model No.	**9774.510**	**8686.000**	**7993.800**	**7993.700**
Suitable for outdoor use	■	–	■	–
Weight kg	85.0	92.3	35.0	32.0
Protection category	IP 55	IP 55	IP 66	IP 66
Product-specific scope of supply/accessories				
Door(s)	■	■	■	■
Cam lock	–	–	■	■
4-point lock	■	■	–	–
Security lock	■	8618.250	2537.300	2537.300
Base/plinth	–	8620.003	■	■
Mounting plate	5051.036 + 5050.063	■	■	■
Mounting angles	7827.181	See Cat. 36, page 1080	–	–
Punched sections with mounting flanges	8612.060/8612.160	See Cat. 36, page 990	–	–
Support rail	–	See Cat. 36, from page 996	2393.210	2393.210
Rain canopy	■	–	■	■
Cable entry	See Cat. 36, page 1044	See Cat. 36, page 1044	2583.080	2583.080

[1)] Other dimensions available to order on request

Climate control for charging infrastructure

Accessories for climate control Catalogue 36, page 533

Various forms of climate control may be required in a charging park.
- Fans, cooling units and heaters for controlling the temperature of the installed components
- Chiller for water cooling the charging cable in the HPC area or cooling the components with liquid cooling in the enclosure
- Individual design of the required climate control system with the help of our Therm software application

Passive climate control is sufficient with low heat losses. Outlet filters can also be used without a fan-and-filter unit if the power loss is low. If high demands are made on the protection category of the enclosures, it is important not to damage the enclosures' outer shell.

Note:
- Further output classes and comparable types with increased EMC protection can be found in Catalogue 36 from page 456 onwards or online at www.rittal.com

Approvals:
Available on the Internet

	Enclosure heater	**Enclosure heater**	**TopTherm fan-and-filter units**	**TopTherm fan-and-filter units**	**TopTherm fan-and-filter units**	**TopTherm fan-and-filter units**	**TopTherm fan-and-filter units**	**TopTherm fan-and-filter units**
	Without fan	With fan				With EC technology, speed controlled		
Application area	Indoor/Outdoor		Indoor/Outdoor in combination with hose-proof hood					
Air/thermal output	50 W	400 W	55 m^3/h	230 m^3/h	700 m^3/h	55 m^3/h	230 m^3/h	700 m^3/h
Power consumption (W)	–	–	19	40	95	6	16	80
Model No.	**3105.340**	**3105.390**	**3238.100**	**3241.100**	**3244.100**	**3238.500**	**3241.500**	**3244.500**
Weight kg	0.40	1.22	0.80	2.20	4.30	0.62	1.98	2.70
Protection category	IP 20	IP 20	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54
Product-specific scope of supply/accessories								
Fine filter mat	–	–	3238.055	3182.100	3183.100	3238.055	3182.100	3183.100
Hose-proof hood	–	–	3238.080	3240.080	3243.080	3238.080	3240.080	3243.080
Outlet filters	–	–	3238.200	3241.200	3243.200	3238.200	3240.200	3243.200
Thermostat	3110.000	3110.000	3110.000	3110.000	3110.000	3110.000	3110.000	3110.000
Temperature indicator	3114.200	3114.200	3114.200	3114.200	3114.200	3114.200	3114.200	3114.200
Hygrostat	3118.000	3118.000	–	–	–	–	–	–

Climate control for the charging infrastructure

Accessories for climate control Catalogue 36, page 533

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Note:
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Approvals:
Available on the Internet

	Wall-mounted cooling unit Blue e+ outdoor	Air/water heat exchangers, wall-mounted	Thermo-electric coolers	Thermo-electric coolers	Wall-mounted Blue e+ cooling unit	Roof-mounted Blue e+ cooling unit	Blue e+ chiller
Application area	Outdoor	Indoor	Indoor/Outdoor		Indoor	Indoor	Indoor
Cooling/thermal output W	1500	600	100	100	1600	1300	4000
Rated operating voltage	–	230 V, 1~	100 – 240 V, 1~	24 V (DC)	110 – 240 V, 1~ 380 – 480 V, 3~	110 – 240 V, 1~ 380 – 480 V, 3~	380 – 415 V, 3~ 440 – 480 V, 3~
Model No.	**3185.330**	**3214.100**	**3201.200**	**3201.300**	**3185.830**	**3185.730**	**3334.300**
Weight kg	37.1	–	3.0	2.4	–	–	103.0
Protection category	–	IP 55	IP 54	IP 54	IP 54	IP 54	–
Product-specific scope of supply/accessories							
Fine filter mat	–	–	3201.050	3201.050	3285.800	3285.700	3285.920
Condensate hose	–	3301.612	3301.606	3301.606	3301.612	–	–
IoT interface	3124.300	–	–		3124.300	3124.300	3124.300
Door-operated switch	4127.010	4127.010	–	–	4127.010	4127.010	–

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