

Rittal – The System.

Faster – better – everywhere.

Integrated value creation System solutions for the maritime industry

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



Rittal – The System.

Faster – better – everywhere.



ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

Rittal – The System.

Unlimited options from a single source.

For over 50 years, we have been redefining the future. We produce and develop solutions for you, our customers, covering enclosures, power distribution, climate control, IT infrastructure, software and services. The modular system architecture of our solutions enables them to be tailored to your specific needs and requirements – on a completely customised basis, depending on your industry and the size of your company, and directly from series production. We cater to a wide range of sectors – from mechanical and plant engineering and the automotive industry right through to information technology.

Based on the principle “Faster – better – everywhere”, our “Rittal – The System.” offers a perfectly coordinated system platform that combines innovative products, pioneering engineering solutions and worldwide service to meet a diverse range of requirements:

Faster – As a full-service provider, we help you with planning, assembly, conversion, commissioning and servicing.

Better – Our certified products and services are available off-the-shelf and deliver verifiable energy and cost efficiency.

Everywhere – Rittal offers solutions throughout the world for a variety of industries, including mechanical and plant engineering, IT and telecommunications.

IT INFRASTRUCTURE

SOFTWARE & SERVICES





5

3

4

6

1

2

Maritime applications

Every industry makes specific demands on the applications it uses. In the “maritime applications” sector, Rittal offers a range of complete system solutions that are sufficiently robust to reliably withstand these demands, including systems for particular environmental requirements, resistance to vibrations and seawater, and products with special approvals such as Det Norske Veritas, Germanischer Lloyd, Lloyd’s Register and American Bureau of Shipping, which are important for maritime applications.

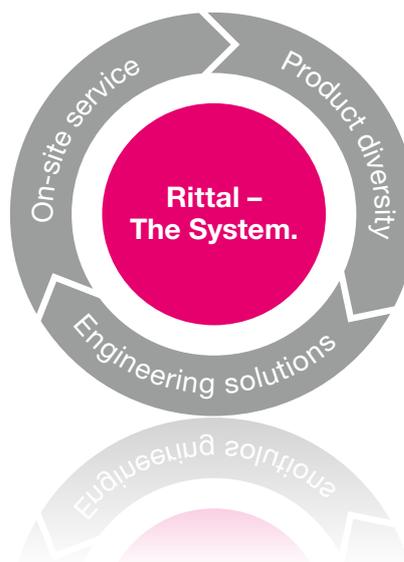
Because our solutions incorporate the vast product diversity of Rittal’s standard range, they may be flexibly combined with one another and are rapidly available ex works, for considerable time and cost savings.

A perfectly developed system platform, innovative products, pioneering engineering solutions and comprehensive service all come together in “Rittal – The System.” The system comprises all the elements you need to compile your own customised system solution.

Rittal’s customers benefit from:

- Broad product diversity
- Consistent engineering
- Service in the field
- Specific industry solutions

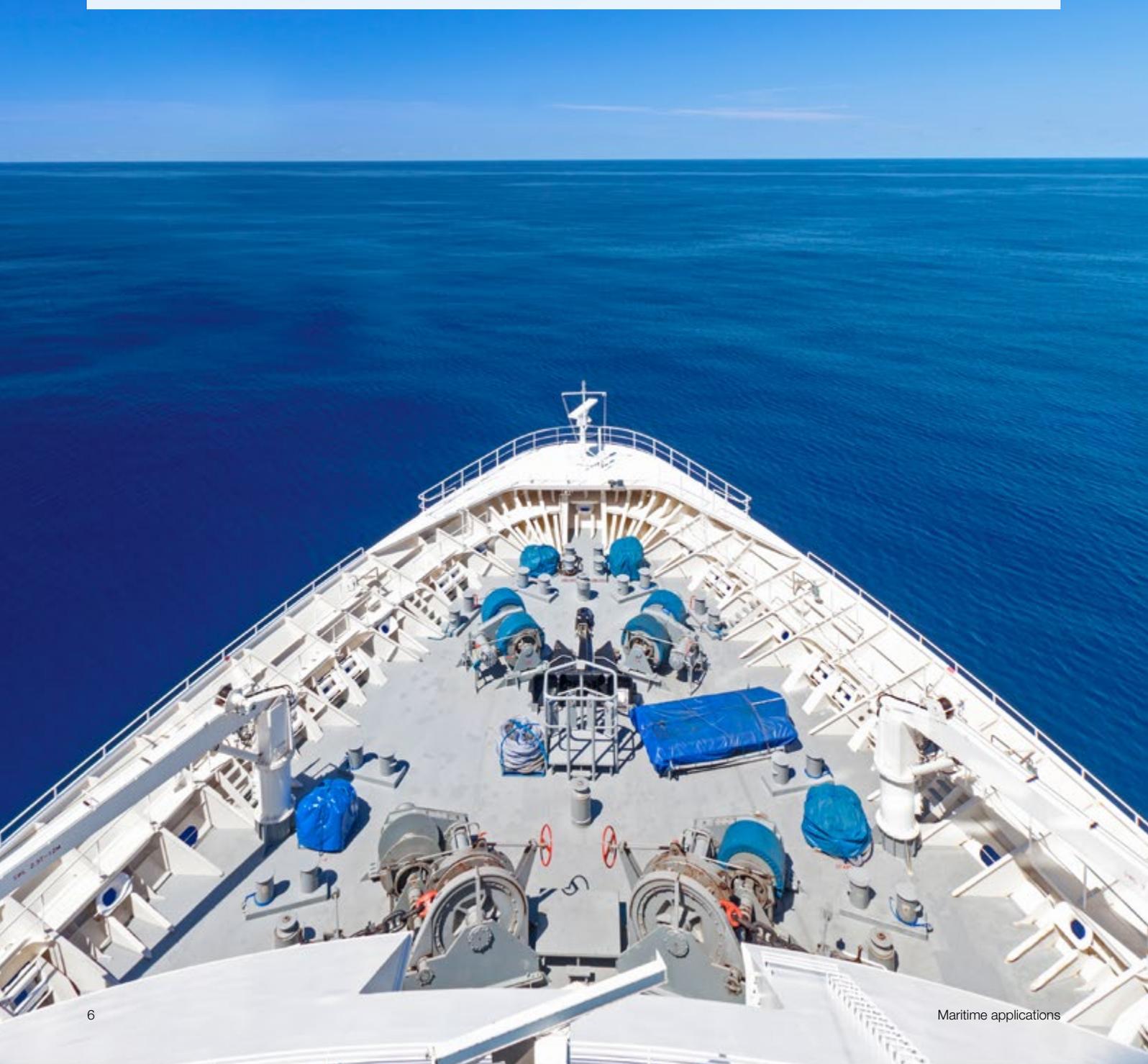
1 Shipyard & vessel	page 6/7
2 Port & logistics	page 8/9
3 Offshore & energy	page 10/11
4 Inland shipping & infrastructure	page 10/11
5 System solutions	page 12/13
6 References	page 14/15



Solutions that keep you on course.

For a luxury liner to stay on course or a container ship to complete its journey in the scheduled time, it is vital to ensure a perfect interplay between sensitive nautical instruments including navigation devices, marine radio systems, radar equipment and satellite telephones. Industry-compatible solutions from Rittal guarantee the required high level of operational reliability, even under

the demanding conditions of international shipping. Rittal offers enclosure systems in a range of sizes, designs and surface coatings which provide secure accommodation for controllers and switchgear, including targeted climate control solutions, even in heavy seas and extreme temperature and humidity conditions.



IT solutions for cruise liners

Rittal solutions for passenger administration, entertainment and communication:

- Standardised server racks and network enclosures
- Scalable IT cooling concepts
- Modular energy distribution
- Worldwide service



Marine switchboards for reliable power supply

Rittal solutions for main and emergency switchboards, motor starters and lighting:

- Modular power distribution systems up to 5,500 A
- Power engineering software for power distribution systems in line with IEC 61439



Packaging for ship's operating equipment

Rittal solutions for ballast water management, fuel systems, waste systems and vessel safety:

- Small and compact enclosures
- EMC protection and IP protection category
- Customer-specific enclosure machining with AE laser express

Navigation and automation systems

Rittal solutions for navigation and position-finding, control desks in the engine control room, as well as energy monitoring and evaluation:

- Modular console systems
- System enclosures VX25 and SE 8



Solutions you can rely on.

Rittal supplies perfect solutions for the broad range of applications in the port sector, from reliable data communication to optimum controller installation. Global, comprehensive, and all from a single source. Rittal enclosure solutions are available in sheet steel, aluminium zinc, plastic and stainless steel, with a similarly extensive choice of surface finishes.

Super-tough surface coatings permanently protect the sensitive electronics to maintain reliable functioning at all times. A high protection category is provided as a matter of course. The enclosure and case systems from Rittal are extremely corrosion-proof and weather-resistant from -30°C bis $+70^{\circ}\text{C}$.

Reliable shore-side and on-board energy supply

Rittal's solutions for passenger and cargo safety equipment, port administration data centres, logistics and VTS marine traffic monitoring systems:

- Uninterruptible power supply
- Energy management with Power Distribution Rack and Power System Module
- Rack cooling with Liquid Cooling Package



Logistics in a global world

Rittal solutions for cargo handling systems, loading and unloading systems and transport systems:

- Stainless steel enclosure systems
- Climate control
- Enclosures for switchgear to IEC 61439



Supply systems at the quayside

Rittal solutions for control systems, shore-side electricity supply and supply and disposal systems:

- Modular low-voltage switchgear
- Support from engineering tools
- Weather-proof outdoor enclosures



Meeting every need.

Offshore applications place high demands on the equipment used. Oil and gas extraction platforms and transmission substations on wind farms have particularly stringent safety requirements in terms of systems operation and explosion protection. Unmanned platforms pose a particular challenge. Rittal's VX25 Ri4Power main distribution system ensures safe, fast assembly of low-voltage switchgear.

Inland shipping is an important link in the green logistics chain. In Germany alone, the infrastructure covers some 7,350 km of inland waterways including countless weirs, locks and lifting gear, all of which must be operated safely. Rittal's products are designed for optimum operation under demanding conditions, and ensure reliable functioning of locks and flood barriers as well as helping to ensure the flow of shipping traffic on the canals. This entails the use of modular, weather-proof enclosure systems, switchgear, communications technology, IT rooms and emergency and backup power supplies, to name but a few examples.



Connecting offshore wind farms to the grid

Rittal solutions for wind farms, transmission platforms (HVDC and AC) and measurement, open-loop and closed-loop control technology:

- Low-voltage switchgear with Form separation
- Planning and project management
- Modularity with component adaptors
- Bar systems (also available for DC applications)
- Planning software for designing low-voltage switchgear in line with IEC 61439



Safety in offshore oil and gas extraction

Rittal solutions for operating systems technology and for hazardous and potentially explosive zones on production platforms:

- Ex enclosures to ATEX
- Stainless steel enclosures
- Enclosure system solutions SE 8 and VX25



Reliable operation of locks and flood barriers

Rittal solutions for centralised control (remote control), switchgear, motor control, communications technology and administration IT rooms:

- Enclosure systems, power distribution, climate control, software & services = "Rittal – The System."
- The perfect solution for any size of application – from network and server racks through to finished data centres



Inland shipping – part of the green logistics chain

Rittal solutions for crane control, shore-side electricity supply, water level measurement on canals, and inland cargo vessels:

- Weather-proof outdoor enclosures
- Energy-efficient climate control solutions



Environmental testing passed with flying colours!

Electrical switchgear such as main switchboards, emergency switchboards and motor control centres forms part of the safety-relevant equipment on all ships.



Busbar systems and components – Always A1

RiLine, Maxi-PLS and Flat-PLS, including the corresponding components, have approvals for the following classes

- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)
- Lloyd's Register (LR)
- American Bureau of Shipping (ABS)

These certificates and documentation simplify and accelerate planning and approval processes and prototype approvals.



RiLine/Maxi-PLS/Flat-PLS – Pulling out all the stops

Technical data for all three busbar systems:

- U_i = up to 1000 V/up to 1000 V/up to 1000 V
- U_{imp} = up to 8 kV/up to 8 kV/up to 8 kV
- I_n = up to 1600 A/up to 4000 A/up to 5500 A
- I_{cw} = up to 50 kA, 1 sec./up to 70 kA, 1 sec./up to 100 kA, 1 sec.
- I_{pk} = up to 110 kA/up to 154 kA/up to 220 kA



All requirements met!

Today's merchant ships such as containers, bulk carriers and tankers are fitted with an increasing amount of IT equipment. Most highly sensitive electronic devices need to be housed securely.



IT security – Easier than ever before

IT racks need to meet a wide range of requirements at sea and on land. They are used as network and server enclosures. They can perform simple distribution tasks or provide a safe environment for servers with intelligent climate control, power distribution and security technology. Rittal also offers TS IT racks including accessories that meet ship class requirements in terms of vibration.



Modular UPS systems – Perfect for ship applications

The electrical energy supply for critical consumers on board ships and on offshore platforms must be assured at all times. Uninterruptible power supplies (UPS) ensure this, even if the power supply fails or is interrupted for a short period. Thanks to online double converter technology, DPA UPScale ST TS 8 ensures an output supply that is completely independent of the input.



Keeping up with the demands of cruise ship passengers.

On the Norwegian Joy – one of the world's largest passenger ships – high-performance IT solutions from Rittal ensure reliable data centre operation.



“Over many years, we’ve repeatedly collaborated with Rittal to develop clever, fail-safe and space-saving solutions for installing sensitive IT components on ships.”

Frank Langen, Technical Design Department at the Meyer Werft shipyard



All the world's a stage

In addition to the limited space available, a cruise ship presents further special challenges:

- Limited opportunities for maintenance and repairs while the ship is at sea
- IT solutions need to be specially protected due to the continuous vibrations of the ship's engines
- Temperature and humidity fluctuate very widely, depending on the location

High-performance IT on board

The Norwegian Joy has two redundant data centres and over 25 technology rooms:

- Closed TS IT racks from Rittal
- LCP-series cooling systems with output up to 30 kW
- Worldwide warranty and global support for servicing





Full speed ahead.

Radical changeover – Germany’s first ferry powered by eco-friendly gas. MWB Maritime Technology GmbH used “Rittal – The System” for the enclosure technology.



A true all-rounder

Ferry conversion with special requirements:

- Complete renewal of the main and emergency switchboards with Ri4Power, incl. prototype testing
- Secure housing of navigation and communications technology in TS IT racks
- Clear automation in the engine room integrated in TopConsole enclosures



Big things come in small packages

If there’s no room for a large enclosure, you can simply mount small enclosures on the wall:

- Other installation technology housed in compact wall-mounted CM and AE enclosures for the smallest niches
- Versatile interior fitting options with standard components for rapid installation

Rittal – The System.

Faster – better – everywhere.

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

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



www.rittal.com/contact

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP

