IT cooling
What is the best cooling solution?

Climate control concepts from Rittal cover the full spectrum of applications, from cooling a single rack through to entire data centres. Security plus optimum energy and cost efficiency are paramount. A diverse range of technical solutions creates individual climate control concepts for racks, suites and rooms.

TEN APPLICATIONS AT A GLANCE

1. Chillers for IT cooling
2. Adiabatic cooling
3. Aisle containment
4. HPC cooling
5. Climate control in the data centre
6. Refrigeration container
7. Office environments
8. Corridor distributors
9. Production – IT racks with protection category
10. Planning and project management

Further details may be found on the following pages.
What is the best cooling solution? from page 2
The diversity of Rittal solutions........................................ 4

References from page 6
Liquid Cooling Package DX .............................................. 6
Liquid Cooling Package CW .......................................... 10
Liquid Cooling Unit DX ................................................ 14

IT cooling – Rittal solutions from page 18
Overview of rack/bayed suite cooling ......................... 20
Liquid Cooling Unit DX ................................................ 22
Liquid Cooling Package DX ........................................... 28
Liquid Cooling Package CW .......................................... 34
IT cooling accessories .................................................. 40
Roof-mounted cooling units ........................................ 47
Aisle containment ....................................................... 48
Small cooling units ...................................................... 50
CRAC – Computer Room Air Conditioner ..................... 54
Chillers for IT cooling .................................................. 56
The diversity of Rittal solutions

1. **Chiller for IT cooling**

Supplies rack, suite and room climate control solutions with cooling medium at a predefined temperature via the integral pump and cooling circuit. A water/glycol mixture is generally used as the cooling medium, because the chiller is sited outdoors, where it emits the absorbed waste heat from the medium to the ambient air. Rittal IT chillers are available in the cooling output range from 15 to 481 kW. Use of an additional free cooler (indirect) saves operating costs at lower temperatures, because there is no need for a chiller compressor mode; only the pump and the free cooler fan are operational.

See page 56

2. **Adiabatic dry cooling**

Adiabatic dry coolers are used for applications where it is necessary to cool the cooling medium in the data centre (e.g. water) to an outlet temperature that is below the external temperature. Up to the relevant external temperature, the unit functions as a dry cooler. If the external temperature rises above a defined limit, atomised water is sprayed into the air inlet via spray nozzles. This adiabatically lowers the intake temperature.

3. **Aisle containment**

Whether with or without raised floor, cold or hot aisle, aisle containment is a simple technique for decisively improving the efficiency of cooling. Aisle containment prevents mixed air temperatures from forming, which would reduce the drive energy of the fans integrated into the cooling units to the minimum volumetric flow, for optimised efficiency. Rittal cooling solutions are perfectly tailored to this application.

See page 49

4. **HPC cooling**

With HPC (high-performance computing) applications, enclosures with up to 55 kW thermal load may be cooled with direct rack cooling. With this solution, the HPC enclosure is assigned directly to a water-cooled LCP. An integral intelligent controller allows the LCP to permanently adjust the water flow rate and the volumetric air flow to the required output. The LCP modulates the cooling output precisely to the thermal load of the HPC rack.

See page 34
Climate control in the data centre

With CRAC systems, as well as dissipating the thermal output of the IT equipment from the data centre, it is also possible to regulate the humidity inside the data centre. In circulating mode, the CRAC systems cool, heat, filter, humidify and dehumidify the air in the data centre. The raised floor serves as an air intake channel, whereby the cold air is homogeneously distributed throughout the raised floor, and streams upwards in front of the IT enclosures. This allows the heat load to be dissipated. The CRAC systems can condition the humidity to ensure compliance of the air quality with ASHRAE TC 9.9 at all times.

See page 54

Refrigeration container

For simplified transportation and easier siting outdoors, the efficient chiller systems may also be pre-installed in an (ISO) container frame. These cooling centres can be sited in next to no time, and ensure a reliable supply of cooling output for a data centre. Alternatively, two high-efficiency, regulated cooling stations with 70 kW or 100 kW, comprised of two chillers, a free cooler and the hydraulic peripheral, may be used in a container frame to achieve a very low PUE and significant power savings.

See page 54

Office environments

There are a wide range of passive and noise-reduced solutions designed specifically for office environments, where IT enclosures are accommodated in the immediate vicinity of screens and workstations – from enclosure accessories that support cooling with thermal circulation, through to office fans that flood the enclosure with air at reduced noise generation levels.

See page 50

Corridor distributors

Rittal offers a wide range of solutions to protect the IT equipment from overheating, specifically for the rising thermal loads in corridor distributors. The thermal load is dissipated in a modulating fashion, based on rack cooling. Depending on the application, redundant solutions may also be used here which permit alternating operation with maximum efficiency. The refrigerant-based split cooling units LCU DX and LCP DX have become well-established for these types of applications.

See page 24

Production – IT racks with protection category

There are cooling units designed especially for IT enclosures with a protection category, which reliably cool the enclosure, dissipate the thermal load, and create a system limit guarantee of the protection category.

See page 47

Planning and project management

The best product is only as good as the complete system. Professional support with planning and project management therefore provides the basis for fault-free IT operation. Rittal develops and optimises individual ITC solutions on your behalf, from small IT units through to complex data centres. Our specialists carefully analyse the current status and your future requirements, the structural and physical conditions, and the existing IT structures, and use this information to tap into proven optimisation potential.
IT infrastructure
from a single source

“We opted for Rittal because they offer a complete product range and have a good reputation when it comes to data centre and industrial applications.”

Joan Puigdemont
CIO, Noel Alimentaria S.A.U.
Established in 1940, Noel Alimentaria has become one of the leading companies in the Spanish meat industry. Environmental responsibility is very important to the company. To lower energy consumption, it decided to install a new data centre from Rittal.

**New data centre to reduce energy consumption**

Most business processes at Noel need the data centre running smoothly. An unscheduled break of just one hour could result in the company losing around € 30,000. Moreover, the company wanted to reduce its energy consumption. Noel estimates that achieving a PUE (Power Usage Effectiveness) value of 1.4 or less could lead to annual savings of € 10,000. Following an exacting selection process, Noel Alimentaria chose the Rittal IT partner Abast for the data centre project.

**Focus on secure solutions**

Abast equipped the new data centre entirely with Rittal components. These are housed in a Rittal security room. A modular UPS provides an autonomous power supply for 120 minutes. Rittal LCP DX split systems located between the server racks are used to cool the systems. The cold-aisle design principle ensures a high level of energy efficiency. The Rittal CMC monitoring solution keeps track of ambient conditions such as moisture and temperature.

**A PUE of around 1.1**

Noel Alimentaria uses the Rittal components to run a tier-2 data centre. The IT systems have exhibited 100 percent availability since implementation. The average PUE value achieved is 1.1. This way, Noel has been able to reduce its CO₂ emissions and save an annual € 17,000 in electricity charges.

---

Rittal IT cooling

**IT INFRASTRUCTURE**  **SOFTWARE & SERVICES**
Edge Data Center with high cooling output ensures maximum computing power with short latency periods

The digital transformation means a radical shake-up for many sectors of industry. In the Industry 4.0 era, new technologies such as smart cities, connected cars, streaming services and mobile data naturally offer new opportunities, but also necessitate the retention and rapid processing of huge data volumes, and linked to this, reliable, efficient server cooling.

You need increasingly flexible and modular IT solutions to achieve this efficiently, quickly and reliably. Ideally, these should be located where the data is produced, i.e. close to your production operations. This is where Edge Data Centers, with their optimised climate control, come into their own, combining short latency times with exceptional computing power and maximum reliability.

The Rittal Edge Data Center is a platform for rapid configuration of a solution that can be used flexibly in any IT environment. The platform, comprised of Rittal TS IT racks, is fully equipped right down to the server architecture and can be efficiently cooled with a Liquid Cooling Package DX in a range of output categories. In this way, a fully functioning data centre with optimum operating efficiency is available in next to no time.

Rittal Edge Data Center solutions are available with 2, 4, 6 or 8 racks, incorporating predefined components for energy supply, cooling, IT security and monitoring. You have the option of installing the racks as free standing racks, in an IT security room or a container, thus giving you a high degree of flexibility when selecting a location.

Split units tailored to the rack load are used for cooling. Either the Liquid Cooling Unit DX or Liquid Cooling Package is used, depending on the level of heat loss. The smart CMC III monitoring system keeps a close eye on all relevant parameters. Despite the larger range of functions, the administrators’ workload is reduced to just the essential tasks.

Rittal has developed its own web-based configurator with integrated CFD (computational fluid dynamics) analysis for edge data centre planning, to selectively optimise the enclosure and IT room climate control to the predefined ambient conditions.

For further information on the Edge Data Center, please visit our IT website at www.rittal.com/it-solutions/en
Your benefits at a glance:
- Modular and easy to extend
- Fully pre-configured for plug & play assembly
- Straightforward planning with configurator

CFD (computational fluid dynamics) takes into account the geometrical and thermal properties of the enclosure and the installed components, and generates a thermal image.

Computer Multi Control III (CMC III) monitors temperature, air humidity, smoke, energy and access. The CAN (Controller Area Network) bus system reduces the amount of wiring and installation work required.
“Rittal’s knowledgeable consultants gave us in-depth expert advice. We felt they understood the challenges facing a thermal facility of this size, spread over multiple sites. The fact that we can still be flexible with the assembly and expansion of the IT systems, despite the high level of standardisation, reinforced our decision.”

Franz Hofstetter
Head of IT at the WUND Group
When large volumes of data are processed around-the-clock so that customers can rely on smooth operations, a failure in the data centre IT systems is business-critical. With this in mind, the WUND Group uses autonomous edge data centres and standardisation from Rittal for its thermal spa facilities across Germany.

**High availability in continuous operation**

If its IT systems were to malfunction, the WUND Group could face financial losses or damage to its reputation. High availability of the data was therefore an important factor when opting for an IT infrastructure from Rittal. A separate technical room is provided for the modular, redundant UPS system and power distributors. The Rittal Liquid Cooling Packages and cold aisle encapsulation provide rack suite-based cooling in the server room. Cooling is generated via indirect free cooling.

**Future-safe, thanks to maximum standardisation**

The high availability necessitated autonomous data centres at the Group’s locations. Highly standardised, virtually identical data centres make life easier by facilitating rapid intervention at any time if problems do arise. Although the individual systems function independently of one another, the option of extending the IT infrastructure and associated processes simplifies operation, and were ultimately the deciding factor in favour of Rittal.
High-performance computing with efficient cooling

High power density is a key requirement in high-performance computing (HPC), where there may be several thousand processors in a single IT rack. And because a latest-generation CPU generates more heat than a hotplate, an increase in power density places great demands on the cooling system.

When HPC cluster simulations or other computation-intensive applications are running, the processor cores can often be operating at full load for days at a time. When that happens, every single processor generates enormous quantities of waste heat, which must be reliably dissipated. This task is often made more difficult by the fact that the rack systems are packed so full.

An HPC cooling system must therefore generate a high cooling output of up to 55 kW per rack while also minimising the volume of air, ensure that cooling is dynamically adapted when the blade servers are switched on and off, and protect the expensive hardware if individual components fail.

TS IT racks and Liquid Cooling Packages (LCP) from Rittal meet all these requirements and are ideal for modern-day data centres where powerful server nodes introduce increasingly high loads and waste heat into the server racks.

The space-optimised LCP Inline CW solution from Rittal is a compact water-based cooling solution for simple suite cooling, including cooling of HPC centres. An air/water heat exchanger unit is installed directly adjacent to the IT racks. The warm waste air from the IT systems is extracted at the rear of the unit, cooled and then blown into the cold aisle at the front. Maximum efficiency is achieved in combination with an aisle containment system.

Monitoring and remote management can deliver lasting maintenance and operating cost savings and also increase availability. For example, comprehensive monitoring, measurement and control tasks minimise the risk of failure and facilitate preventive intervention.

In the case of emergency cooling with automatic door opening, for instance, the doors of the IT racks open automatically if an alarm is triggered. This means the cold air in the data centre room can be used to shut down the HPC cluster in a controlled manner for a certain period of time.

Rittal’s HPC racks are based on the TS IT platform. The options for flexibly expanding this system ensure a high level of investment security. An intelligent modular system of racks and accessories and the assembly-friendly snap-in technology cover just about every conceivable requirement with regard to modular, flexible network and server racks.

For further information on high-performance computing with efficient cooling, please visit our IT website at www.rittal.com/it-solutions/en
Bayed suite cooling with the Rittal LCP Inline is extremely powerful, and the ideal climate control solution for exceptionally high cooling demands, particularly when server racks cannot be cooled via the room air-conditioning system.

The comprehensive PDU range delivers smart power distribution in IT racks with measuring, switching and monitoring – right down to each individual slot if necessary.

Your benefits at a glance:
- Individual climate control concepts for rack, suite and room cooling
- Monitoring of all system-relevant parameters
- Tried-and-tested system solutions for demanding HPC applications
LIQUID COOLING UNIT DX

A data centre for Industry 4.0 requirements

“In the Micro Data Center from Rittal, we have found a solution which enables us to operate a secure, redundant data centre without having to implement any complex structural measures.”

Werner Mielenbrink
Head of Media Supply at B. Braun
The experts at B. Braun, one of the world’s leading manufacturers of medical technology and pharmaceutical products, faced a serious challenge when their brand new, state-of-the-art production facility called for a rapid expansion of the IT infrastructure.

**Highly available, compact and safe**
IT infrastructure requires around half-a-dozen server enclosures. Originally, the team had planned to use simple server enclosures to assemble the IT infrastructure, but the physical protection requirements for the IT system could not be met in this way.

**The solution: Rittal Micro Data Center**
A solution was found in the Micro Data Center from Rittal, a data safe for IT systems. The solution delivers the required fail-safeness and modularity for automated production to Industry 4.0. IT components such as the server, storage and network are operated in a protected room up to resistance class 4. Chains of 3 and 4 Micro Data Centers, each containing a complete, redundant IT environment consisting of three or four IT racks including cooling, power distribution, monitoring and fire protection, are created. The server enclosures are cooled by the integral split climate control unit LCU DX (Liquid Cooling Unit) from Rittal.

**Central monitoring**
B. Braun puts its trust in the Rittal CMC III solution for monitoring the entire system. This application allows central monitoring of key parameters in all aspects of IT operation, such as temperature and humidity. The fire and extinguisher system DET-AC, also integrated, detects even minuscule particles of smoke in the air and sends a pre-alarm to an engineer. In the event of a fire, DET-AC floods the IT enclosure with the extinguisher gas Novec 1230, which is non-harmful to IT components.
Compact IT infrastructures demand compact solutions

Every IT decision-maker is familiar with the imposing images of enormous data centres. They look almost futuristic, with their seemingly endless aisles, flanked on either side by flashing component towers.

By contrast, IT infrastructures comprised of just one or two enclosures are rather less impressive, but must still demonstrate all the features of a large data centre, from a reliable power supply and cooling, through to monitoring.

Cooling is based on the output of the installed active components. Rittal offers a wide selection of different cooling solutions.

The Liquid Cooling Unit (LCU) is used for the small output range from 3 kW to 6.5 kW. The internal part is discreetly and space-savingly installed inside the enclosure. Refrigerant lines transport waste heat to the external part, which is sited outside on the external wall or on the roof.

If larger heat losses are incurred, a Liquid Cooling Package (LCP) DX can be bayed to the side of the rack, for cooling one or two IT racks with a total output of up to 35 kW.

The extensive range of system accessories includes all the additional products needed for tidy air routing, together with socket systems, cable routing and cable management. The coordinated components in the Rittal modular system may be flexibly selected for a bespoke and efficient solution.

For further information on compact IT infrastructures, please visit our IT website at www.rittal.com/it-solutions/en
The LCP DX can be used for rack-based climate control, and also for suite climate control within the context of aisle containment.

If larger cooling outputs are required, the LCP DX offers a solution in the output range from 12 to 35 kW.

Your benefits at a glance:
- Flexible cooling solution in the output range from 3 kW to 6.5 kW
- Space-saving installation inside the enclosure
- Minimal space requirements for the redundant version with two cooling circuits in one unit
- Extensive range of coordinated system accessories
IT cooling – Rittal solutions
Overview of rack/bayed suite cooling

Rittal IT cooling

20

Data centres support ever more powerful corporate processes. The packing density in computer systems is increasing, and processor capacity is growing. This in turn means ever higher heat generation. Keep temperatures at a constant level with the highly efficient Rittal Liquid Cooling Packages (LCP). With optimised operating costs, our LCPs precisely and effortlessly dissipate heat losses of up to 53 kW per enclosure.

The ideal cooling solution for small to medium IT installations. Up to 6.5 kW heat load can be dissipated with the inverter-controlled LCU DX split cooling unit. The LCP Rack DX has a cooling output of 12 kW and is capable of cooling up to two server racks. Both units are inverter-controlled, allow IT-compatible cooling, and regulate the server inlet air temperature. The external unit dissipates thermal energy directly to the exterior air, thereby preventing the server rack installation location from heating up. Rack cooling with the typical “back-to-front” air routing used in IT can be achieved with the roof-mounted cooling unit, even for smaller output categories up to 3 kW.

### LCP Rack CW
- Cooling output from 10 kW to 53 kW
- Energy saving with high water inlet temperatures (more free cooling)
- Minimised operating costs thanks to efficient EC fan technology
- Spatial separation of cooling and server rack
- Integral condensate and leak management
- Highly developed control concept including online connection
- Optional cooling of one or two server racks
- Optimised variants available for cooling with water/glycol mixtures
- Ideal in conjunction with a heat pump, as the LCP CW glycol variants generate high water return temperatures
- Simple representation of redundancies
- Assembly- and service-friendly – maintenance from above is no longer necessary
- Integration into RiZone (data centre management software)

### LCP Rack DX
- Cooling output up to 12 kW
- Refrigerant R410a
- Minimised operating costs thanks to efficient EC fan technology and output-regulated compressor
- Spatial separation of cooling and server rack
- Integral condensate and leak management
- Highly developed control concept including online connection
- Optional cooling of one or two server racks
- Simple representation of redundancies
- Assembly- and service-friendly
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone (data centre management software)
- Cost-effective installation by laying small-diameter refrigerant lines

### LCU DX
- Cooling outputs of up to 3 kW and up to 6.5 kW
- Single and redundant version
- Refrigerant R410a
- High energy efficiency thanks to EC fan technology and output-regulated compressor
- Space-saving installation of the internal unit (evaporator coil) in the server rack

### Roof-mounted cooling unit
- Cooling output up to 3 kW
- Refrigerant R134a
- “Front-to-back” air routing typical of IT systems
- Even air distribution in front of the 482.6 mm (19”) level
- Control of the server air inlet temperature
- External circuit IP 20
- Internal circuit IP 20
## Overview of rack/bayed suite cooling

Bayed suite cooling with the Rittal LCP Inline is extremely powerful and the ideal climate control solution for exceptionally high cooling demands, particularly when server racks cannot be cooled via the room climate control. Alternatively, bayed suite cooling can be used to support the existing climate control system in the room or for transforming existing structures into server rooms. A raised floor is not necessary for the operation of bayed suite cooling.

### Water-based

Bayed suite cooling with the Rittal LCP Inline is extremely powerful and the ideal climate control solution for exceptionally high cooling demands, particularly when server racks cannot be cooled via the room climate control. Alternatively, bayed suite cooling can be used to support the existing climate control system in the room or for transforming existing structures into server rooms. A raised floor is not necessary for the operation of bayed suite cooling.

### Refrigerant-based

Both the LCP DX Inline and the LCP CW Inline support the cooling of bayed enclosure suites. The LCP DX Inline. The cooling output is up to 35 kW. The Inline units are generally used in conjunction with aisle containment.

### Refrigerant and water/glycol

These LCP DX/FC variants include both a refrigerant and a water/glycol heat exchanger. There is an additional free cooler integrated into the external condenser. Using indirect free cooling helps to save operating costs.

### LCP Inline CW

- Cooling output from 10 kW to 53 kW
- Cooling of several server racks
- Energy saving with high water inlet temperatures (more free cooling)
- Optimised operating costs with efficient EC fan technology
- Spatial separation of cooling and server rack
- Integral condensate and leak management
- Sophisticated control concept including online connection
- Assembly- and service-friendly – maintenance from above is no longer necessary
- Optimised variants available for cooling with water/glycol mixtures
- Ideal in conjunction with a heat pump, as the LCP CW glycol variants generate high water return temperatures
- Increased performance and efficiency in conjunction with Rittal aisle containment
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone (data centre management software)

### LCP Inline DX

- Cooling output from 12 kW to 35 kW
- Cooling of several server racks
- Refrigerant R410a
- Variants available in widths 300 mm and 600 mm
- Minimised operating costs with efficient EC fan technology
- Spatial separation of cooling and server rack
- Integral condensate and leak management
- Sophisticated control concept including online connection
- Assembly- and service-friendly
- Increased performance and efficiency in conjunction with Rittal aisle containment
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone (data centre management software)

### LCP Inline DX/FC

- Cooling output up to 35 kW
- Cooling of multiple server racks
- Refrigerant R410a and water/glycol mixture
- External condenser with additional, integral free cooler
- Minimised operating costs with efficient EC fan technology and indirect free cooling
- Automatic control between free cooling, mixed and compressor mode
- Spatial separation of cooling and server rack
- Integral condensate and leak management
- Highly developed control concept including online connection
- Assembly- and service-friendly
- Increased performance and efficiency in conjunction with Rittal aisle containment
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone (data centre management software)
LIQUID COOLING UNIT DX

Efficient cooling with no loss of space
The benefits

- Cooling of TS IT racks and Micro Data Centers
- Space-saving installation of the internal unit between the 482.6 mm (19") level and side panel
- External unit is sited outside the building
- Maximum energy efficiency by cooling the individual rack, rather than the whole room
- Efficient operation thanks to EC fan technology
- High availability designed for continuous, 24/7 operation

Technology

- Refrigerant-based split cooling unit comprised of an internal unit (evaporator coil) and an external unit with integral compressor (inverter-controlled)
- Optimum support of IT-compatible, “front-to-back” air routing
- Optimum adaptation of the compressor output to the current heat load of the IT rack with inverter control
- The internal and external unit are connected with refrigerant, data and supply lines
- Absorbed thermal energy is emitted directly to the ambient air via the external unit
- Control of the server air inlet temperature
- The availability of single and redundant variant ensures a high level of fail-safeness.
- Ultimate security with optional alarm forwarding via CMC III

Control

- Set the setpoint for the server air inlet temperature
- Switch the unit on and off

For further information on efficient cooling with no loss of space, please visit our IT website at www.rittal.com/it-solutions/en
Applications:
- Cooling unit for TS IT server enclosures and for Micro Data Center

Benefits:
- Space-saving solution by installing the internal unit in the TS IT server enclosure or the Micro Data Center
- Maximum energy efficiency due to EC fan technology and IT-based control
- Control of the server inlet temperature
- The inverter-controlled compressor adapts the cooling output to the current heat loss inside the enclosure
- Absorbed thermal energy is emitted directly to the ambient air at the (inverter-controlled) external unit’s location, without heating up the installation room

Functions:
- The device supports front-to-back air routing typical of IT applications, and regulates the server inlet temperature to the set value
- Color:
  - Internal unit: RAL 7035
  - External unit: white
- Protection category IP to IEC 60 529:
  - Internal unit IP 20
  - External unit IP X4
- Supply includes:
  - Internal unit (evaporator coil)
  - External unit (inverter-controlled)
  - 482.6 mm (19”) mounting trim panel with display and control components
  - Condensate hose

Note:
- Below the operating limit, fluctuations in the air inlet temperature are possible
- The electrical connection is made on the external unit. The internal unit is supplied by the external unit.

Installation in TS IT:
- 482.6 mm (19”) levels must be designed as mounting angles and offset in the width by 50 mm off-centre
- The front distance between the 482.6 mm (19”) mounting angles and the front edge of the TS frame must be at least 100 mm
- Not suitable for combination with 482.6 mm (19”) mounting frame
- Two punched sections with mounting flanges are required for attachment on the inner mounting level
- To separate the hot/cold zones within an enclosure, an air baffle plate for TS IT is required
- A base/plinth is required to route the cable downwards
## Liquid Cooling Unit

### LCU DX, single

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3311.490</th>
<th>3311.492</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useful cooling output L22 L35 kW</td>
<td></td>
<td>3</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>Modulation range kW</td>
<td></td>
<td>1 - 3</td>
<td>3 - 6.5</td>
<td></td>
</tr>
<tr>
<td>For enclosure width mm</td>
<td></td>
<td>800</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>For enclosure height mm</td>
<td></td>
<td>≥ 1800</td>
<td>≥ 1800</td>
<td></td>
</tr>
<tr>
<td>For enclosure depth mm</td>
<td></td>
<td>≥ 1000</td>
<td>≥ 1000</td>
<td></td>
</tr>
<tr>
<td>External unit, W x H x D mm</td>
<td></td>
<td>810 x 558 x 310</td>
<td>845 x 700 x 320</td>
<td></td>
</tr>
<tr>
<td>Internal unit, W x H x D mm</td>
<td></td>
<td>105 x 1550 x 820</td>
<td>105 x 1550 x 820</td>
<td></td>
</tr>
<tr>
<td>Type of electrical connection</td>
<td></td>
<td>Connection clamp</td>
<td>Connection clamp</td>
<td></td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td></td>
<td>230, 1~, 50</td>
<td>230, 1~, 50</td>
<td></td>
</tr>
<tr>
<td>Rated current (max.), A</td>
<td></td>
<td>7</td>
<td>15.9</td>
<td></td>
</tr>
<tr>
<td>Pre-fuse A</td>
<td></td>
<td>16</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td></td>
<td>R410a</td>
<td>R410a</td>
<td></td>
</tr>
<tr>
<td>Duty cycle %</td>
<td></td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Sound pressure level at a distance of 10 m (external unit) dB(A)</td>
<td></td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range (external unit)</td>
<td></td>
<td>-20°C...+45°C</td>
<td>-20°C...+45°C</td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td></td>
<td>116.0</td>
<td>121.5</td>
<td></td>
</tr>
<tr>
<td>Accessories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerant lines</td>
<td>1 pc(s)</td>
<td>3311.495</td>
<td>3311.496</td>
<td>40</td>
</tr>
</tbody>
</table>

### Rittal Quick-Check – know what’s going on!

The IT Quick-Check allows our service experts to assess the current status. The Rittal service expert will assess your IT infrastructure with regard to:

- Energy efficiency
- Maintenance status
- Leaks
- Obsolescence risk of products and systems
- Review of alarm chains
- Statutory requirements, guidelines, standards

You will then receive an assessment report indicating your options for optimisation, including identified cost drivers and potential savings.

**Arrange a service appointment now for an IT Quick-Check!**

servicesales@rittal.de
+49(0) 2772 505-1717
Liquid Cooling Unit

Applications:
- Cooling unit for TS IT server enclosures and for Micro Data Center in a redundant design

Benefits:
- Space-saving solution by installing the redundantly designed internal unit in the TS IT server enclosure or the Micro Data Center
- Maximum energy efficiency due to EC fan technology and IT-based control
- Control of the server inlet temperature
- The inverter-controlled compressor adapts the cooling output to the current heat loss inside the enclosure
- Absorbed thermal energy is emitted directly to the ambient air at the (inverter-controlled) external unit’s location, without heating up the installation room

Functions:
- The redundant variants have two cooling circuits and controllers inside the internal unit, plus two inverter-regulated external units. The fault and operating hours changeover allows regular switching between the two external units, and ensures automatic changeover in the event of a malfunction or failure.
- The device supports front-to-back air routing typical of IT applications, and regulates the server inlet temperature to the set value
- Colour:
  - Internal unit: RAL 7035
  - External unit: white

IEC 60529:
- Internal unit IP 20
- External unit IP X4

Supply includes:
- Internal unit (evaporator coil)
- 2 external units (inverter-controlled)
- 482.6 mm (19”) mounting trim panel with display and control components
- Condensate hose

Note:
- Below the operating limit, fluctuations in the air inlet temperature are possible
- The electrical connection is made on the external unit. The internal unit is supplied by the external unit.
- A separate power supply may be needed, depending on the external unit

Installation in TS IT:
- 482.6 mm (19”) levels must be designed as mounting angles and offset in the width by 50 mm off-centre
- The front distance between the 482.6 mm (19”) mounting angles and the front edge of the TS frame must be at least 100 mm
- Not suitable for combination with 482.6 mm (19”) mounting frame
- Two punched sections with mounting flanges are required for attachment on the inner mounting level
- To separate the hot/cold zones within an enclosure, an air baffle plate for TS IT is required
- A base/plinth is required to route the cable downwards
<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3311.491</th>
<th>3311.493</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useful cooling output L22 L35 kW</td>
<td>3</td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modulation range kW</td>
<td>1 - 3</td>
<td>3 - 6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For enclosure width mm</td>
<td>800</td>
<td>800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For enclosure height mm</td>
<td>≥ 1800</td>
<td>≥ 1800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For enclosure depth mm</td>
<td>≥ 1000</td>
<td>≥ 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External unit, W x H x D mm</td>
<td>810 x 558 x 310</td>
<td>845 x 700 x 320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal unit, W x H x D mm</td>
<td>105 x 1500 x 820</td>
<td>105 x 1550 x 820</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of electrical connection</td>
<td>Connection clamp</td>
<td>Connection clamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td>230, 1~, 50</td>
<td>230, 1~, 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated current (max.), A</td>
<td>7</td>
<td>15.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-fuse A</td>
<td>16</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R410a</td>
<td>R410a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duty cycle %</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sound pressure level at a distance of 10 m (external unit) dB(A)</td>
<td>40</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range (external unit)</td>
<td>-20°C...+45°C</td>
<td>-20°C...+45°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td>161.0</td>
<td>184.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessories</td>
<td>Refrigerant lines</td>
<td>1 pc(s)</td>
<td>3311.495</td>
<td>3311.496</td>
</tr>
</tbody>
</table>
LIQUID COOLING PACKAGE DX

The latest output categories in bayed suite cooling
The benefits

LCP Inline DX
- New output categories: 20 kW and 35 kW
- Minimal power consumption thanks to an inverter-controlled compressor

LCP Inline DX/FC
- New variant with integral refrigerant and additional water/glycol heat exchanger
- Minimised operating costs with optimum use of indirect free cooling
- Minimal power consumption thanks to inverter-regulated pumps/compressors

Technology

LCP Inline DX/FC
- External hybrid condenser with refrigerant for indirect free cooling, mixed and pure compressor modes
- Automatic control between free cooling, mixed and compressor mode
- Integral inverter-controlled pump
- Expansion tank integrated into the water circuit, plus safety components
- External condenser with integral free cooler

Distribution of hours among the various operating modes, Munich

For further information on the new output categories in bayed suite cooling, please visit our IT website at www.rittal.com/it-solutions/en
Applications:
– Ideal for IT cooling of small and medium-sized locations
– One or two racks can be cooled separately

Benefits:
– Maximum energy efficiency due to EC fan technology and IT-based control
– Minimal pressure loss at the air end, which in turn minimises the power consumption of the fans
– Control of the server inlet temperature
– Thanks to the speed-regulated compressor, the cooling output is ideally adapted to actual requirements
– With redundant temperature sensor integrated at the air end as standard
– Specific maintenance of the LCP DX due to separation of cooling and server racks

Functions:
– The LCP draws in the air at the sides at the rear of the server enclosures, cools it using high-performance compact impellers, and blows the cooled air back into the front part of the server enclosure at the sides
– Absorbed thermal energy is emitted to the ambient air at the external condenser location, without heating up the installation room
– Control of the server inlet temperature
– Thanks to the speed-regulated compressor, the cooling output is ideally adapted to actual requirements
– With redundant temperature sensor integrated at the air end as standard
– Specific maintenance of the LCP DX due to separation of cooling and server racks

IT monitoring:
– Direct connection of the unit via SNMP over Ethernet
– Integration into RiZone

Temperature control:
– Linear fan control
– Inverter-controlled compressor

Colour:
– RAL 7035

Protection category IP to IEC 60 529:
– IP 20

Optional:
– Humidifier
– Dehumidification and reheater
– Condensate drain pump
– Higher cooling output
– Low-temperature/high-temperature condenser (-40°C / +53°C)

Note:
– Variant with UL approval available on request

Photo shows a configuration example with equipment not included in the scope of supply

### LCP Rack DX

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>Modulation range kW</th>
<th>Total cooling output/Number of fan modules required kW</th>
<th>Width mm</th>
<th>Height mm</th>
<th>Depth mm</th>
<th>Type of electrical connection</th>
<th>Installtion in bayed enclosure suite</th>
<th>Rated operating voltage V, ~, Hz</th>
<th>Pre-fuse (T) A</th>
<th>Air throughput at max. cooling output m³/h</th>
<th>Fans may be exchanged with the system operational</th>
<th>EC fan</th>
<th>Rated current max. A</th>
<th>Refrigerant</th>
<th>Duty cycle %</th>
<th>Operating temperature range</th>
<th>Weight as delivered kg</th>
<th>Also required</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3311.410</td>
<td>3 - 12</td>
<td>300</td>
<td>2000</td>
<td>1000</td>
<td>Connection clamp</td>
<td>Flush</td>
<td>400 - 3~, 50</td>
<td>20</td>
<td>4800</td>
<td>❌</td>
<td>❌</td>
<td>7.5</td>
<td>R410a</td>
<td>100</td>
<td>+15°C...+35°C</td>
<td>207.0</td>
<td>Condenser unit</td>
<td>3311.390</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3311.420</td>
<td>3 - 12</td>
<td></td>
<td></td>
<td></td>
<td>Connection clamp</td>
<td>Flush</td>
<td>380 - 480, 3~, 60</td>
<td>20</td>
<td>4800</td>
<td>❌</td>
<td>❌</td>
<td>7.5</td>
<td>R410a</td>
<td>100</td>
<td>+15°C...+35°C</td>
<td>227.0</td>
<td>1 pc(s).</td>
<td>3311.360</td>
</tr>
</tbody>
</table>

Also required:
- Condenser unit
- SNMP card

Available in packs of 3311.410 and 3311.420. Further technical information available on the Internet.
Applications:
- Ideal for IT cooling of small and medium-sized locations
- One or two racks can be cooled separately

Benefits:
- Maximum energy efficiency due to EC fan technology and IT-based control
- Minimal pressure loss at the air end, which in turn minimises the power consumption of the fans
- Temperature monitoring and control
- With redundant temperature sensor integrated at the air end as standard

Functions:
- Thanks to the speed-regulated compressor, the cooling output is ideally adapted to actual requirements
- Specific maintenance of the LCP DX due to separation of cooling and server racks
- Using indirect free cooling helps to save operating costs

IT monitoring:
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone

Temperature control:
- Linear fan control
- Inverter-controlled compressor

Protection category IP to IEC 60 529:
- IP 20

Optional:
- Humidifier
- Dehumidification and reheater
- Condensate drain pump
- Higher cooling output
- Air filter
- Low-temperature/high-temperature condenser (-40°C / +53°C)

Note:
- Variant with UL approval available on request

Photo shows a configuration example with equipment not included in the scope of supply

---

Liquid Cooling Package

LCP Inline DX

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3311.390</th>
<th>3311.430</th>
<th>3311.440</th>
<th>3311.450</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulation range kW</td>
<td></td>
<td>6 - 20</td>
<td>3 - 12</td>
<td>3 - 12</td>
<td>8 - 35</td>
<td></td>
</tr>
<tr>
<td>Total cooling output/Number of fan modules required kW</td>
<td>20 / 4</td>
<td>12 / 4</td>
<td>12 / 4</td>
<td>35 / 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width mm</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height mm</td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth mm</td>
<td>1200</td>
<td>1000</td>
<td>1200</td>
<td>1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of electrical connection</td>
<td>Connection clamp</td>
<td>Connection clamp</td>
<td>Connection clamp</td>
<td>Connection clamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation in bayed enclosure suite</td>
<td>Flush</td>
<td>Flush</td>
<td>Flush</td>
<td>Flush</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>380, 3~, 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-fuse (T) A</td>
<td>32</td>
<td>20</td>
<td>20</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air throughput at max. cooling output m³/h</td>
<td>4800</td>
<td>4800</td>
<td>4800</td>
<td>9900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fans may be exchanged with the system operational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC fan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNMP card</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated current max. A</td>
<td>12.4</td>
<td>7.5</td>
<td>7.5</td>
<td>22.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duty cycle %</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>+35°C</td>
<td>+15°C...+35°C</td>
<td>+15°C...+35°C</td>
<td>+15°C...+35°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td>201.0</td>
<td>208.0</td>
<td>233.5</td>
<td>398.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Also required
Condenser unit 1 pc(s). 3311.363 3311.360 3311.360 3311.370 40

Accessories
SNMP card 1 pc(s). – 3311.320 3311.320 – 41
Liquid Cooling Package

LCP Inline DX

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3311.460</th>
<th>3311.470</th>
<th>3311.480</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulation range kW</td>
<td></td>
<td>8 - 35</td>
<td>8 - 35</td>
<td>8 - 35</td>
<td></td>
</tr>
<tr>
<td>Total cooling output/Number of fan modules required kW</td>
<td></td>
<td>35 / 3</td>
<td>35 / 3</td>
<td>35 / 3</td>
<td></td>
</tr>
<tr>
<td>Width mm</td>
<td></td>
<td>600</td>
<td>600</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Height mm</td>
<td></td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>Depth mm</td>
<td></td>
<td>1000</td>
<td>1200</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td>Type of electrical connection</td>
<td></td>
<td>Connection clamp</td>
<td>Connection clamp</td>
<td>Connection clamp</td>
<td></td>
</tr>
<tr>
<td>Installation in bayed enclosure suite</td>
<td></td>
<td>Flush</td>
<td>Flush</td>
<td>Flush</td>
<td></td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td></td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>380 - 480, 3~, 60</td>
<td>380 - 480, 3~, 60</td>
<td>380 - 480, 3~, 60</td>
<td></td>
</tr>
<tr>
<td>Pre-fuse (T) A</td>
<td></td>
<td>40</td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Air throughput at max. cooling output m³/h</td>
<td></td>
<td>9900</td>
<td>9900</td>
<td>9900</td>
<td></td>
</tr>
<tr>
<td>Fans may be exchanged with the system operational</td>
<td></td>
<td>◼ ◼ ◼</td>
<td>◼ ◼ ◼</td>
<td>◼ ◼ ◼</td>
<td></td>
</tr>
<tr>
<td>EC fan</td>
<td></td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td></td>
</tr>
<tr>
<td>SNMP card</td>
<td></td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td></td>
</tr>
<tr>
<td>Rated current max. A</td>
<td></td>
<td>31.6</td>
<td>22.4</td>
<td>31.6</td>
<td></td>
</tr>
<tr>
<td>Cooling medium</td>
<td></td>
<td>Water/glycol</td>
<td>–</td>
<td>Water/glycol</td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td></td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td></td>
</tr>
<tr>
<td>Duty cycle %</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td></td>
<td>+15°C...+35°C</td>
<td>+15°C...+35°C</td>
<td>+15°C...+35°C</td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td></td>
<td>398.0</td>
<td>398.0</td>
<td>398.0</td>
<td></td>
</tr>
</tbody>
</table>

Also required

Condenser unit | 1 pc(s). | 3311.380 | 3311.370 | 3311.380 | 40 |

Accessories

SNMP card | – | – | – | 41 |

Modular data centres in containers

www.rittal.com/container-platform
The Rittal service for your climate control!

Our expertise:
- All services from a single source
- Manufacturer expertise
- Qualified technicians with an in-depth knowledge of Rittal products and training in refrigeration engineering
- Proximity to the customer
- Short response times

The Rittal service portfolio:
- Fast trouble-shooting
- Professional maintenance
- Configuration, assembly, installation and commissioning
- Original spare parts
- Modular service agreements
- Advice on efficiency and applications
- Modernisation

Our Rittal service for your data centre
Individual security with customised service agreements

<table>
<thead>
<tr>
<th></th>
<th>1 x per year</th>
<th>2 x per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability</td>
<td>Business hours (Mon – Fri, 7 a.m. – 5 p.m.)</td>
<td>5 x 24 hrs. (Mon – Fri)</td>
</tr>
<tr>
<td>On-site service</td>
<td>Next working day (Mon – Fri, 7 a.m. – 5 p.m.)</td>
<td>Next week day (Mon – Sat, 7 a.m. – 5 p.m.)</td>
</tr>
<tr>
<td>Warranty extension</td>
<td>+12/+24/+36 months, includes defined spare parts and repairs</td>
<td>+12/+24/+36 months, includes defined spare parts and repairs, and the preventive replacement of parts</td>
</tr>
<tr>
<td>Stocking of spare parts</td>
<td>At Rittal</td>
<td>At Rittal and delivered within 24 hours</td>
</tr>
<tr>
<td>Inspection</td>
<td>1 x per year</td>
<td>4 x per year</td>
</tr>
<tr>
<td>Leak checks for refrigeration systems</td>
<td>1 x per year from 5 t CO₂ equivalent</td>
<td>2 x per year from 50 t CO₂ equivalent</td>
</tr>
</tbody>
</table>

* Only on request
LIQUID COOLING PACKAGE CW

High-performance cooling
The benefits

- Reduced noise levels and electrical power consumption, thanks to the flexible use of continually regulating EC fan modules
- Tool-free fan replacement with the plug & play system
- Because the electrical assembly pulls out forwards, maintenance from above is unnecessary
- LCP CW glycol variants:
  - Improved thermal recovery thanks to high water return temperatures
  - High cooling output even with the water/glycol mixture

Technology

- Integral Delta T control at the water end for simple setting of the individual Delta T
- High fail-safeness – Maximum cooling output even in emergency situations
- High-performance heat exchangers guarantee maximum cooling output in a small space

New type of condensate management

- High condensate removal with a new type of spray eliminator (patent pending)
- Optimum condensate management, making it ideal for use in areas with high humidity, or for use with low water inlet temperatures

For further information on high-performance cooling, please visit our IT website at www.rittal.com/it-solutions/en
Benefits:
- Maximum energy efficiency due to EC fan technology and IT-based control
- Minimal pressure loss at the air end, which in turn minimises the power consumption of the fans
- Control of the server inlet temperature
- With redundant temperature sensor integrated at the air end as standard
- Optimum adaptability due to dynamic, continuous control of the cold water volume flow
- By using high water inlet temperatures, the proportion of indirect free cooling is increased, which in turn reduces operating costs
- Targeted cooling output due to modular fan units
- Fan modules configurable as n+1 redundancy
- Standard 3-phase connection for electrical redundancy

Functions:
- The LCP draws in the air at the sides at the rear of the server enclosures, cools it using high-performance compact impellers, and blows the cooled air back into the front part of the server enclosure at the sides
- Improved heat recovery, thanks to high water return temperatures when using LCP CW glycol variants
- Optimum access for maintenance and servicing from the front and rear
- Tool-free replacement of the fan modules

IT monitoring:
- Monitoring of all system-relevant parameters such as server air intake temperature, server waste air temperature, water inlet/return temperature, water flow, cooling output, fan speed, leakage
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone

Temperature control:
- Linear fan control
- Two-way control valve

Colour:
- RAL 7035

Protection category IP to IEC 60 529:
- IP 20

Optional:
- Fully integrated fire detection and extinguisher system
- Automatic server enclosure door opening
- Direct connection of additional CMC III sensors is supported
- Racks 2200 mm high

Photo shows a configuration example with equipment not included in the scope of supply
### Liquid Cooling Package

**LCP Rack CW**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3312.130</th>
<th>3312.230</th>
<th>3312.250</th>
<th>3312.260</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cooling output/Number of fan modules required kW</td>
<td>10 / 1</td>
<td>10 / 1</td>
<td>30 / 4</td>
<td>48 / 4</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 / 2</td>
<td>20 / 2</td>
<td>32 / 5</td>
<td>51 / 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 / 3</td>
<td>30 / 3</td>
<td>35 / 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of fan modules in supplied state</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width mm</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height mm</td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth mm</td>
<td>1000</td>
<td>1200</td>
<td>1200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of electrical connection</td>
<td>Connector</td>
<td>Connector</td>
<td>Connector</td>
<td>Connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation in bayed enclosure suite</td>
<td>Flush</td>
<td>Flush</td>
<td>Flush</td>
<td>Flush</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td>230, 1~, 50/60</td>
<td>230, 1~, 50/60</td>
<td>230, 1~, 50/60</td>
<td>230, 1~, 50/60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>400, 3~, 50/60</td>
<td>400, 3~, 50/60</td>
<td>400, 3~, 50/60</td>
<td>400, 3~, 50/60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air throughput at max. cooling output m³/h</td>
<td>4800</td>
<td>4800</td>
<td>4800</td>
<td>8000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fans may be exchanged with the system operational</td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC fan</td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimised condensate management, even at low water inlet temperatures</td>
<td>–</td>
<td>–</td>
<td>◼</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling medium</td>
<td>Water</td>
<td>Water</td>
<td>Water/glycol</td>
<td>Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water inlet temperature °C</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remissible operating pressure (p. max.) bar</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duty cycle %</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water connection</td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td>260.0</td>
<td>260.0</td>
<td>260.0</td>
<td>260.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Accessories**

| Fan module | 1 pcs(s) | 3312.016 | 3312.016 | 3312.016 | 3312.016 | 43 |
| Touchscreen display, colour | 1 pcs(s) | 3311.020 | 3311.020 | 3311.020 | 3311.020 | 40 |
| Connection hose | 2 pcs(s) | 3311.040 | 3311.040 | 3311.040 | 3311.040 | 41 |
| Condensate pump | 1 pcs(s) | – | – | 3312.012 | – | 42 |

Further technical information available on the Internet.
Benefits:
- Maximum energy efficiency due to EC fan technology and IT-based control
- Minimal pressure loss at the air end, which in turn minimises the power consumption of the fans
- Optimum adaptability due to dynamic, continuous control of the cold water volume flow
- By using high water inlet temperatures, the proportion of indirect free cooling is increased, which in turn reduces operating costs
- Targeted cooling output due to modular fan units
- Fan modules configurable as n+1 redundancy
- Standard 3-phase connection for electrical redundancy
- With redundant temperature sensor integrated at the air end as standard
- The separation of cooling and enclosure prevents the ingress of water into the server enclosure
- Up to 53 kW cooling output on a footprint of just 0.36 m²
- Ideal in conjunction with a heat pump, as the LCP CW glycol variants generate high water return temperatures
- Improved heat recovery, thanks to high water return temperatures when using LCP CW glycol variants
- Optimum access for maintenance and servicing from the front and rear
- Tool-free replacement of the fan modules

Functions:
- The hot air is drawn in from the room or hot aisle at the rear of the device and expelled at the front into the cold aisle after cooling. With this product, a raised floor is not necessary

IT monitoring:
- Monitoring of all system-relevant parameters such as server air intake temperature, server waste air temperature, water inlet/return temperature, water flow, cooling output, fan speed, leakage

Temperature control:
- Linear fan control
- Two-way control valve

Colour:
- RAL 7035

Protection category IP to IEC 60 529:
- IP 20

Optional:
- Direct connection of additional CMC III sensors is supported
- Racks 2200 mm high

Photo shows a configuration example with equipment not included in the scope of supply
### LCP Inline CW

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3312.530</th>
<th>3312.540</th>
<th>3312.550</th>
<th>3312.560</th>
<th>3312.570</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total cooling output/Number of fan modules required kW</strong></td>
<td></td>
<td>10 / 1</td>
<td>18 / 2</td>
<td>16 / 2</td>
<td>48 / 4</td>
<td>30 / 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 / 2</td>
<td>27 / 3</td>
<td>25 / 3</td>
<td>51 / 5</td>
<td>32 / 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 / 3</td>
<td>30 / 4</td>
<td>28 / 4</td>
<td>53 / 6</td>
<td>35 / 6</td>
<td></td>
</tr>
<tr>
<td><strong>Number of fan modules in supplied state</strong></td>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Width mm</strong></td>
<td></td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td><strong>Depth mm</strong></td>
<td></td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td><strong>Type of electrical connection</strong></td>
<td></td>
<td>Connector</td>
<td>Connector</td>
<td>Connector</td>
<td>Connector</td>
<td>Connector</td>
<td></td>
</tr>
<tr>
<td><strong>Installation in bayed enclosure suite</strong></td>
<td></td>
<td>Set forward</td>
<td>Flush</td>
<td>Flush</td>
<td>Set forward</td>
<td>Set forward</td>
<td></td>
</tr>
<tr>
<td><strong>Rated operating voltage V, ~, Hz</strong></td>
<td></td>
<td>230, 1~, 50/60</td>
<td>400, 3~, 50/60</td>
<td>230, 1~, 50/60</td>
<td>400, 3~, 50/60</td>
<td>230, 1~, 50/60</td>
<td>400, 3~, 50/60</td>
</tr>
<tr>
<td><strong>Air throughput at max. cooling output m³/h</strong></td>
<td></td>
<td>4000</td>
<td>5000</td>
<td>5000</td>
<td>8000</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td><strong>Fans may be exchanged with the system operational</strong></td>
<td></td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td>◼</td>
<td></td>
</tr>
<tr>
<td><strong>Optimised condensate management, even at low water inlet temperatures</strong></td>
<td></td>
<td>–</td>
<td>–</td>
<td>◼</td>
<td>–</td>
<td>◼</td>
<td></td>
</tr>
<tr>
<td><strong>Cooling medium</strong></td>
<td></td>
<td>Water</td>
<td>Water</td>
<td>Water/glycol</td>
<td>Water</td>
<td>Water/glycol</td>
<td></td>
</tr>
<tr>
<td><strong>Water inlet temperature °C</strong></td>
<td></td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td><strong>Permissible operating pressure (p. max.) bar</strong></td>
<td></td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>Water connection</strong></td>
<td></td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td>DN 40 (G 1½&quot; external thread)</td>
<td></td>
</tr>
<tr>
<td><strong>Weight as delivered kg</strong></td>
<td></td>
<td>260.0</td>
<td>260.0</td>
<td>260.0</td>
<td>260.0</td>
<td>260.0</td>
<td></td>
</tr>
</tbody>
</table>

**Accessories**

- **Fan module**: 1 pc(s). 3312.016, 3312.016, 3312.016, 3312.016, 3312.016, 3312.016, 3312.016
- **Touchscreen display, colour**: 1 pc(s). 3311.030, 3311.030, 3311.030, 3311.030, 3311.030, 3311.030, 3311.030
- **Connection hose**: 2 pc(s). 3311.040, 3311.040, 3311.040, 3311.040, 3311.040, 3311.040, 3311.040
- **Rear adaptor**: 1 pc(s). 3311.080, –, –, 3311.080, 3311.080, 3311.080, 3311.080
- **Condensate pump**: 1 pc(s). –, –, 3312.012, –, 3312.012, 3312.012, 3312.012

Further technical information available on the Internet.
IT cooling

Accessories

**Refrigerant lines**
for LCU DX

For connecting the internal and external unit of the LCU DX. Consisting of intake gas line and liquid line. The refrigerant lines are insulated.

<table>
<thead>
<tr>
<th>Design</th>
<th>Length m</th>
<th>Product-specific scope of supply</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCU DX 3 kW</td>
<td>20</td>
<td>Intake gas line ½&quot; Liquid line ¼&quot;</td>
<td>1 pc(s).</td>
<td>3311.495</td>
</tr>
<tr>
<td>LCU DX 6.5 kW</td>
<td>20</td>
<td>Intake gas line ¾&quot; Liquid line ⅜&quot;</td>
<td>1 pc(s).</td>
<td>3311.496</td>
</tr>
</tbody>
</table>

**Touchscreen display, colour**
for LCP Rack/Inline CW

The display offers the opportunity of directly monitoring key functions of the LCP, and implementing settings.

Supply includes:
- Assembly parts

<table>
<thead>
<tr>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pc(s).</td>
<td>3311.030</td>
</tr>
</tbody>
</table>

**Condenser unit**
for LCP DX

The condenser units are necessary for operating refrigerant-based LCPs. Depending on the version, the units have an external condenser and fan, or additionally a free cooler. The variant with free cooler is needed for the combination variant LCP DX/FC. The units are suitable for roof and wall mounting.

Supply includes:
- Assembly parts

<table>
<thead>
<tr>
<th>W x H x D mm</th>
<th>Design</th>
<th>Temperature control</th>
<th>No. of fans</th>
<th>Rated operating voltage V, ~, Hz</th>
<th>Cooling medium</th>
<th>Refrigerant</th>
<th>Weight kg</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1303 x 578 x 510</td>
<td>Condenser</td>
<td>Speed-controlled fan</td>
<td>2</td>
<td>230, 1~, 50/60</td>
<td>–</td>
<td>R410a</td>
<td>34.0</td>
<td>1 pc(s).</td>
<td>3311.360</td>
</tr>
<tr>
<td>2282 x 480 x 510</td>
<td>Condenser</td>
<td>Speed-controlled fan</td>
<td>3</td>
<td>230, 1~, 50/60</td>
<td>–</td>
<td>R410a</td>
<td>48.0</td>
<td>1 pc(s).</td>
<td>3311.363</td>
</tr>
<tr>
<td>2393 x 1270 x 1110</td>
<td>Condenser</td>
<td>Speed-controlled fan</td>
<td>2</td>
<td>230, 1~, 50/60</td>
<td>–</td>
<td>R410a</td>
<td>170.0</td>
<td>1 pc(s).</td>
<td>3311.370</td>
</tr>
<tr>
<td>3047 x 1270 x 1111</td>
<td>Condenser with free cooler</td>
<td>Speed-controlled fan</td>
<td>2</td>
<td>230, 1~, 50/60</td>
<td>Water/glycol</td>
<td>R410a</td>
<td>285.0</td>
<td>1 pc(s).</td>
<td>3311.380</td>
</tr>
</tbody>
</table>

Further technical information available on the Internet.
SNMP card
For connecting LCP Rack/Inline DX units to the network. The SNMP card is plugged into the control board of the LCP and is ready to use. Software configuration is subsequently carried out via the Web interface.

Functions:
- Automatic alarm messages by e-mail or SNMP trap when a limit value is exceeded
- Remote modification of the device setpoint

Supply includes:
- SNMP card
- RJ 45 coupling
- CAT 6 cable STP

Vertical shielding
for TS IT
To block the airflow on the left and right of the 482.6 mm (19") level, for enclosure height 2000 mm.

Design:
- Self-adhesive on one side

Material:
- Cellular PU foam
- Flame-inhibiting to UL 94 (HF1)

Sealing between | W x H x D mm | Packs of | Model No.
----------------|-------------|---------|---------
LCP and 482.6 mm (19") level | 210 x 1915 x 110 | 800 | 1 pc(s). | 3301.320
LCP and 482.6 mm (19") level | 110 x 1915 x 110 | 600 | 1 pc(s). | 3301.370
Side panel and 482.6 mm (19") level | 84 x 1910 x 84 | 600 | 1 pc(s). | 3301.380
Side panel and 482.6 mm (19") level | 184 x 1910 x 84 | 800 | 1 pc(s). | 3301.390

Connection hose
for LCP Rack/Inline CW
Flexible connection hose at the bottom or top, may be cut to required length, including union nuts on both ends for connecting the LCP to existing pipe-work.

Length m | Water connections | Packs of | Model No.
----------|------------------|---------|---------
1.8 | 1½" | 2 pc(s). | 3311.040

Rear adaptor
for LCP Inline CW
May be positioned to the rear of the set forward LCP Inline CW to close the existing gap to the rear section.

Supply includes:
- Adaptor
- With roof plate
- Assembly parts

Further technical information available on the Internet.
### Filter mat holder
**for LCP Inline CW**
The filter mat holder is comprised of a metal frame, into which the open-pore filter mat is inserted. The filter mat is fixed in the frame with additional metal brackets. The filter mat holder itself is secured in the perforated rear door of the LCP Inline CW using magnets.

**Supply includes:**
- Filter mat holder
- Filter mat
- Assembly parts

<table>
<thead>
<tr>
<th>Filter class to DIN EN 779</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>1 pc(s).</td>
<td>3311.042</td>
</tr>
</tbody>
</table>

**Accessories:**
- Filter mat, see page 42

### Filter mat
**for LCP Inline CW**
Matching, open-pore spare filter mat for the filter mat holder in the LCP Inline CW.

**Colour:**
- Dark grey

<table>
<thead>
<tr>
<th>Filter class to DIN EN 779</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>3 pc(s).</td>
<td>3311.043</td>
</tr>
</tbody>
</table>

### Condensate pump
**for LCP Rack/Inline CW**
For discharging condensate with LCP Rack/Inline CW applications.

**Benefits:**
- Plug & play installation in all LCP Rack/Inline CW variants

**Supply includes:**
- Condensate pump
- Condensate hose
- Condensate sensor
- Connection cable
- Assembly parts

<table>
<thead>
<tr>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pc(s)</td>
<td>3312.012</td>
</tr>
</tbody>
</table>
Fan module for LCP Rack/Inline CW

To increase the cooling output, individual fan modules may be retro-fitted into the LCPs. Additional integration can also achieve redundancy and reduce the electrical power consumption of the LCP.

<table>
<thead>
<tr>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pc(s).</td>
<td>3312.016</td>
</tr>
</tbody>
</table>

The LCP 3312.130/.230/.530 (max. 30 kW) is supplied with one fan module as standard.

To achieve the max. cooling output, the customer/service should install two additional fan modules.

The LCP 3312.540/.550 (max. 30/28 kW) is supplied with two fan modules as standard.

To achieve the max. cooling output, the customer/service should install two additional fan modules.

The LCP 3312.250/.260/.560/.570 (max. 40/53/53/35 kW) is supplied with four fan modules as standard.

To achieve the max. cooling output, the customer/service should install two additional fan modules.

Note:
- The max. cooling output for the relevant LCP variants can be found in the order tables from page 36.
Air baffle plates for TS IT 482.6 mm (19") mounting angles

With all-round brush strip for collision-free shielding with installed bar systems on the outer mounting level.

Applications:
- To separate the hot/cold zones within an enclosure with aisle containment or when using an LCP system.

Material:
- Sheet steel
- Blanking panel: Plastic, UL 94-HB, halogen-free
- Brush strip: Plastic, UL 94-HB

Surface finish:
- Spray-finished

Colour:
- RAL 9005

Supply includes:
- 2 vertical trim panels
- 2 horizontal trim panels
- 4 brush strips
- 4 cellular PU foam pieces
- Assembly parts

Assembly instruction:
- The vertical trim panels with brush strip may be fitted on both the front and rear 482.6 mm (19") mounting angles for partitioning.
- The horizontal trim panels with brush strips can only be mounted on the front 482.6 mm (19") mounting angles.

Air baffle plates for TS IT 482.6 mm (19") mounting frames

With all-round brush strip for collision-free shielding with installed rail systems on the outer mounting level.

Applications:
- To separate the hot/cold zones within an enclosure with aisle containment or when using an LCP system.

Material:
- Sheet steel
- Blanking panel: Plastic, UL 94-HB, halogen-free
- Brush strip: Plastic, UL 94-HB

Surface finish:
- Spray-finished

Colour:
- RAL 9005

Supply includes:
- 2 vertical trim panels
- 2 horizontal trim panels
- 4 brush strips
- Assembly parts

Assembly instruction:
- The vertical and horizontal trim panels with brush strip may be fitted on both the front and rear 482.6 mm (19") mounting frames for partitioning.

Air baffle plates for TS IT 482.6 mm (19") mounting frames
**482.6 mm (19") air duct**

*for horizontal air routing*

Air duct, passive, for cold air supply to 482.6 mm (19") IT equipment installed at the rear of server racks; air is drawn in from the front.

**Benefits:**
- For superior air infeed to the rear 482.6 mm (19") components
- Integral brush strip for cable entry of 482.6 mm (19") IT equipment
- Supports front-to-back air routing
- Depth-variable

**Material:**
- Sheet steel, spray-finished
- Brush strip: Plastic, UL 94-HB

**Colour:**
- RAL 9005

<table>
<thead>
<tr>
<th>Width mm</th>
<th>Height U</th>
<th>Depth mm</th>
<th>Packs of 1 pc(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>482.6</td>
<td>1</td>
<td>223 - 356</td>
<td>3301.391</td>
</tr>
</tbody>
</table>

**Also required:**
- Air baffle plates for TS IT 482.6 mm (19") mounting frames, see page 44
- Air baffle plates for TS IT 482.6 mm (19") mounting angles, see page 44

**Assembly instruction:**
- Only suitable for fitting on the front 482.6 mm (19") installation level
- Can only be mounted in the area of the vertical 19" openings of the air baffle plate

---

**Air duct**

*for side air routing*

Air duct, passive, for cold air intake to 482.6 mm (19") equipment with side air inlet.

**Benefits:**
- For superior air infeed to the rear 482.6 mm (19") equipment with side air routing
- Integral membrane cover allows cable entry to the rear
- Depth-variable

**Installation options:**
- for TS IT 482.6 mm (19") mounting angles
- for TS IT 482.6 mm (19") mounting frames

**Material:**
- Sheet steel, spray-finished

**Colour:**
- RAL 9005

**Supply includes:**
- Adaptor for attaching to 482.6 mm (19") mounting angles
- Magnetic strip to cover the remaining vertical openings in the air baffle plate

<table>
<thead>
<tr>
<th>Height U</th>
<th>Depth mm</th>
<th>For enclosure width mm</th>
<th>Packs of 1 pc(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>275 - 418</td>
<td>800</td>
<td>3301.392</td>
</tr>
</tbody>
</table>
IT cooling

Accessories

Cover, magnetic
For optionally covering the front system punchings in the event of complete air blocking of the front, or in the absence of installed cable fingers or dynamic rack control strip. With numerical labelling on an imperial pitch pattern for clear identification of the various height units. The double-sided labelling allows the counting direction to be freely selected from 1 – 47 U.

Material:
- Cover: PVC
- Adhesive measurement strips: Plastic

Supply includes:
- 1 cover (front)
- 2 adhesive measurement strips, self-adhesive, 1-47 U (bi-directional)

<table>
<thead>
<tr>
<th>Length m</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1 p(c)s.</td>
<td>5501.895</td>
</tr>
</tbody>
</table>

Blanking panel, 3 U
Tool-free attachment, 482.6 mm (19")
The blanking panel is used to seal unused areas within the 482.6 mm (19") mounting level. Quick tool-free attachment means that it is easily integrated anywhere, and can also be removed again if necessary. The consistent use of blanking panels ensures targeted air routing in partially populated racks.

Benefits:
- May be adjusted individually to size by snapping off prepunched 1 U elements
- Each individual element is self-supporting and may therefore be combined into larger units in conjunction with other elements

Material:
- Plastic
- Fire protection: Self-extinguishing , to UL 94 HB, halogen-free

Colour:
- RAL 9005

Supply includes:
- Blanking panel, 3 U, with integral quick-fastening

<table>
<thead>
<tr>
<th>Installation height U</th>
<th>Width mm</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>482.6</td>
<td>3 p(c)s.</td>
<td>7151.305</td>
</tr>
</tbody>
</table>

Further technical information available on the Internet.
Applications:
- Cooling of IT equipment in IT enclosures sited as stand-alone units in secondary rooms

Benefits:
- Even air distribution in front of the 482.6 mm (19") level

Functions:
- The device supports front-to-back air routing typical of IT applications, and regulates the server inlet temperature to the set value
- The hot waste air from the IT equipment is drawn into the device at the rear of the IT enclosure, cooled, and the cooled air blown back in front of the 482.6 mm (19") level

IT monitoring:
- Monitoring of incoming air temperature

Temperature control:
- Control of the server inlet temperature

Material:
- Sheet steel

Colour:
- RAL 7035

Protection category IP to IEC 60 529:
- External circuit IP 20
- Internal circuit IP 20

Supply includes:
- Nano-coated condenser
- Integral electric condensate evaporation
- Fully wired ready for connection
- Drilling template
- Air baffle plate
- Assembly parts

for cooling IT equipment

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cooling output L25 L35 W</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Total cooling output L35 L45 W</td>
<td>3200</td>
<td></td>
</tr>
<tr>
<td>Width mm</td>
<td>597</td>
<td></td>
</tr>
<tr>
<td>Height mm</td>
<td>417</td>
<td></td>
</tr>
<tr>
<td>Depth mm</td>
<td>895</td>
<td></td>
</tr>
<tr>
<td>Type of electrical connection</td>
<td>Plug-in terminal strip</td>
<td></td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td>230, 1~, 50</td>
<td></td>
</tr>
<tr>
<td>Start-up current max. A</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Pre-fuse (T) A</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Rated current max. A</td>
<td>10.4</td>
<td></td>
</tr>
<tr>
<td>Refrigerant g</td>
<td>R134a, 1200</td>
<td></td>
</tr>
<tr>
<td>Permissible operating pressure (p. max.) bar</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Duty cycle %</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>+20°C...+45°C</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>+20°C...+25°C</td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td>97.0</td>
<td></td>
</tr>
<tr>
<td>Also required</td>
<td>see page</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensate hose</td>
<td>3301.612</td>
</tr>
<tr>
<td>Door-operated switch</td>
<td>4127.010</td>
</tr>
<tr>
<td>Air baffle plates for TS IT 482.6 mm (19&quot;) mounting angles</td>
<td>see page</td>
</tr>
<tr>
<td>Filter mats</td>
<td>3286.500</td>
</tr>
</tbody>
</table>
AISLE CONTAINMENT

Consistently separate!

Customised options
- Sliding doors or swing doors
- Mechanical door lock
- Automatic door opening/closing via motor
- Roof elements for the integration of extinguisher nozzles
- Self-opening roof elements in combination with room extinguisher

Cold aisle with raised floor
CRAC systems supply cooled air into the cold aisle via the perforated panels of the raised floor.
- Even with low room heights, the raised floor height is maximised for cooling air supply without flow losses
- Undisturbed supply and uniform distribution of cooling air in the cold aisle guarantees high efficiency
- Hardware racks not connected to the enclosure do not impair cooling efficiency via the cold aisle

Cold aisle without raised floor
The LCP Inline routes the cooled air directly to the cold aisle at the front.
- Simple routing of the piping in the base/plinth
- Homogeneous distribution of cooling air in the cold aisle guarantees a high level of efficiency
- Hardware racks not connected to the containment system do not impair cooling efficiency via the cold aisle
- Room heights play only a minimal role

Hot aisle without raised floor
The LCP Inline extracts the hot air directly at the point where it is created. The cooling performance of the cooling units is utilised to optimum effect, and the overall efficiency of the system increases significantly.
- Simple routing of the piping in the base/plinth
- Suitable for use with high heat losses
- Room-neutral dissipation of the heat loss

1. Door element with viewing window and sliding door
2. Robust roof elements in a composite material with a high level of light permeability
Aisle containment

Slimline door element with viewing window and sliding door. Stable roof elements in a composite material with a high level of light permeability. Where required, safety glass may also be used. The aisle width is 1,200 mm.

Applications:
- Depending on the application, aisle containment may be used with CRAC systems or LCP Inline as hot or cold aisle containment.

Benefits:
- Increased energy efficiency and performance capability of climate control.
- Easily installed and retrofitted, as it is fully compatible with the TS IT enclosure system.
- An inexpensive way to boost the performance of your existing installation, lengthening the investment cycle until a replacement needs to be purchased.

Functions:
- Aisle containment is a combination of door and roof components which facilitate consistent separation of the hot and cold air in the data centre. Such separation is pivotal to saving energy and increasing the efficiency of the available climate control technology.

Colour:
- RAL 7035

Photo shows a configuration example with equipment not included in the scope of supply.

<table>
<thead>
<tr>
<th>Design</th>
<th>Packs of</th>
<th>Door element</th>
<th>Door element</th>
<th>Roof element centre</th>
<th>Roof element centre</th>
<th>Roof element centre</th>
<th>Roof element centre</th>
<th>Roof element centre</th>
<th>Roof element start/end</th>
<th>Roof element start/end</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model No.</td>
<td>1 pc(s)</td>
<td>3311.161</td>
<td>3311.163</td>
<td>3311.170</td>
<td>3311.180</td>
<td>3311.190</td>
<td>3311.200</td>
<td>3311.210</td>
<td>3311.270</td>
<td>3311.280</td>
</tr>
<tr>
<td>For enclosure depth mm</td>
<td>1000</td>
<td>1200</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Width (B) mm</td>
<td>3200</td>
<td>3600</td>
<td>600</td>
<td>800</td>
<td>300</td>
<td>900</td>
<td>1100</td>
<td>600</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>Height (H) mm</td>
<td>2000</td>
<td>2000</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Depth (T) mm</td>
<td>–</td>
<td>–</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td>120.0</td>
<td>150.0</td>
<td>30.0</td>
<td>35.0</td>
<td>20.0</td>
<td>30.0</td>
<td>33.0</td>
<td>30.0</td>
<td>28.0</td>
<td></td>
</tr>
</tbody>
</table>
Small cooling units

Roof plates
for TS IT
Roof plate with matching cut-out for the roof-mounted cooling unit for cooling IT equipment

Applications:
– Roof-mounted cooling units

Material:
– Sheet steel

Supply includes:
– Roof plate, 1000 mm
– Including brush strip to extend to 1200 mm
– Seal
– Assembly parts

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Width mm</th>
<th>For enclosure depth mm</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK 3301.800</td>
<td>600</td>
<td>1000 1200</td>
<td>1 pc(s.)</td>
<td>3302.880</td>
</tr>
<tr>
<td>SK 3301.800</td>
<td>800</td>
<td>1000 1200</td>
<td>1 pc(s.)</td>
<td>3302.880</td>
</tr>
</tbody>
</table>

Assembly instruction:
– Only possible in conjunction with TS IT with mounting angles.

Roof-mounted fans
for TS, TS IT, for the office sector
This roof ventilation concept offers a wealth of performance, assembly and cost benefits associated with the use of integrated ventilation systems. This roof-mounted fan may be ordered with and without a roof plate. For the version with roof plate, the roof-mounted fan is pre-installed. This roof plate also has an integral rear cable entry via a sliding plate with rubber cable clamp strip. Another outstanding feature is the enormous volumetric flow combined with exceptionally low noise levels, making it ideal for use in sensitive office areas.

Benefits:
– Easy assembly, the roof plate variant eliminates the need to create mounting cut-outs
– Fully wired ready for connection

Colour:
– RAL 7035

Supply includes:
– Roof-mounted fans
– Assembly parts

Note:
– Reduction in the specified air throughput to 800 m³/h at 40 Pa counterpressure using two vented base/plinth trim panels

<table>
<thead>
<tr>
<th>Model No.</th>
<th>3164.230</th>
<th>3164.620</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packs of</td>
<td>1 pc(s.)</td>
<td>1 pc(s.)</td>
</tr>
<tr>
<td>Rated operating voltage V, -Hz</td>
<td>230, 1~, 50/60</td>
<td>230, 1~, 50/60</td>
</tr>
<tr>
<td>Air throughput, unimpeded air flow m³/h</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td>Design</td>
<td>without roof plate</td>
<td>With roof plate</td>
</tr>
<tr>
<td>Rated current A</td>
<td>0.3 / 0.35</td>
<td>0.3 / 0.35</td>
</tr>
<tr>
<td>Power consumption W</td>
<td>88 / 81</td>
<td>88 / 81</td>
</tr>
<tr>
<td>Width mm</td>
<td>511</td>
<td>800</td>
</tr>
<tr>
<td>Height mm</td>
<td>227</td>
<td>240</td>
</tr>
<tr>
<td>Depth mm</td>
<td>511</td>
<td>800</td>
</tr>
<tr>
<td>Required mounting cut-out mm</td>
<td>410 x 410</td>
<td>–</td>
</tr>
<tr>
<td>Fan</td>
<td>Radial</td>
<td>Radial</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>+20°C...+55°C</td>
<td>+20°C...+55°C</td>
</tr>
<tr>
<td>Noise level dBA</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Weight kg</td>
<td>19.5</td>
<td>30.0</td>
</tr>
</tbody>
</table>

Accessories:
– Digital enclosure internal temperature display and thermostat integrated into a patch panel 1 U, see Cat. 35, page 466
– Digital enclosure internal temperature display and thermostat, see Cat. 35, page 466
– Thermostat, see Cat. 35, page 467
– Thermostat with strain relief, see Cat. 35, page 467

Further technical information available on the Internet.
**Fan mounting plate**

_for TS IT, TE_

For active ventilation. The unit may optionally be extended with additional fans.

**Applications:**
- For use in the cut-out integrated into the roof plate.

**Colour:**
- RAL 7035

**Supply includes:**
- 1 fan unit
- 2 fans
- 1 thermostat
- Connection cable, open-ended
- Assembly parts

**Note:**
- The noise level given refers to the first fan.
- Connection via distributor box or country-specific connector.

<table>
<thead>
<tr>
<th>W x H x D mm</th>
<th>Installation options</th>
<th>No. of fans</th>
<th>Number of fans (max.)</th>
<th>Air throughput per fan m³/h</th>
<th>Output per fan W</th>
<th>Rated operating voltage V, ~, Hz</th>
<th>Operating temperature range</th>
<th>Noise level per fan dB(A)</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 x 59 x 550</td>
<td>In the TS IT with W x D: 600 x 1000 / 600 x 1200 / 800 x 600</td>
<td>2</td>
<td>3</td>
<td>160 / 180</td>
<td>15 / 14</td>
<td>230, 1~, 50/60</td>
<td>+5°C...+55°C</td>
<td>37</td>
<td>1 pc(s)</td>
<td>5502.010</td>
</tr>
<tr>
<td>340 x 54 x 550</td>
<td>In the TS IT with W x D: 600 x 600 / 600 x 800 / 600 x 1000 / 800 x 600 / 800 x 800 / 800 x 1000</td>
<td>2</td>
<td>6</td>
<td>160 / 180</td>
<td>15 / 14</td>
<td>230, 1~, 50/60</td>
<td>+5°C...+55°C</td>
<td>37</td>
<td>1 pc(s)</td>
<td>5502.020</td>
</tr>
</tbody>
</table>

**Accessories:**
- Fan expansion kit, see page 53

**Small cooling units**

Further technical information available on the Internet.
Small cooling units

Fan mounting plate

For upgrading existing DK-TS applications. The plate is mounted at the front of the enclosure, whilst the rear section is left free for cable entry. A rubber cable clamp strip is supplied loose for optional sealing at the rear.

Installation options:
- In a solid roof plate raised with 20 or 50 mm roof spacers
- In a roof plate for cable entry raised with 20 or 50 mm roof spacers
- In a vented roof plate for cable entry

Colour:
- RAL 7035

Supply includes:
- Fan mounting plate including 2 fans and additional cut-outs for more fans
- 1 thermostat
- Self-adhesive foam cable clamp strip
- Thermostat and fan fully wired to connection cable (3.5 m).

Note:
- Not suitable for crane transportation
- In combination with the swing frame, large, or roof plate for cable entry at the rear, the fan mounting plate should be selected as follows: Fan mounting plate = enclosure depth – 200 mm
- Not suitable in combination with 482.6 mm (19") mounting frame
- The air throughput can be increased with fan expansion kit 7980.000.
- The noise level given refers to the first fan.

<table>
<thead>
<tr>
<th>To fit enclosure width/depth mm</th>
<th>No. of fans</th>
<th>Number of fans (max.)</th>
<th>Air throughput per fan m³/h</th>
<th>Output per fan W</th>
<th>Rated operating voltage V, ~, Hz</th>
<th>Operating temperature range</th>
<th>Noise level per fan dBA</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>600 x 600</td>
<td>2</td>
<td>4</td>
<td>160 / 180</td>
<td>15 / 14</td>
<td>230, 1-, 50/60</td>
<td>+5°C ... +55°C</td>
<td>37</td>
<td>1 pc(s).</td>
<td>7966.035</td>
</tr>
<tr>
<td>600 x 800</td>
<td>2</td>
<td>6</td>
<td>160 / 180</td>
<td>15 / 14</td>
<td>230, 1-, 50/60</td>
<td>+5°C ... +55°C</td>
<td>37</td>
<td>1 pc(s).</td>
<td>7968.035</td>
</tr>
<tr>
<td>600 x 1000</td>
<td>2</td>
<td>6</td>
<td>160 / 180</td>
<td>15 / 14</td>
<td>230, 1-, 50/60</td>
<td>+5°C ... +55°C</td>
<td>37</td>
<td>1 pc(s).</td>
<td>7986.035</td>
</tr>
<tr>
<td>600 x 1200</td>
<td>2</td>
<td>6</td>
<td>160 / 180</td>
<td>15 / 14</td>
<td>230, 1-, 50/60</td>
<td>+5°C ... +55°C</td>
<td>37</td>
<td>1 pc(s).</td>
<td>7988.035</td>
</tr>
</tbody>
</table>

Further technical information available on the Internet.
Fan expansion kit

For use as a stand-alone fan, and for upgrading various fan units or to supplement the fan mounting plate.

Supply includes:
- Fan
- Connection cable (0.61 m)
- Assembly parts

Fan expansion kit

<table>
<thead>
<tr>
<th>W x H x D mm</th>
<th>Air throughput (unimpeded air flow) m³/h</th>
<th>Rated operating voltage V, ~, Hz</th>
<th>Power consumption W</th>
<th>Operating temperature range</th>
<th>Noise level dBA</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>119 x 119 x 38</td>
<td>160 / 180</td>
<td>230, 1-, 50/60</td>
<td>15 / 14</td>
<td>-10°C...+55°C</td>
<td>37 / 37</td>
<td>1 pc(s)</td>
<td>7980.000</td>
</tr>
<tr>
<td>119 x 119 x 25</td>
<td>108 / 120</td>
<td>230, 1-, 60/60</td>
<td>14 / 12</td>
<td>-20°C...+70°C</td>
<td>34 / 34</td>
<td>1 pc(s)</td>
<td>7980.100</td>
</tr>
<tr>
<td>119 x 119 x 38</td>
<td>184</td>
<td>48 (DC)</td>
<td>7.7</td>
<td>-20°C...+70°C</td>
<td>43</td>
<td>1 pc(s)</td>
<td>7980.148</td>
</tr>
</tbody>
</table>

Vent cover

for TS, TS IT

The ideal addition for incorporating sealed racks into an existing central climate control system. The stepped connection is suitable for standard pipe diameters, thereby ensuring effective cooling thanks to targeted air exchange inside the rack.

Material:
- PET-G, transparent

Supply includes:
- Assembly parts

Vent cover

<table>
<thead>
<tr>
<th>W x H x D mm</th>
<th>Note</th>
<th>Diameter of hose connection mm</th>
<th>Weight kg</th>
<th>Packs of</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>450 x 144 x 300</td>
<td>Required cut-out in the roof plate (W x D): 380 x 230 mm</td>
<td>150/200</td>
<td>0.96</td>
<td>1 pc(s)</td>
<td>7826.750</td>
</tr>
</tbody>
</table>
Precision climate control units for data centres
The technology – Simply efficient

Precision climate control units from Rittal ensure optimum climatic conditions in data centres that are exposed to high thermal loads. By precisely regulating the temperature and humidity, these climate control units guarantee optimum ambient conditions for your valuable IT equipment. Waste heat is dissipated according to requirements. Redundant solutions offer a high degree of fail-safeness and energy-efficient use.

CRAC DX precision climate control units for direct evaporation with external air-cooled condenser unit
- Upflow, downflow, displacement
- AC fan or optionally EC fan
- Available with electronic expansion valve, electric heater, steam humidifier, additional heat exchanger for cooling with cold water instead of direct evaporation or internal water-cooled condenser unit
- Complete set of optional accessories: Network protocol cards, filters, plenum space, base frame

CRAC DX precision climate control units for direct evaporation with inverter-controlled compressor and external air-cooled condenser unit
- Upflow, downflow, displacement
- EC fan
- Available with electric heater, steam humidifier, additional heat exchanger for cooling with cold water instead of direct evaporation or internal water-cooled condenser unit
- Complete set of optional accessories: Network protocol cards, filters, plenum space, base frame

CRAC CW precision climate control units for cold water operation
- Upflow, downflow, displacement
- Fans positioned in the device or in the raised floor (downflow only)
- EC fan
- Available with electric heater, steam humidifier
- Complete set of optional accessories: Network protocol cards, filters, plenum space, base frame

For further information on precision climate control units for data centres, please visit our IT website at www.rittal.com/it-solutions/en
Applications:
- Especially for cooling IT applications, such as LCP or CRAC

Benefits:
- Indirect free cooling – internal and external
- High-efficiency pumps in the cold water circuit
- At least two high-performance compressors
- Two independent cooling circuits from 50 kW
- Up to 8 chillers may be linked together to form a cascade

IT monitoring:
- Monitoring of all system-relevant parameters such as server air intake temperature, server waste air temperature, water inlet/return temperature, water flow, cooling output, fan speed, leakage
- Direct connection of the unit via SNMP/Modbus over Ethernet.
- Integration into RiZone

Technical specifications:
- Compact design with control components in the front and air intake via both side panels, air outlet upwards
- Pressure-sealed system
- Integral bypass
- Protection category IP to IEC 60 529:
  - Electrical components IP 54

Supply includes:
- Chiller wired ready for connection
- Multi-lingual documentation
- Functional diagram and wiring plans

Optional:
- Free cooling may be integrated from 15 kW. Please follow the instructions
- Buffer store for separate siting
- Emergency cooling with mains water infed
- Cooling outputs > 500 kW

Note:
- Technical deviations in terms of cooling output, dimensions or weight are possible for unit types with free cooling
- The performance data varies according to the option package chosen, and should be taken from the IT chiller configurator. We reserve the right to make technical modifications
- Pump and tank are available as options with IT chillers. If these configuration options are required, their technical data applies

Total cooling output 15 – 67 kW

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3232.701</th>
<th>3232.711</th>
<th>3232.721</th>
<th>3232.731</th>
<th>3232.741</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cooling output kW</td>
<td>15</td>
<td>24</td>
<td>36</td>
<td>48</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Width mm</td>
<td>810</td>
<td>810</td>
<td>810</td>
<td>1000</td>
<td>1100</td>
<td></td>
</tr>
<tr>
<td>Height mm</td>
<td>1542</td>
<td>1542</td>
<td>1542</td>
<td>1780</td>
<td>1606</td>
<td></td>
</tr>
<tr>
<td>Depth mm</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>2300</td>
<td>3240</td>
<td></td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td></td>
</tr>
<tr>
<td>Air throughput at max. cooling output m³/h</td>
<td>10880</td>
<td>10880</td>
<td>14000</td>
<td>18000</td>
<td>22000</td>
<td></td>
</tr>
<tr>
<td>Power consumption kW</td>
<td>6.9</td>
<td>9.7</td>
<td>14.6</td>
<td>21</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Rated current max. A</td>
<td>23</td>
<td>25</td>
<td>37</td>
<td>46.5</td>
<td>52.2</td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R407c</td>
<td>R407c</td>
<td>R407c</td>
<td>R407c</td>
<td>R410a</td>
<td></td>
</tr>
<tr>
<td>Permissible operating pressure (p. max.) bar</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td></td>
</tr>
<tr>
<td>Temperature of liquid</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td></td>
</tr>
<tr>
<td>Pump capacity l/min</td>
<td>60</td>
<td>60</td>
<td>120</td>
<td>120</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Pump pressure bar</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Number of cooling circuits</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Steel tank, with 10 mm condensate insulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tank capacity l</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>100</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Water connection</td>
<td>G 1½&quot; internal thread</td>
<td>G 1½&quot; internal thread</td>
<td>G 1½&quot; internal thread</td>
<td>G 1½&quot; internal thread</td>
<td>G 2½&quot; internal thread</td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td>400.0</td>
<td>415.0</td>
<td>505.0</td>
<td>710.0</td>
<td>896.0</td>
<td></td>
</tr>
<tr>
<td>Operating weight kg</td>
<td>448.0</td>
<td>463.0</td>
<td>553.0</td>
<td>810.0</td>
<td>1096.0</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>RAL 7035</td>
<td>RAL 7035</td>
<td>RAL 7035</td>
<td>RAL 7035</td>
<td>RAL 9002</td>
<td></td>
</tr>
</tbody>
</table>
## Chillers for IT cooling

Total cooling output 77 – 124 kW

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3232.751</th>
<th>3232.761</th>
<th>3232.771</th>
<th>3232.781</th>
<th>3232.791</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cooling output kW</td>
<td></td>
<td>77</td>
<td>88</td>
<td>99</td>
<td>117</td>
<td>124</td>
</tr>
<tr>
<td>Width mm</td>
<td></td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
</tr>
<tr>
<td>Height mm</td>
<td></td>
<td>1606</td>
<td>1606</td>
<td>1606</td>
<td>1875</td>
<td>1875</td>
</tr>
<tr>
<td>Depth mm</td>
<td></td>
<td>3240</td>
<td>3240</td>
<td>3240</td>
<td>3240</td>
<td>3240</td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td></td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
</tr>
<tr>
<td>Air throughput at max. cooling output m³/h</td>
<td></td>
<td>22000</td>
<td>27000</td>
<td>27000</td>
<td>34100</td>
<td>34100</td>
</tr>
<tr>
<td>Power consumption kW</td>
<td></td>
<td>24</td>
<td>26</td>
<td>29</td>
<td>36</td>
<td>41</td>
</tr>
<tr>
<td>Rated current max. A</td>
<td></td>
<td>59.2</td>
<td>64.2</td>
<td>69.2</td>
<td>84.1</td>
<td>89.1</td>
</tr>
<tr>
<td>Refrigerant</td>
<td></td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
</tr>
<tr>
<td>Permissible operating pressure (p. max.) bar</td>
<td></td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td></td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
</tr>
<tr>
<td>Temperature of liquid</td>
<td></td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
</tr>
<tr>
<td>Pump capacity l/min</td>
<td></td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>470</td>
<td>470</td>
</tr>
<tr>
<td>Pump pressure bar</td>
<td></td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Number of cooling circuits</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Steel tank, with 10 mm condensate insulation</td>
<td></td>
<td>❌</td>
<td>❌</td>
<td>❌</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>Tank capacity l</td>
<td></td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Water connection</td>
<td></td>
<td>G 2½” internal thread</td>
<td>G 2½” internal thread</td>
<td>G 2½” internal thread</td>
<td>G 2½” internal thread</td>
<td>G 2½” internal thread</td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td></td>
<td>896.0</td>
<td>906.0</td>
<td>912.0</td>
<td>1000.0</td>
<td>1000.0</td>
</tr>
<tr>
<td>Operating weight kg</td>
<td></td>
<td>1096.0</td>
<td>1106.0</td>
<td>1112.0</td>
<td>1300.0</td>
<td>1300.0</td>
</tr>
<tr>
<td>Colour</td>
<td></td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
</tr>
</tbody>
</table>

Total cooling output 155 – 261 kW

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3232.801</th>
<th>3232.811</th>
<th>3232.821</th>
<th>3232.891</th>
<th>3232.831</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cooling output kW</td>
<td></td>
<td>155</td>
<td>172</td>
<td>196</td>
<td>235</td>
<td>261</td>
</tr>
<tr>
<td>Width mm</td>
<td></td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
</tr>
<tr>
<td>Height mm</td>
<td></td>
<td>1875</td>
<td>1875</td>
<td>1875</td>
<td>1975</td>
<td>2450</td>
</tr>
<tr>
<td>Depth mm</td>
<td></td>
<td>3240</td>
<td>3240</td>
<td>3240</td>
<td>4240</td>
<td>3450</td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td></td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
</tr>
<tr>
<td>Air throughput at max. cooling output m³/h</td>
<td></td>
<td>32600</td>
<td>32600</td>
<td>50000</td>
<td>49000</td>
<td>72800</td>
</tr>
<tr>
<td>Power consumption kW</td>
<td></td>
<td>47</td>
<td>52</td>
<td>60</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>Rated current max. A</td>
<td></td>
<td>108</td>
<td>120</td>
<td>127</td>
<td>149</td>
<td>181</td>
</tr>
<tr>
<td>Refrigerant</td>
<td></td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
</tr>
<tr>
<td>Permissible operating pressure (p. max.) bar</td>
<td></td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td></td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
</tr>
<tr>
<td>Temperature of liquid</td>
<td></td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
</tr>
<tr>
<td>Pump capacity l/min</td>
<td></td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>810</td>
</tr>
<tr>
<td>Pump pressure bar</td>
<td></td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Number of cooling circuits</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Steel tank, with 10 mm condensate insulation</td>
<td></td>
<td>❌</td>
<td>❌</td>
<td>❌</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>Tank capacity l</td>
<td></td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>700</td>
</tr>
<tr>
<td>Water connection</td>
<td></td>
<td>G 2½” internal thread</td>
<td>G 2½” internal thread</td>
<td>G 2½” internal thread</td>
<td>G 2½” internal thread</td>
<td>G 3” internal thread</td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td></td>
<td>1000.0</td>
<td>1000.0</td>
<td>1000.0</td>
<td>1900.0</td>
<td>2500.0</td>
</tr>
<tr>
<td>Operating weight kg</td>
<td></td>
<td>1300.0</td>
<td>1300.0</td>
<td>1300.0</td>
<td>2200.0</td>
<td>3200.0</td>
</tr>
<tr>
<td>Colour</td>
<td></td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
</tr>
</tbody>
</table>

**Online presence – Rittal’s IT expertise**

- Innovative IT solutions
- Consulting, service and operational models
- Specific application examples

### Chillers for IT cooling

Rittal IT chillers are available in the cooling output range from 15 to 481 kW. The chillers supply rack, suite and room climate control solutions with cooling medium at a predefined temperature via the integral pump and cooling circuit.

- Speed-controlled or constant pumps
- Redundant pumps
- Hydraulic modules
- Free cooling
- SNMP/Modbus monitoring
- Winter kit
- Efficiency kit

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Packs of</th>
<th>3232.641</th>
<th>3232.651</th>
<th>3232.661</th>
<th>3232.671</th>
<th>3232.681</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cooling output kW</td>
<td></td>
<td>291</td>
<td>326</td>
<td>387</td>
<td>430</td>
<td>481</td>
</tr>
<tr>
<td>Width mm</td>
<td></td>
<td>2200</td>
<td>2200</td>
<td>2200</td>
<td>2200</td>
<td>2200</td>
</tr>
<tr>
<td>Height mm</td>
<td></td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
</tr>
<tr>
<td>Depth mm</td>
<td></td>
<td>3400</td>
<td>3400</td>
<td>4250</td>
<td>4250</td>
<td>4250</td>
</tr>
<tr>
<td>Rated operating voltage V, ~, Hz</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
<td>400, 3~, 50</td>
</tr>
<tr>
<td>Air throughput at max. cooling output m³/h</td>
<td>71500</td>
<td>70200</td>
<td>106200</td>
<td>104100</td>
<td>102000</td>
<td></td>
</tr>
<tr>
<td>Power consumption kW</td>
<td>90</td>
<td>106</td>
<td>121</td>
<td>141</td>
<td>159</td>
<td></td>
</tr>
<tr>
<td>Rated current max. A</td>
<td>203</td>
<td>225</td>
<td>290</td>
<td>307</td>
<td>326</td>
<td></td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td>R410a</td>
<td></td>
</tr>
<tr>
<td>Permissible operating pressure (p. max.) bar</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td>-20°C...+43°C</td>
<td></td>
</tr>
<tr>
<td>Temperature of liquid</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td>+5°C...+15°C</td>
<td></td>
</tr>
<tr>
<td>Pump capacity l/min</td>
<td>810</td>
<td>810</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td>Pump pressure bar</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Number of cooling circuits</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Steel tank, with 10 mm condensate insulation</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>Tank capacity l</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>Water connection</td>
<td>G 3&quot; internal thread</td>
<td>G 3&quot; internal thread</td>
<td>G 4&quot; internal thread</td>
<td>G 4&quot; internal thread</td>
<td>G 4&quot; internal thread</td>
<td></td>
</tr>
<tr>
<td>Weight as delivered kg</td>
<td>2700.0</td>
<td>2800.0</td>
<td>3100.0</td>
<td>3000.0</td>
<td>3600.0</td>
<td></td>
</tr>
<tr>
<td>Operating weight kg</td>
<td>3400.0</td>
<td>3500.0</td>
<td>3800.0</td>
<td>3700.0</td>
<td>4300.0</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td>RAL 9002</td>
<td></td>
</tr>
</tbody>
</table>

Further technical information available on the Internet.
Rittal – The System.
Faster – better – everywhere.

Rittal Edge Data Center
Quickly and easily build IT environments to meet the challenges of Industry 4.0 and the Internet of Things (IoT) – with standardised, preconfigured infrastructure modules from Rittal. A Rittal Edge Data Center is comprised of two, four, six or eight Rittal TS IT racks, plus components for climate control, power distribution, UPS, fire protection, monitoring and access protection, tailored to the specific application.
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