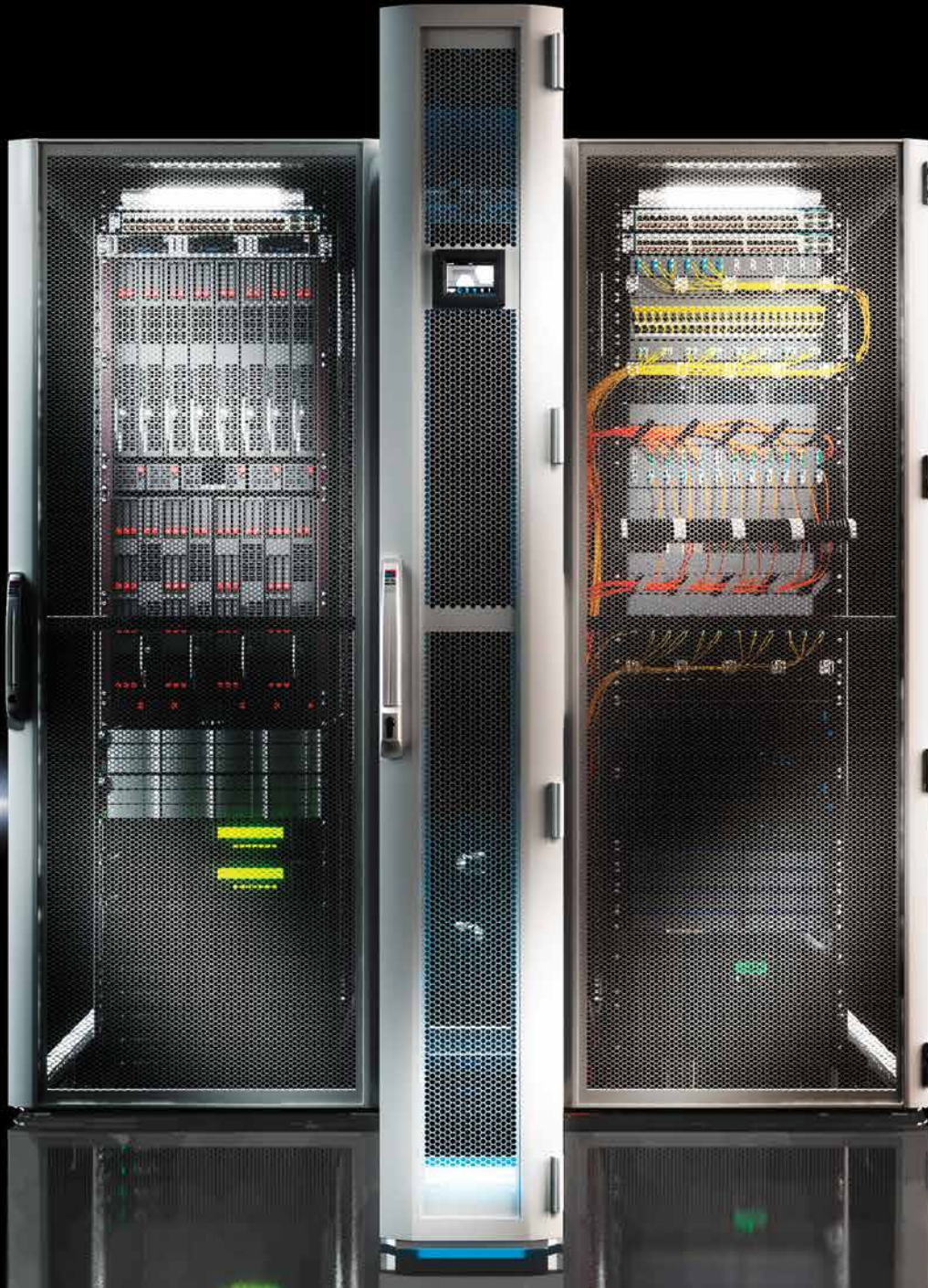


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► Liquid Cooling Package LCP Cooling Systems



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The whole is more than the sum of its parts.

The same is true of “Rittal – The System.” With this in mind, we have bundled our innovative enclosure, power distribution, climate control and IT infrastructure products together into a single system platform. Complemented by our extensive range of software tools and global service, we create unique added value for all industrial applications: Production plant, test equipment, facility management and data centers. Following our simple principle, “faster – better – everywhere”, we combine innovative products with efficient service for optimum results.

Faster – with our “Rittal – The System.” range of modular solutions, which guarantees fast planning, assembly, conversion and commissioning thanks to system compatibility.

Better – by being quick to translate market trends into products. In this way, our innovative strength helps you to secure competitive advantages.

Everywhere – thanks to global networking across 150 locations. Rittal has over 60 subsidiaries, more than 250 service partners and over 1,000 service engineers worldwide. For more than 50 years, we have been on hand to offer advice, assistance and product solutions.

IT INFRASTRUCTURE

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B.

A.

RACK CLIMATE CONTROL

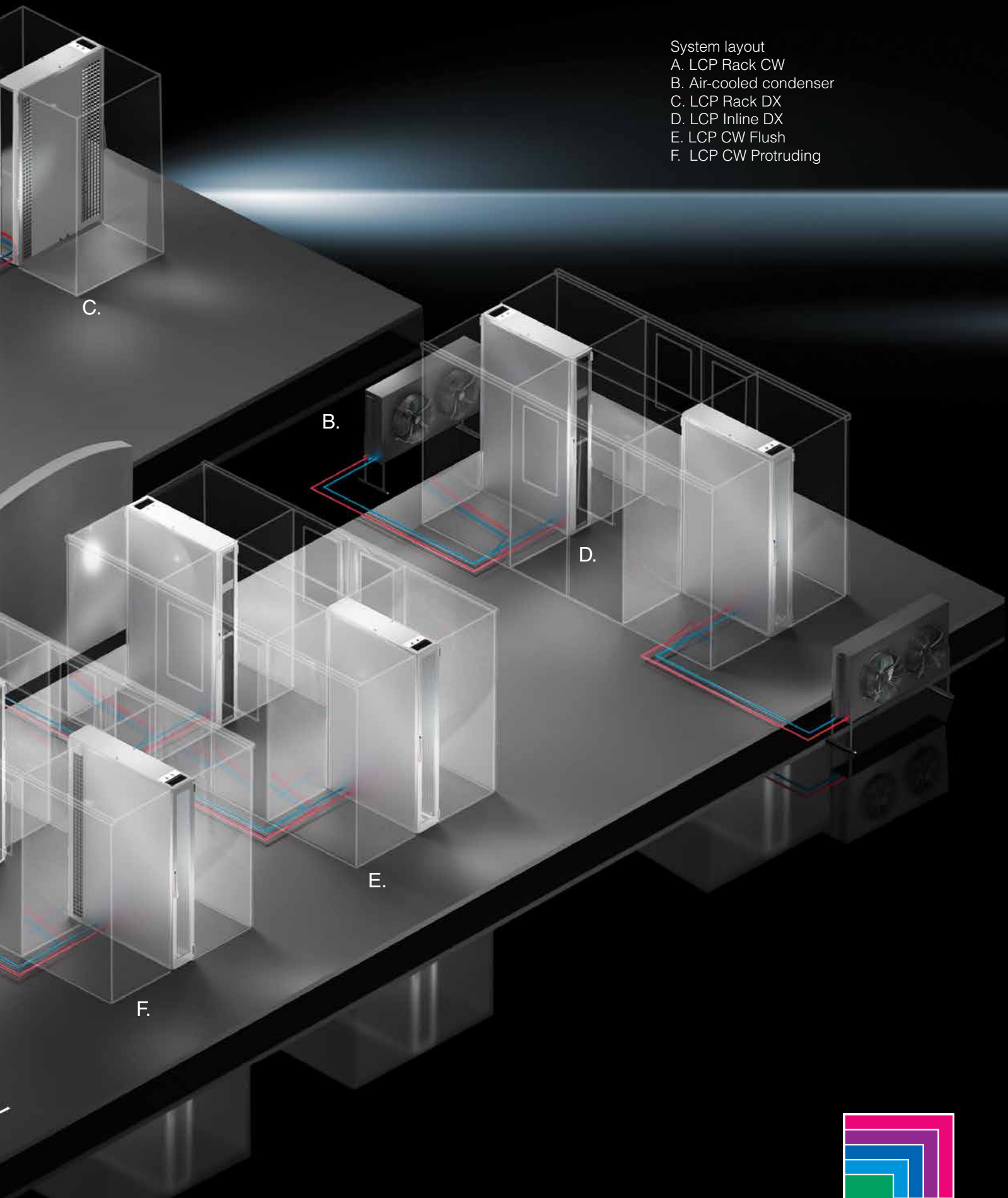
BAYED CLIMATE CONTROL

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- System layout
A. LCP Rack CW
B. Air-cooled condenser
C. LCP Rack DX
D. LCP Inline DX
E. LCP CW Flush
F. LCP CW Protruding



IT INFRASTRUCTURE

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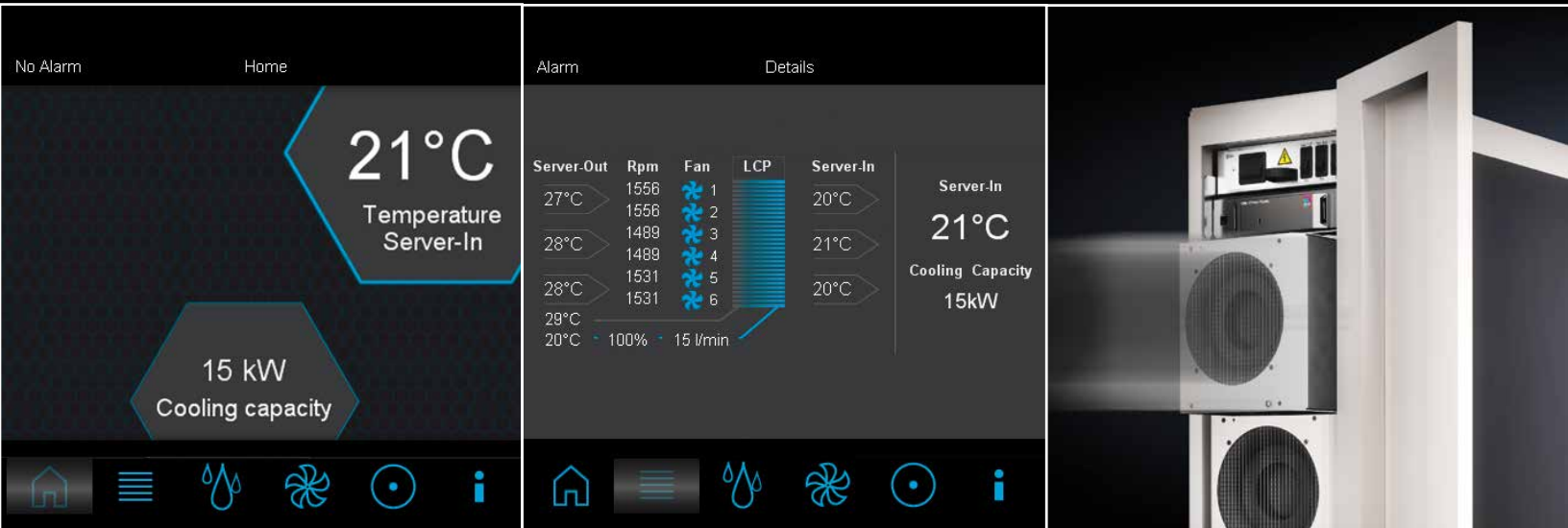


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IT Cooling. Made Better.



Easily achieve 50% energy savings!

Thanks to intelligent control and the flexibility to add additional fans, partial load efficiencies can increase energy savings of up to 50% at the same volumetric flow and constant cooling output.

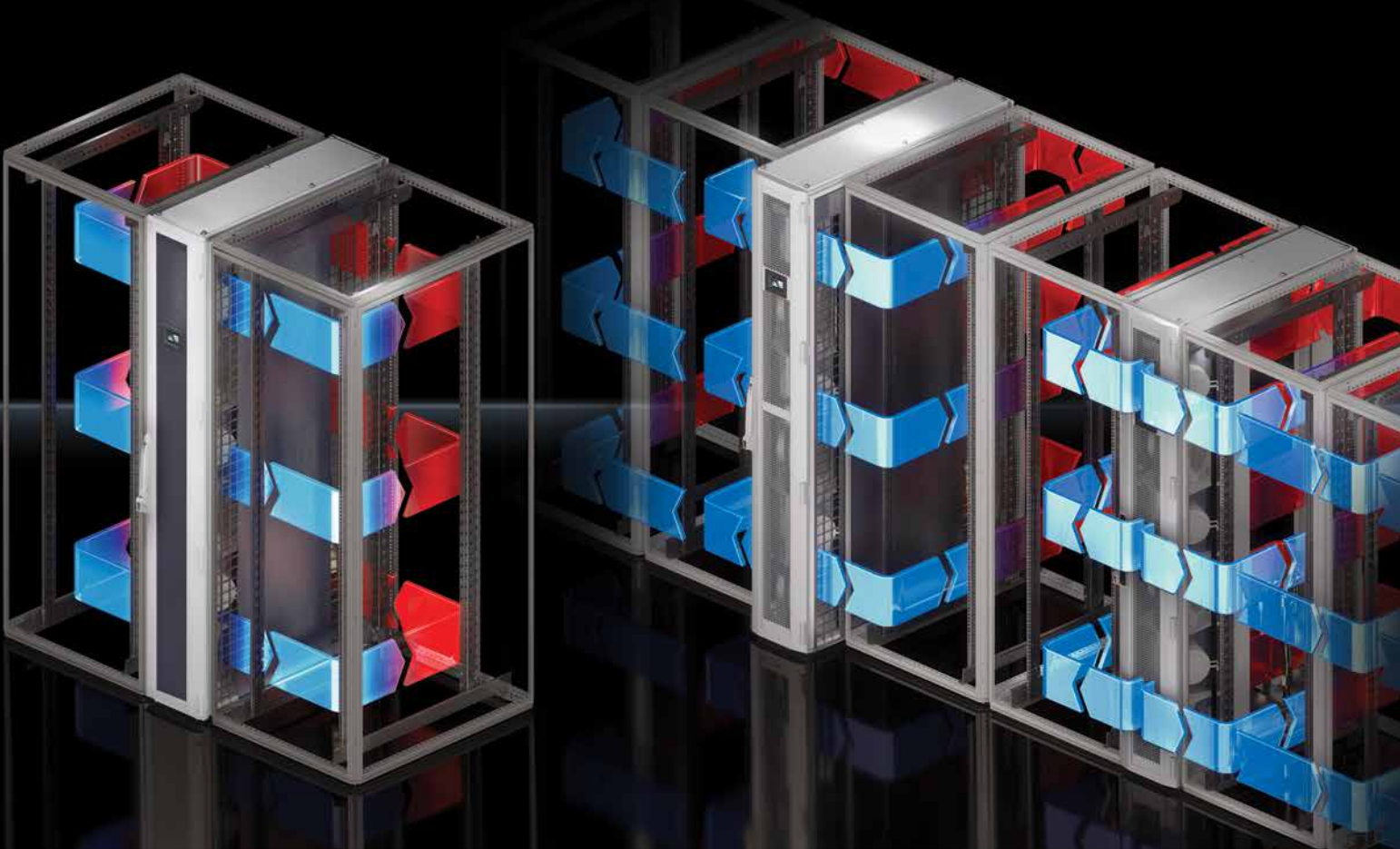
- Partial loading of fans improves efficiency
- Identical volumetric flow can be maintained with 3 – 6 fans
- Reduced noise levels with lower speeds
- Short amortization period

IT INFRASTRUCTURE

SOFTWARE & SERVICES

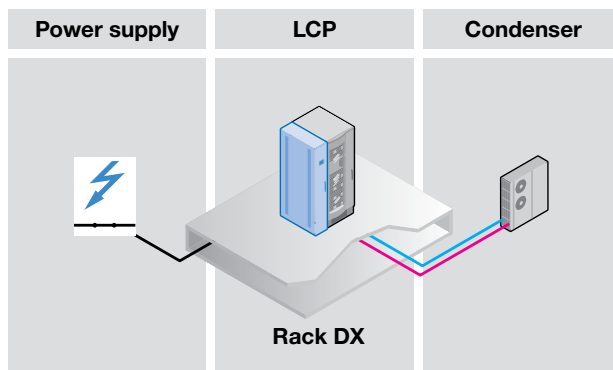
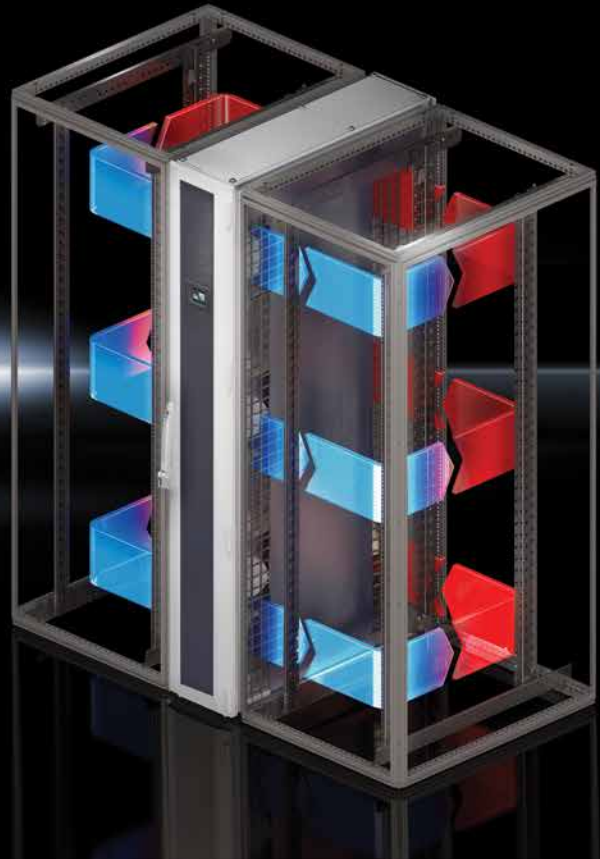


Water-based cooling solution



Rack cooling	Suite cooling
<p>Data centers support corporate processes at ever-higher outputs. The packing density in computer systems is increasing, and processor capacity is growing. This leads to a continuous rise in heat development. Keep temperatures at a constant level with the highly efficient Rittal Liquid Cooling Packages (LCP). With optimized operating costs, our LCPs precisely and effortlessly dissipate heat losses of up to 60 kW per enclosure</p>	<p>Bayed suite cooling with the Rittal LCP Inline is extremely powerful, and the ideal climate control solution for exceptionally high cooling demands, particularly when the cooling of server racks cannot be achieved 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 suite cooling.</p>
<p>LCP Rack CW</p> <ul style="list-style-type: none"> ■ Cooling output from 10 kW to 60 kW ■ Energy saving with high water inlet temperatures (more free cooling) ■ Minimized operating costs with efficient EC fan technology ■ Spatial separation of cooling and server rack ■ Integral condensate and leakage management ■ Sophisticated control concept including online connection ■ Optional cooling of one or two server racks ■ Redundancy designed into the LCP ■ Assembly- and service-friendly ■ Integration into RiZone (data center management software) 	<p>LCP Inline CW</p> <ul style="list-style-type: none"> ■ Cooling output from 10 kW to 60 kW ■ Cooling of several server racks ■ Energy saving with high water inlet temperatures (more free cooling) ■ Minimized operating costs with efficient EC fan technology ■ Spatial separation of cooling and server rack ■ Integral condensate and leakage management ■ Sophisticated control concept including online connection ■ Assembly- and service-friendly ■ Optional front cover to reduce the air outlet speed and for superior air distribution ■ Increased performance and efficiency in conjunction with Rittal aisle containment ■ Integration into RiZone (data center management software) ■ Protruding variant for ideal air distribution (cold air curtain) ■ Flush variant for confined spaces (narrow cold aisle)

Refrigerant-based cooling solution



Rack cooling

For rack-based cooling of one or two server racks in a closed loop configuration, an LCP Rack DX is the ideal cooling solution for small to medium-sized IT installations.

Rack cooling provides the benefits of a containment system inside the rack.

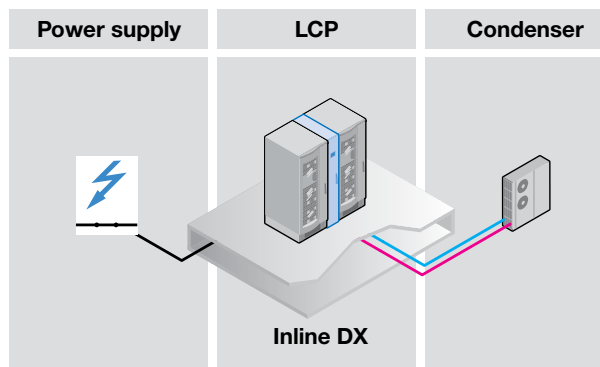
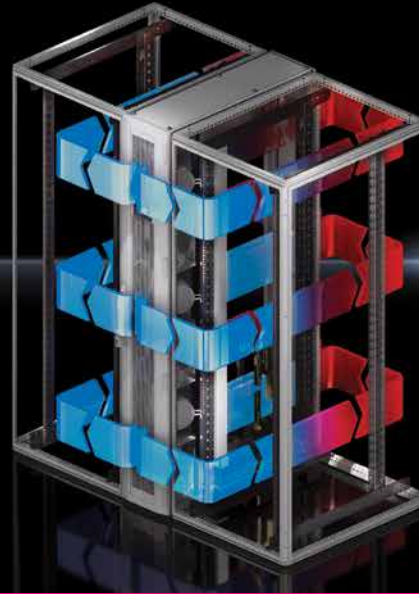
In particular, the stand-alone IT application is easily cooled with these devices.

Whereas in the past, cooling of stand-alone IT applications led to difficulties with conventional ceiling or air-conditioning units, the LCP DX devices provide always on IT-compatible cooling. For retrofitting or exchanges, the existing coolant pipework can often be reused.

LCP Rack DX

- Cooling output 3-12 kW with EC compressor
- Minimized operating costs with efficient EC fan technology
- Sophisticated control concept maintains constant server inlet temperature
- Optional cooling of one or two server racks
- Online access and warnings
- Assembly- and service-friendly
- Integration into RiZone (data center management software)
- Cost-effective installation where chilled water is not available
- Environmentally friendly refrigerant R410a

Refrigerant-based cooling solution



Suite cooling

Suite cooling with LCP Inline DX is the ideal cooling solution for small to medium-sized IT installations. In particular, stand-alone closets and server rooms are easily cooled with these devices. Cooling of stand-alone IT rooms can lead to difficulties with conventional building AC or air-conditioning units, the LCP DX devices allow IT-compatible cooling. Cooling adjusts to meet changing needs on days, nights and weekends.

LCP Inline DX

- Cooling output 3-12 kW
- Cooling of several server racks
- Minimized operating costs with efficient EC fan technology
- Spatial separation of cooling and server rack
- Sophisticated control concept can be set to maintain either server inlet or room temperature
- Assembly- and service-friendly
- Independent systems can provide cost effective N+1 redundancy
- Increased performance and efficiency in conjunction with Rittal aisle containment
- Integration into RiZone (data center management software)
- Environmentally friendly refrigerant R410a

LCP – Liquid Cooling Package Rack CW



Benefits:

- Maximum energy efficiency due to EC fan technology and IT-based control
- Minimal pressure loss at the air end, which in turn minimizes the power consumption of the fans
- Control of the server intake air temperature
- Redundant temperature sensor integrated at the air end
- 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
- The separation of cooling and enclosure prevents water from entering the server enclosure
- Up to 60 kW cooling output on a footprint of just 3.87 ft²
- Minimal area load thanks to low weight

Approvals:

- UL
- cUL

Functions:

The LCP draws in the air at the sides at the rear of the server enclosures, cools it using a

high performance multi-row heat exchanger, and blows the cooled air back into the front part of the server enclosure at the sides.

Monitoring:

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

Temperature control:

- Infinitely variable fan control
- 2-way control valve

Color:

- RAL 9005 – Black

Protection category IP to IEC 60 529:

- IP 20

Cooling medium:

- Water

Optional:

- Automatic server enclosure door opening
- Various sensors
- Racks 2200 mm high

Technical details:

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

LCP Rack CW (North American Version) Model Number	Packs of	3311.238	3311.268
Total cooling output/number of fan modules required BTU (kW)		34121 (10)/1 68243 (20)/2 102364 (30)/3	136486 (40)/4 153546 (45)/5 187668 (60)/6
Number of fan modules in supplied state		1	4
Height inches (mm)		79 (2000)	79 (2000)
Width inches (mm)		12 (300)	12 (300)
Depth inches (mm)		47 (1200)	47 (1200)
Installation in bayed enclosure suite		Flush	Flush
Rated operating voltage V, ~, Hz		208, 2~, 60 230, 1~, 50/60	208, 2~, 60 230, 1~, 50/60
Type of connection (electrical)		Hard-wired	Hard-wired
Air throughput at max. cooling output cfm (m ³ /h)		2825 (4800)	4709 (8000)
Fans may be exchanged with the system operational		■	■
EC fan		■	■
Water inlet temperature °F		59	59
Permissible operating pressure (p. max.) psi (bar)		87 (6)	87 (6)
Duty cycle %		100	100
Water connection		1½" BSP Male Thread	1½" BSP Male Thread
Weight in supplied state lb (kg)		485 (220.0)	529 (240.0)
Accessories			
Fan module	1 pc(s).	3311.016	3311.016
Touchscreen display, color	1 pc(s).	3311.030	3311.030
Connection hose, bottom and top	2 pc(s).	3311.040	3311.040

LCP – Liquid Cooling Package Inline CW



Benefits:

- Maximum energy efficiency due to EC fan technology and IT-based control
- Minimal pressure loss at the air end, which in turn minimizes 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

- Redundant temperature sensor integrated at air end
- The separation of cooling and enclosure prevents water from entering the server enclosure
- Water supply can be set to either top or bottom
- Up to 60 kW cooling output on a footprint of just 3.87 ft²
- Minimal area load thanks to low weight

Functions:

The hot air is drawn in from the room or hot aisle at the rear of the device and passing through a high efficiency multi-row heat exchanger expelled at the front into the cold aisle after cooling. The LCP achieves maximum performance

and efficiency in conjunction with cold aisle containment. With this product, a raised floor is not necessary.

Approvals:

- UL
- cUL

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, and leakage
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone

Temperature control:

- Infinitely variable fan control
- 2-way control valve

Color:

- RAL 9005

Protection category IP to IEC 60 529:

- IP 20

Cooling medium:

- Water
- Water/Glycol

Optional:

- Various sensors
- Racks 2200 mm high

Technical details:

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

LCP Inline CW North American Version Model No.	Packs of	3311.148	3311.538	3311.548	3311.568
Total cooling output/number of fan modules required BTU (kW)		61419 (18)/2 92128 (27)/3 102364 (30)/4	34121 (10)/1 68243 (20)/2 102364 (30)/3	61419 (18)/2 92128 (27)/3 102364 (30)/4	136486 (40)/4 153546 (50)/5 187668 (60)/6
Number of fan modules in supplied state		2	1	2	4
Height inches (mm)		79 (2000)	79 (2000)	79 (2000)	79 (2000)
Width inches (mm)		12 (300)	12 (300)	12 (300)	12 (300)
Depth inches (mm)		41 (1050)	47 (1200)	47 (1200)	47 (1200)
Installation in bayed enclosure suite		Flush	Protruding	Flush	Protruding
Rated operating voltage V, ~, Hz		208, 2~, 60 230, 1~, 50/60	208, 2~, 60 230, 1~, 50/60	208, 2~, 60 230, 1~, 50/60	208, 2~, 60 230, 1~, 50/60
Type of connection (electrical)		Hard-wired	Hard-wired	Hard-wired	Hard-wired
Air throughput at max. cooling output cfm (m ³ /h)		2825 (4800)	2825 (4800)	2825 (4800)	4709 (8000)
Fans may be exchanged with the system operational		■	■	■	■
EC fan		■	■	■	■
Permissible operating pressure (p. max.) psi (bar)		87 (6)	87 (6)	87 (6)	87 (6)
Duty cycle %		100	100	100	100
Water connection		1½" BSP Male Thread	1½" BSP Male Thread	1½" BSP Male Thread	1½" BSP Male Thread
Water inlet temperature °F		59	59	59	59
Weight in supplied state lb (kg) 485		485 (220.0)	485 (220.0)	485 (220.0)	529 (240.0)
Accessories					
Fan module	1 pc(s).	3311.016	3311.016	3311.016	3311.016
Touchscreen display, color	1 pc(s).	3311.030	3311.030	3311.030	3311.030
Connection hose, bottom and top	2 pc(s).	3311.040	3311.040	3311.040	3311.040

LCP – Liquid Cooling Package DX



Benefits:

- Maximum energy efficiency due to EC fan technology and IT-based control
- Minimal pressure loss at the air end, which in turn minimizes the power consumption of the fans
- Control of the server intake air temperature (LCP Rack DX)
- Temperature monitoring and room control (LCP Inline DX)
- Due to the speed-regulated compressor, the cooling output tracks actual cooling requirements
- Redundant temperature sensor integrated at the air end
- Minimal area load due to low weight

- Easy maintenance of the LCP DX due to separation of cooling and server enclosure
- Absorbed thermal energy is emitted to the ambient air at the external condenser location, without heating up the installation room
- Ideal for IT cooling of small and medium-sized locations
- One or two racks can be cooled separately (LCP DX Racks)
- One or more enclosures can be cooled separately (LCP Inline DX Enclosures)

Functions:

LCP Rack DX: The LCP closed loop draws in the air at the sides at the rear of the server enclosures, cools it using high-performance heat exchanger, and blows the cooled air back into the front part of the server enclosure at the sides.

LCP Inline DX: LCP for one or more enclosures. Hot air is drawn in from the aisle at the rear of the device, cooled by the high capacity heat exchanger, and blown back into the room or cold aisle after cooling.

Temperature control:

- Infinitely variable fan control
- Inverter-controlled compressor

Color:

- RAL 9005 – Black

Protection category IP to IEC 60 529:

- IP 20

Cooling medium:

- R410a

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

Model No.	Packs of	LCP Rack DX		LCP Inline DX	
		3311.415	3311.425	3311.435	3311.445
Total cooling output/number of fan modules required BTU (kW)		40946 (12)/4	40946 (12)/4	40946 (12)/4	140946 (12)/4
Height inches (mm)		79 (2000)	79 (2000)	79 (2000)	79 (2000)
Width inches (mm)		12 (300)	12 (300)	12 (300)	12 (300)
Depth inches (mm)		39 (1000)	47 (1200)	39 (1000)	47 (1200)
Installation in bayed enclosure suite		Flush	Flush	Flush	Flush
Rated operating voltage V, ~, Hz		208, 1~, 60	208, 1~, 60	208, 1~, 60	208, 1~, 60
Type of connection (electrical)		Terminal	Terminal	Terminal	Terminal
Air throughput at max. cooling output cfm (m³/h)		2825 (4800)	2825 (4800)	2825 (4800)	2825 (4800)
Fans may be exchanged with the system operational		■	■	■	■
EC fan		■	■	■	■
Duty cycle %		100	100	100	100
Weight in supplied state lb (kg) 485		399 (181.0)	399 (181.0)	399 (181.0)	399 (181.0)
Accessories					
SNMP card	1 pc(s).	3311.320	3311.320	3311.320	3311.320
Condenser unit	1 pc(s).	9951.077	9951.077	9951.077	9951.077

Accessories for LCP CW/DX



Touchscreen Display for LCP rack, inline, CW

The color display allows you to directly monitor key LCP functions and apply settings.

For LCP CW	Packs of	Model No.
3311.148 3311.238 3311.268 3311.538 3311.548 3311.568	1 pc(s).	3311.030



Vertical Shielding for enclosure height 2000 mm

To block the airflow to the left and right of the 19" (482.6 mm) level.

Length: 1900 mm

Material:

- Cellular PU foam
- Flame-inhibiting to UL 94 (HF1)
- Self-adhesive on one side

For seal between	For enclosure width inches (mm)	Packs of	Model No.
Side panel and 19" (482.6 mm) level	24 (600)	1 pc(s).	3301.380
LCP and 19" (482.6 mm) level	24 (600)	1 pc(s).	3301.370

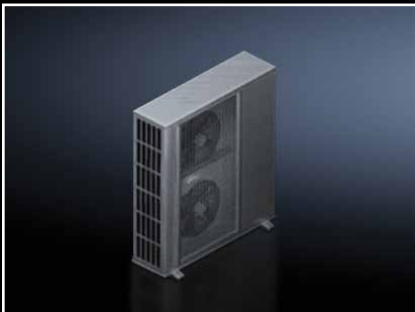


Connection Hose bottom and top

Flexible rubber hose, may be shortened. Requires Hose Conversion Kit 9977.379 for connection to LCP.

Part Number	Description	Packs of
9977.379	Hose Connection Kit	1
9971.173	10' Hose	1
9971.174	15' Hose	1
9971.175	25' Hose	1

For use with LCP CW 3311.148, 3311.238, 3311.268, 3311.538, 3311.548, 3311.568



Condenser Unit

The condenser unit is needed to operate the refrigerant-based LCPs and comprises the external condenser and fan.

Refrigerant:

- R410a

For LCP DX	Packs of	Model No.
3311.415 3311.425 3311.435 3311.445	1 pc(s).	Single Circuit 9951.077
For 2 LCP DX units	1 pc(s).	Dual Circuit 9982.148

Note:

- The pipework between the LCP DX and the condenser is not included with the supply

SNMP card

For integrating LCP Rack/Inline DX units into the network.

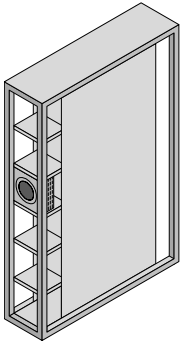
For LCP DX	Packs of	Model No.
3311.415 3311.425 3311.435 3311.445	1 pc(s).	3311.320

Accessories for LCP CW

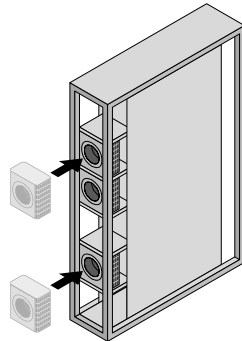
Fan Module for LCP

To increase the cooling output, individual fan modules can be retro-fitted into the LCPs. This helps to generate redundancy or reduce the electrical power consumption of the LCP.

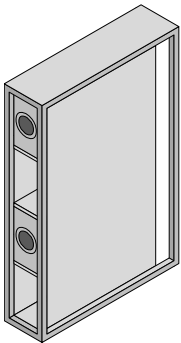
For LCP	Color	Packs of	Model No.
3311.148, 3311.238, 3311.268, 3311.538, 3311.548, 3311.568	RAL 9005	1 pc(s).	3311.016



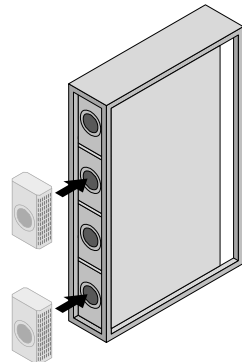
The LCP 3311.238/538 (max. 30 kW) is supplied with one fan module as standard



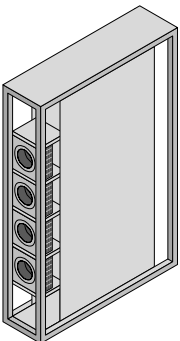
To achieve the max. cooling output of 30 kW, the customer/service should install two additional fan modules.



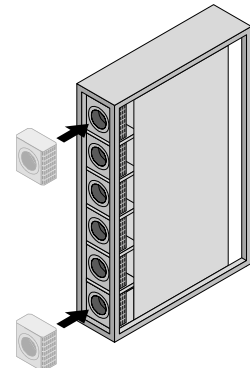
The LCP 3311.148/548 (30 kW) is supplied with two fan modules as standard.



To achieve the max. cooling output of 30 kW, the customer/service should install two additional fan modules.



The LCP 3311.268/.568 (max. 60 kW) is supplied with four fan modules as standard



To achieve the max. cooling output of 60 kW, the customer/service should install two additional fan modules

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