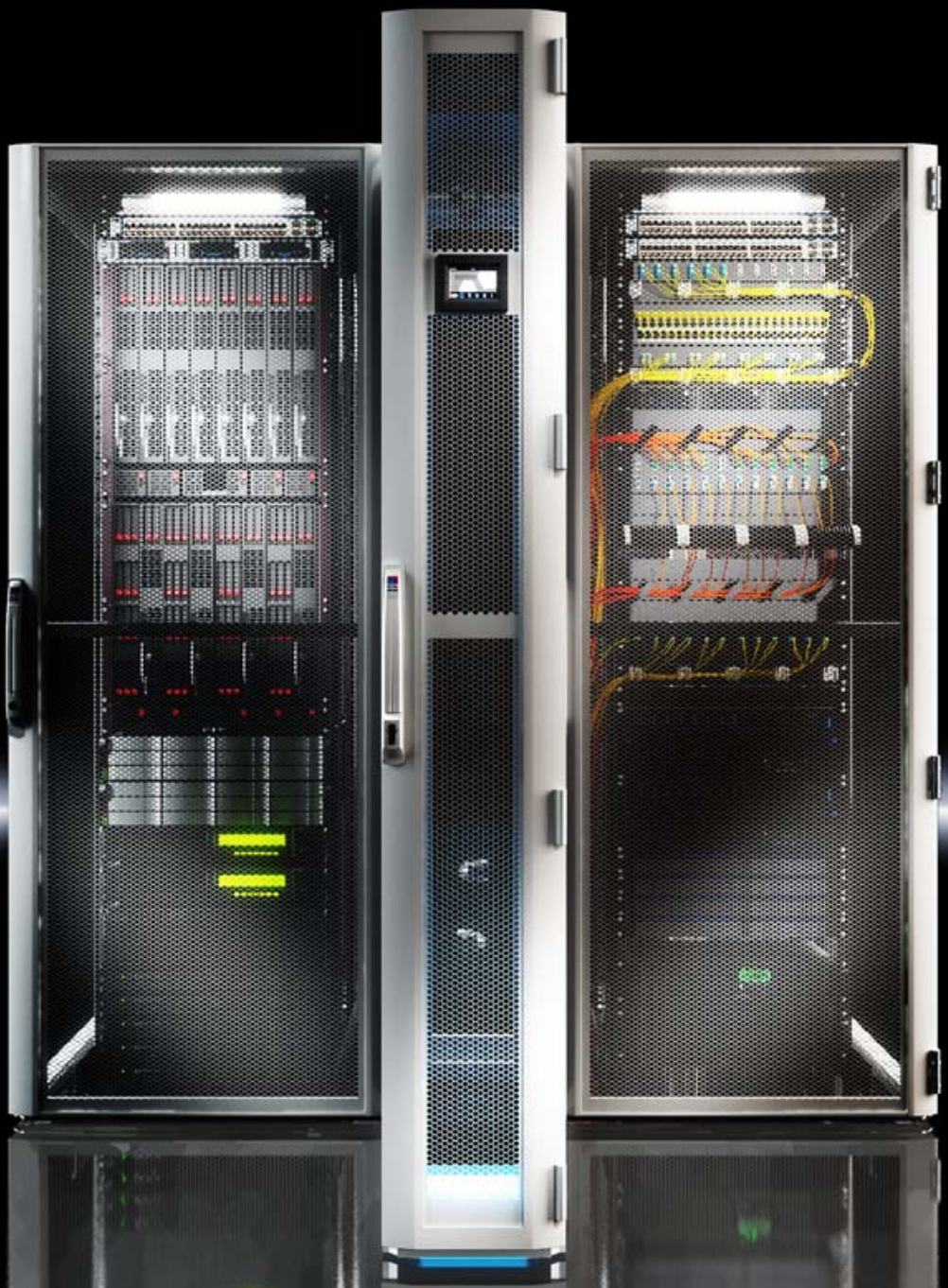
Rittal – The System.

Faster – better – worldwide.

Liquid Cooling Package LCP Cooling Systems

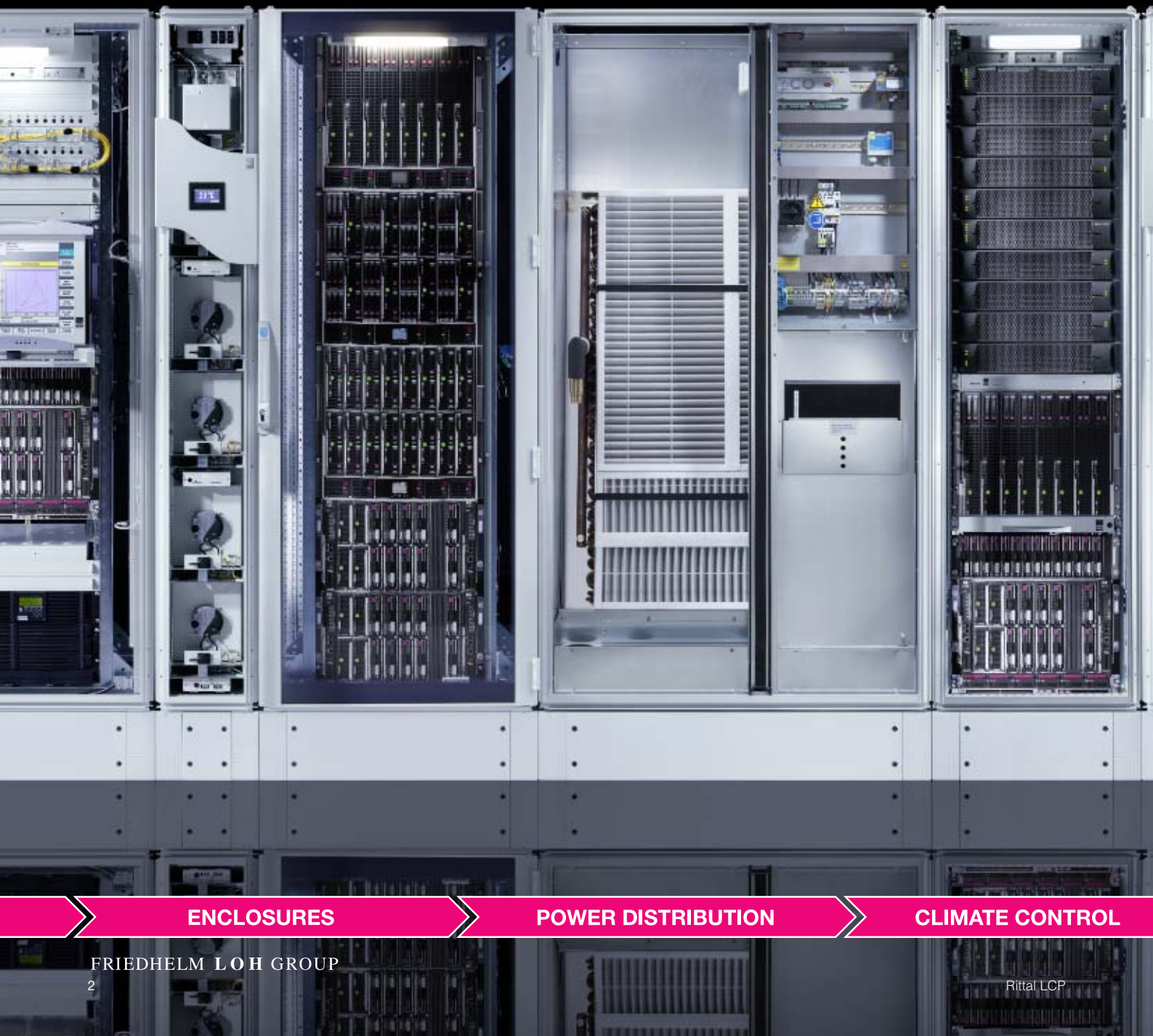


ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL | IT INFRASTRUCTURE | SOFTWARE & SERVICES

FRIEDHELM LOH GROUP

Rittal – The System.

Faster – better – worldwide.



ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL

Rittal – The System.

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 centres. Following our simple principle, “faster – better – worldwide”, we combine innovative products with efficient service for optimum results.

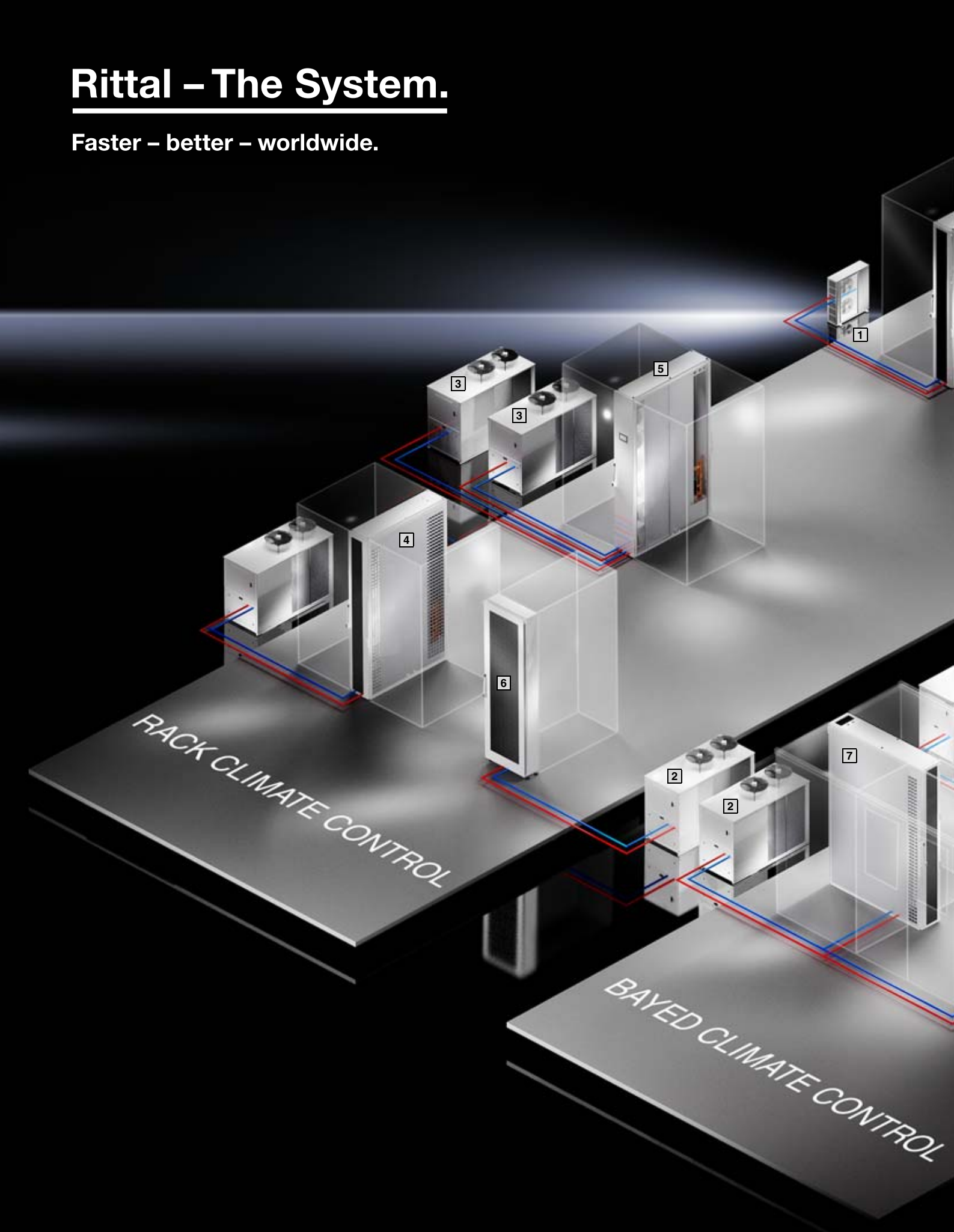
Faster – with our “Rittal – The System.” range of modular solutions, which guarantees fast planning, assembly, conversion and commissioning thanks to system compatibility.

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

Worldwide – 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.

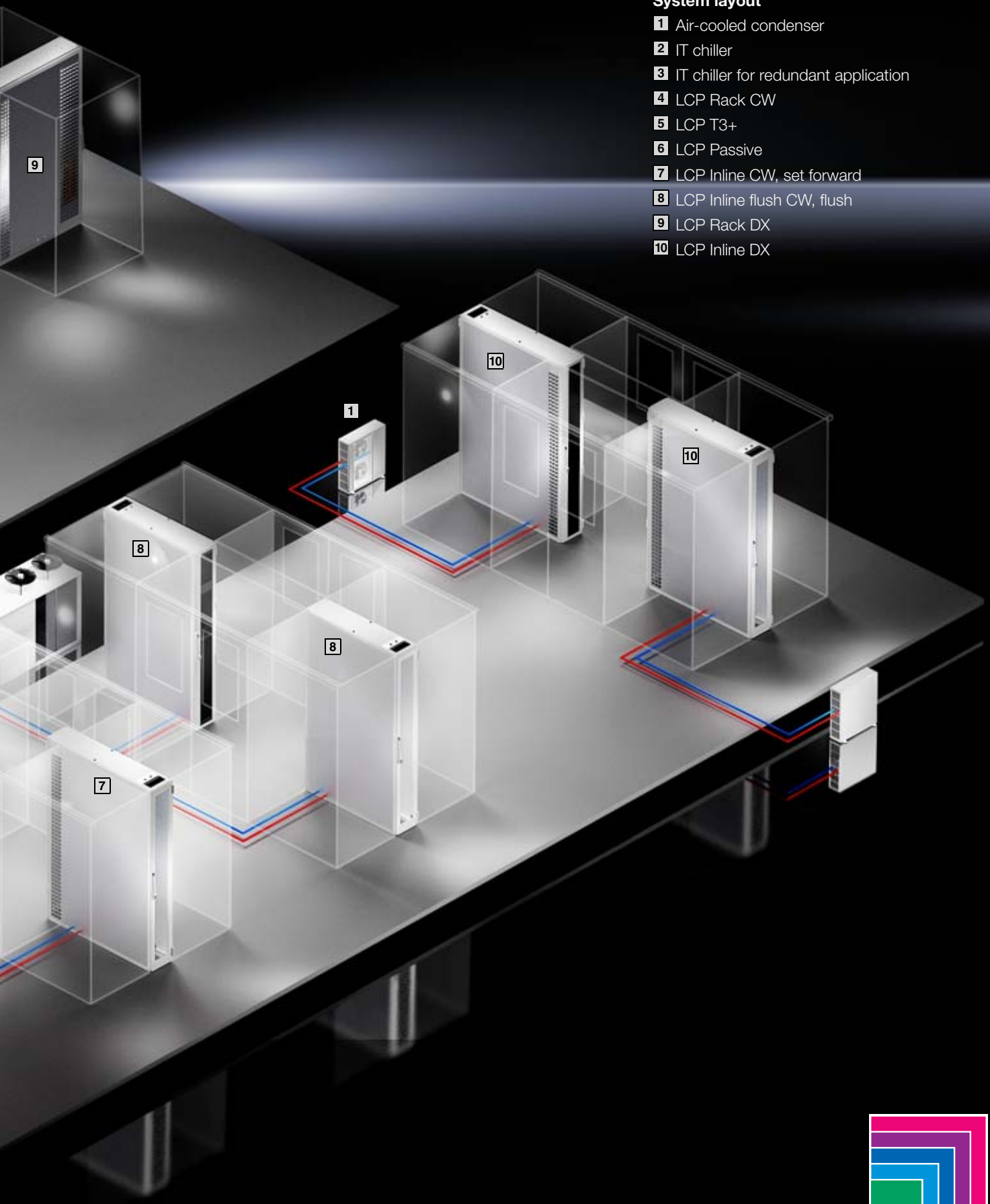
Rittal – The System.

Faster – better – worldwide.



ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL

IT cooling.

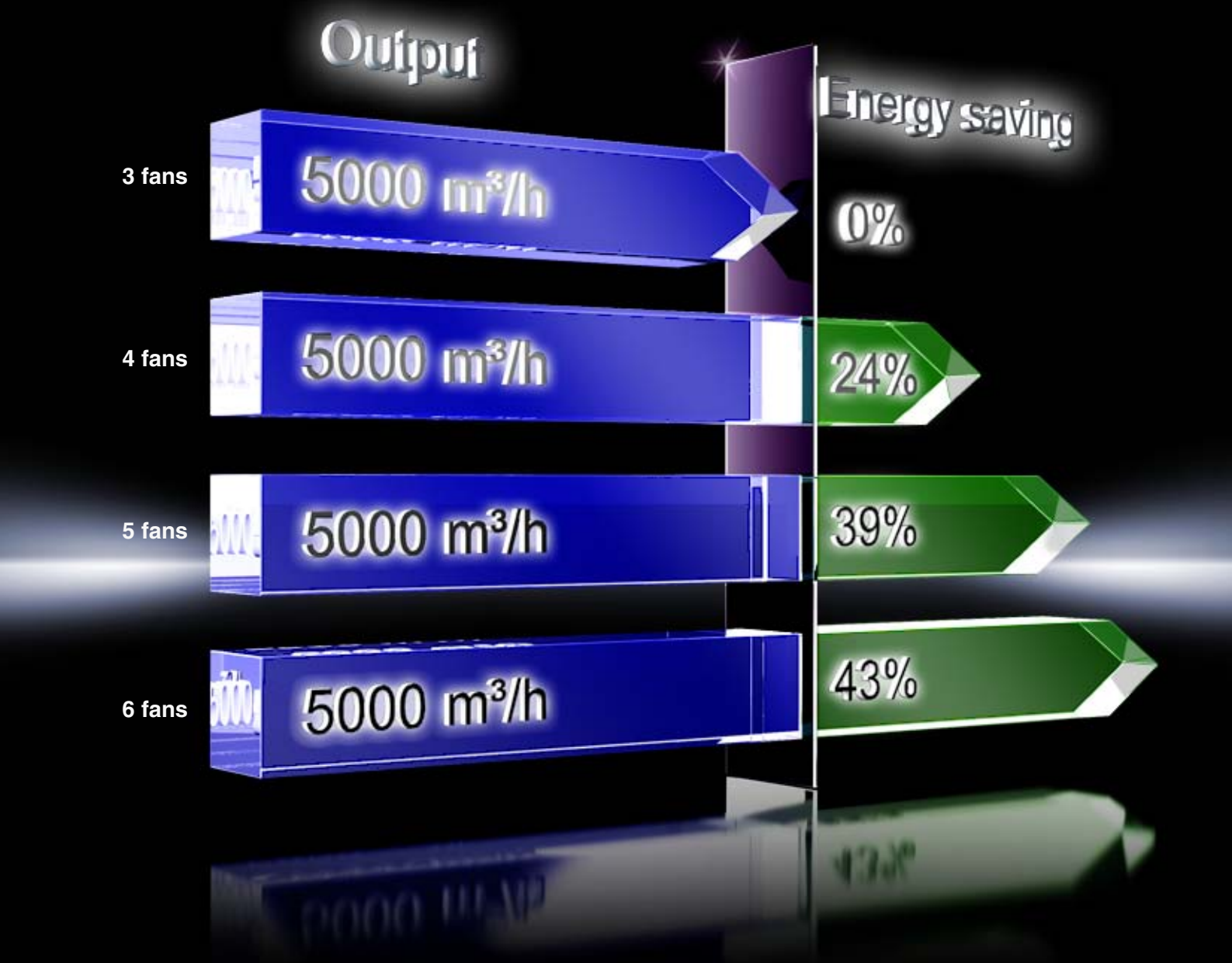


System layout

1. Air-cooled condenser
2. IT chiller
3. IT chiller for redundant application
4. LCP Rack CW
5. LCP T3+
6. LCP Passive
7. LCP Inline CW, set forward
8. LCP Inline flush CW, flush
9. LCP Rack DX
10. LCP Inline DX

Rittal – The System.

Faster – better – worldwide.



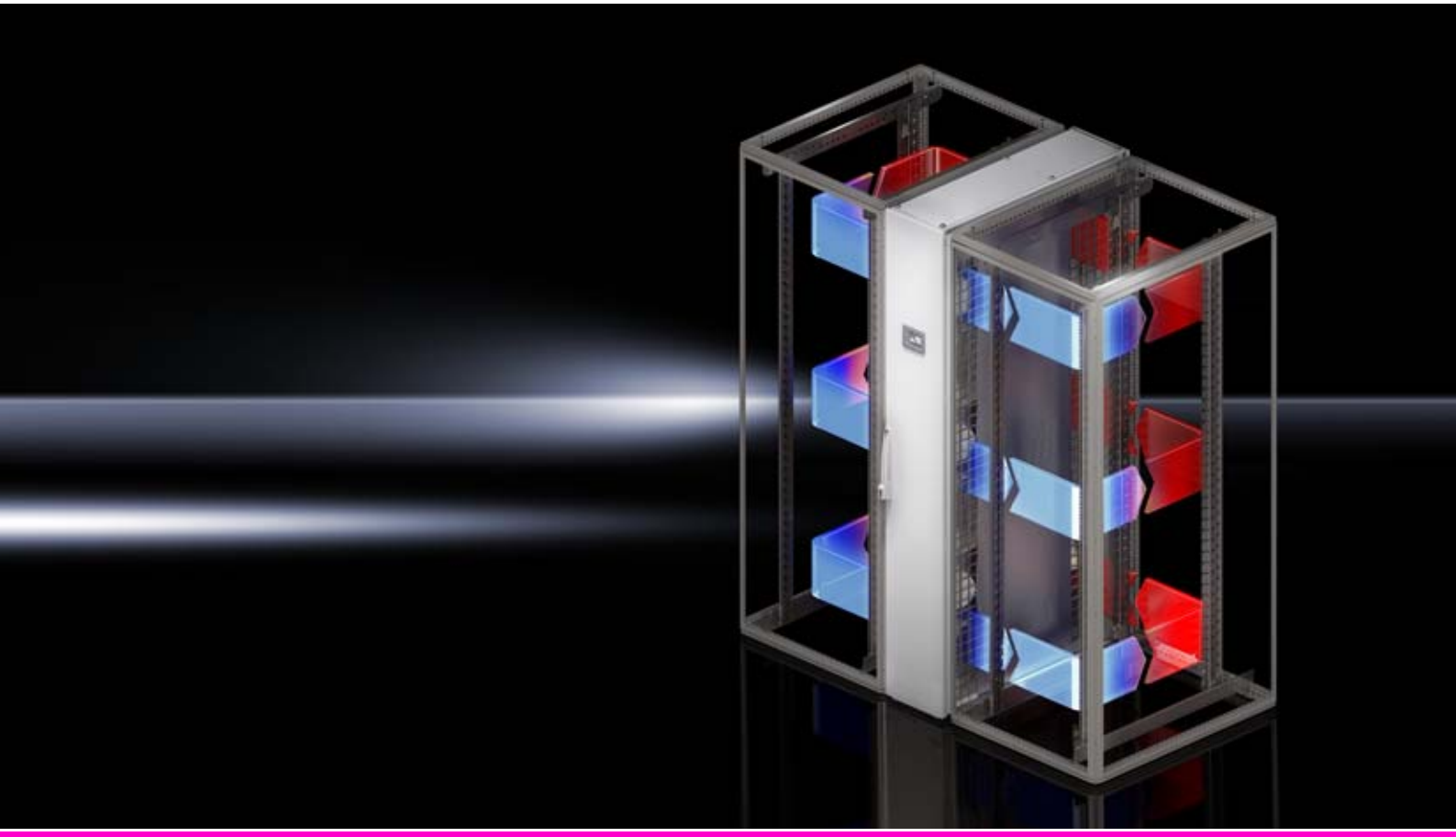
ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL

Better.

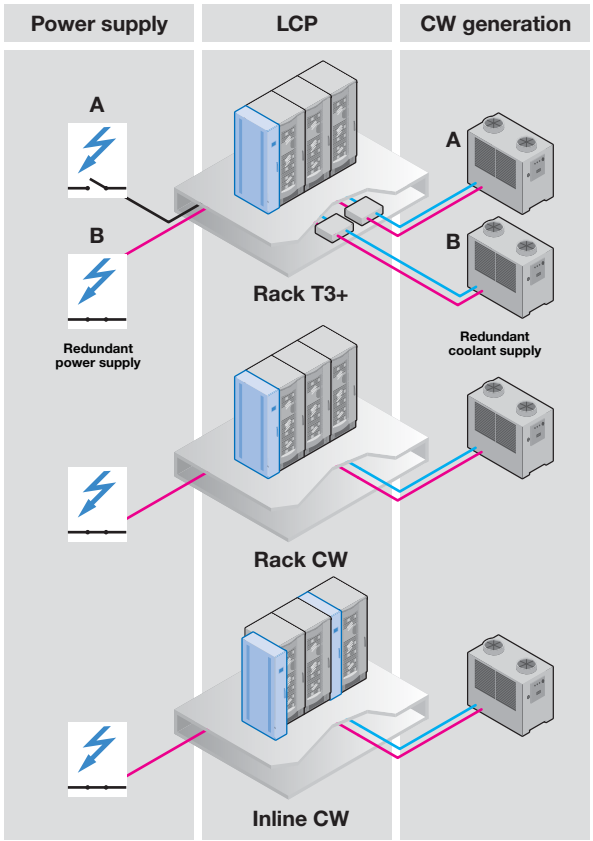
Easily achieve 50% energy savings!
Thanks to intelligent control and flexible configuration with additional fans, energy savings of up to 50% are easily achieved with the new LCP generation, at the same volumetric flow and constant cooling output.

- Identical volumetric flow with 3 – 6 fans
- Reduced noise levels with lower speeds
- Short amortisation period

Water-based cooling solution



Rack cooling

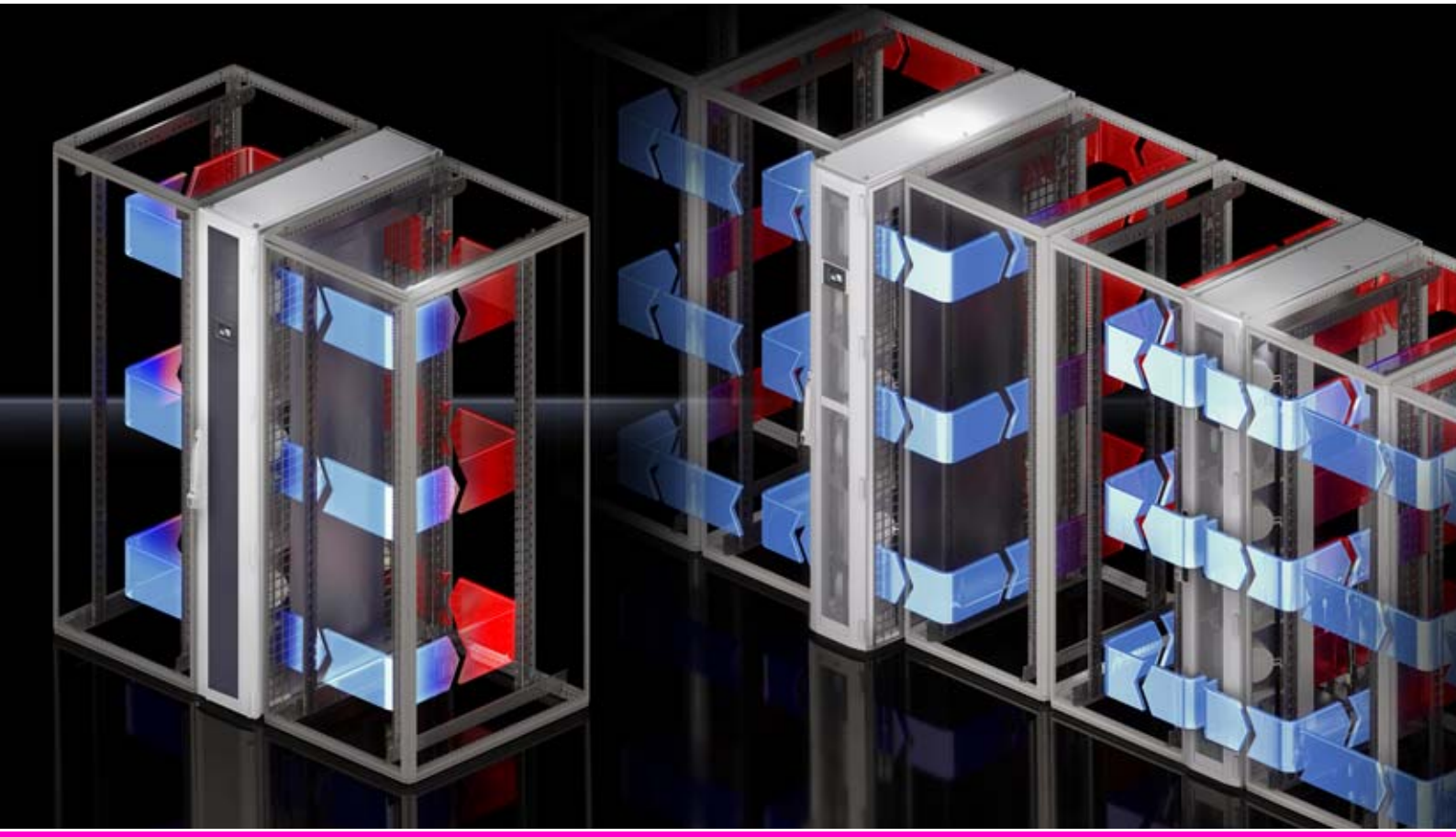


Data centres support corporate processes at ever-higher outputs. The packing density in computer systems is increasing, and processor capacity is growing. This leads to a continuous rise in heat development.
Keep temperatures at a constant level with the highly efficient Rittal Liquid Cooling Packages (LCP). With optimised operating costs, our LCPs precisely and effortlessly dissipate heat losses of up to 24 kW per enclosure.

LCP Rack T3+, CW

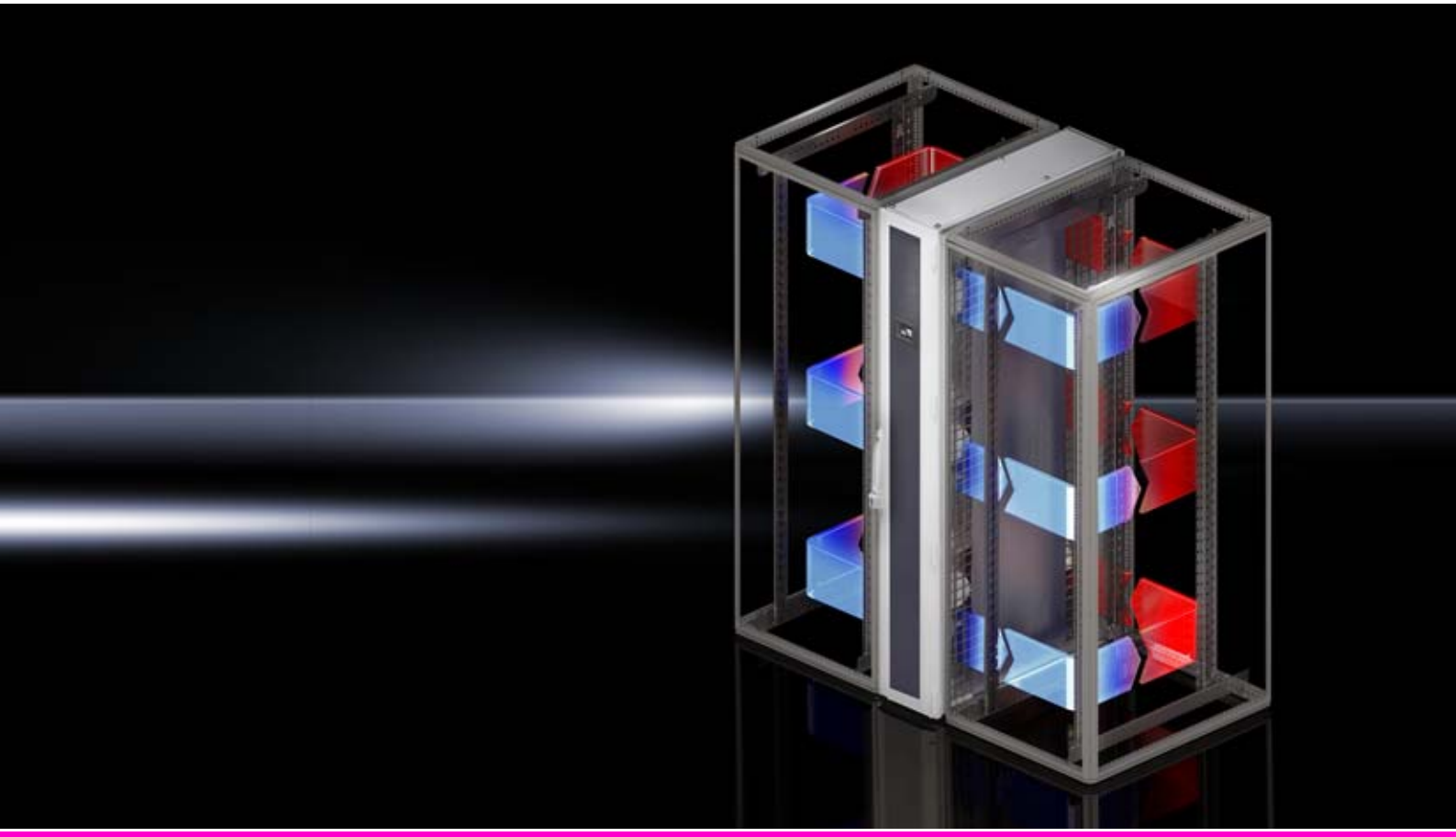
- Redundant heat exchanger unit with two active water circuits (A/B medium supply)
- Redundant power infeed (A/B power supply) with automatic changeover in case of an emergency
- Fully redundant cooling output of 24 kW
- Redundant fan design
- Integrated controller with its own web server for network and BMS interfaces
- Auto-load balancing function
- Auto-recovery function
- Energy saving with high water inlet temperatures (more free cooling)
- Minimised operating costs with efficient EC fan technology
- Integration into RiZone (data centre management software)

Water-based cooling solution



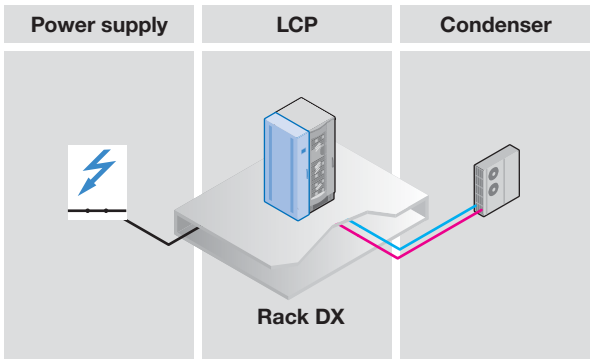
	Rack cooling	Suite cooling
	Data centres support corporate processes at ever-higher outputs. The packing density in computer systems is increasing, and processor capacity is growing. This leads to a continuous rise in heat development. Keep temperatures at a constant level with the highly efficient Rittal Liquid Cooling Packages (LCP). With optimised operating costs, our LCPs precisely and effortlessly dissipate heat losses of up to 55 kW per enclosure.	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.
	LCP Rack CW ■ Cooling output from 10 kW to 55 kW ■ Energy saving with high water inlet temperatures (more free cooling) ■ Minimised 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 ■ Simple representation of redundancies ■ Assembly- and service-friendly ■ Integration into RiZone (data centre management software)	**LCP Inline CW** ■ Cooling output from 10 kW to 55 kW ■ Cooling of several server racks ■ Energy saving with high water inlet temperatures (more free cooling) ■ Minimised 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 centre management software) ■ Variant set forward for ideal air distribution (cold air curtain) ■ Flush variant for confined spaces (narrow cold aisle)

Coolant-based cooling solution



Rack cooling

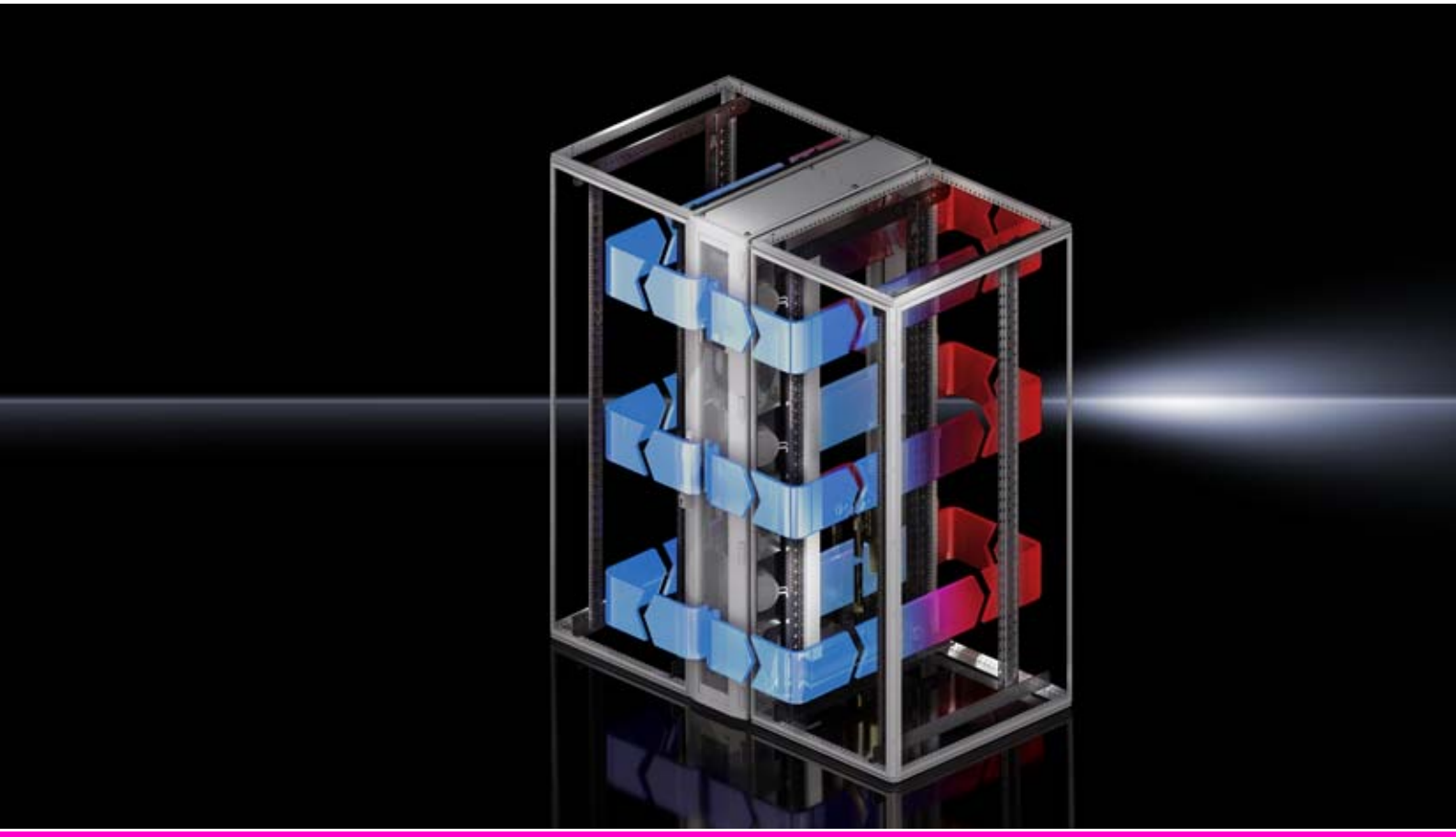
Whether rack-based cooling of one or two server racks, or suite cooling with aisle containment. LCP Rack DX or LCP Inline DX are the ideal cooling solution for small to medium-sized IT installations.
In particular, the stand-alone IT application is easily cooled with these devices.
Whereas in the past, cooling of stand-alone IT applications led to difficulties with conventional ceilings or air-conditioning units, the LCP DX devices support IT-compatible cooling. For retrofitting or exchanges, the existing coolant pipework can often be reused.



LCP Rack DX

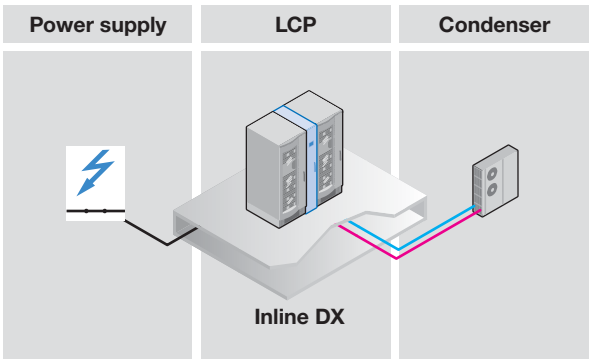
- Cooling output 12 kW
- Refrigerant R410a
- Minimised operating costs with efficient EC fan technology
- Spatial separation of cooling and server rack
- Integral condensate and leakage management
- Sophisticated control concept including online connection
- Optional cooling of one or two server racks
- Simple representation of redundancies
- Assembly- and service-friendly
- Integration into RiZone (data centre management software)
- Cost-effective installation by laying small-diameter coolant lines

Coolant-based cooling solution



Suite cooling

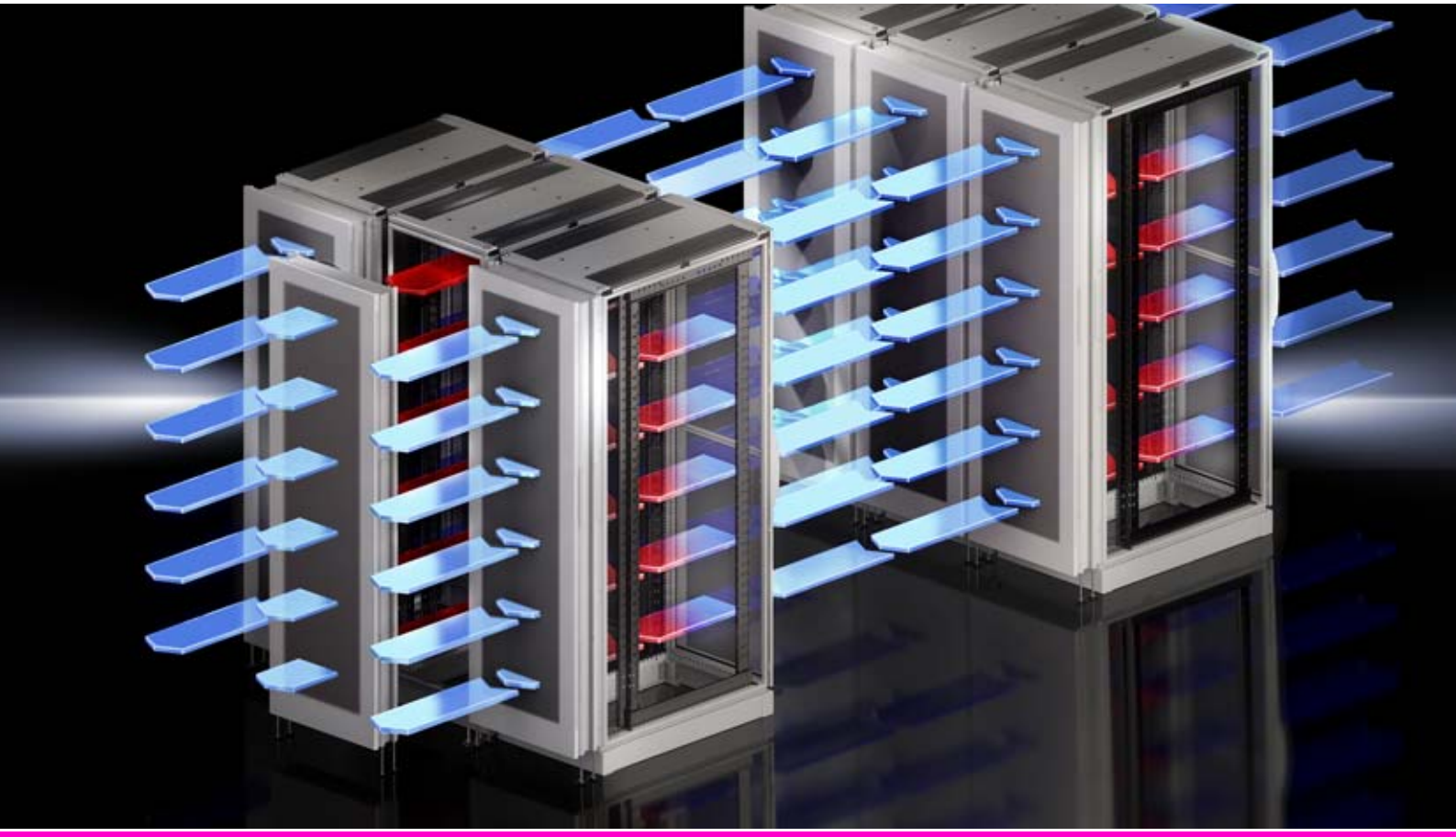
Whether rack-based cooling of one or two server racks, or suite cooling with aisle containment, LCP Rack DX and LCP Inline DX are the ideal cooling solution for small to medium-sized IT installations.
In particular, the stand-alone IT application is easily cooled with these devices.
Whereas in the past, cooling of stand-alone IT applications led to difficulties with conventional ceilings or air-conditioning units, the LCP DX devices allow IT-compatible cooling. For retrofitting or exchanges, the existing coolant pipework can often be reused.



LCP Inline DX

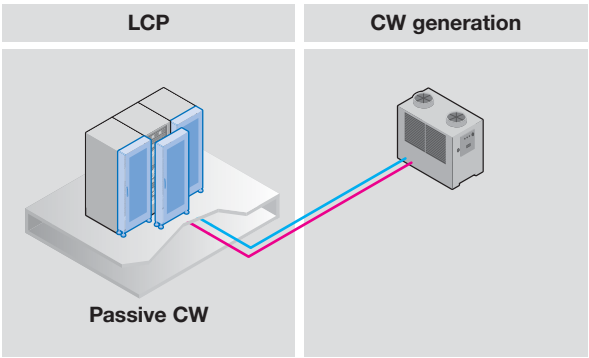
- Cooling output 12 kW
- Cooling of several server racks
- Refrigerant R410a
- Minimised operating costs with efficient EC fan technology
- Spatial separation of cooling and server rack
- Integral condensate and leakage management
- Sophisticated control concept including online connection
- Assembly- 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 centre management software)

Water-based fanless cooling solution



Rack cooling

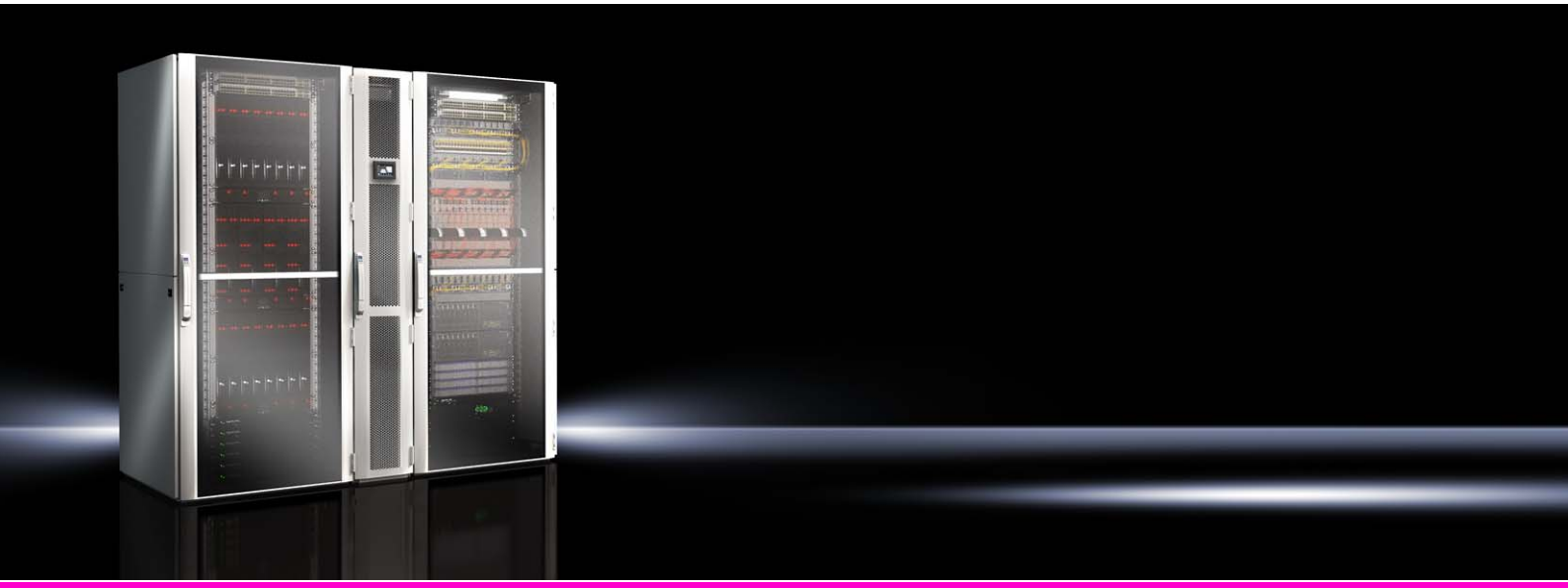
The fans in the IT equipment independently guide the warm air over the high-capacity heat exchanger. The entire data centre functions as a cold aisle, and there is homogeneous temperature distribution. The LCP Passive creates a very large, effective heat exchanger surface area in the data centre which facilitates high water inlet temperatures and a high proportion of free cooling.



LCP Passive CW

- High cooling output of 20 kW in a minimal space
- Easily exchanged for the standard rear door of the server enclosure
- Retrofitting is not a problem
- A door opening angle of 120° allows rear access to the server enclosure and makes assembly and configuration inside the enclosure easier
- The LCP does not have its own fan, and therefore does not need an integrated control
- Maximum energy efficiency, as there is no electrical power consumption whatsoever

LCP – Liquid Cooling Package CW



Accessories from page 48

Benefits:
- Maximum energy efficiency thanks 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 thanks to dynamic, continuous control of the cold water volume flow
- Using high water inlet temperatures increases the proportion of indirect free cooling, which in turn reduces operating costs
- Targeted cooling output thanks to modular box-type plug-in fan units
- Box-type plug-in fan units 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 rack prevents the ingress of water into the server enclosure
- Up to 55 kW cooling output on a footprint of just 0.36 m^2
- Minimal area load thanks to low weight
- Touchscreen display may be retrofitted

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
- Optional sensors
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone (data centre management software)

Application and mode of operation:
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.

Colour:
- RAL 7035
- Special colours available on request

Protection category:
- IP 40 to IEC 60 529

Technical information:
Available on the Internet.

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

TopTherm LCP Rack CW

Cooling medium		Water (see Internet for specifications)								
Model No.		**3311.130**			**3311.230**			**3311.260**		
Variant in relation to rack suite		Flush			Flush			Flush		
Rated operating voltage V, Hz		230, 1~, 50/60, 400, 3~, 50/60			230, 1~, 50/60, 400, 3~, 50/60			230, 1~, 50/60, 400, 3~, 50/60		
Dimensions mm	W x H x D	300 x 2000 x 1000			300 x 2000 x 1200			300 x 2000 x 1200		
	Height 2200	On request			On request			On request		
No. of fans in supplied state		1			1			4		
Useful cooling output		**10 kW**	**20 kW**	**30 kW**	**10 kW**	**20 kW**	**30 kW**	**40 kW**	**45 kW**	**55 kW**
Number of fans required		1	2	3	1	2	3	4	5	6
Air throughput, max.		4800 m^3/h with 3 fans			4800 m^3/h with 3 fans			8000 m^3/h with 6 fans		
Water inlet temperature		15 °C								
Permissible operating pressure		6 bar								
Duty cycle		100%								
Type of electrical connection		Connector								
Water connection		$1^1/_2$″ external thread								
Weight, max.		200 kg	207 kg	214 kg	200 kg	207 kg	214 kg	221 kg	228 kg	235 kg
Temperature control		Linear fan control								
		Two-way control valve								
Fans may be exchanged with the system operational		yes			yes			yes		
EC fan		■			■			■		

Accessories	Packs of				Page
Fan module	1	3311.010	3311.010	3311.010	19
Touchscreen display, colour	1	3311.030	3311.030	3311.030	465[1)]
Connection hose, top	2	3311.040	3311.040	3311.040	465[1)]

■ Included with the supply. [1)] See Catalogue 33.

LCP – Liquid Cooling Package CW

Accessories from page 48

Benefits:
- Maximum energy efficiency thanks 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 thanks to dynamic, continuous control of the cold water volume flow
- Using high water inlet temperatures increases the proportion of indirect free cooling, which in turn reduces operating costs
- Targeted cooling output thanks to modular box-type plug-in fan units
- Box-type plug-in fan units 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 rack prevents the ingress of water into the server enclosure
- Up to 55 kW cooling output on a footprint of just 0.36 m²
- Minimal area load thanks to low weight
- Touchscreen display may be retrofitted

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
- Optional sensors
- Direct connection of the unit via SNMP over Ethernet
- Integration into RiZone (data centre management software)

Note:
- Height 2200 mm available on request.

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

Application and mode of operation:
The LCP is designed for siting within a bayed enclosure suite. 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. The LCP achieves maximum performance and efficiency in conjunction with aisle containment. A raised floor is not required.

Colour:
- RAL 7035
- Special colours available on request

Protection category:
- IP 40 to IEC 60 529

Technical information:
Available on the Internet.

TopTherm LCP Inline CW

Cooling medium		Water (see Internet for specifications)								
Model No.		**3311.530**			**3311.540**			**3311.560**		
Variant in relation to rack suite		Set forward			Flush			Set forward		
Rated operating voltage V, Hz		230, 1~, 50/60, 400, 3~, 50/60			230, 1~, 50/60, 400, 3~, 50/60			230, 1~, 50/60, 400, 3~, 50/60		
Dimensions mm	W x H x D	300 x 2000 x 1200			300 x 2000 x 1200			300 x 2000 x 1200		
No. of fans in supplied state		1			2			4		
Useful cooling output		**10 kW**	**20 kW**	**30 kW**	**18 kW**	**25 kW**	**30 kW**	**40 kW**	**45 kW**	**55 kW**
Number of fans required		1	2	3	2	3	4	4	5	6
Air throughput, max.		4800 m³/h with 3 fans			4800 m³/h with 3 fans			8000 m³/h with 6 fans		
Water inlet temperature		15 °C								
Permissible operating pressure		6 bar								
Duty cycle		100%								
Type of electrical connection		Connector								
Water connection		1 1/2″ external thread								
Weight, max.		200 kg	207 kg	214 kg	207	213	221	221 kg	228 kg	235 kg
Temperature control		Linear fan control								
		Two-way control valve								
Fans may be exchanged with the system operational		yes			yes			yes		
EC fan		■			■			■		

Accessories	Packs of				Page
Fan module	1	3311.010	3311.010	3311.010	19
Touchscreen display, colour	1	3311.030	3311.030	3311.030	465[1)]
Connection hose, top	2	3311.040	3311.040	3311.040	465[1)]
Rear adaptor for LCP Inline	1	3311.080	–	3311.080	18

■ Included with the supply. [1)] See Catalogue 33.

LCP – Liquid Cooling Package CW

Accessories from page 48

Benefits:
- Error-tolerant, efficient cooling of server racks with high thermal loads
- Fully redundant – Two active cooling circuits and two switchable power circuits ensure optimum fail-safeness
- The built-in controllers are capable of adapting all device parameters automatically to preserve the required climate conditions
- A separate decentralised intelligence which automatically recognises emergency situations and responds appropriately with the “auto-load balancing” and “auto-recovery” functions
- Interfaces which facilitate user-friendly operation and monitoring via the network or BSM systems

Optional:
– Fully integrated fire detection and extinguisher system
– Automatic server enclosure door opening
– Various sensors

Application and mode of operation:
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 enclosures at the sides.

Colour:
– RAL 7035

Protection category:
– IP 40 to IEC 60 529

TopTherm LCP T3+ CW

Cooling medium		Water (see Internet for specifications)
Model No.		**3300.239**
Rated operating voltage V, Hz		230, 1~, 50/60 400, 3~, 50/60
Dimensions mm	W x H x D	300 x 2200 x 1200
Usable U		42
Useful cooling output, redundant		**up to 20 kW**

Duty cycle	100%
Type of electrical connection	C19/C20
Temperature control	Linear fan control
	Two-way control valve
Fans may be exchanged with the system operational	■
EC fan	■
Auto-load balancing	■
Auto-recovery	■

LCP – Liquid Cooling Package CW

Accessories from page 48

Benefits:
- High cooling output of 20 kW in a minimal space
- Easily exchanged for the standard rear door of the server enclosure
- Retrofitting is not a problem
- A door opening angle of 120° allows rear access to the server enclosure and makes assembly and configuration inside the enclosure easier
- The LCP does not have its own fan
- Maximum energy efficiency, as there is no electrical power consumption whatsoever

Application and mode of operation:
Air/water heat exchanger mechanically integrated into a rear door for server enclosures. The 482.6 mm (19″) equipment built into the server enclosure must have suitable airflow capabilities in order to route the heated waste air through the heat exchanger rear door. The waste air is cooled down to room temperature. The heat energy absorbed by the water is transported to the external cold water supply, where it is cooled back down to the required inlet temperature.

Colour:
– RAL 7035

Approvals:
Available on the Internet.

TopTherm LCP Passive CW

Model No.		**3311.600**
Dimensions mm	W x H x D	600 x 2000 x 170
Usable U		42
Useful cooling output		**up to 20 kW**

LCP – Liquid Cooling Package DX

Accessories from page 48

Benefits:
- Maximum energy efficiency thanks 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
- Absorbed thermal energy is emitted to the ambient air at the external condenser location, without heating up the installation room
- Ideal for IT cooling in small and medium-sized locations
- Humidifier, reheater or condensate pump available on request
- Higher cooling outputs available on request
- Specific maintenance of the LCP DX thanks to separation of cooling and server rack

Functions of the LCP Rack DX:
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 rack at the sides.

Functions of the LCP Inline DX:
The LCP is designed for siting within a bayed enclosure suite. Hot air is drawn in from the room or hot aisle at the rear of the device, cooled by the high-capacity compact impellers, and blown back into the room or cold aisle after cooling.

LCP Rack/Inline DX

Installation in bayed enclosure suite	**Flush/Rack DX**		**Flush/Inline DX**	
Cooling medium	R410a	R410a	R410a	R410a
Model No.	**3311.410**	**3311.420**	**3311.430**	**3311.440**
Rated operating voltage V, Hz	380 V AC, 3~, 50 480 V AC, 3~, 60	380 V AC, 3~, 50 480 V AC, 3~, 60	380 V AC, 3~, 50 480 V AC, 3~, 60	380 V AC, 3~, 50 480 V AC, 3~, 60
Dimensions mm W x H x D	300 x 2000 x 1000	300 x 2000 x 1200	300 x 2000 x 1000	300 x 2000 x 1200
Number of fans	4	4	4	4
Air throughput of fans	4800 m³/h	4800 m³/h	4800 m³/h	4800 m³/h
Cooling output	**12 kW**	**12 kW**	**12 kW**	**12 kW**
Duty cycle %	100	100	100	100
Type of connection (electrical)	Connection clamp	Connection clamp	Connection clamp	Connection clamp
Fans may be exchanged with the system operational	■	■	■	■
EC fan	■	■	■	■
Colour	RAL 7035 Special colours available on request		RAL 7035 Special colours available on request	
Temperature control	Linear fan control Inverter-regulated compressor		Linear fan control Inverter-regulated compressor	
Condenser unit	3311.360		3311.360	
SNMP card	3311.320		3311.320	

■ Included with the supply

Accessories for LCP CW/DX

Touchscreen display, colour

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

For LCP CW	Packs of	Model No.
3311.130 3311.230 3311.260 3311.530 3311.540 3311.560	1	**3311.030**

Condenser unit

The condenser unit is needed to operate the coolant-based LCPs, and comprises the external condenser and fan. The pipework between the LCP DX and the condenser is not included with the supply.

Coolant:
– R410a

For LCP DX	Packs of	Model No.
3311.410 3311.420 3311.430 3311.440	1	**3311.360**

Vertical shielding

To block the airflow on the left and right of the 482.6 mm (19″) level, for enclosure height 2000 mm.

Material:
– Cellular PU foam
– Flame-inhibiting to UL 94 (HF1)
– Length: 1900 mm
– Self-adhesive on one side

For sealing between	For enclosure width mm	Packs of	Model No.
Side panel and 482.6 mm (19″) level	600	1	**3301.380**
	800	1	**3301.390**
LCP and 482.6 mm (19″) level	600	1	**3301.370**
	800	1	**3301.320**

Connection hose, bottom and top

Flexible connection hose, may be cut to required length, including union nuts on both sides for connecting the LCP to existing pipework.

For LCP CW	Thread	Water connection from	Packs of	Model No.
3311.130 3311.230 3311.260 3311.530 3311.560	1½″	bottom/ top	2	**3311.040**

Rear adaptor

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

For LCP	Packs of	Model No.
3311.530 3311.560	1	**3311.080**

SNMP card

SNMP card as an accessory for connecting LCP Rack/Inline DX units to the network.

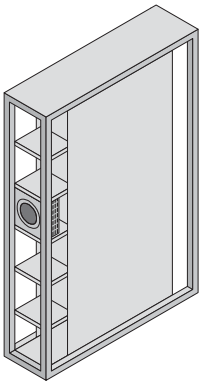
For LCP DX	Packs of	Model No.
3311.410 3311.420 3311.430 3311.440	1	**3311.320**

Fan module

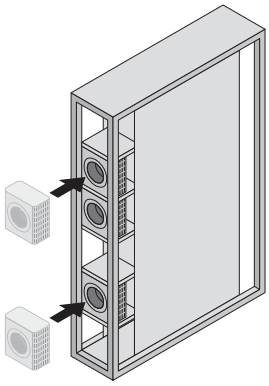
for LCP

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

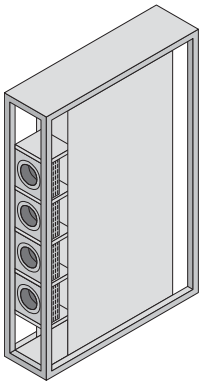
For LCP	Packs of	**Model No.**
3311.130, 3311.230, 3311.260, 3311.530, 3311.560	1	**3311.010**



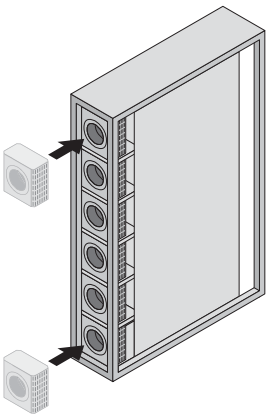
The LCP 3311.130/ .230/.530 (max. 30 kW) is supplied with one fan module as standard.



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



The LCP 3311.260/.560 (max. 55 kW) is supplied with four fan modules as standard.



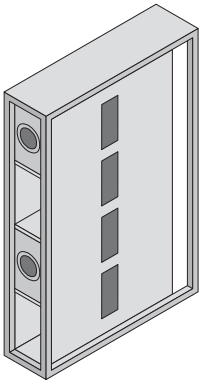
To achieve the max. cooling output of 55 kW, the customer/service needs to install two additional fan modules.

Fan module

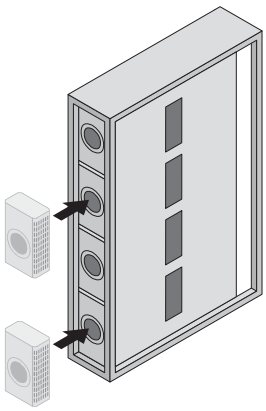
for LCP

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

For LCP	Packs of	**Model No.**
3311.540	1	**3311.011**



Supplied as standard with two fan modules.



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

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