



IT Cooling Solutions

CyberRow

Intelligent air flow control – for more efficiency in rack cooling

STULZ



Direct rack air-conditioning goes in a new direction

An innovative idea ensures precise climate control and reliable ICT systems – CyberRow from STULZ

There are various ways of air conditioning a data centre – and any of these may lead to your goal. For delivering the best results for your requirements, we are the only manufacturer in the world to offer a range of different, all-embracing air-conditioning solutions for the diverse needs of the data centre. For it is often the little details that make a particular system the perfect choice.

With CyberRow, we have now developed an innovative air-conditioning system in which the air is conveyed in a completely new direction – horizontally! The individual units are positioned in the server room itself between the racks, so that they can dissipate extreme heat from the servers. This technique considerably improves air conduction, as the cold air is transported in two directions via an outlet on the side, and evenly distributed throughout the data centre. The system's closeness to the rack means the air does not have to flow very far, so pressure losses are kept to a minimum. All of these features are reflected in a high efficiency rating.

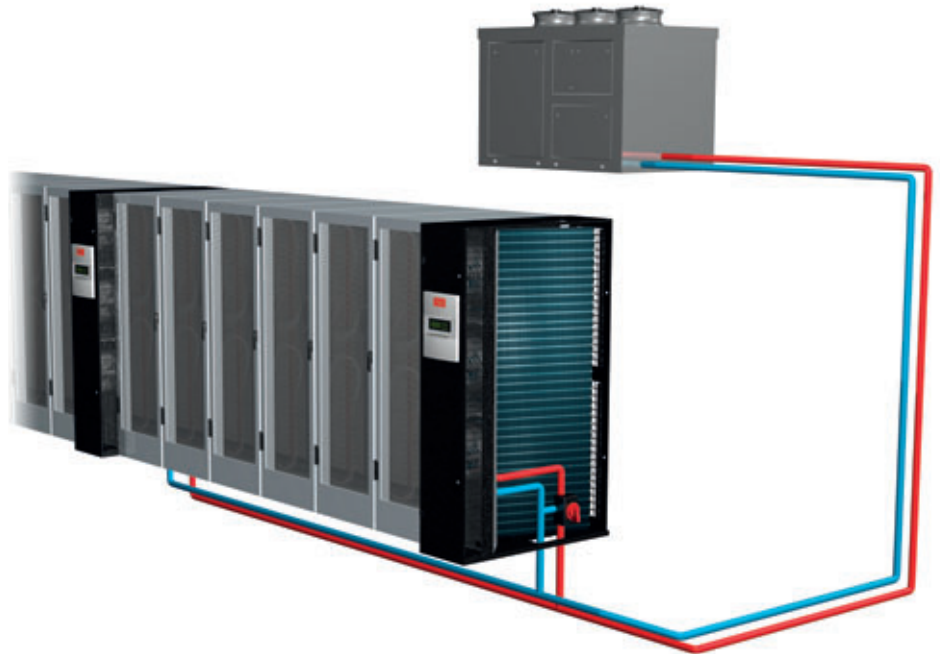


A-system with compressor cooling

The refrigerant circuit of the A/C units consists of an evaporator, an electronic expansion valve, an inverter-driven compressor and an external air-cooled condenser. As the room air, encouraged by fans, flows through the evaporator, heat is removed from it and emitted into the refrigerant. The A/C unit and external condenser are connected to one another by means of a closed refrigerant circuit.

CW system with liquid cooling

The CW unit manages without its own refrigerant circuit, but requires separate chilled water generation. The room air conveyed by the fans flows through the direct cooling unit, which transfers the heat to the cooling water. A chiller removes the heat from the cooling water. The A/C unit and chiller are connected to one another by means of a closed cooling water circuit.



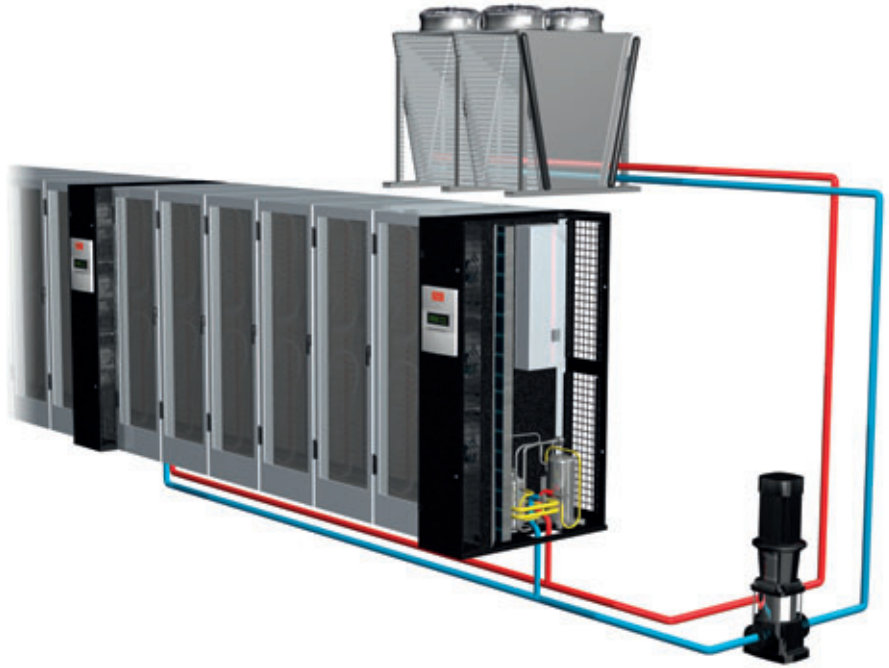
Uncompromising installation and cooling with CyberRow

The choice is yours: Based on our four systems, you can configure an entirely new air-conditioning solution with rack cooling or you can integrate CyberRow into an existing data centre, making use of available resources. EC fans, inverter-controlled scroll compressors and electronically controlled expansion valves ensure precision climate control as standard, thereby achieving maximum efficiency in partial-load mode.

- Independent of rack manufacturer, usable in any data centre
- Use in low and high density areas
- Ideal for data centres without raised floors
- Highly efficient cold-aisle containment systems can be implemented. Thanks to the horizontal air flow, additional housing is not essential.

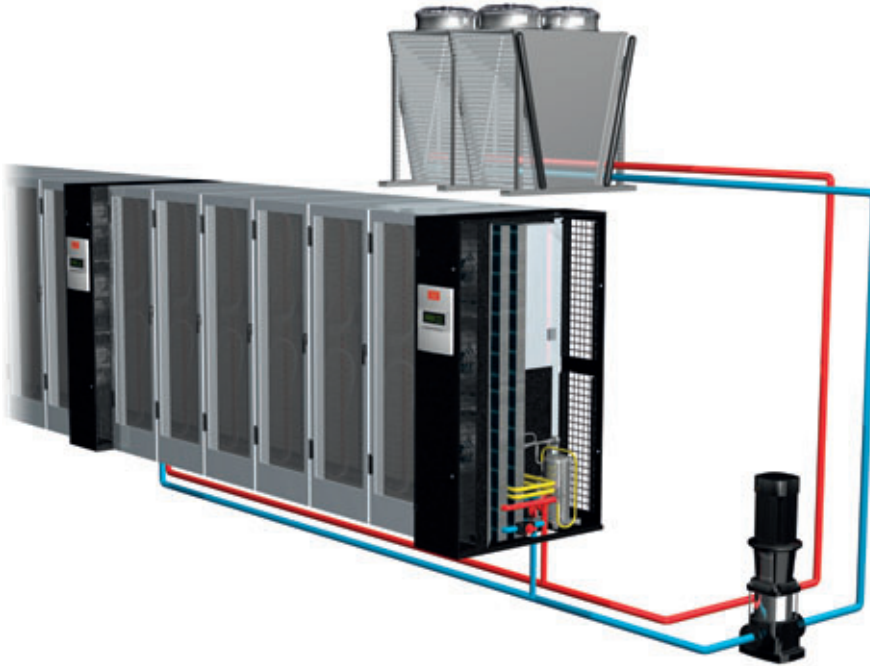
G-system with compressor cooling and plate type condenser

Like the A-system, but with a difference: in the G-system, the heat from the DX circuit is transferred to a water-glycol mixture by a plate-type condenser integrated in the A/C unit. The mixture circulates in a closed circuit, and emits the heat to the outside air via an external dry cooler.



GE system with Indirect Free Cooling

This cooling system combines a G-system with Indirect Free Cooling. The GE system switches to energy-saving mode as soon as the ambient air temperature permits. The ambient air is then utilised for Indirect Free Cooling. Electricity consumption for Racks falls by up to 60%. Using CyberRow GE cuts operating costs and is environmentally friendly.

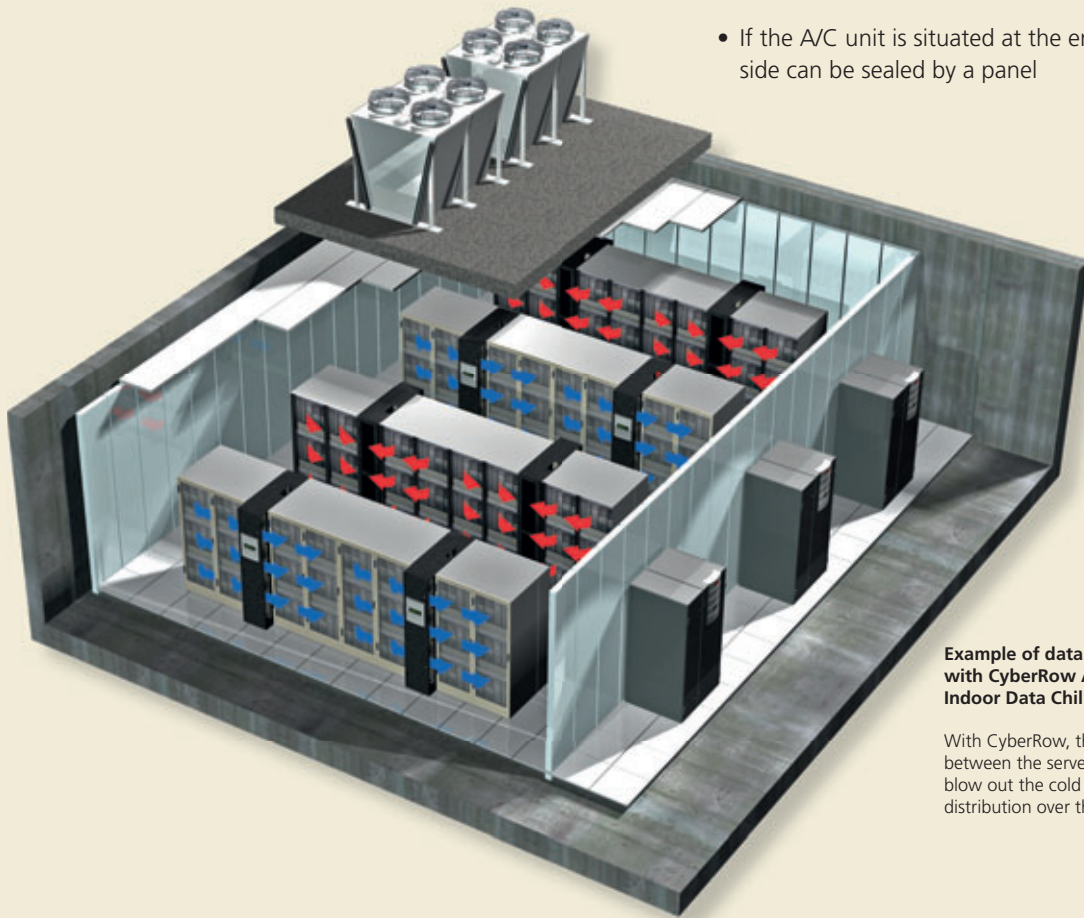


As an option, we can also supply CyberRow with a frontal air outlet

Advantages of rack cooling with STULZ CyberRow

Thanks to its horizontal dual-direction frontal air outlet, CyberRow creates a uniform, close-contact air flow directly in front of the racks – meaning the cold air is always directed to just where it is needed.

- The distribution of cold air is targeted
- At the end of the rows of servers, the cold air automatically prevents the warm return air from entering the cold aisle
- The servers to the left and right of the A/C unit receive an optimum supply of cold air
- The A/C units do not need to be oversized because of the better air control
- If the A/C unit is situated at the end of the server row, one side can be sealed by a panel

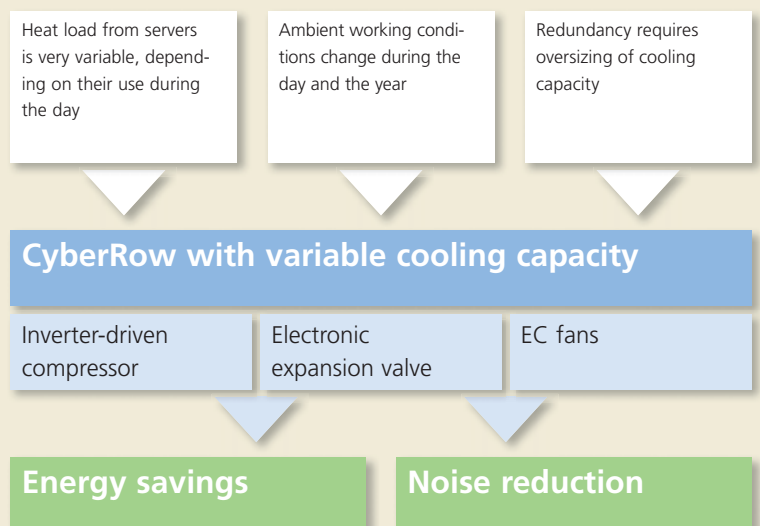


Example of data centre air conditioning with CyberRow A/C units and CyberCool Indoor Data Chiller:

With CyberRow, the A/C units are placed directly between the servers. The speed-controlled EC fans blow out the cold air from the sides, ensuring uniform distribution over the entire length of the aisle.

CyberRow with variable cooling

High-performance IT systems work around the clock, and conditions in the data centre change as the day goes by. CyberRow A/C units take this into account – and vary their cooling capacity in accordance with the heat load. This ensures that there is never insufficient or excess cold air.



CyberRow DX – compressor cooling integrated right where you need it

The CyberRow DX is the embodiment of our decades of experience in the air conditioning of data centres. All its tried and tested components are perfectly tuned to each other, and can reliably deliver the necessary cooling capacity even in the most restricted space.



- 1 E-box
- 2 Air filter
- 3 Evaporator
- 4 EC fans
- 5 Inverter-driven compressor
- 6 Humidifier (optional)

Inverter-controlled brushless scroll compressor (for DX models only)

The compressor speed is infinitely variable dependent on the heat load, so delivering maximum efficiency. The resultant savings are especially rewarding in partial-load mode.



CyberRow CW – Liquid cooling integrated right where you need it

High performance values and top results in the most restricted space: this requirement was also decisive in the development of our CW units. Here, too, you can rely on ultra-reliable, tried and tested STULZ technology.



- 1 CW heat exchanger with low air and liquid-side pressure losses
- 2 EC fans
- 3 Air filter
- 4 Pipe connections (access from above and below always possible)
- 5 2-way valve

Ideal cold water supply for CyberRow: STULZ Indoor Data Chiller

Optimum cold water supply to CyberRow units is provided by STULZ CyberCool GE Indoor Data Chillers with Indirect Free Cooling – safe, efficient and space-saving.

CyberCool GE selects the optimum operating mode depending on the ambient temperatures and cold water conditions. Energy-intensive compressor cooling is only used when the ambient temperature does not allow Free Cooling.



CyberRow – Efficiency at a glance

CyberRow is the innovative air-conditioning system in which the air conduction takes a whole new direction – horizontal! The individual units are positioned in the server room itself between the racks, greatly improving air conduction. This is what the CyberRow has to offer:



- Two sizes:
Size 1: 1,950x400x1,175 (HxWxD)
Size 2: 1,950x600x1,175 (HxWxD)
- 3x EC fans, independently controlled, with speed modulation according to return and supply air temperatures
- Inverter-driven and brushless scroll compressor (only for DX units available)
- Maintenance access only from front and back
- C2020 connectivity to BMS for telemonitoring
- Zig-zag G4 air filter with metallic frame
- Powder-coated external frame with hinged front and back panels
- Passage of chilled water and refrigerant pipes from bottom and top

CyberRow		DX		CW	
Unit Type		EHMB4A	EHMC7A	EHMC2W	EHME5W
Height	mm	1,950	1,950	1,950	1,950
Depth	mm	1,175	1,175	1,175	1,175
Width	mm	400	600	400	600
Cooling capacity ¹⁾	kW	24.0	36.5	32.2	56.0
Airflow ¹⁾	m ³ /h	4,700	7,700	6,000	10,800
Water flow - cooling ¹⁾	l/h	n.a.	n.a.	5,540	9,630

¹⁾ Nominal conditions

Return air temperature 35°C / RH 30%, DX units: Condensing temperature 45°C, CW units: EWT all models 10°C, Water dT all models 5°C, refrigerant: water without additives,

Gross cooling capacities (including power dissipated by fans)

Convenient control and monitoring of CyberRow – with the C2020 microprocessor

The C2020 microprocessor forms part of every STULZ CyberRow air-conditioning module, and keeps all the system's active components in balance. This proven controller forms the heart of the control concept, and enables you to reliably keep control of your STULZ CyberRow precision air-conditioning system. You can monitor the system and view operating data either using separate operator terminals, your PC or via a link to existing BMS.

Control features

- **Six temperature probes**

3 probes for supply air, 3 probes for return air, for closed-loop controlled cooling in 3 independent vertical zones. The fan is modulated as a function of the temperature difference between the return and the supply air. The compressor speed and chilled water valve opening are adjusted in line with the supply air temperature.

- **Fan redundancy**

When a fan fails, the remaining 2 fans speed up.

- **Sequencing LAN units**

Connection of units in LAN to manage sequencing and redundancy when a unit is faulty

- **Air flow and filter alarms**

- **BMS connectivity**

Standard serial port RS485 for connectivity to BMS via ModBus and Stulz protocols

- **Optional humidity sensor**

- **Optional water detector**



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IT Cooling Solutions

Close to you all over the world.

... With specialist, competent partners in our subsidiaries and exclusive sales and service partners around the world. Our five production sites are in Europe, North America and Asia.