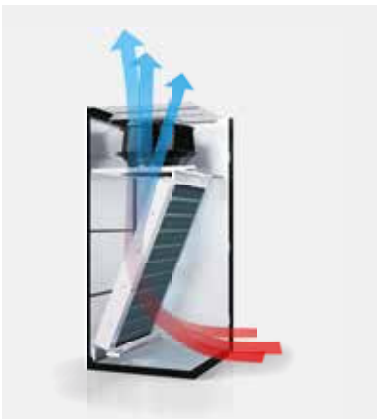


**STULZ**

CLIMATE. CUSTOMIZED.



# CyberAir 3PRO CW

Innovative chilled water cooling for data centers.  
Made in Germany.

# Services on your doorstep



With over 10 branches and 140 highly qualified service engineers throughout Germany, STULZ Service offers expert, rapid solutions to problems in all fields.

STULZ is a global company with headquarters in Hamburg, Germany, 19 subsidiaries, 10 production sites, plus sales and service partners in more than 140 countries.

Since 1971 STULZ has specialized in the development and production of precision air conditioning units and chillers for data centers.



## Technical development from Germany

We put a great deal of experience and innovative spirit into our air conditioning systems. Engineers, special departments and sales employees work closely together and are involved through all stages of development, all the way to the finished product. We brook no compromise where the efficiency of our products is concerned, and cost-effective operation is at the heart of our endeavors.

## Test to your specifications

In our state-of-the-art, 700-square-meter Test Center with its various climate chambers, we can perform a variety of tests on precision air conditioning systems. If you decide to purchase a STULZ solution, you have the option of booking a witness test at our Test Center. This allows you to have the desired air conditioning system tested according to your exact specifications, ensuring transparency and providing you with information on the system's performance and energy consumption.



## Maximum cooling capacity Minimum footprint Optimum efficiency

The CyberAir 3PRO CW controls the conditions in the data center with the utmost precision, reliability and energy efficiency. Because STULZ technology leads the field, it can exploit potential savings to the full while still ensuring maximum reliability.

No matter how different data centers may be, the CyberAir 3PRO CW is flexible and made to measure: it is available in Upflow, Downflow, Raised Floor and High versions, and in seven sizes.

## + Advantages at a glance

- Maximum energy efficiency thanks to leading STULZ technology
- Maximum potential savings with Indirect Dynamic or Direct Free Cooling
- Maximum cooling capacity with a minimal footprint
- Highly efficient air conduction (Airflow Efficiency Ratio)
- Optimized for operating conditions based on the ASHRAE recommendation
- Flexibility for individual customer solutions: 2 cooling systems (CW, CW2), 7 sizes, different air conduction methods, a variety of heat exchangers
- Superior EER values due to maximum size heat exchangers and filter surfaces
- Minimal pressure drops thanks to the unit's optimum design
- EC fans reduce power consumption
- Compact design facilitates transport and installation
- Control based on the supply air, return air, room air and server inlet temperature
- CW-Standby-Management, Differential Pressure Control and Filter-Control-Management
- Individual unit test at the STULZ Test Center

**"Reliability and energy efficiency are the principal challenges for all data center operators. The CyberAir 3PRO CW has been developed to satisfy both these requirements."**

**Reliability & energy efficiency #1**

## **Fans in the raised floor**

The CyberAir 3PRO CW offers four air conduction systems. ASR air conduction (fans integrated under the raised floor), in particular, hugely reduces fan power consumption by ensuring minimal turbulence and changes in airflow direction, for energy savings that you will notice straight away.

**Reliability & energy efficiency #2**

## **Heat exchangers with optimized Energy Efficiency Ratio (EER)**

The new CyberAir 3PRO CW has enabled EER values to be considerably increased even further. This was achieved by modifying the geometry of the heat exchangers and optimizing the unit's design to ensure minimal pressure drops, greatly increasing efficiency.



## EC fan with 630 mm diameter



### Increased energy efficiency, reduced power consumption and noise:

- Specially developed for the STULZ CyberAir 3PRO
- Speed-controlled fan
- Minimal power consumption
- Reduced noise
- Nominal airflow rate at a fan speed optimized for partial load
- High airflow in each size
- State-of-the-art motors, electronic processor and impellers
- Aerodynamically optimized vanes
- Integrated soft start
- Surpasses the requirements of EU Ecodesign Directive ErP 2015



## Optimized heat transfer

In chilled water systems, the heat exchangers are the most important component and a guarantee of the best possible heat transfer. The heat exchanger system of the CyberAir 3PRO CW is continually being further developed and optimized for the latest data center applications. Different versions of heat exchangers are available, ensuring the flexibility to satisfy every customer's specific requirements.

### Special solution for modernized data centers:

A special heat exchanger is suitable for operation at high air-side and low water-side temperatures – and therefore for data center modernization projects where old chillers will continue to be used. This configuration enables supply air conditions in accordance with the ASHRAE recommendation.

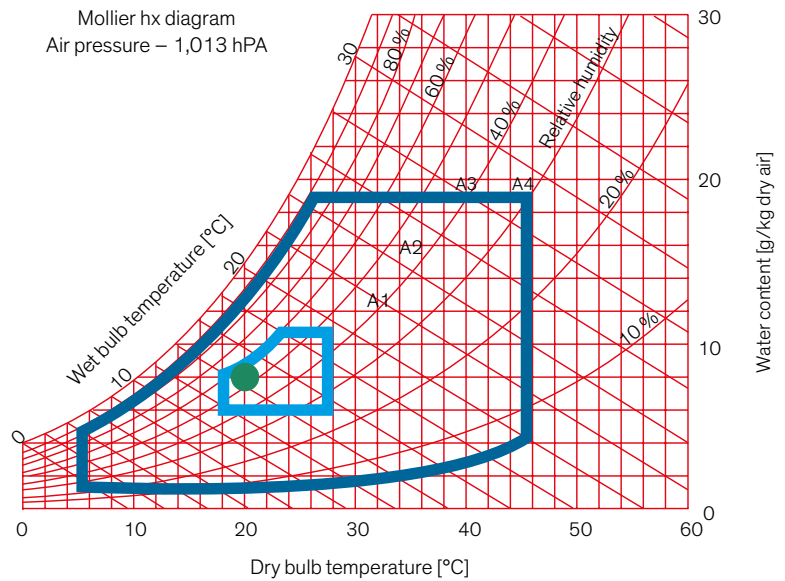
### + Advantages at a glance

- Optimized cooling unit geometry
- Reduced water and air-side pressure drops
- Several versions for maximum flexibility

# Optimum supply air conditions as per ASHRAE recommendation

In order to cool data centers as efficiently as possible without compromising on reliability in return, ASHRAE has published a recommendation for the air temperature at the server inlet. For decades, STULZ has been developing air conditioning units for mission-critical applications, in which malfunctions could have severe consequences. However, in order to keep a constant eye on energy efficiency as well, the supply air conditions of the CyberAir 3PRO CW have been optimized to achieve the range recommended by ASHRAE.

- ASHRAE recommendation: Range in which IT systems work both with the greatest reliability and the most energy efficiency
- Supply air temperature of the STULZ CyberAir 3PRO CW
- allowable range



# Safe control, reliable monitoring

## Everything at a glance with the C7000 controller:

- Autonomous controllers in every air conditioning module ensure maximum redundancy (no chain reaction if a module fails)
- Optional sequencing with standby functions enables the individual air conditioning modules of a group to be used to a greater or lesser extent with the utmost flexibility
- Central control of up to 20 air conditioning modules per data bus system is possible



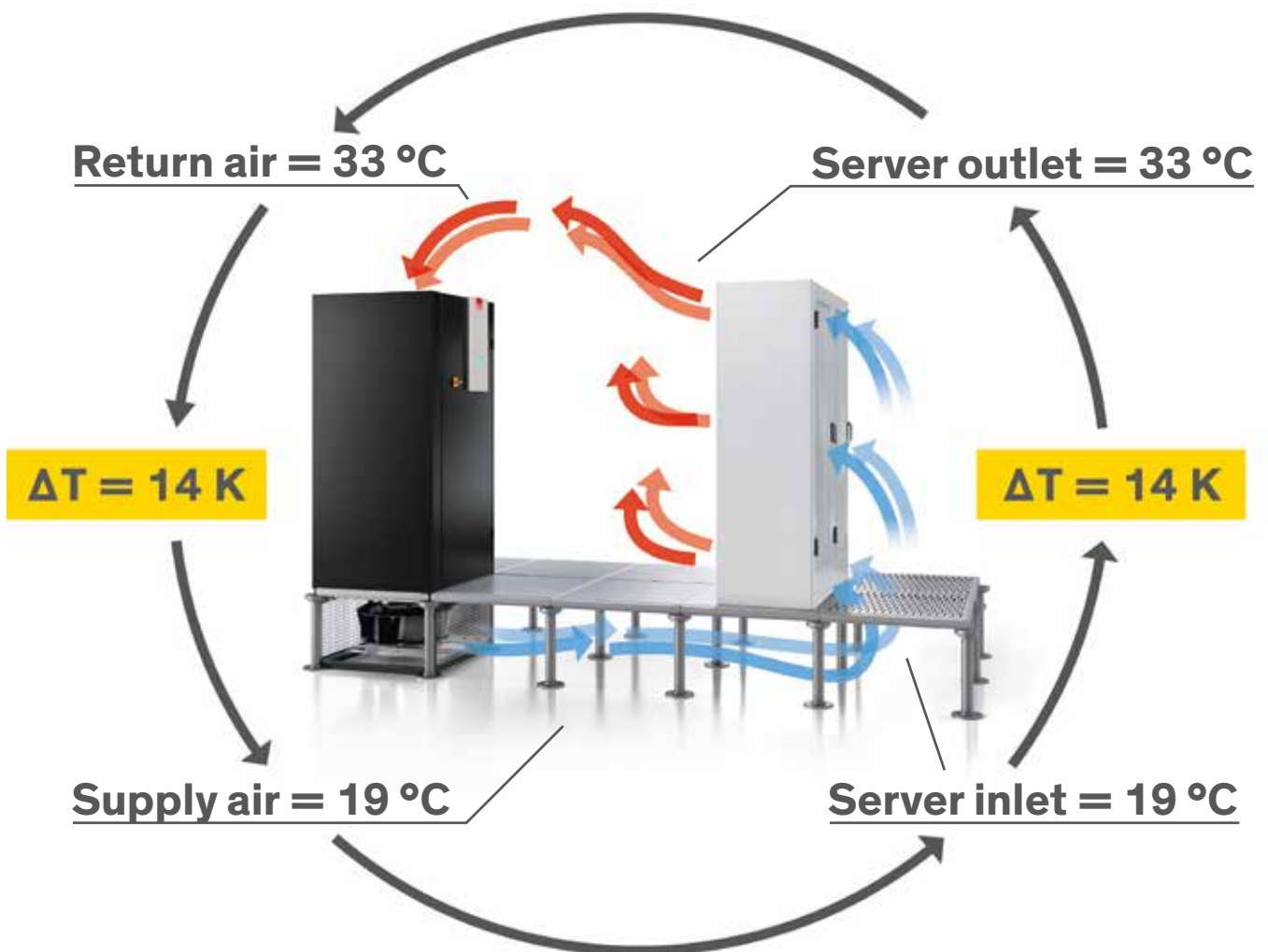


# Dynamic control for precise temperature regulation

The air-side difference in temperature between the air inlet and outlet of server cabinets and air conditioning systems is known as  $\Delta T$ . To ensure optimum operation and the greatest possible savings on running costs, it is vital that the  $\Delta T$  of the air conditioning units is adapted precisely and efficiently to the  $\Delta T$  of your server cabinets.

The dynamic control enables this adaptation to changing IT requirements, thereby ensuring maximum energy efficiency during operation.

**Schematic diagram:**



# Potential savings with Free Cooling

## Direct Free Cooling

With Direct Free Cooling, the CyberAir 3PRO CW air conditions data centers up to 90 % more economically than conventional compressor cooling systems. The prerequisite for this is data centers with wider temperature and humidity tolerances.

Direct Free Cooling exploits the potential of outside temperatures to air condition the data center using the cool outside air. Via the CyberAir 3PRO CW, the outside air, which has been treated by filter systems, gets directly into the server room.



The FCP design with the dampers on top is a flexible construction that takes up no extra space.

## Special solution for small to medium-sized data centers: Direct Free Cooling with FreeCool Plenum

To exploit huge potential savings in smaller data centers, too, and when modernizing existing cooling systems, CyberAir 3PRO CW units with downflow air conduction can be equipped with the FreeCool Plenum Free Cooling box. With this option, Free Cooling is automatically combined with the chiller system's compressor cooling in three variable stages, to suit the outside temperature and cooling needs, ensuring that maximum savings are always exploited to the full:

### 1. Free Cooling

- The outside air damper opens
- Outside air is conveyed through the filter of the FreeCool Plenum directly into the unit, then into the data center
- The compressor of the chiller system remains off, completely saving the cooling energy normally required

### 2. Mixed mode

- As 1, plus:
- The compressor of the chiller system is additionally switched on for support
- When the outside air damper is open, the compressor of the chiller system runs in partial load mode
- The return air damper of the FreeCool Plenum opens to the appropriate degree

### 3. DX mode

- The CyberAir 3PRO CW cools exclusively using the chiller system's compressor
- The outside air damper remains closed, and no outside air is used for cooling
- Return air damper open 100 %



# Indirect Dynamic Free Cooling

Indirect Dynamic Free Cooling is the only system in the world with automatic efficiency optimization, which is developed and marketed exclusively by STULZ. It offers a twofold advantage: In addition to energy savings of up to 60 %, the dual circuit system increases redundancy and therefore cuts the probability of failure to a minimum, so that the cooling system always runs with minimal energy consumption.

## Indirect:

With Indirect Free Cooling, no outside air gets into the data center.

## Dynamic:

The dry cooler, chiller and precision air conditioning unit are actuated automatically to suit the prevailing heat load and outside temperature, irrespective of water temperatures.

## Indirect Dynamic Free Cooling components



## Advantages of Indirect Dynamic Free Cooling with the CyberAir 3PRO CW2

- The world's only Free Cooling with automatic efficiency optimization
- Up to 60 % energy savings
- Situational control based on heat load and outside temperature, with no fixed Free Cooling start value
- Networking of all active components: CyberAir 3PRO CW modules (including standby units), dry cooler, chiller and pumps
- Dual cooling circuit for maximum reliability

# Combined efficiency from STULZ: CyberAir 3P

Air conditioning solutions from STULZ offer synchronized overall systems that cool server rooms efficiently and reliably. For data centers, in particular, combining the CyberCool 2 chiller with the CyberAir 3PRO CW precision air conditioning unit is an investment in lasting quality, reliability and outstanding efficiency.



## Chilled water cooling (CW) – efficiency, flexibility and reliability

### Maximum efficiency

Water transfers heat 3,500 times better than air, which explains the efficiency of chilled water systems. Only the chilling energy the data center actually needs is produced. And Free Cooling has the potential to reduce power consumption radically – by up to 90 %.

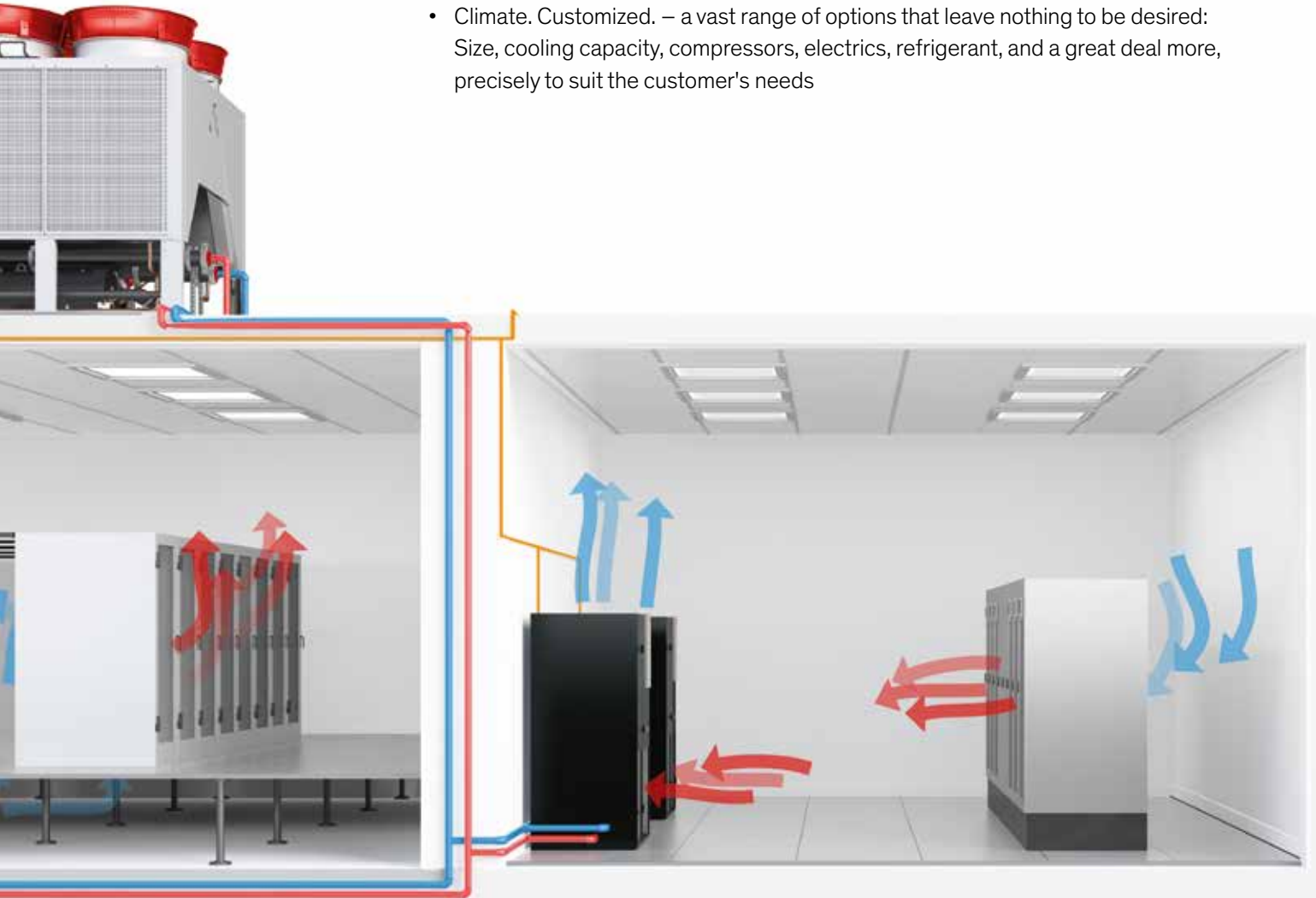
### Optimum flexibility

Chilled water systems can be flexibly adapted, whether intended for a first-time installation or for modernization. The components can be adapted in terms of size, quantity, layout, room type, IT, heat load and air conduction, and can be combined with and without raised floor. A CW system is always universal.

# RO CW with CyberCool 2 chiller

## Efficient, reliable and quiet: the CyberCool 2 chiller

- TCO leader: the lowest overall costs over lifetime
- Maximum size components for the highest possible energy efficiency
- Operational reliability made in Germany: ideally harmonized system components for use 24/7/365
- Climate. Customized. – a vast range of options that leave nothing to be desired: Size, cooling capacity, compressors, electrics, refrigerant, and a great deal more, precisely to suit the customer's needs



### Superior reliability

Made in Germany – at STULZ, this is a promise of quality, reliability and a long life. It incorporates solid production engineering, innovative cooling technology, simple and intuitive use and – if the occasion arises – lightning-fast service on your doorstep and excellent spare part availability.

### TCO leader

STULZ chiller solutions are consistently further developed to be the best when it comes to a TCO comparison: chiller systems that continue to have the lowest overall running costs over their lifetime, in all operating conditions. With STULZ, data center operators are making a sensible investment decision, because they realize: investing in the quality, reliability and efficiency of STULZ chiller solutions pays off during operation after just a short time, due to energy savings and operational reliability.

# Integration made easy: ASR, ASH, ASD and ASU versions

The CyberAir 3PRO CW is a model of adaptability. Size, cooling capacity, blow-out direction, type of heat exchanger, or control: you can adapt STULZ air conditioning solutions precisely to your data center's individual requirements.



**ASR and ASH version**



**ASR**  
Air conduction front/  
back/down



**ASR**  
Air conduction  
front



**ASH**  
Air conduction  
down



**ASH**  
Air conduction as  
displacement



**ASD and ASU version**



**ASD**  
Downflow



**ASU**  
Upflow

**ASR (R=Raised Floor)**  
**ASH (H=High)**  
**ASD (D=Downflow)**  
**ASU (U=Upflow)**

# Climate. Customized.

From standard units to completely tailor-made customer solutions – the ability to offer such a bandwidth for customers is the embodiment of our philosophy, "Climate. Customized." Our aim is to put our customers' wishes into practice in the ideal way, to create perfectly adapted air conditioning solutions that are at once powerful, reliable and efficient.

## **Climate. Customized. #1 Standard units**

For its standard units, STULZ offers a huge selection of accessories and options, which permit high flexibility and individualization – from our standard catalog.

## **Climate. Customized. #2 Standard units with special options**

If the standard catalog does not suffice, our Design and Development departments can create special options that further individualize the standard unit.

## **Climate. Customized. #3 Tailor-made air conditioning solutions**

STULZ has the solution! In the best case, this can mean that the planning, implementation and ongoing support of air conditioning solutions is completely tailored to the customer's needs. Ideally, the data center and air conditioning solution are developed hand in hand, so that all performance features are perfectly harmonized right from the beginning.

# Options for the CyberAir 3PRO CW

**Tailor-made solutions for data centers are achieved by numerous options and equipment versions:**

- Dual power supply with automatic or manual switchover plus option of UPS buffering of the controller
- Pressure independent 2-way control ball valve
- C7000 Advanced user interface
- C7000 AT controller with display of airflow rate, total cooling capacity, unit EER
- Indirect Dynamic Free Cooling for CW2
- Intake plenum for Direct Free Cooling
- Electric heater, one to three stages, continuous
- Reheating of hot water reheat
- Continuous steam humidification
- Raised floor stand in various heights
- Louver dampers
- Duct fitting with pocket filter attachment F7, F9
- 3-way CW valve
- Smoke and fire alarms
- Suitable for connection to all common BMS systems, RS485 and RS232 interface for direct connection to a BMS

# Pressure independent 2-way control ball valve

The CyberAir 3PRO CW can be equipped with a pressure independent control valve.

**Performance features and advantages:**

- The water flow rate is regulated independently from the differential pressure
- Automated hydraulic compensation
- Reduced energy consumption of pumps in the hydraulic system





# Technical data

# CyberAir 3PRO ASR/ASH CW

## Technical Data

### CyberAir 3PRO ASR CW

Raised Floor (1 chilled water circuit)		400	610	1040	1360	1710	2060	2410
Airflow	m <sup>3</sup> /h	10,200	12,700	20,000	24,000	31,000	40,000	46,000
Cooling capacity (total) <sup>1)</sup> Water temperature: 12 °C/18 °C	kW	56.5	74.3	114.2	140.9	181.1	237.9	272.8
Noise <sup>1)2)</sup>	dBA	50	55	54	58	57	56	59
EER <sup>1)</sup>	kW/kW	40.36	49.53	45.68	41.44	41.16	40.32	35.43
AER <sup>1)3)</sup>	W/(m <sup>3</sup> /h)	0.14	0.12	0.13	0.14	0.14	0.15	0.17
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>	<b>8</b>

### CyberAir 3PRO ASH CW

High (1 chilled water circuit)		400	610	1040	1360	1710	2060	2410
Airflow	m <sup>3</sup> /h	9,600	12,200	19,500	23,200	30,000	39,500	44,500
Cooling capacity (total) <sup>1)</sup> Water temperature: 12 °C/18 °C	kW	53.8	71.8	111.8	136.8	176.1	235.4	265.2
Noise <sup>1)2)</sup>	dBA	55	55	54	58	58	56	58
EER <sup>1)</sup>	kW/kW	35.87	44.88	39.93	38.00	31.45	36.22	32.74
AER <sup>1)3)</sup>	W/(m <sup>3</sup> /h)	0.16	0.13	0.14	0.16	0.19	0.16	0.18
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>	<b>8</b>

### Dimensions

Size		1	2	3	4	5	7	8
Width	mm	950	1,400	1,750	2,200	2,550	3,110	3,350
Height	mm	2,495						
Depth	mm	890					980	

### Comments:

All data apply at 400 V/3 ph/ 50 Hz with 20 Pa ESD

<sup>1)</sup> Return air conditions: 33 °C/30 % r.h.; glycol proportion: 0 %

<sup>2)</sup> Noise measured at a distance of 2 m in free-field conditions

<sup>3)</sup> AER = Airflow Efficiency Ratio = Fan power input / Airflow

# CyberAir 3PRO ASR CW2

## Technical data

### CyberAir 3PRO ASR CW2

Raised Floor (2 chilled water circuits)		360	580	770	1080	1460	1960	2160
Airflow	m <sup>3</sup> /h	9,500	12,200	18,400	22,600	29,500	38,000	45,000
Cooling capacity (total) <sup>1)</sup> Water temperature: 12 °C/18 °C	kW	2 x 40.2	2 x 56.3	2 x 92.2	2 x 115.2	2 x 139.7	2 x 186.7	2 x 195.0
Noise <sup>1)2)</sup>	dBA	49	55	54	57	56	55	58
EER <sup>1)</sup>	kW/kW	33.50	40.21	38.42	36.00	34.07	34.57	28.26
AER <sup>1)3)</sup>	W/(m <sup>3</sup> /h)	0.13	0.11	0.13	0.14	0.14	0.14	0.15
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>	<b>8</b>

### Dimensions

Size		1	2	3	4	5	7	8
Width	mm	950	1,400	1,750	2,200	2,550	3,110	3,350
Height	mm	2,495						
Depth	mm	890					980	

### Comments:

All data apply at 400 V/3 ph/ 50 Hz with 20 Pa ESD

<sup>1)</sup> Return air conditions: 33 °C/30 % r.h.; glycol proportion: 0 %

<sup>2)</sup> Noise measured at a distance of 2 m in free-field conditions

<sup>3)</sup> AER = Airflow Efficiency Ratio = Fan power input / Airflow

# CyberAir 3PRO ASD/U CW

## Technical data

### CyberAir 3PRO ASD CW

Downflow (1 chilled water circuit)		430	640	940	1220	1560	2080
Airflow	m <sup>3</sup> /h	9,000	12,800	19,000	22,000	29,500	39,000
Cooling capacity (total) <sup>1)</sup> Water temperature: 12 °C/18 °C	kW	47.3	69.4	99.6	121.4	157.9	214.6
Noise <sup>1)2)</sup>	dBA	55	58	56	58	59	57
EER <sup>1)</sup>	kW/kW	24.89	31.55	31.12	31.13	28.20	29.00
AER <sup>1)3)</sup>	W/(m <sup>3</sup> /h)	0.21	0.17	0.17	0.18	0.19	0.19
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>

### CyberAir 3PRO ASU CW

Upflow (1 chilled water circuit)		430	640	940	1220	1560
Airflow	m <sup>3</sup> /h	9,000	12,500	19,000	21,500	29,000
Cooling capacity (total) <sup>1)</sup> Water temperature: 12 °C/18 °C	kW	47.3	68.1	99.6	119.1	155.8
Noise <sup>1)2)</sup>	dBA	57	59	58	59	60
EER <sup>1)</sup>	kW/kW	23.65	29.61	27.67	29.77	26.86
AER <sup>1)3)</sup>	W/(m <sup>3</sup> /h)	0.22	0.18	0.19	0.19	0.20
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

### Dimensions

Size		1	2	3	4	5	7
Width	mm	950	1,400	1,750	2,200	2,550	3,110
Height	mm	1,980					
Depth	mm	890					980

### Comments:

All data apply at 400 V/ 3ph/ 50 Hz with 20 Pa ESD for Downflow and 50 Pa ESD for Upflow units

<sup>1)</sup> Return air conditions: 33 °C/30 % r.h.; glycol proportion: 0 %

<sup>2)</sup> Noise measured at a distance of 2 m in free-field conditions

<sup>3)</sup> AER = Airflow Efficiency Ratio = Fan power input / Airflow

# CyberAir 3PRO ASD/U CW2

## Technical data

### CyberAir 3PRO ASD CW2

Downflow (2 chilled water circuits)		280	480	700	850	1090	1280
Airflow	m <sup>3</sup> /h	7,500	11,000	16,500	19,500	26,500	34,500
Cooling capacity (total) <sup>1)</sup> Water temperature: 12 °C/18 °C	kW	34.6	53.4	76.9	91.0	124.1	160.0
Noise <sup>1)2)</sup>	dBA	52	55	54	56	58	56
EER <sup>1)</sup>	kW/kW	24.71	29.67	28.48	27.58	24.33	24.24
AER <sup>1)3)</sup>	W/(m <sup>3</sup> /h)	0.19	0.16	0.16	0.17	0.19	0.19
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>

### CyberAir 3PRO ASU CW2

Upflow (2 chilled water circuits)		280	480	700	850	1090
Airflow	m <sup>3</sup> /h	7,500	10,500	16,200	19,100	26,200
Cooling capacity (total) <sup>1)</sup> Water temperature: 12 °C/18 °C	kW	34.6	51.6	75.9	89.6	123.1
Noise <sup>1)2)</sup>	dBA	55	56	56	58	60
EER <sup>1)</sup>	kW/kW	23.07	30.35	26.17	26.35	22.38
AER <sup>1)3)</sup>	W/(m <sup>3</sup> /h)	0.20	0.16	0.18	0.18	0.21
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

### Dimensions

Size		1	2	3	4	5	7
Width	mm	950	1,400	1,750	2,200	2,550	3,110
Height	mm	1,980					
Depth	mm	890					980

### Comments:

All data apply at 400 V/3 ph/ 50 Hz with 20 Pa ESD for Downflow and 50 Pa ESD for Upflow units

<sup>1)</sup> Return air conditions: 33 °C/30 % r.h.; glycol proportion: 0 %

<sup>2)</sup> Noise measured at a distance of 2 m in free-field conditions

<sup>3)</sup> AER = Airflow Efficiency Ratio = Fan power input / Airflow

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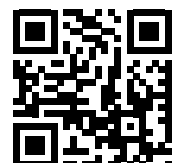
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