



IT Cooling Solutions

## Precision Cooling Solutions

Maximum efficiency in data centre air conditioning





## Maximum availability and efficiency, minimum cost

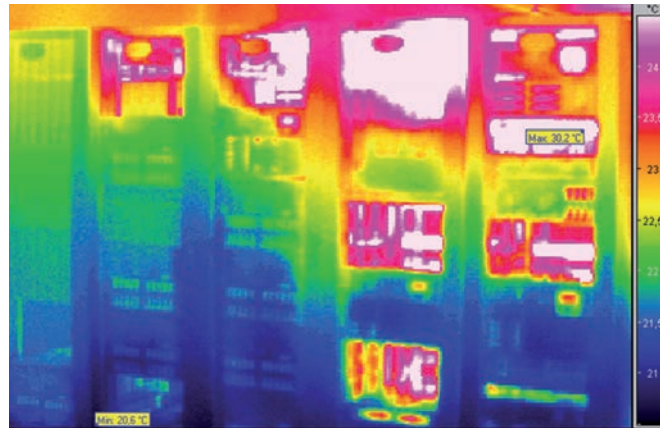
Global communication demands fast access to data and applications. Even small delays in the communications flow can have a negative impact and lead to losses in turnover. To maximise availability at minimum cost, data centres must be air conditioned precisely, reliably and efficiently.

# CyberAir 3 from STULZ – on a Mission Energy in the data centre

When we introduced the CyberAir 2, we were the first manufacturer worldwide to present a precision air-conditioning system that cools data centres 60 % more economically. Now, in keeping with the goals of our Mission Energy, our engineers in Hamburg have taken on the task of extracting a few more percent in potential savings for you.

## German Engineering powered by STULZ

For 40 years, we have been building and developing precision air-conditioning systems for data centres. These many years of experience, combined with state-of-the-art development tools, have come to fruition in the CyberAir 3. No other precision air-conditioning system offers more flexibility than the CyberAir 3, for each STULZ system can be tailored to your requirements.



A thermographic image visualises the hot and cold zones in the data centre, as on a weather map. In this way you can detect critical conditions in the air-conditioning system that may increase consumption.

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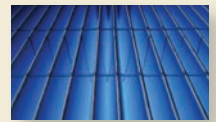
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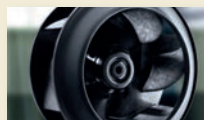
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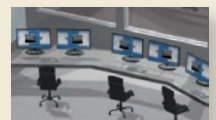
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Unlimited versatility with a diverse range of options





## Air-conditioning concepts for individual solutions

Planning the construction of a data centre is an engineering challenge that lies right at the start of our Mission Energy. The local climate, room configuration, environmental conditions, noise protection and safety – all these have a direct influence on the amount invested and on running costs.

The STULZ CyberAir 3 precision air-conditioning system answers to all these demands. From a wealth of options, our STULZ specialist advisers put together an individual system solution, which precisely matches your project requirements.

Whether you are refurbishing or running a legacy system or building a new one – choose energy-efficient air conditioning from STULZ



**Expert,  
punctual implementation**

Project and site management during the construction phase, selecting and monitoring subcontractors, not to mention actual start-up – STULZ is your specialist partner for expert, punctual implementation of your air-conditioning system. Every STULZ air-conditioning system is fully certified to ISO 9001:2000 and ISO 14001. Start-up includes a meticulous process of adjustment to the customer's situation, which is precisely logged and documented.



**Tailored  
to individual requirements**

To enable you to accurately estimate your budget, STULZ draws up a detailed quotation based on your requirements in terms of performance, availability, space planning and operational cost. Your STULZ specialist adviser configures an individual air-conditioning system, and helps you to draw up service specifications and invitations to tender.



**Service  
without delay**

STULZ CyberAir 3 precision air-conditioning systems are manufactured from high-quality components. In the STULZ Test Centre, they undergo an extensive stress test at temperatures ranging from -20° to +45° Celsius. In this way, we at STULZ ensure that our air-conditioning systems work reliably in any climate on Earth. Nevertheless, should problems arise, our STULZ Service Support is available worldwide.

## STULZ advice and support

- Individual planning assistance
- Specific performance data for individual projects
- Digital documentation
- Expert implementation and start-up
- Worldwide service

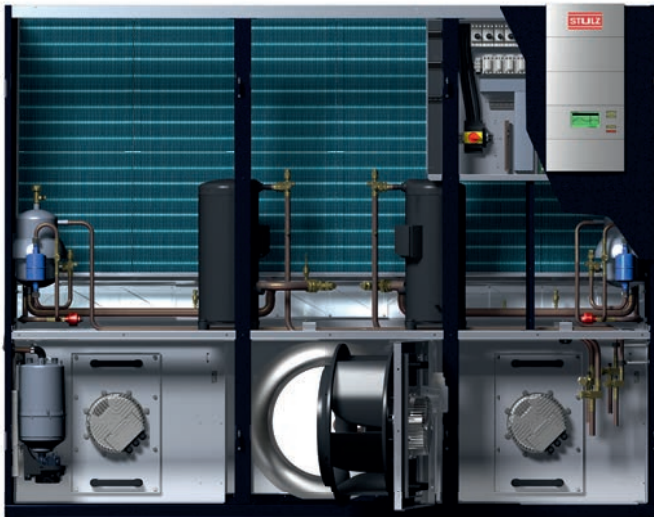


# The air-conditioning system

## Mission Energy: Precision air conditioning wholly reinvented

Along with the high demands on data centre air conditioning, the need for exceptional ideas is also growing, such as how to regulate temperatures to within a degree at the lowest possible cost. To reach this goal, our engineers strive daily to enhance the energy efficiency of the precision climate control solutions.

The CyberAir 3 shows how serious we are: The result is a system with completely reworked air conduction, optimised in many details that work together in perfect harmony.

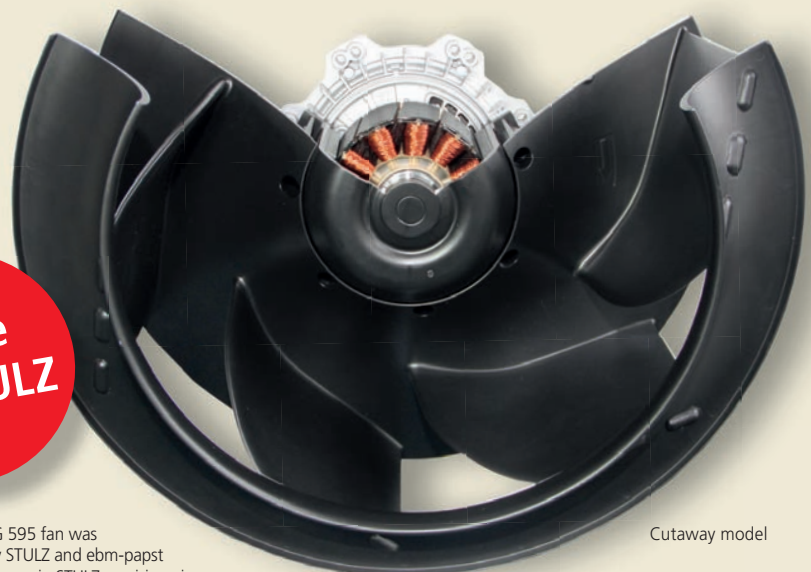


### Eight cooling systems cool with three refrigerants

From a choice of eight cooling systems, data centre operators will find the optimum balance between investment, operating costs and energy efficiency. In addition to water as the cooling medium, the STULZ CyberAir 3 can run with three different refrigerants: standard R407C and R410A refrigerants, and high temperature R134a refrigerant.

The CyberAir 3 is available in cooling capacities between 18 ~ 245 kW.

EC fan with  
fibreglass-reinforced  
plastic wheel



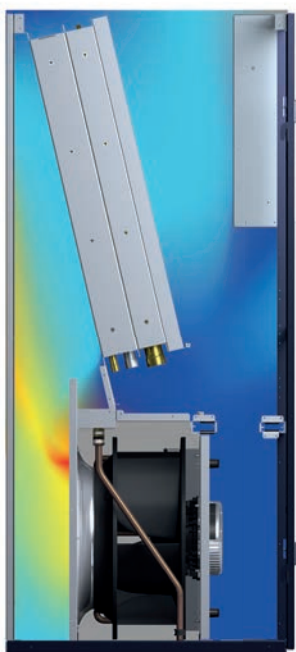
The new R3G 595 fan was developed by STULZ and ebm-papst exclusively for use in STULZ precision air-conditioning systems.

Cutaway model

## Ideal air flow thanks to CFD simulation Efficient, energy-saving technology

In the automotive industry, exterior surfaces are designed strictly according to aerodynamic considerations to reduce hindrances in air flow. For the CyberAir 3, we attacked the problem from the inside, using computational fluid dynamics (CFD) systems to analyse and build the new air conditioner according to air flow considerations. With the CFD analysis, we were able to find all areas in the air conditioner that have a negative effect on air flow and performance.

Thanks to the new fan and the CFD simulations, the CyberAir 3 has even better air conduction and takes full advantage of the positive effects that has on efficient operation.



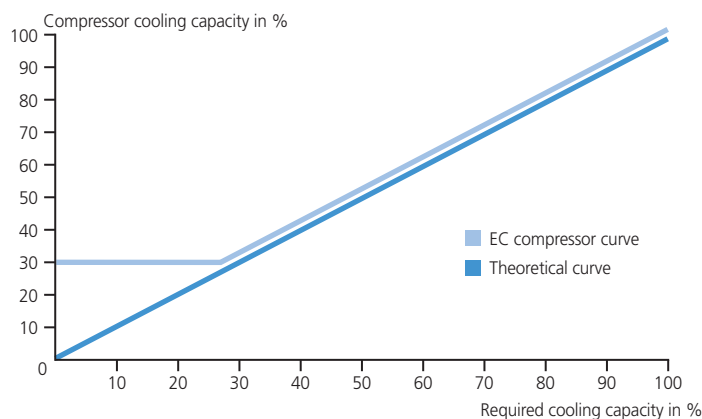
Better air conduction results in more efficient operation of the air-conditioning system; the analysis was performed with CFD



## EC compressors for savings in partial load mode New panel system

CyberAir 3 AS/GS and GES units are available with EC compressors, so that cooling capacity is changed by speed regulation, depending on actual heat load. That means maximum efficiency for partial loads combined with rapid changes in cooling capacity over a wide range from 30 % to 100 %.

- Best efficiency in cooling capacity due to stepless compressor control
- Best electronic efficiency due to brushless and maintenance-free motor
- Best mechanical efficiency due to scroll compressor



EC compressor

Only components of the highest quality are developed for precision air-conditioning systems from STULZ. To develop them, we seek the cooperation of select engineering partners such as ebm-papst, who designed a fan with a fibreglass-reinforced plastic wheel and vane-type blades precisely in line with STULZ specifications.

With the latest materials and high-end injection moulding techniques, it is possible to produce a fully formed 3-D wheel that increases fan surface and reduces noise - and is a perfect fit for the CyberAir 3.

## The new EC fan with fully formed 3-D plastic wheel

- reduces the fan's power consumption
- is quieter
- moves the air more efficiently

# Superior technology that pays for itself

The STULZ CyberAir 2 precision air-conditioning system satisfies the most exacting demands for availability and energy efficiency. From a selection of 8 cooling systems, 7 sizes and numerous equipment options, our STULZ specialist advisers select and configure a tailored solution for your specific operational infrastructure.







CyberAir 3 A/C units in standard door sizes are available as energy or space-saving versions. The seven available sizes range from 950 to 3,350 mm in width. The largest two sizes have a depth of 980 mm.

### Control by microprocessor

Each STULZ CyberAir 3 A/C unit has its own electronic controller. The C7000 microprocessor controls all active components and communicates with other A/C units and BMS interfaces in the system.

### Eight cooling systems

From a choice of eight cooling systems, data centre operators will find the optimum balance between investment, running costs and energy efficiency. All systems are available as both upflow and downflow versions.

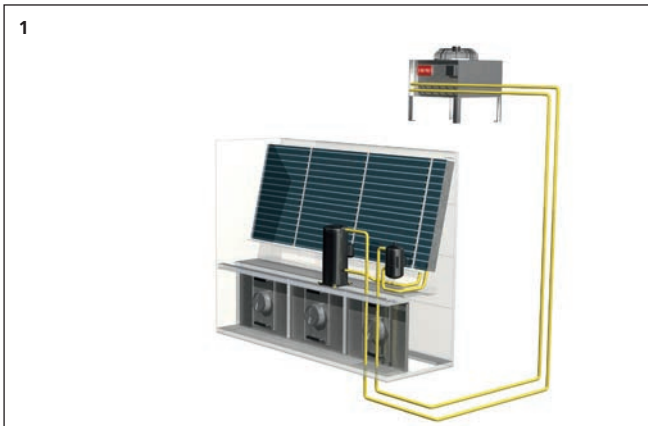
### Save space and energy

STULZ CyberAir 3 A/C units are produced as a space-saving standard version, while the GE and GES types are also available in an energy-optimised, low-energy version.

## STULZ CyberAir 3

- Stand-alone precision air-conditioning system for data centres and equipment rooms
- Flexible: 8 cooling systems in both upflow and downflow format, 7 sizes, standard and lowenergy versions
- The cooling systems are scalable in terms of both output and efficiency.
- Up to 90 % more energy efficiency with STULZ DFC and DFC<sup>2</sup> automatic air conditioning
- The C7000 microprocessor efficiently regulates all system states, CW standby management, the EC fan and the electronic expansion valve. Up to 20 air-conditioning modules can be operated per bus system.
- Three refrigerants
- Reliability through built-in redundancy and automatic alarm notification via SMS or e-mail
- Compact dimensions
- Filter control management
- All parts requiring maintenance can be accessed from the front

# Eight systems ensure availability



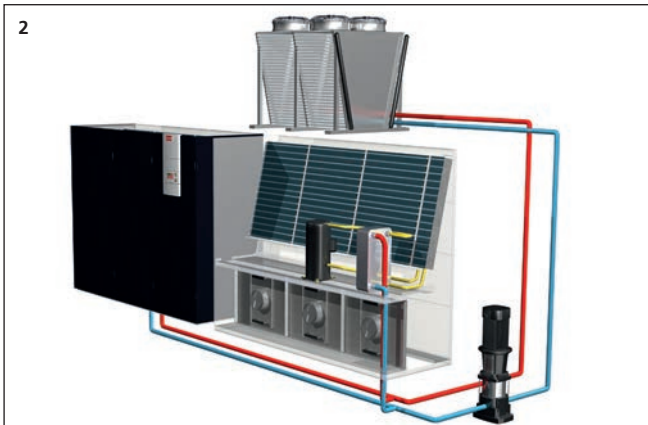
## 1. A-system: Compressor cooling system based on the direct evaporator principle (DX/direct expansion)

The refrigerant circuit of the A/C module consists of an evaporator, an expansion valve, a scroll compressor and an external air-cooled condenser.

The ambient air conveyed by the fan flows through the evaporator. As it does so, heat is removed from the air and is transferred to the refrigerant. The A/C unit and the external condenser are linked by means of a closed refrigerant circuit.

### AS system:

Like the A-system, the AS system works according to the direct evaporator principle. And to make the system even more efficient, the AS system is exclusively available with an infinitely adjustable EC compressor.

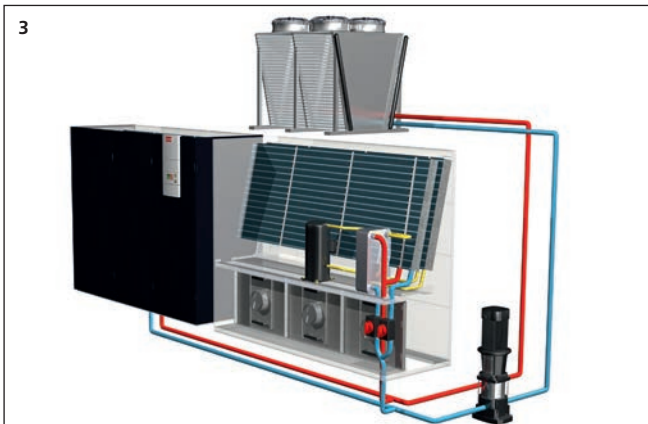


## 2. G-system: Simple heat dissipation via the waterglycol mixture

Like the A-system. 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.

### GS system:

The GS system functions in the same way as the G-system. And to make the system even more efficient, the GS system is exclusively available with an infinitely adjustable EC compressor.



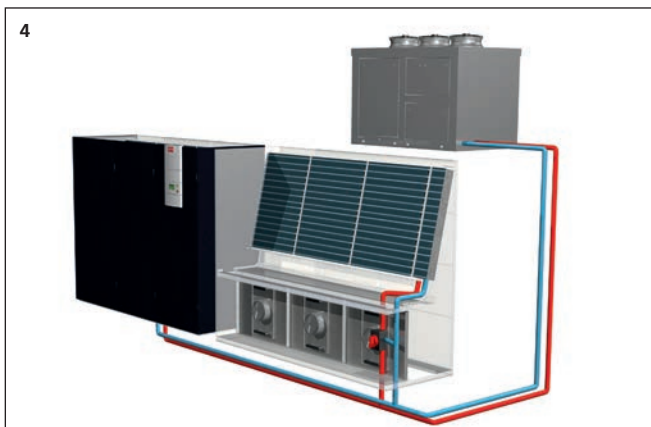
## 3. GE-system: Hybrid G-system with indirect free cooling

A hybrid cooling system, which combines a G-system with indirect free cooling. The GE system switches to energy-saving mode as soon as the outside temperature permits. The ambient air is then utilised for indirect free cooling. GE systems form the basis of DFC (Dynamic Free Cooling).

### GES system: Hybrid G-system with Indirect Free Cooling and EC compressor

Like the GE system, the GES system functions on the principle of Indirect Free Cooling. And to make the system even more efficient, the GES system is exclusively available with an infinitely adjustable EC compressor.

Energy efficiency, capital investment, running costs, room size, noise protection, redundancy, local climate – every project has its own specific requirements when it comes to the precise air conditioning of sensitive data centres. The STULZ CyberAir 3 is therefore available with eight cooling systems: air or water-cooled, flexible mixed operation, backed up by Indirect and Direct Free Cooling, and energy-saving with STULZ DFC automatic air conditioning.

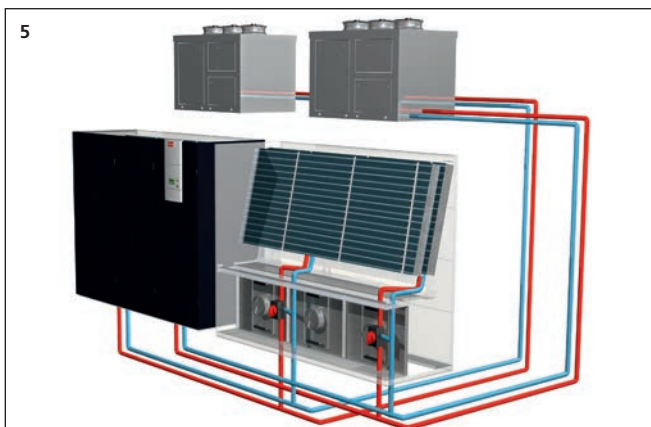


#### 4. CW system: Liquid-cooled system

CW units manage without a refrigerant circuit of their own, but require separate chilled water production. The ambient air conveyed by the fan flows through the direct cooling unit, which transfers heat to the water-glycol mixture. A chiller removes the heat from this water-glycol mixture. The A/C unit and the chiller are connected to one another by means of a closed water-glycol circuit.

##### CWE/CWU systems:

These function like the CW system. To further increase efficiency, CWE/CWU systems feature a larger filter surface and offer the option of in-floor fan installation.

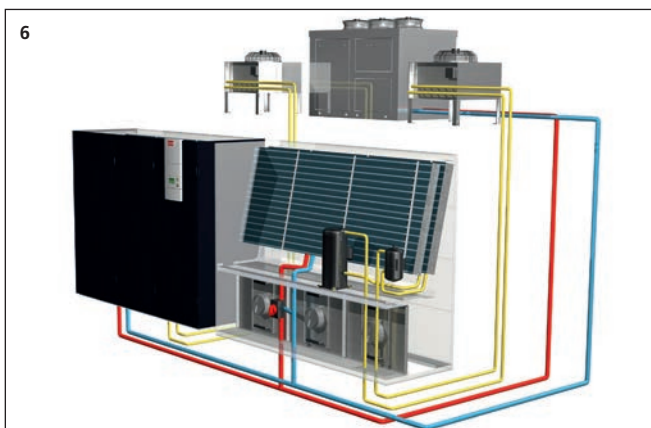


#### 5. CW2 system: Liquid-cooled system with built-in redundancy

High-security systems often require a second, independent chilled water supply. Therefore, in the CW2 system, two redundant CW systems are integrated in one A/C unit, saving valuable space in the data centre.

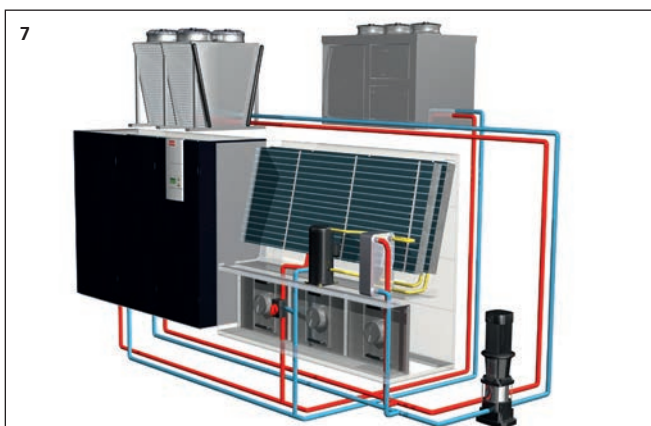
##### CWE2/CWU2 systems:

These function like the CW2 system. To further increase efficiency, CWE2/CWU2 systems feature a larger filter surface and offer the option of in-floor fan installation.



#### 6. ACW system: CW system with redundant A-system (dual fluid)

Two independent cooling systems (CW and A) in one A/C module ensure maximum failure resistance. If the main, liquid-cooled system (CW) fails, the air-cooled A-system ensures that air conditioning continues without interruption.



#### 7. GCW system: CW system with redundant G-system (dual fluid)

Similar design to the ACW cooling system, but with a liquid-cooled G-system working in combination with the CW system, instead of the A-system.

#### 8. AU-System with Direct Free Cooling (DFC<sup>2</sup>)

For information and technical data on this system, please refer to the current STULZ DFC<sup>2</sup> brochure.



## Efficiency is a matter of intelligence

Computers and smartphones are versatile all-rounders that shape our everyday private and business lives, while information is available around the clock. Our communication behaviour changes from day to day, making ever greater demands on data centres. But more power and faster servers necessarily lead to higher energy consumption for cooling the racks.

Most of the energy consumed in cooling data centres can be saved by the use of intelligent systems and innovative technology. And with the STULZ CyberAir 3, we are one step closer to achieving our Mission Energy goal in the data centre.

### Adaptive ventilation with EC technology

With the introduction of the CyberAir 2, we were the first manufacturer to employ EC-driven fans for an entire product family. For the CyberAir 3 we went one step further, and entrusted ebm-papst with the task of developing a fibreglass-reinforced EC fan in a special size for the CyberAir 3, precisely in line with our specifications. The electronically controlled EC fans react steplessly to changing output requirements and are especially economical in partial load mode. EC fans consume up to 30 % less energy than conventional AC models!

### More efficiency with EC compressor

The stepless drive of the EC compressors ensures fast changes in capacity in a range between 30 % and 100 %. Within this range, the system generates precisely the cooling capacity that is required to dissipate the actual heat load. EC compressors consume up to 24 % less energy than on/off controlled scroll compressors.

### High-efficiency rear panel (optional for DX and GE systems downflow)

CyberAir 3 DX and GE systems can be equipped with an optional high-efficiency rear panel. This increases the depth of the units and ensures the surface area of the heat exchanger is used even more efficiently. To enable the units to still fit through normal standard doors, the rear panel can be removed and refitted with the greatest of ease.

### Save with electronic load distribution at half the energy

All chilled water-cooled versions of the STULZ CyberAir 3 are available with the electronic CW standby manager as standard – keeping all A/C units in perfect balance in energy-saving partial load mode. In this way, the fans of the STULZ CyberAir 3 are able to use up to 70 % more economical.

### Using reserves sensibly

The CW standby manager controls the speed of the EC fans and incorporates redundant standby units in a combined system operation. If an A/C unit drops out, the standby manager automatically increases the cooling output of the remaining devices. To do so, it accesses information from the C7000 microprocessor, which regulates the individual units of the system in a peer-to-peer network.



In conventional operating mode, the active A/C units run continuously at full load. The standby unit remains unused.



In partial load mode, the CW standby manager distributes the reserve capacity evenly between all A/C units. If individual units shut down or require maintenance, the remaining units automatically switch to controlled full load operation.

## STULZ CyberAir: Always a good decision

### Fan with the latest EC technology

- High efficiency of up to 92 %, reaping obvious savings in running costs
- Quiet-running, long life, maintenance-free
- Compressor with EC technology and state-of-the-art electronically controlled expansion valves
- Infinite compressor control for cooling capacity with maximum efficiency

### High-efficiency rear panel (optional)

- The heat exchanger surface is used to the full
- Areas with hindrances to air flow are avoided

## Up to 60 % more economical with STULZ DFC automatic air conditioning



STULZ CyberAir with DFC is the first precision airconditioning system in the world that automatically switches to the best operating mode on the basis of the heat load in the data centre and seasonal variations in outside temperature. For the CyberAir 3, the DFC system has been further developed and improved.

### Full hybrid with Indirect Free Cooling

DFC combines compressor cooling and free cooling in four stages, and automatically searches for the most economical operating mode. In cool weather, DFC makes use of economical Indirect Free Cooling, which extracts all its cooling power from the ambient air. Energy-intensive compressor cooling (DX) is only switched on when absolutely necessary.

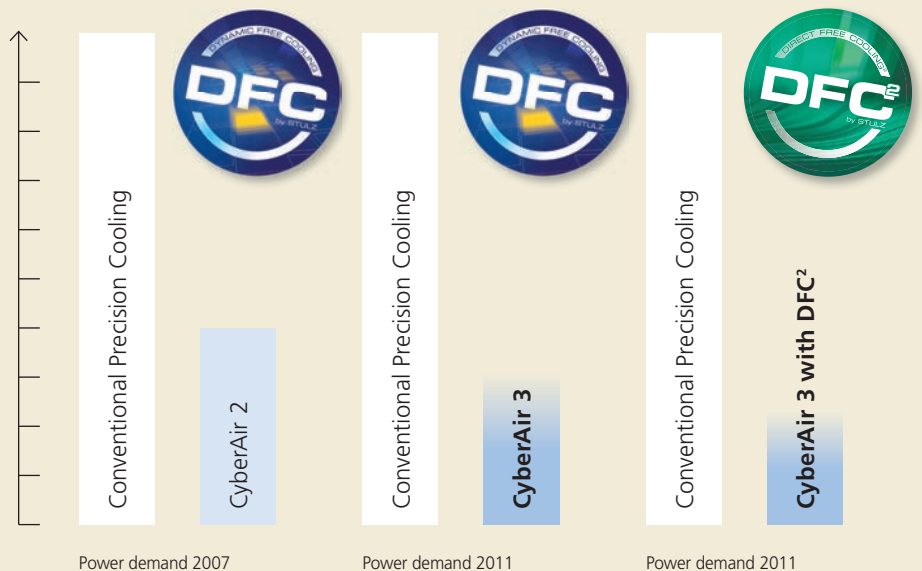
### Complete electronic control for DFC savings

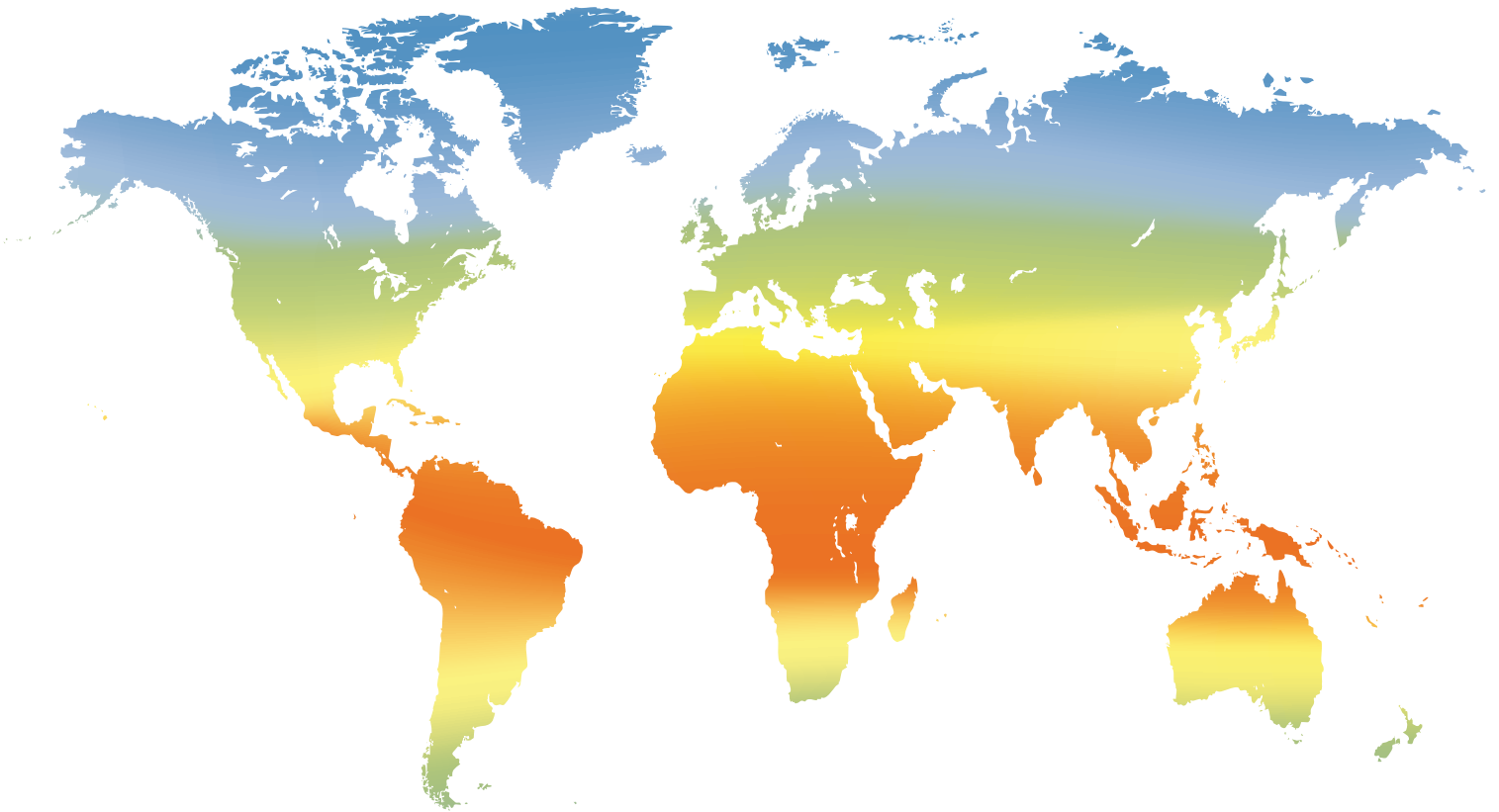
With utmost sensitivity and precision, DFC selects the most energy-saving mode, controls the speed of the EC fans in the A/C unit and those of the dry cooler, regulates the position of the control valves, reduces the electricity consumption of the pumps and ensures precise interior climate control. By incorporating standby units as well, DFC keeps all units, pumps and dry coolers in perfect balance in energy-saving partial load mode.

Whether you are interested in optimisation, construction or operation – STULZ can give you added scope for managing your operating costs – especially in comparison with conventional air-conditioning systems.

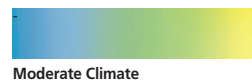
Even compared with the previous STULZ CyberAir 2 system, further reductions in energy consumption can still be realised with the new CyberAir 3.

\*With Direct Free Cooling DFC<sup>2</sup> from STULZ, in many parts of the world the energy consumption of data centre air conditioning can be reduced by up to 90 %.



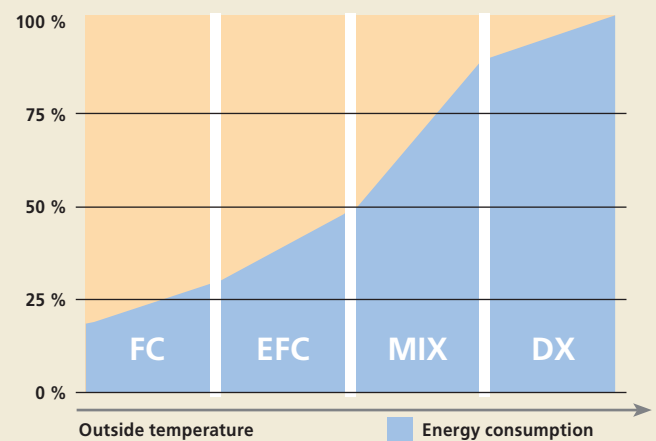


In moderate climates north and south of the equatorial zone, the energy-saving advantages of the STULZ CyberAir 3 with DFC and DFC2 can be exploited to the full. Electricity consumption for data centre air conditioning falls by up to 90 %.



### STULZ DFC automatic air conditioning

- Electronically controlled GE cooling system, combining compressor cooling and free cooling in four stages:
  - FC – Free cooling energy-saving mode
  - EFC – Extended free cooling
  - MIXED – Compressor and free cooling
  - DX – Compressor cooling
- Electronic load distribution for partial load mode
- The efficiency of the compressor is increased in mixed mode thanks to the electronic expansion valve

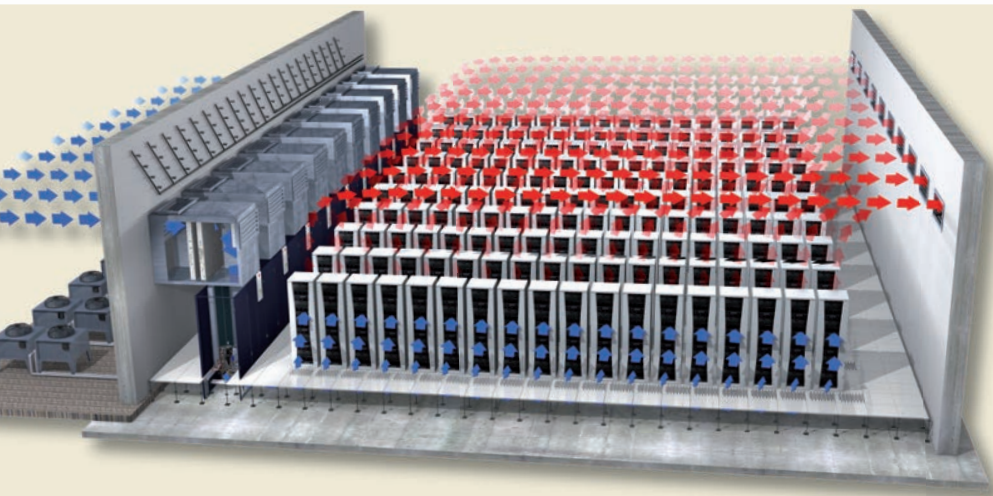


# On a green mission – with Direct Free Cooling from STULZ

## Future-proof and cost-efficient from years of experience

The trend is towards densely packed server rooms, which generate ever more computing power over an ever smaller surface area – and the resulting power is almost completely converted into heat. Without the use of energy-efficient air-conditioning solutions, the running costs of air-conditioning climb dramatically and can exceed the entire purchase cost of the technology in the data centre in just a few years.

With every new product development, therefore, our engineers are dedicated to the pursuit of further reducing the running costs of air-conditioning. We have repeatedly led the field of precision air-conditioning for almost 20 years now, and continue to develop new, even more efficient systems. Now and in the future, we are focused on one vision: Mission Energy from STULZ.



**CyberAir units with Direct Free Cooling  
and fold-away heat exchanger**

## It pays to have energy efficiency with STULZ air-conditioning systems:

The air-conditioning of a Hamburg data centre with a surface area of 800 m<sup>2</sup> and a heat load of 1 MW costs only € 34,000.- a year with Direct Free Cooling, as opposed to € 296,000.- a year with compressor cooling only. This corresponds to savings of € 262,000.- a year.

Source: STULZ comparison of system costs, basis for calculation 13 ct/kWh



# Energy-saving potential thanks to ambient air

With Direct Free Cooling, conditioned ambient air below 18 °C is used to keep the data centre cool. This brings huge potential savings, but challenges as well. With this cooling method, a large volume of ambient air enters the rooms, so that extended temperature and humidity tolerances must be permitted. If the ambient temperature rises above 18 °C, either an integrated DX system with compressors or a separate chiller assumes the task of cooling the data centre, depending on the air-conditioning solution that is installed.

Thanks to our many years of experience with precision air-conditioning solutions, we have succeeded in optimising all components for Direct Free Cooling, ensuring compliance with the specifications for data centre temperature tolerances according to ASHRAE TC 9.9 – 2011.

In addition, the cooling unit and mixing and filtration box are available in various sizes, so they can be selected precisely to suit your requirements and to achieve optimum energy efficiency.

## Percentage and number of hours per year of temperatures up to and including 18 °C (up to 27 °C possible according to ASHRAE TC 9.9 – 2011)

	Hamburg	London	Moscow	Canberra	Madrid	Istanbul	New York	Beijing	Johannesburg
<b>Annual no. of hours below 18 °C<sup>1</sup></b>	8247	8014	7805	7786	6338	6224	5997	5563	4833
<b>Percentage<sup>2</sup></b>	95 %	91 %	89 %	89 %	72 %	71 %	68 %	63 %	55 %

<sup>1</sup>Hours per year of temperatures up to and including 18 °C

<sup>2</sup>Percentage of hours with temperatures up to and including 18 °C over the year

### Advantages

- Save up to 85 % on costs a year – with Direct Free Cooling
- High energy efficiency through the direct use of Free Cooling
- Fold-away heat exchanger in the CyberAir AMD for additional energy efficiency
- Additional savings opportunities in Mixed and DX mode, thanks to enlarged heat exchanger surfaces and low condensing temperature
- Excellent system scalability – “Build as you grow!”  
No hydraulics (pipework, pumps, fittings)
- Maximum reliability thanks to self-contained, simply constructed air-conditioning systems
- Drastically lower energy consumption than all conventional systems
- High-quality materials and perfectly harmonised components
- Lower capital investment than with conventional Indirect Free Cooling systems

# Energy efficiency in a whole new dimension

CyberAir CWE/CWU air-conditioning systems deliver maximum cooling capacity. Each unit is made up of two modules, and with their standard door format they are easy to transport and flexible in their data centre installation options.

Up to four maintenance-free, high-efficiency EC fans inside the separate module and variable control concepts greatly reduce energy consumption and cut operating costs.

New: CyberAir 3 ASD 2050 with new fibreglass-reinforced plastic wheel fan

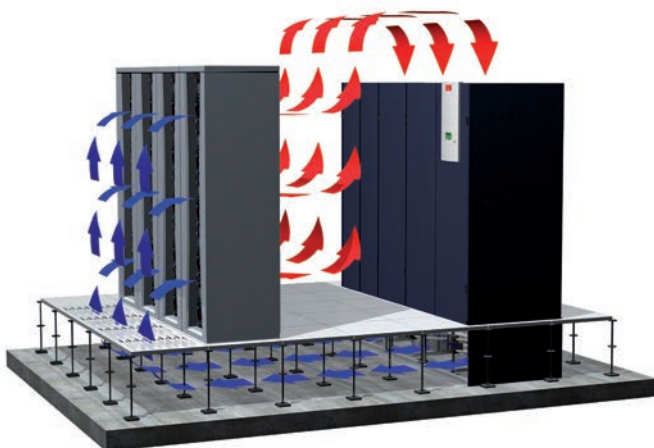


Working in combination with modern, free cooling chillers, STULZ CyberAir CWE/CWU air conditioners ensure energy-efficient operation and, depending on the system's location, can considerably reduce the running costs of the system as a whole.

When planning the system layout, an allowance should be made for high chilled water temperatures, to ensure that the proportion of Free Cooling can be maximised to suit the annual operating hours.

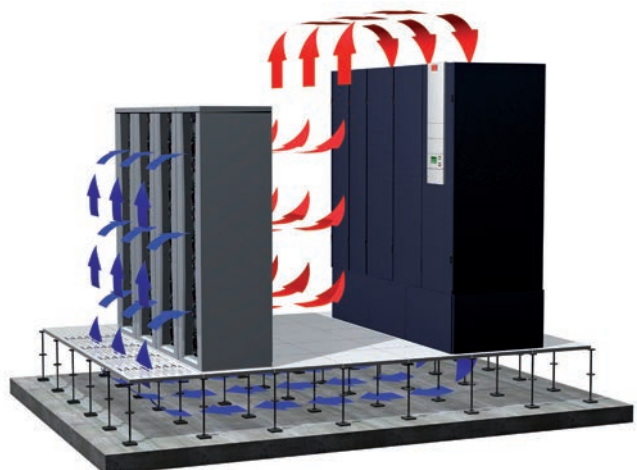
## Other technical features of the CyberAir CWE/CWU series

- Maximum useful cooling capacity with greatly reduced power input
- Flexible installation according to available space and site conditions
- C7000 controller / CW standby management
- Very service-friendly, with front access
- Energy-optimised heat exchanger for high water and return air temperatures



### CWU version:

Fan unit installed under raised floor (power input of fans is up to 35 % less than when installed on the raised floor)



### CWE version:

Fan unit installed on raised floor when height of raised floor is insufficient



## Save space and energy



The swivelling heat exchanger from STULZ automatically makes room for the most economical operating mode. At STULZ, efficiency is more than just a word. For we continuously invent, patent and test pioneering air-conditioning solutions, which are put to use all over the world.

Now, with our swivelling heat exchanger, you can exploit the possibilities of Direct Free Cooling to the full – and save up to 90 % of your energy costs! In this operating mode, our DFC<sup>2</sup> system cools your data centre exclusively with filtered ambient air. And this works best when the heat exchanger is not situated in the air duct!



STULZ CyberAir 3 allows for both central and distributed arrangement of A/C units. Every unit has its own intelligence. Up to 20 units work together in the system network.

## High-quality, reliable and flexible

STULZ CyberAir 3 A/C units are manufactured with care from high-quality components. They are compact and can be combined as desired – and so adapt flexibly to the space and characteristics of your data centre. Redundant standby units ensure maximum levels of availability. Whether you have two units in a data centre or 20 – you will always benefit from STULZ quality. In all cases, the system ensures an optimum air supply.

### Growing to suit the load

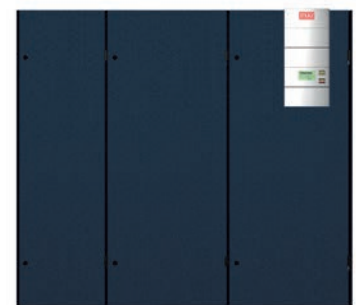
The resilient scalability of the STULZ CyberAir 3 range responds to rising heat loads caused by your expanding IT infrastructure. Further A/C units can even be added during ongoing operation. The C7000 microprocessor links up to 20 units in a network zone.

### Targeted air conditioning

The A/C units can be located centrally in an air-conditioning room or distributed around the data centre. The cooling capacity of each A/C unit can be precisely adapted to the respective operating conditions. In all cases, the system enables optimum air distribution, which effectively prevents hot spots.

### Small footprint, numerous possibilities

Designed to fit through a standard doorway, space can easily be found for every A/C unit without spending a great deal of time on transport and assembly. The system is preconfigured and ready for start-up once installed.





Made in Germany

### Expertise in development and planning

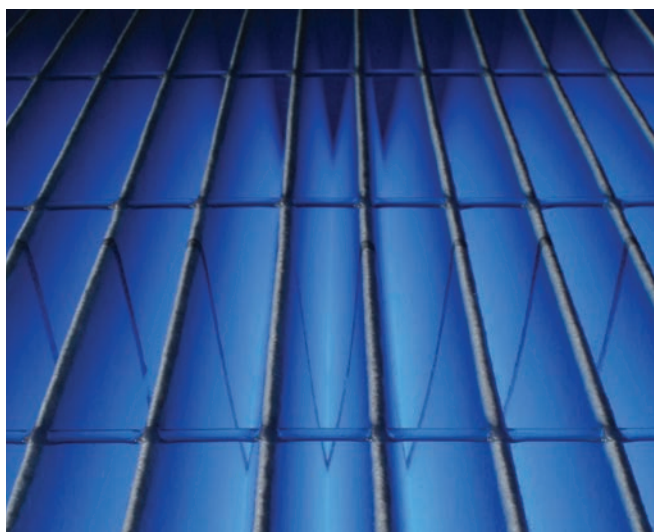
Experience from projects around the world, integrated development processes and regular audits and training of our partners ensures constant quality Made in Germany. We continually invest in new technology and processes, so that we can offer you the best solution. Our air-conditioning experts provide end-to-end support for your project, from initial contact through commissioning – and beyond if needed.

### Quality workmanship

STULZ CyberAir 3 precision air-conditioning systems are manufactured from high-quality materials. Reliability and a long service life are guaranteed by production Made in Germany and continuous quality assurance. Each STULZ CyberAir 3 A/C unit is equipped with its own microprocessor, which automatically switches to a standby unit in the event of problems.

### Simple maintenance

All fine tuning can be accomplished smoothly using the operator terminal of the STULZ C7000 microprocessor. Wearing parts inside the A/C units are positioned in such a way that all main components can be accessed from the front.



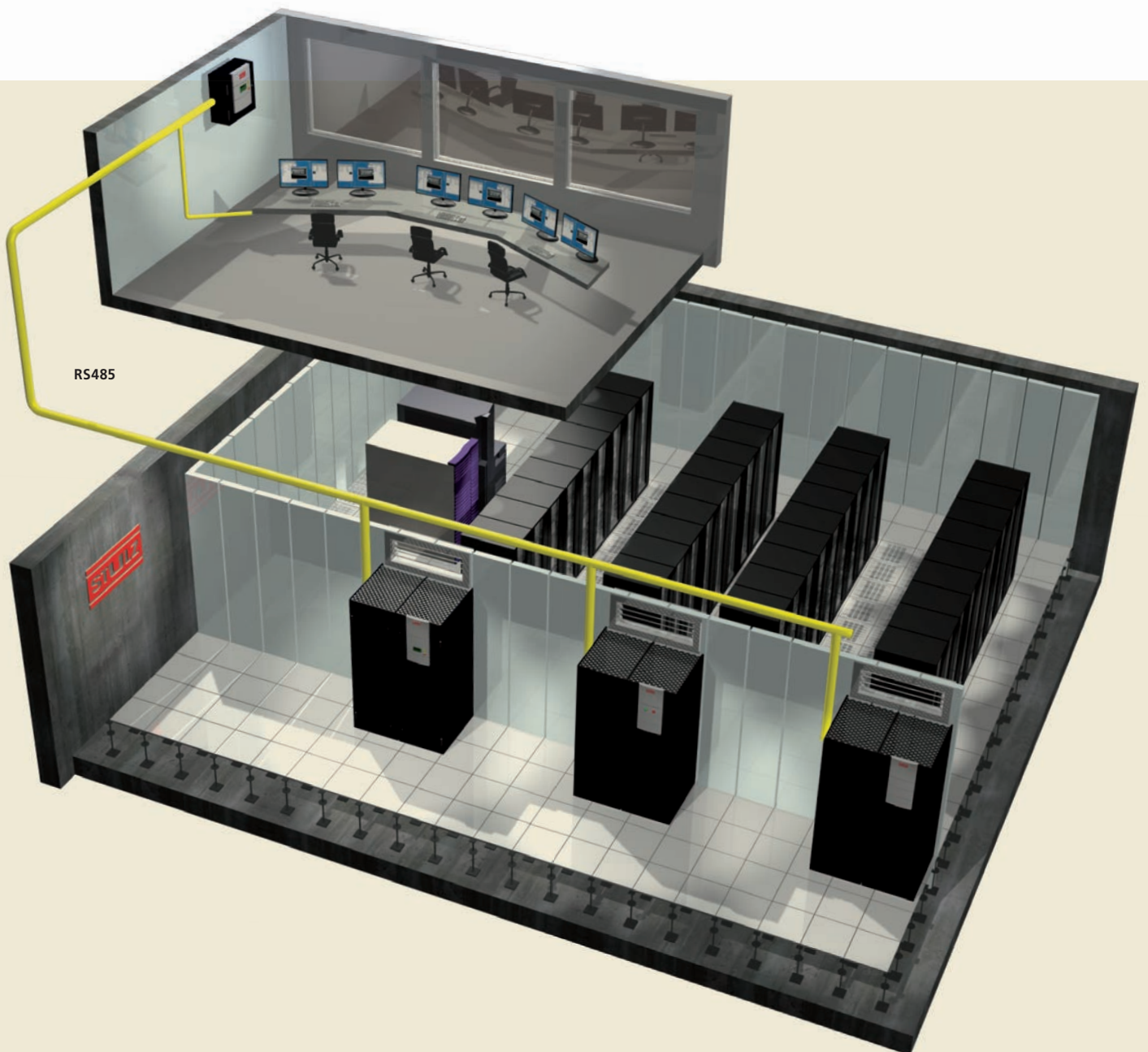
The filter system increases filter life while allowing minimal pressure losses. Filter class G4 (EU4) is standard

### Quality down to the last detail

- A/C units in 7 sizes and with 8 cooling systems
- Precise air distribution, targeted removal of hotspots
- Scalable thanks to its modular construction, up to 20 units per room without additional hardware
- Automatic switchover to redundant standby units in the event of problems
- Perfect workmanship, superior materials
- Compact standard version or energy-optimised low-energy version
- Standard door size facilitates transport and assembly
- Convenient front only access for easy maintenance
- High-quality, hard-wearing powder coating of front panels

## Control by microprocessor

To achieve the precise, reliable control of air conditioning, standby reserves and energy consumption, the STULZ CyberAir 3 is based on highly developed electronics. The STULZ C7000 microprocessor, which is integrated in every A/C unit, is the nerve centre of our innovative control concepts.

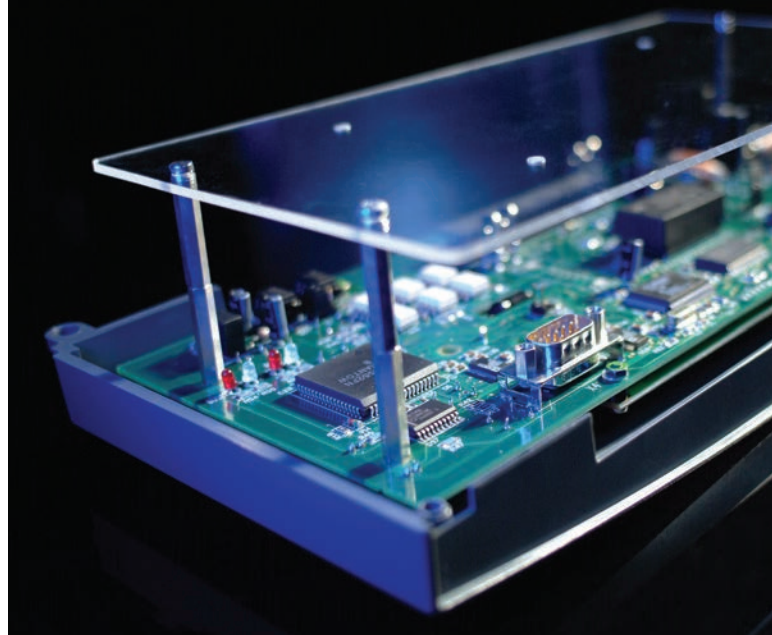


### Networked system based on the RS485 standard

Bus systems based on the RS485 standard protocol offer high transmission rates and good reliability. Unlike an open Ethernet network, the closed RS485 bus system hermetically seals off the air-conditioning system out of harms' way of viruses and faulty software. As the global industry standard, RS485 ensures compatibility with all common BMS systems now and in the future.

## All active components in perfect balance

The microprocessor keeps all active components of the system in balance. It adapts various parameters such as airflow, external pressure, noise level and cooling capacity of each A/C unit precisely in line with the room conditions. In addition, it supplies the data for the remote control units, initiates service messages and alarms via e-mail or SMS and can be linked via interfaces to all common BMS systems and to the internet.



## C7000 basic version

This version comes equipped with all the necessary functions for controlling and monitoring the air-conditioning system. A service interface enables the C7000 to be precisely configured using a laptop. Optional signal lamps on the housing keep the user informed about the operating state of the A/C unit. The Modbus protocol frequently used for connection to BMS systems is already integrated in the microprocessor:

- High level of redundancy and availability thanks to autonomous controllers in every A/C module
- Sequencing with standby functions
- Control of up to 20 A/C modules per data bus system
- UPS operation with configurable components for low unit power consumption
- Recording of room conditions
- Event log
- Zone operation
- Service interface
- Modbus protocol preinstalled

## C7000 Advanced user interface

This interface also features an external control panel with graphic display and an extended operator interface for connection to all common BMS systems. The Windows-type menu structure enables you to centrally control up to 20 A/C units. In addition to the functions of the basic version, the C7000 Advanced also offers the following:

- Large LCD graphic display for operation and control, either integrated in the A/C unit or as a separate remote control
- Simple adaptation to local conditions on start-up
- Can be operated in 12 languages
- Service interface for configuration and downloading software
- Manual mode for service purposes
- Suitable for connection to all common BMS systems. The RS485 and RS232 ports enable connection and interfacing to a BMS.
- Modbus and other data protocols preinstalled
- Optical and acoustic signalling of events
- The operator terminal is either incorporated in the air-conditioning unit, or available as a separate module

# Network connection for convenient control

With intelligent network solutions from STULZ, you will always be in control of your STULZ CyberAir 3 precision air-conditioning system. You can enter and adjust setpoints, monitor the system and output operating data either using separate operator terminals, your PC or via a link to existing building management systems.

The serial RS485/RS232 interfaces enable connection with all common BMS systems from other manufacturers. Enjoy the convenience of controlling your air-conditioning system by web browser using the STULZ WIB8000 internet interface. And incorporate it in building management bus systems via the LonWorks®-based STULZ LIB7000 interface.

## Basic interface STULZ MIB7000

- MIB = Multifunctional Interface Board
- BMS interfaces to bus systems in conformity with RS485 and RS232 standard
- Interfaces RS485 and RS232

## Internet interface STULZ WIB8000

- WIB = Web Interface Board
- Communication via SNMP and HTTP IP protocols
- Browser-based configuration and operation (HTTP)

## LonWorks® interface STULZ LIB7000

- LIB = Lon Interface Board, upgrade to MIB7000
- LonWorks® technology for STULZ air-conditioning systems

BMS suppliers	Data protocol							
Controller		C7000 IOC with E-bus	C7000 IOC	C7000 IOC with E-bus	C7000 IOC with E-bus	C7000 IOC with E-bus	C7000 IOC	C7000 IOC
Gateway			+ Advanced	+ MIB	+ WIB	+ MIB + LIB	+ CompTrol SMS	+ AT + LIB
Various manufacturers	Modbus	●	●	●				
Kieback & Peter	P90		●	●				
Saia	S-Bus		●					
Various manufacturers	BACnet	●	●●					
LonWorks®	LonTalk®	●	●			●		●
Various manufacturers	SNMP				●			
Various manufacturers	HTTP				●			
Various manufacturers	GSM						●	

Cross-reference table: Gateway – data protocol

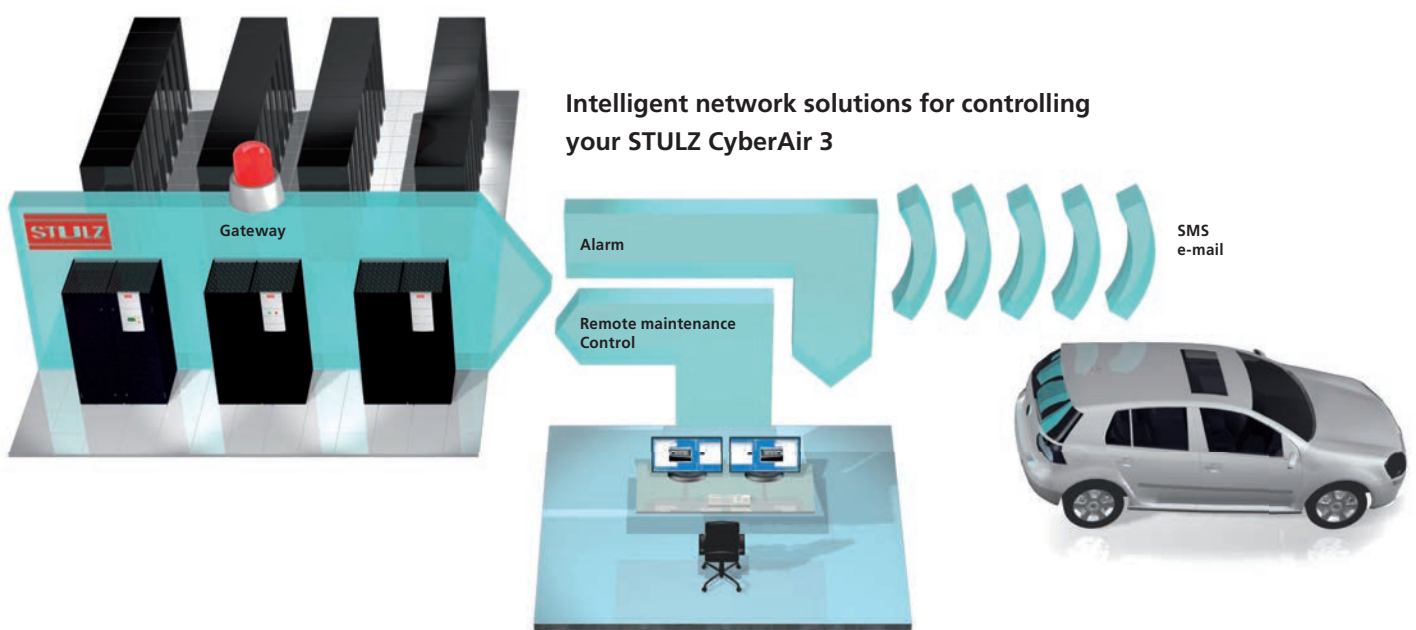
- Full functionality
- A customised gateway solution with protocol converter is available for high transmission rates in larger bus systems

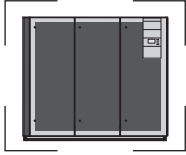




### Fully networked with building management systems

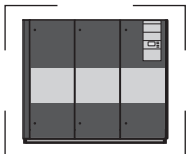
- Link to all building management systems from well-known manufacturers
- Remote control via web browser and SNMP and HTTP Internet protocols
- SMS or e-mail alarm notification via mobile phone with GSM modem





## Mechanical and general options

- High-efficiency rear panel (optional for DX and GE systems downflow)
- Raised floorstand
- Louvered shutters
- Flexible canvas fittings
- Fresh air connection
- Filter class F5 (EU5)
- Discharge air plenums
- Suction base for upflow units
- Duct fitting with pocket filter attachment F6, F7, F9
- Mufflers
- Dual wall design
- Condensate pump
- Special paint

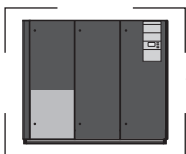


## Heating options

- Electric heating, 1 to 3 stages, continuous
- Refrigerant heating
- Low-pressure hot water heating

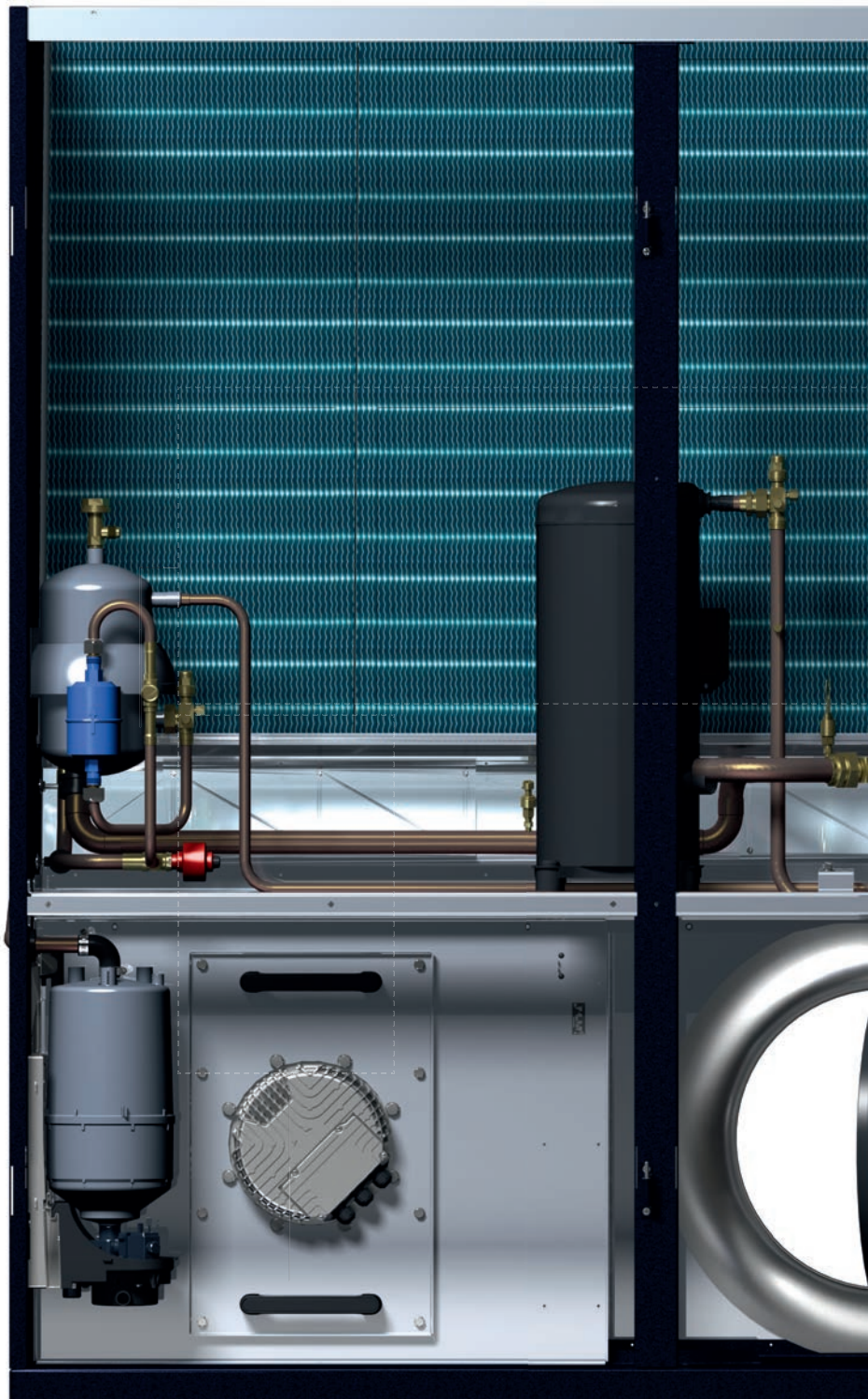
## Options for air-cooled condensers

- Fan speed control
- Winter set-up for operation at temperatures down to -45 °C
- Anti-corrosive coating of heat exchanger pipes

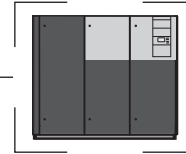
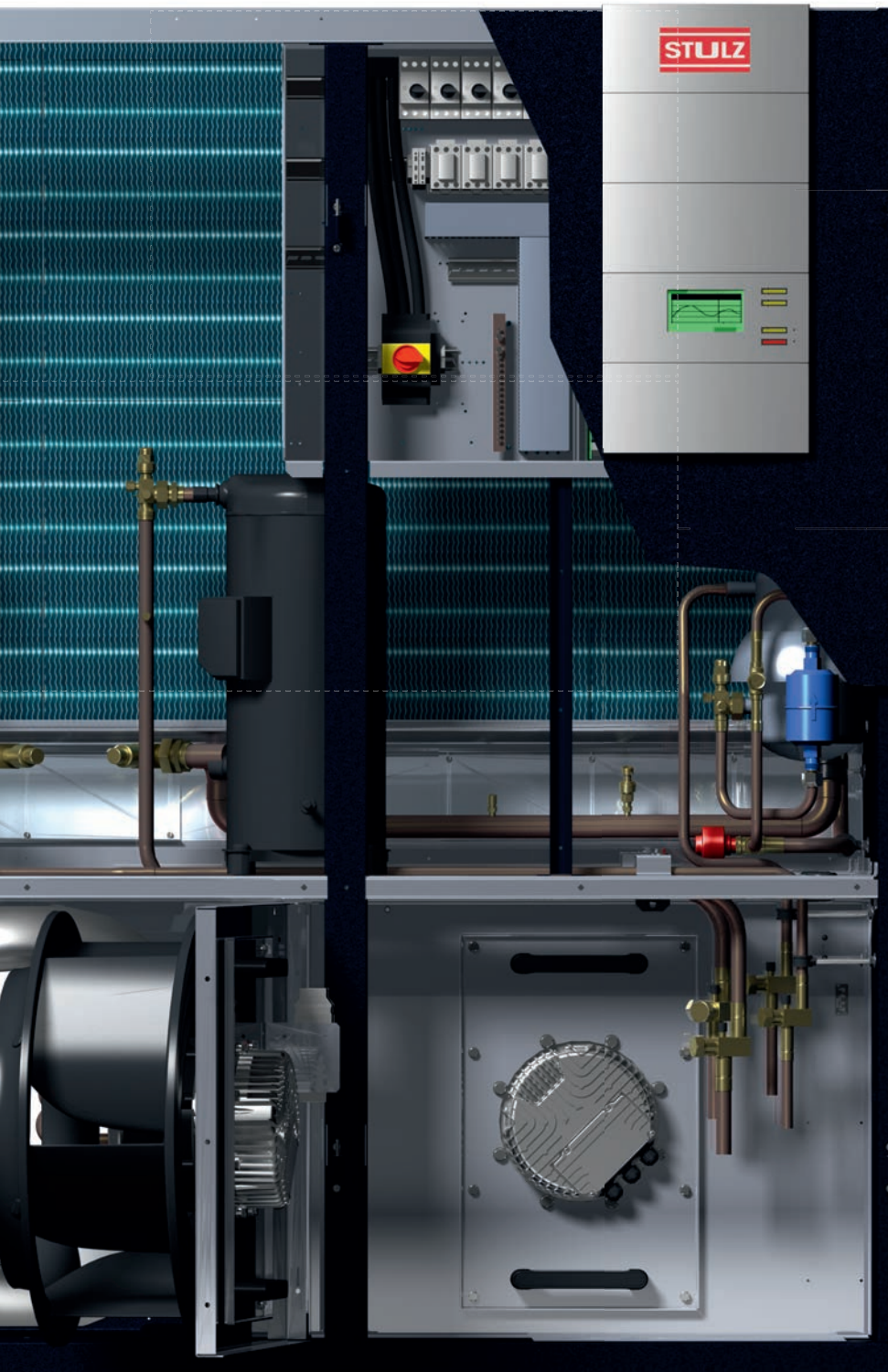


## Humidifier options

- Continuous steam humidification
- External ultrasonic humidification function

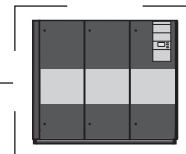


# CyberAir 3 – Unlimited versatility with a diverse range of options



## Electrotechnical options:

- Fire alarms
- Smoke alarms
- Emergency fire shutdown
- Water detection system
- Emergency manual override
- Triggering of fire doors
- Phase sequence monitoring
- Connection facility for remote On/Off
- Special voltages



## Cooling system options

- Output regulation with suction throttle or discharge bypass
- 2-way CW valve
- Microprocessor-controlled regulation of condensation pressure via 2 or 3-way valves

## Optional refrigerants

- R407C (standard)
- R410A
- R134a

## Ease of maintenance

- Direct front access to all components requiring service, including the EC fans



<b>Dimensions and number of fans</b>						
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Width	mm	950	1,400	1,750	2,200	2,550
Height	mm	1,980	1,980	1,980	1,980	1,980
Depth	mm	890	890	890	890	890
Number of fans		1	1	2	2	3
<b>Humidifier output and heating capacity</b>						
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Max. humidifier capacity	kg/h	8	8	15	15	15
Max. no of heating steps (Downflow)		2	2	2	3	3
Max. heating capacity per step	kW	9	9	9	9	9
Max. overall heating capacity	kW	18	18	18	27	27
Max. no of heating steps (Upflow)		1	2	2	3	3
Max. heating capacity per step	kW	9	9	9	9	9
Max. overall heating capacity	kW	9	18	18	27	27



## CyberAir 3

### CW units, Downflow (1 chilled water circuit)

ASD xxx CW		320	420	550	650	800	950	1000	1180	1250	1550	1800	2100
Air flow	m³/h	7,000	9,000	10,000	13,000	15,500	18,500	19,000	21,500	24,000	29,000	33,000	39,000
CW cooling capacity (total) <sup>1)</sup>	kW	30.1	38.2	54.0	67.5	83.7	100.4	112.6	125.9	135.2	159.4	184.0	214.0
Water temperature: 7 °C/12 °C													
CW cooling capacity (sensible) <sup>1)</sup>	kW	26.7	34.0	42.9	54.5	66.6	79.7	85.5	96.3	105.1	126.1	144.2	168.8
Water temperature: 7 °C/12 °C													
Hydraulic pressure drop <sup>1)</sup>	kPa	34	53	55	85	42	61	58	72	74	105	67	91
Water temperature: 7 °C/12 °C													
CW cooling capacity (total) <sup>2)3)</sup>	kW	28.4	35.0	42.7	53.2	68.5	80.7	84.6	94.7	103.5	122.9	139.8	162.7
Water temperature: 10 °C/16 °C													
CW cooling capacity (sensible) <sup>2)3)</sup>	kW	28.4	35.0	42.7	53.2	68.5	80.7	84.6	94.7	103.5	122.9	139.8	162.7
Water temperature: 10 °C/16 °C													
Hydraulic pressure drop <sup>2)3)</sup>	kPa	78	116	70	104	55	75	79	97	68	93	64	86
Water temperature: 10 °C/16 °C													
Max. available ESP	Pa	300	290	300	80	300	110	300	190	300	230	300	150
Noise level <sup>4)</sup>	dBA	50.4	57.1	53.4	60.4	60.6	65.0	60.8	63.9	59.4	64.3	61.4	65.5
Fan absorbed power <sup>5)</sup>	kW	0.9	1.8	1.1	2.4	2.9	4.9	3.1	4.5	3.6	6.3	5.8	9.4
Weight	kg	281		350		503		586		688		870	
Size		1	1	2	2	3	3	4	4	5	5	7	7

### CW units, Upflow (1 chilled water circuit)

ASU xxx CW		320	420	550	650	800	950	1000	1180	1250	1550
Air flow	m³/h	7,000	9,000	10,000	13,000	16,000	19,000	19,000	22,000	24,000	29,000
CW cooling capacity (total) <sup>1)</sup>	kW	30.1	38.2	54.0	67.5	77.7	92.9	100.3	115.9	127.7	153.9
Water temperature: 7 °C/12 °C											
CW cooling capacity (sensible) <sup>1)</sup>	kW	26.7	34.0	42.9	54.5	64.9	77.2	80.2	92.7	102.3	123.2
Water temperature: 7 °C/12 °C											
Hydraulic pressure drop <sup>1)</sup>	kPa	33	52	55	85	32	45	54	71	68	97
Water temperature: 7 °C/12 °C											
CW cooling capacity (total) <sup>2)3)</sup>	kW	28.4	35.0	42.7	53.2	62.1	72.7	81.1	92.7	101.5	120.5
Water temperature: 10 °C/16 °C											
CW cooling capacity (sensible) <sup>2)3)</sup>	kW	28.4	35.0	42.7	53.2	62.1	72.7	81.1	92.7	101.5	120.5
Water temperature: 10 °C/16 °C											
Hydraulic pressure drop <sup>2)3)</sup>	kPa	77	115	70	105	38	51	71	92	63	87
Water temperature: 10 °C/16 °C											
Max. available ESP	Pa	450	280	450	60	410	190	410	190	450	230
Noise level <sup>4)</sup>	dBA	52.8	59.1	55.4	62.2	55.1	58.9	55.6	58.8	61.2	65.9
Fan absorbed power <sup>5)</sup>	kW	1.0	1.9	1.3	2.7	2.8	4.6	3.1	4.7	3.8	6.5
Weight	kg	282		351		514		605		721	
Size		1	1	2	2	3	3	4	4	5	5

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units

<sup>1)</sup> Return air conditions: 24 °C, 50 % r. h.; glycol: 0 %

<sup>2)</sup> Return air conditions: 26 °C, 40 % r. h.; glycol: 0 %

<sup>3)</sup> Data apply to units with optional high-powered cooler

<sup>4)</sup> Noise level at 2 m distance, free field

<sup>5)</sup> The electric power input of the fans must be added to the room load

Technical data subject to change without notice.

### Dimensions and number of fans

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

### Humidifier output and heating capacity

Size		1	2	3	4	5	7
Max. humidifier capacity	kg/h	8	8	15	15	15	15
Max. no of heating steps		1	1	2	2	3	3
Max. heating capacity per step	kW	9	9	9	9	9	9
Max. overall heating capacity	kW	9	9	18	18	27	27

## CyberAir 3

### CWE/CWU units, Downflow (1 chilled water circuit)

ASD xxx CWE/CWU		390	600	1050	1350	1700	2050	2400
Air flow	m <sup>3</sup> /h	10,000	12,500	23,000	24,000	33,000	47,000	48,000
CW cooling capacity (total) <sup>1)</sup> Water temperature: 7 °C/12 °C	kW	39.8	70.0	93.5	134.2	174.8	213.3	237.4
CW cooling capacity (sensible) <sup>1)</sup> Water temperature: 7 °C/12 °C	kW	36.3	54.8	84.5	105.0	140.1	183.7	196.1
Hydraulic pressure drop <sup>1)</sup> Water temperature: 7 °C/12 °C	kPa	42	69	70	91	189	82	102
CW cooling capacity (total) <sup>2)3)</sup> Water temperature: 10 °C/16 °C	kW	36.9	54.0	82.7	97.7	120.7 <sup>7)</sup>	186.0	195.6
CW cooling capacity (sensible) <sup>2)3)</sup> Water temperature: 10 °C/16 °C	kW	36.9	54.0	82.7	97.7	120.7 <sup>7)</sup>	186.0	195.6
Hydraulic pressure drop <sup>2)3)</sup> Water temperature: 10 °C/16 °C	kPa	55	80	111	101	158 <sup>7)</sup>	110	100
Noise level CWE (Fan on raised floor) <sup>4)</sup>	dBA	54.3	59.8	60.5	61.9	61.6	62.6	63.6
Noise level CWU (Fan in raised floor void) <sup>4)6)</sup>	dBA	54.1	58.9	60.0	59.3	58.7	61.4	61.9
Fan absorbed power CWE (Fan on raised floor) <sup>3)</sup>	kW	1.9	2.1	5.0	4.7	7.0	11.3	11.2
Fan absorbed power CWU (Fan in raised floor void) <sup>3)6)</sup>	kW	1.2	1.9	3.7	3.5	4.8	8.6	8.4
Weight	kg	365	482	559	692	863	1,055	1,133
Size		1	2	3	4	5	7	8

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units; filter class F5

<sup>1)</sup> Return air conditions: 24 °C, 50 % r. h.; glycol: 0 %

<sup>2)</sup> Return air conditions: 26 °C, 40 % r. h.; glycol: 0 %

<sup>3)</sup> Data apply to units with optional high-powered cooler

<sup>4)</sup> Noise level at 2 m distance, free field

<sup>5)</sup> The electric power input of the fans must be added to the room load

<sup>6)</sup> Measured at a height of raised floor = 900 mm

<sup>7)</sup> Data with reduced air flow, details provided on request

Technical data subject to change without notice.

### Dimensions and number of fans

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
Number of fans		1	1	2	2	3	4	4

### Humidifier output and heating capacity

Size		1	2	3	4	5	7	8
Max. humidifier capacity	kg/h	8	8	15	15	15	15	15
Max. no of heating steps		1	1	2	2	3	3	3
Max. heating capacity per step	kW	9	9	9	9	9	9	9
Max. overall heating capacity	kW	9	9	18	18	27	27	27



<b>CyberAir 3</b>							
<b>CW2 units, Downflow (2 chilled water circuit)</b>							
<b>ASD xxx CW2</b>		<b>270</b>	<b>510</b>	<b>670</b>	<b>810</b>	<b>1070</b>	<b>1170</b>
Air flow	m <sup>3</sup> /h	8,500	11,500	17,500	21,000	26,000	36,000
CW cooling capacity (total) <sup>1)</sup>	kW	31.3	49.3	68.2	86.3	107.6	137.2
Water temperature: 7 °C/12 °C							
CW cooling capacity (sensible) <sup>1)</sup>	kW	28.3	42.6	60.7	74.7	93.4	120.7
Water temperature: 7 °C/12 °C							
Hydraulic pressure drop <sup>1)</sup>	kPa	109	79	69	91	111	85
Water temperature: 7 °C/12 °C							
CW cooling capacity (total) <sup>2)3)</sup>	kW	27.8	41.6	59.3	72.4	90.2	118.4
Water temperature: 10 °C/16 °C							
CW cooling capacity (sensible) <sup>2)3)</sup>	kW	27.8	41.6	59.3	72.4	90.2	118.4
Water temperature: 10 °C/16 °C							
Hydraulic pressure drop <sup>2)3)</sup>	kPa	96	99	82	136	141	161
Water temperature: 10 °C/16 °C							
Max. available ESP	Pa	210	70	190	180	290	240
Noise level <sup>4)</sup>	dBA	55.0	56.7	57.2	57.5	57.7	59.0
Fan absorbed power <sup>5)</sup>	kW	2.0	2.7	4.2	4.6	5.3	7.8
Weight	kg	293	380	461	553	644	844
Size		1	2	3	4	5	7
<b>CW2 units, Upflow (2 chilled water circuit)</b>							
<b>ASU xxx CW2</b>		<b>270</b>	<b>510</b>	<b>670</b>	<b>810</b>	<b>1070</b>	<b>1170</b>
Air flow	m <sup>3</sup> /h	8,500	10,500	17,000	20,000	26,000	36,000
CW cooling capacity (total) <sup>1)</sup>	kW	31.3	46.1	66.3	83.3	107.6	137.2
Water temperature: 7 °C/12 °C							
CW cooling capacity (sensible) <sup>1)</sup>	kW	28.3	39.7	59.1	71.9	93.4	120.7
Water temperature: 7 °C/12 °C							
Hydraulic pressure drop <sup>1)</sup>	kPa	106	73	65	83	120	85
Water temperature: 7 °C/12 °C							
CW cooling capacity (total) <sup>2)3)</sup>	kW	27.8	38.5	58.0	69.8	90.2	118.4
Water temperature: 10 °C/16 °C							
CW cooling capacity (sensible) <sup>2)3)</sup>	kW	27.8	38.5	58.0	69.8	90.2	118.4
Water temperature: 10 °C/16 °C							
Hydraulic pressure drop <sup>2)3)</sup>	kPa	94	86	78	124	145	161
Water temperature: 10 °C/16 °C							
Max. available ESP	Pa	160	150	170	200	260	240
Noise level <sup>4)</sup>	dBA	57.2	57.4	58.9	58.8	58.9	59.0
Fan absorbed power <sup>5)</sup>	kW	2.3	2.5	4.5	4.6	5.8	7.8
Weight	kg	296	384	476	573	718	844
Size		1	2	3	4	5	7

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units

<sup>1)</sup> Return air conditions: 24 °C, 50 % r. h.; glycol: 0 %

<sup>2)</sup> Return air conditions: 26 °C, 40 % r. h.; glycol: 0 %

<sup>3)</sup> Data apply to units with optional high-powered cooler

<sup>4)</sup> Noise level at 2 m distance, free field

<sup>5)</sup> The electric power input of the fans must be added to the room load

Technical data subject to change without notice.

<b>Dimensions and number of fans</b>							
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>
Width	mm	950	1,400	1,750	2,200	2,550	3,110
Height	mm	1,980	1,980	1,980	1,980	1,980	1,980
Depth	mm	890	890	890	890	890	980
Number of fans		1	1	2	2	3	4
<b>Humidifier output and heating capacity</b>							
<b>Size</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>7</b>
Max. humidifier capacity, Downflow	kg/h	4	8	15	15	15	15
Max. humidifier capacity, Upflow	kg/h	8	8	15	15	15	15
Max. no of heating steps		1	1	2	2	3	3
Max. heating capacity per step	kW	9	9	9	9	9	9
Max. overall heating capacity	kW	9	9	18	18	27	27

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