STULZ

CLIMATE. CUSTOMIZED.

CyberHandler 2

The Indirect Evaporative Free Cooling Air Handling Unit

Services on your doorstep

For over 40 years we have been one of the world's leading manufacturers of air conditioning solutions for mission-critical applications. For our customers, we develop and produce air conditioning systems, chillers, and air handling units, plan individual air conditioning solutions, implement the systems and keep them up and running with our own Service and an international partner network.

Our headquarters are in Hamburg. With 19 subsidiaries, 9 production sites, and sales and service partners in more than 140 countries, we make sure we are close to our customers wherever they are in the world.

Technical development from Germany

We put a great deal of experience and innovative spirit into our air conditioning systems. Engineers, specialist 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.

Flexible & Efficient

11 sizes from 30 kW to 520 kW to fit your needs with maximum efficiency

Typical pPUE between 1.02&1.10

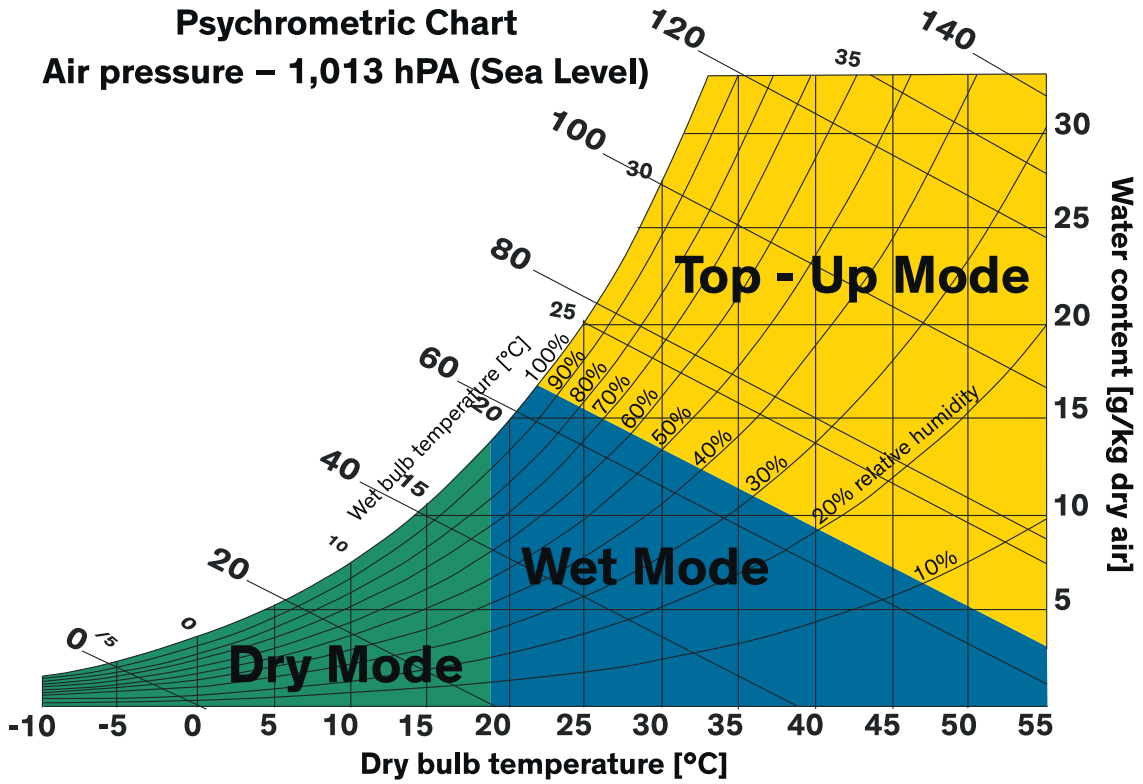
The STULZ CyberHandler 2 is a complete air conditioning solution especially designed for data centers.

With its outdoor housing, it can easily be installed next to a building or on a roof, freeing up precious floor space in the data center. 11 different sizes and various output ratings from 30 kW to 520 kW lay foundations upon which we can satisfy customers´ specific wishes.

Within each system, numerous options allow project-based configuration and adaptation to suit local conditions. A very efficient combination of Free Cooling and evaporative cooling in an optimized design mean that 100 % mechanical cooling is no longer necessary in most regions. pPUE values as low as 1.02 can be achieved.

Data centers are mission-critical systems requiring maximum operational reliability. For the CyberHandler 2 we employ a mix of components that we use in our STULZ precision air conditioning solutions for data centers, and each unit is equipped with its own STULZ controller, specially developed for controlling mission-critical chilling systems.

Operating Modes & Benefits



3 operating modes based on ambient air temperatures:

- **"DRY MODE"** (Free Cooling only)
  Adiabatics OFF
  Mechanical Cooling OFF
  At low outside temperatures, hot air from the data center is cooled down by the cold outside air via the plate heat exchanger.

- **"WET MODE"** (Adiabatic):
  Adiabatics ON
  Mechanical Cooling OFF
  When the outside temperature is moderate, the outside air is pre-cooled by the adiabatic system before passing through the heat exchanger, where it cools down the air from data center.

- **"TOP-UP MODE"** (Mixed Mode):
  Adiabatics ON
  Mechanical Cooling ON
  At very high outside temperatures, a compressor refrigeration system is used in addition to the adiabatic system to provide top-up cooling.

The benefits of Indirect Evaporative Cooling:

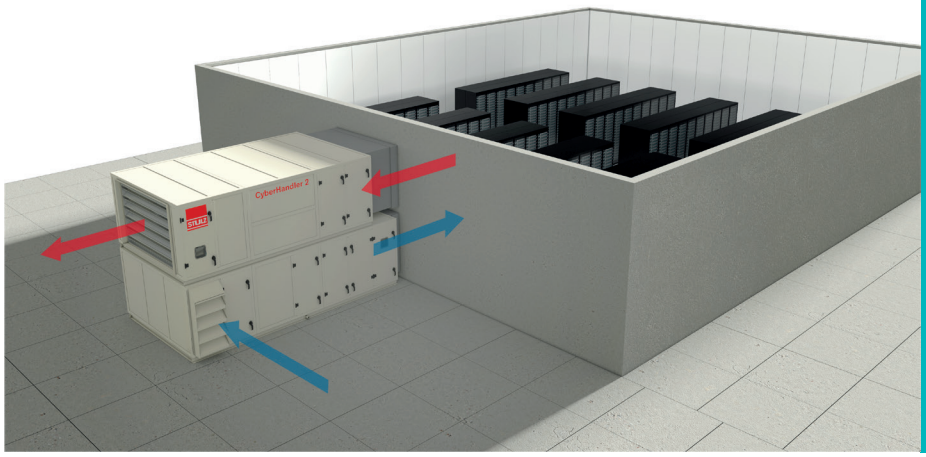
- No contamination from the outside
- Evaporative cooling extends Indirect Free Cooling operation all year round
- Unbeatable energy efficiency levels with pPUEs in the range of 1.02 – 1.10
- Lower total cost of ownership (TCO): reduced CAPEX, OPEX, maintenance, infrastructure costs, etc.
- The unit is installed outdoors, freeing up maximum white space in the data center
- Simplified installation: easier management of wiring, pipes and water, not needed inside the data center
- Downsizing the electrical infrastructure allows savings in CAPEX of 6-8 %
- Faster return on investment

Installation Configurations

Our high-performance air handling units are positioned directly on or next to the building. All the necessary chilling components are integrated in the units´ housing, saving floor space in the data center and facilitating maintenance, as the service engineers no longer need to enter the data center.

Wall - Installation next to the building

Fast and simple



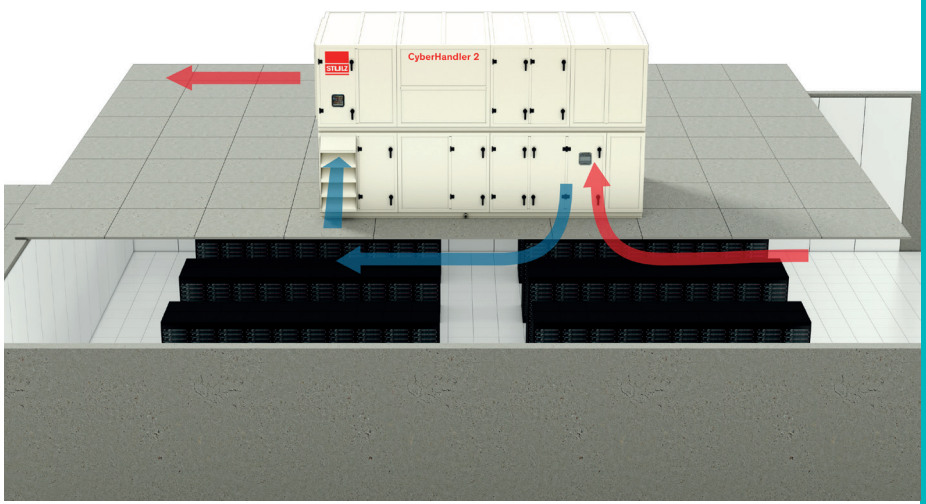
Supply and exhaust air is conveyed horizontally through the air conditioning unit.

The supply air duct can easily be joined to an existing raised floor, while the exhaust air travels conveniently out of the data center straight into the unit.

This kind of installation is especially suitable for data center projects without space restrictions and no need for the units to be visible.

Roof - Installation on the building

Out of sight is out of mind



The air is conducted through the ceiling of the rooms into the CyberHandler 2. No additional air ducts are needed outdoors for connection.

By cleverly locating them on the roof, plus a few minor structural measures, the units can easily be made invisible, which has a dual benefit.

Firstly, units installed on the roof have fewer points of contact with the enviroment and will always generate less noise pollution.

Secondly, data centers are high-security areas, and roof installation makes sabotage more difficult.

This kind of installation is especially suitable for data centers in residential and mixed-use areas.

Cooling Configurations

The requirements for a cooling system vary hugely depending on the location and climate zone. With four basic configurations and many options available, we can offer the right solution for every project requirement in virtually every climate zone.

Indirect Evaporative Free Cooling

The largest mechanical component in the CyberHandler 2 is the air/air heat exchanger. The hot air from the data center is cooled with outside air in the heat exchanger without mixing the two air flows. In addition, adiabatic cooling takes place in the heat exchanger by nozzles spraying water directly on the heat exchanger.
In this way, the air is pre-cooled and the heat exchanger is enhanced, extending the Free Cooling period. In temperate/hot climates, in particular, this covers all cooling needs, and additional mechanical compressor cooling is unnecessary.

Indirect Evaporative Free Cooling with Top-Up integrated DX cooling system

In very hot climates, DX cooling is added to the existing system. The complete DX system with compressor, evaporator and condenser is also housed inside the unit. With this enhancement, 30 % of the required cooling can be generated mechanically. In this way, the system can be used in practically any climate zone.

Redundant cooling configuration for even greater independence
Extreme climatic conditions with strongly fluctuating temperatures and periods of intense heat are now occurring more often in various regions. In isolated cases, when the adiabatic cooling is not enough to guarantee sufficient cooling, the system must be combined with a 100% weather-independent solution. Chilled water systems with chillers and DX heat exchanger systems have proven to be an excellent enhancement here.

Indirect Evaporative Free Cooling with CW Coil Top-Up/Redundant cooling

A CW chiller is added to the adiabatic cooling system, and provides additional cooling in an infinite range. If necessary, the chiller can generate all the cold needed.

Indirect Evaporative Free Cooling with redundant DX cooling system

In this configuration, a DX outdoor unit is connected to the CyberHandler 2, and takes on 100% of cooling if required.

Components Overview

Mechanical cooling options

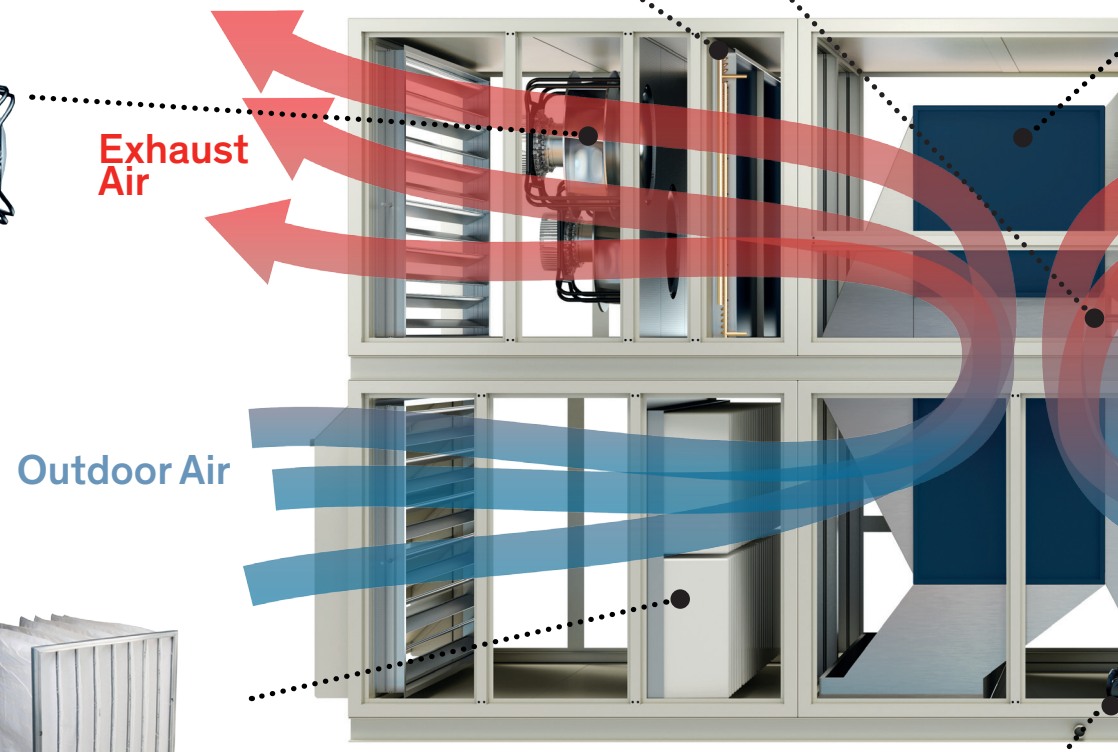
- Chilled water coil (external chiller)
- DX coil (external condenser)
- Integrated DX cooling system (top-up)

Water spray nozzles

- Full cone stainless steel nozzles
- Guarantees a full “shower” on the plate heat exchanger
- Non-clogging design
- Allows the use of demineralized water

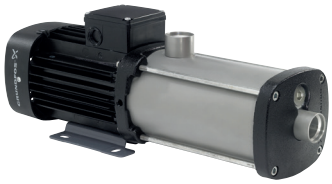
Fans

- Plug fan technology
- State-of-the-art, highly efficient EC motors
- Reduce the noise level



Filters

- Eurovent certified
- Meet the standard EN779:2012
- Low pressure drop design
- Available in different classes (G4, M5, F7 and F9)

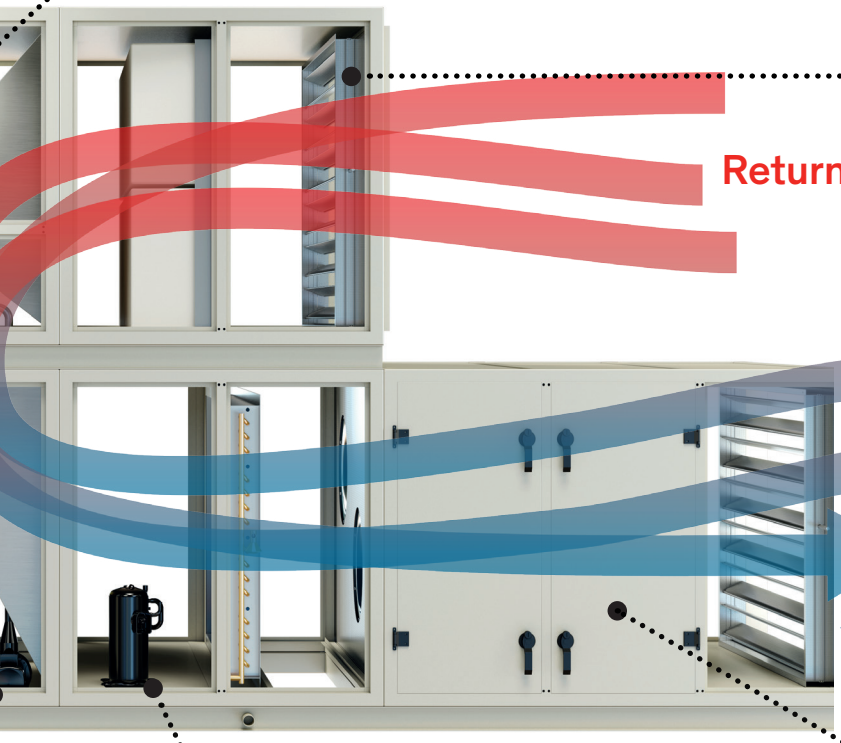


Water Pump

- High efficiency stainless steel circulation pump
- Allows the use of demineralized water
- Low pressure system
- Redundant pump as an optional

Air-to-air plate heat exchangers

- 100 % aluminum, epoxy painted, extra sealed
- 100 % indirect heat recovery
- Eurovent certified
- Excellent efficiency to pressure drop ratio
- Double PHX for higher cooling recovery



Dampers

- 100 % aluminum and plastics (no corrosion issues)
- Low pressure drop design
- Different leakage classes
- available
- Special fire and smoke dampers (optional)

STULZ C7000 controller

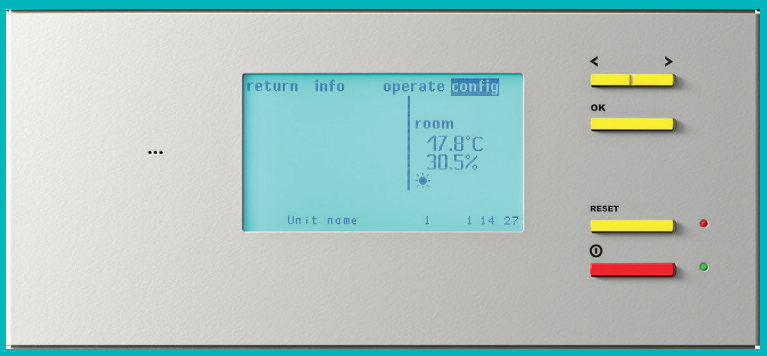
- State-of-the-art intelligent control for IT cooling systems
- Designed specifically for precision control of mission-critical environments
- Hardware and sofware developed in-house

Compressor technology

- The latest EC compressor scroll inverter technology
- Additional tandem scroll compressors for higher capacities
- Maximum efficiency at partial loads

C7000 Controller

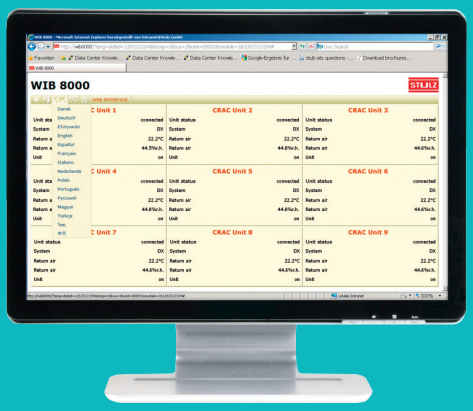
C 7000 Electronic Controller: Intelligent Control for IT Cooling Systems



- Designed specifically for precision control of mission-critical environments.
- Energy-efficient control concepts onboard (CW standby management, raised-floor pressure management, Indirect Dynamic Free Cooling).
- Preservation of parameters during firmware updates.
- Onboard protocol Modbus RTU (customizing Modbus data point list).
- Freely configurable digital alarm inputs.
- Integrated data logger.
- Internal Modbus component communication bus
- Hardware periphery check after boot sequence
- The following BMS protocols are supported: BACnet IP, BACnet MS/TP, Modbus TCP, and LonWorks

WIB 8000: The All-in-One Web Interface for Precision Air Conditioning Systems.

The WIB 8000 is user-friendly and highly functional, and it offers easy data exchange and monitoring with global adaptability.



Functions and monitoring

- Alerts via e-mail to up to five recipients
- Ongoing retrieval of data from the controller
- Monitoring of up to 32 units via web browser
- Ethernet port
- Bus-independent zone operation
- Easy connection to existing building management system

User-friendly

- Works via HTTP and SNMP in parallel
- No JavaScript, no cookies
- Easy and quick configuration via web page
- Easy to install and suitable for retrofitting (only one component to install!)

Selection Tool

The CyberHandler 2 Select is a powerful software tool specially designed to allow an easy and friendly experience during the selection of each Air Handling Unit. The user-friendly interface helps you optimize and customize the unit so it best fits the project requirements. The CyberHandler 2 Select can provide you with the following documentation:

- Technical specification sheets
- 2D drawings
- 3D images
- Quotations
- Life-cycle cost (LCC) calculations
- pPUE calculations (ASHRAE Weather Data Viewer version 5.0 is integrated)

The complete solution

The CyberHandler 2 is more than a product. We offer a full range of services, providing you with a turnkey solution for your data center cooling:

- Software tools for calculating life-cycle cost/pPUE
- Reverse osmosis (RO) water treatment system
- Start-up
- Maintenance
- Warranty

Testing facilities

In our Test Center, located near Madrid in Spain, we can perform a variety of tests on the Air Handling Units in a state-of-the-art test chamber. This enables our clients to witness the units operating under simulated extreme conditions, providing critical information such as performance data, energy consumption and water consumption.

Test parameters

- Function tests for simulating the safety features
- Physical dimensions of the units
- IT load up to 520 kW
- Airflows up to 120,000 m3/h
- Outdoor ambient conditions:
  – Temperature range from +10 to +50
  – Humidity range from 30% RH to 90% RH

Main features at a glance

- Cooling range from 30 kW to 520 kW
- 11 sizes
- Ready for roof and wall installation
- The best casing leak classification according to standard EN1886 (L1/L1)
- Designed for minimum pressure drops
- STULZ C7000 controller designed especially for precision control of mission-critical environments
- Easy access for maintenance
- Several filter classes available: G4, M5, F7 and F9
- Designed to fit standard transportation
- Flexible modular installation
- 3 cooling systems in 1:
  - Indirect Free Cooling
  - Indirect Evaporative Free Cooling
  - Mechanical cooling (as top-up or redundancy)

Customize it...

Customize the CyberHandler 2 to your requirements with a wide range of options

- Dual power supply with automatic or manual switchover
- Ultrasonic humidifiers
- Fresh air damper for CO2 control
- Outdoor installation
- Damper (ambient side and DC room return)
- Silencers
- FAT
- Control systems UPS backed
- Fire and smoke dampers (data center side)
- Different filter classes according to the EN779: M5, F7, F9
- RO water treatment system
- Anti-frost control
- Redundant adiabatic water pump
- Alternative power supply

Technical Data & Nomenclature

Sizes		S1	S2	S3	S4
Technical Data					
Nominal net cooling capacity	kW	25	40	48	64
Nominal data center airflow	m3/h	5350	8500	10200	13600
Max. net cooling capacity	kW	63	106	123	174
Max. data center airflow	m3/h	13400	22575	26200	37050
pPUE (annual)		1.036	1.036	1.033	1.032
EER		19.07	16.54	18.32	19.54

Sizes		S1	S2	S3	S4
Dimensions and Weight					
Width	mm	1400	1775	2010	2620
Height	mm	2400	3010	3010	3010
Depth	mm	3750	4080	4080	4080
Weight	Kg	2300	3400	3650	4470

Example: CH2 - S1 - ADB - SH/RH

Product Range

CH2	CyberHandler2

Size

S1 - S11	From S1 to S11

Cooling Configuration

ADB	ADB: Adiabatic only
CWT	CWT: Chilled Water Top-Up Coil
CWR	CWR: Chilled Water Redundant Coil
DXT	DXT: DX Top-Up integrated system
DXR	DXR: DX Redundant system with outdoor condensing unit

Installation Configurations

SH/RH	SH/RH: Supply Horizontal/Return Horizontal (Wall)
SB/RH	SB/RH: Supply Bottom/Return Horizontal (Roof)
SB/RB	SB/RB: Supply Bottom/Return Bottom (Roof)

S5	S6	S7	S8	S9	S10	S11
72	95	107	122	138	159	190
15350 196	20200 270	22800 276	26000 352	29400 367	33850 428	40450 531
41750	57500	58750	74950	78115	91100	113050
1.034	1.032	1.031	1.03	1.031	1.033	1.033
17.57	17.22	17.63	19.45	19.95	17.71	18.13

S5	S6	S7	S8	S9	S10	S11
2020	2630	2935	2935	3250	3250	3860
4230	4230	4840	4840	4840	5450	5450
4560	4560	4560	4850	4850	5210	5210
5050	5970	6420	7120	7550	8580	9690

Capacities are based on the following conditions:
- Supply air 25°C DB with $\Delta T = 15$ K and 100 Pa ESP
- Ambient air 35.8°C DB / 22.3°C WB

Dimensions and weights are estimates and will depend on the selected cooling/installation configuration.
Annual pPUE calculation based on London Heathrow Airport weather data in nominal conditions.

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Close to you around the world

With specialist, competent partners in ten German branches and in subsidiaries and exclusive sales and service agents around the world.
Our ten production sites are situated in Europe, North America and Asia.

For further information, please visit our website at **www.stulz.com**

You can find out more on our product page.