



IT Cooling Solutions

# CyberCool 2 – Chiller

The high-end chiller for data centers

“There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper, and the people who consider price only are this man’s lawful prey. It’s unwise to pay too much, but it’s worse to pay too little. When you pay too much, you lose a little money – that’s all. When you pay too little, you sometimes lose everything, because the thing you bought was incapable of doing the thing it was bought to do.”

**John Ruskin (1819–1900)**



# STULZ CyberCool 2 – High-end in every detail

In Germany, more than one billion euros a year are spent on supplying electricity to data centers. Data center operators are therefore interested in two things when it comes to air conditioning their IT: Reliability without compromise – and a drastic reduction in the energy costs of air conditioning.

As one of the most advanced companies in the field of IT Cooling Solutions, we have developed a high-end chiller especially for use in data centers, which satisfies all requirements for efficiency and reliability.

"THE NEXT BIG COOLING SOLUTION" is pure German innovative spirit. For with the performance-optimized CyberCool 2, STULZ offers a complete, horizontally integrated air conditioning solution for your IT – including control for higher-level system networking with precision air conditioning components. These units, which were designed and produced in Hamburg, boast a cooling capacity from 50 to as much as 1,400 kW and are available as an air cooled version. Thanks to the diverse range of available options and the intelligent control technology, the new CyberCool 2 is one of the most cost-effective chillers.



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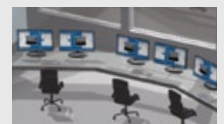
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# STULZ Worldwide



## Global expertise in chiller cooling from over 1000 successful projects

| Outdoor Air cooled    | Global | Throughout Germany | Installed kW worldwide |
|-----------------------|--------|--------------------|------------------------|
| Projects < 100 kW     | > 410  | > 200              | > 30,000               |
| Projects 100 - 800 kW | > 220  | > 130              | > 80,000               |
| Total                 | > 630  | > 330              | > 110,000              |

| Indoor Data Chiller | Quantity | Throughout Germany | Installed kW |
|---------------------|----------|--------------------|--------------|
| Projects            | > 270    | > 110              | > 35,600     |



### German engineering

In 1971 we began specializing in the development and production of precision air conditioning units and chillers for data centers. That's a wealth of experience gathered over 40 years and from many thousands of projects that we have implemented worldwide. We have systems and solutions for data centers of all sizes and with the most diverse requirements – take advantage of our know-how.

### Custom-made

Fitting to your budget, STULZ draws up a detailed quotation based on your requirements in terms of performance, availability, required space and cost. Our specialists put together an individual air conditioning system for you in which internal precision air conditioning systems and external chillers are always viewed as an integrated system. And we help you to draw up service specifications and invitations to tender.

### Quality standards

STULZ offers the best possible reliability levels by manufacturing its precision air conditioning units and CyberCool 2 chillers using high-quality components which meet our extremely strict production standards. Every finished CyberCool 2 chiller undergoes comprehensive live mechanical and electrical testing on our running test bench. There's no other way to achieve 100 % reliability.

## STULZ availability concept

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





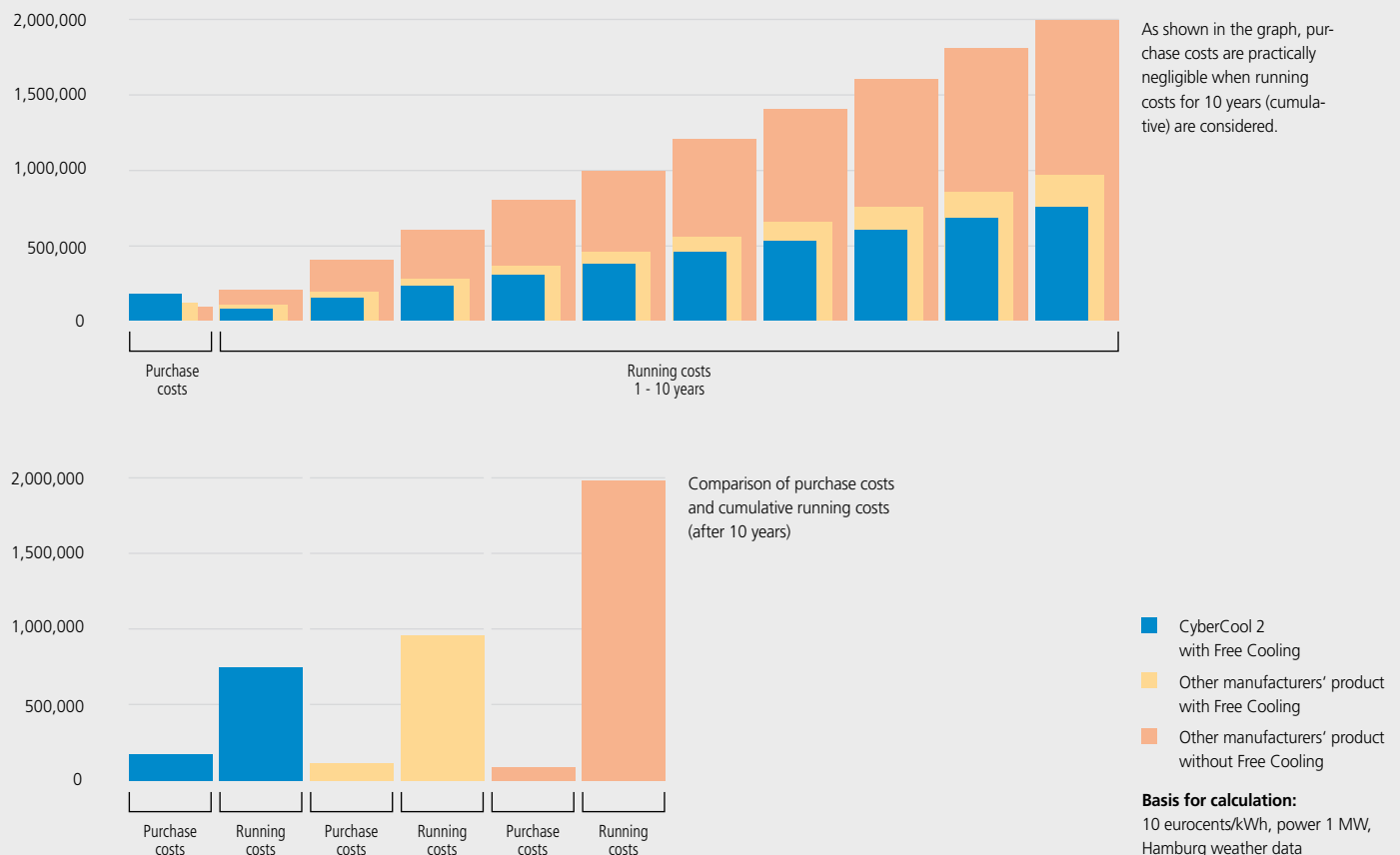


# Total cost of ownership

## Performance-optimized cooling

Chillers for data centers are designed for 24/7 continuous operation and usually for runtime of at least 10 years. In this period, for data centers size 1 MW, for example, with cooling

using standard chillers not specially designed for data centers, running costs could easily reach millions. CyberCool 2 chillers are optimized for high performance and have intelligent options that help achieve data center cooling in a very efficient manner and reduce power consumption by up to 60 %.

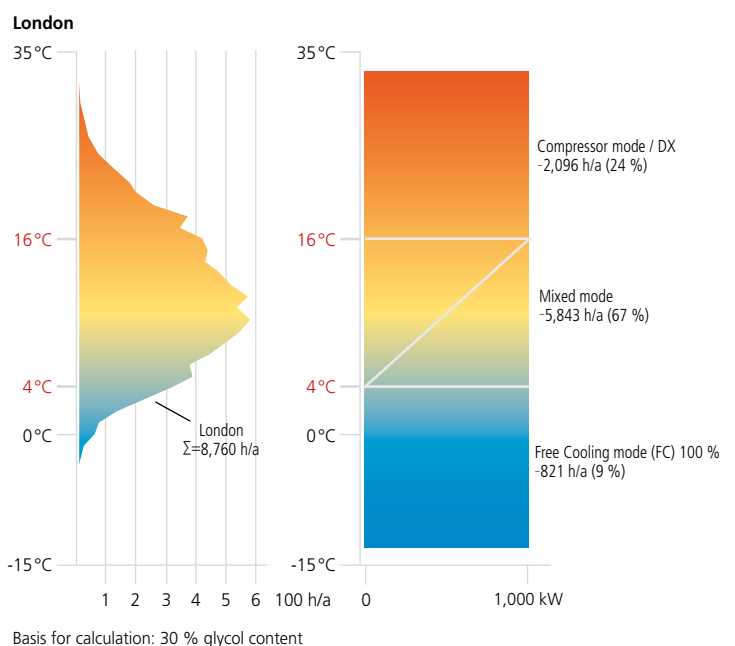


## No efficiency without mixed mode

In order to be energy efficient, a chiller must be technically capable of working over the entire outside temperature range in a way that is optimized for the operating point. Here, according to temperature statistics in the temperate zones, most operating hours are not purely in Free Cooling or compressor mode, but in Mixed mode (approx. 70 %).

Mixed mode uses the Free Cooling coil for pre-cooling the chilled water, and can therefore reduce power consumption of the compressors to a minimum. The smooth changeover between compressor mode and Free Cooling, plus coils with a maximum surface area, are what makes CyberCool 2 successful and most energy efficient in Mixed mode.

CyberCool 2 combines three operating modes in one machine and so always uses the most energy efficient operating point depending on the outside temperature.



# Efficiency

## Minimal energy consumption

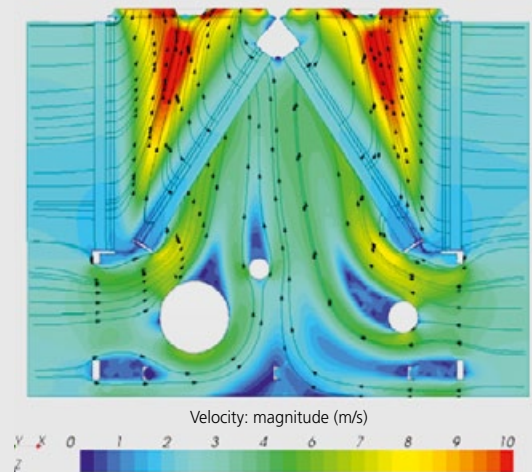
Equipped with innovative high-end components, the CyberCool 2 boosts energy efficiency to the maximum

### Large coil surfaces

The key to thermodynamic performance

#### Condenser

- Full aluminum microchannel coil
- Lower condensation temperature in DX mode
- Improved heat transfer with reduced quantities of refrigerant
- Sized and specified for a low airflow rate
- Reduced fan power requirements by minimizing air-side resistance



CFD analysis of air conduction

### Free Cooling coil with large surface area

- Copper and aluminum coil
- Floating switchover to Mixed/Free Cooling mode reduces compressor runtime
- Pump drive power requirements minimized by low hydraulic pressure losses

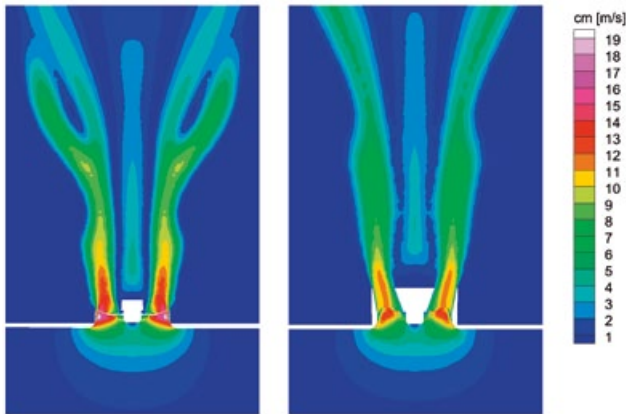
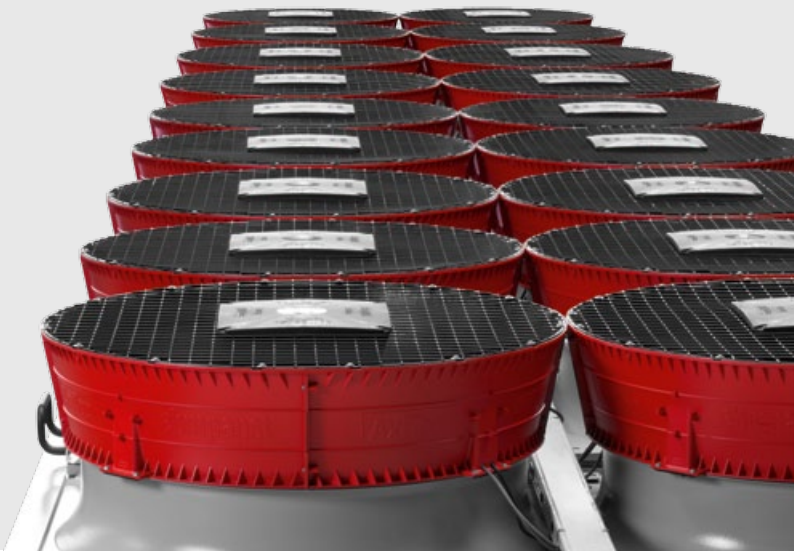




### Fans with large surface areas

Optimized for continuous operation

- EC fans which react continuously to changing performance requirements and are especially energy efficient in comparison with conventional AC fans in partial load mode
- Size-maximized version (ø 910 mm) with lower speeds for noise optimization



Air speed analysis

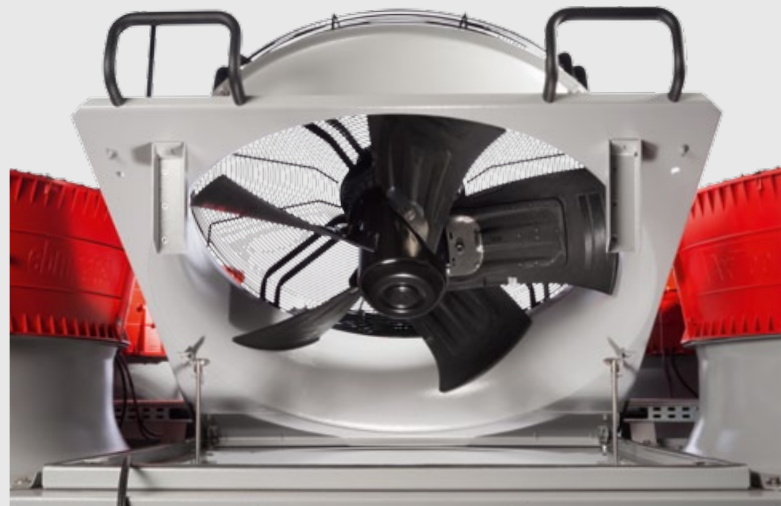
### AxiTop fan diffuser

The “fan diffuser” option (AxiTop) increases energy efficiency and also reduces the sound level of the fan system

- Optimized air conduction
- Lower fan power consumption
- Reduction in chiller sound levels
- Complete fan system  
Use the complete fan system for the CyberCool 2 – infeed nozzle, fan and diffuser attachment – to reduce energy consumption and noise to a minimum
- Available for all sizes of CyberCool 2

### Efficiency-preserving coil cleaning

- Foldaway fans allow residue-free coil cleaning against the airflow, reducing condensation temperature and preventing pressure and heat losses. The result is maximum energy efficiency.
- Foldaway fans on each module, both sides
- Easier coil cleaning and maintenance due to improved access



# Minimal energy consumption

## Constant-speed screw compressors

- Constant-speed screw compressors from approx. 320 to 1,400 kW
- Constant-speed compressors always combined with evaporator dry expansion (DX)
- Refrigerant R134a
- Available with 2-circuit chiller

## Constant-speed scroll compressors

- Cooling capacity approx. 50 to 611 kW
- Evaporator as brazed plate heat exchanger
- Refrigerant R410a
- Available with 1 or 2-circuit chiller

## Variable-speed screw compressors

- Variable-speed screw compressors from approx. 320 to 1 MW
- Variable-speed compressors always combined with evaporator dry expansion (DX)
- Intelligent oil return system
- Refrigerant R134a
- Available with 2-circuit chiller

## Variable-speed scroll compressors

- Cooling capacity approx. 50 to 611 kW
- EC compressor version for optimum adaptation to the respective operating point
- Evaporator as brazed plate heat exchanger
- Refrigerant R410a
- Available with 1 or 2-circuit chiller

## Optimized refrigerant circuit

- Low leakage losses by avoiding use of soldered and welded joints
  - CNC tube bending machine for fitting accuracy with low tolerance
- Electronic expansion valve for all sizes
- Compressed gas pipes of stainless steel for screw compressors
- Symmetrical pipeline system in both refrigerant circuits
- Increased performance thanks to Economizer (brazed plate heat exchanger)

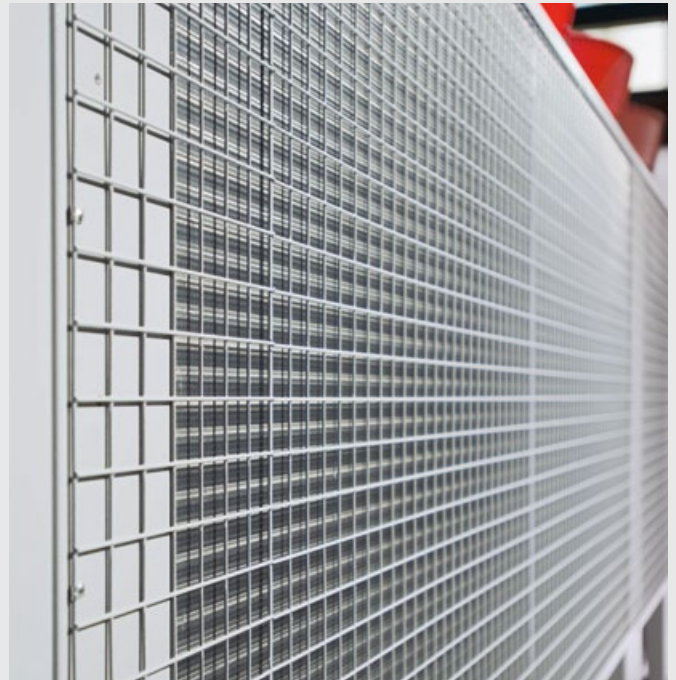


# Reliability

## Fail-safe performance

**CyberCool 2 high-end chillers were developed to provide fail-safe performance and reliable operation in the data center, 24/7**

- Made and engineered in Germany
  - Exclusive use of industry-specific, commonly available system components, for optimal spare parts availability and fail-safe operation
- Continuous quality management throughout production
  - Test runs of all mechanical and electrical components before final quality approval
- Operational and system concept designed for maintaining functionality with interchangeable components (1 spare part for 2 refrigerant circuits)
- Suitable for a broad range of applications
  - Outside temperature -45 to +55 °C
- Immediate start after power failure
- Consistent separation of individual coil sets to prevent return airflow if fans fail
- Certification to ISO 9001 and ISO 14001



## STULZ quality

### Running tests

To meet STULZ quality requirements, CyberCool 2 chillers undergo post-production testing for performance, leak resistance and pressure resistance. Functional testing is integral to all of our production processes and is conducted at our in-house test center.

Test chamber technical data:

- Dimensions: L 22 m x W 9.6 m
- Cooling capacity, air: 100 kW to 1,500 kW
- Cooling capacity, water 100 kW to 1,800 kW
- Outside temperature (simulated): 22 °C to 50 °C
- Volumetric airflow: 20,000 m³/h to 500,000 m³/h
- Glycol based refrigerant circuit



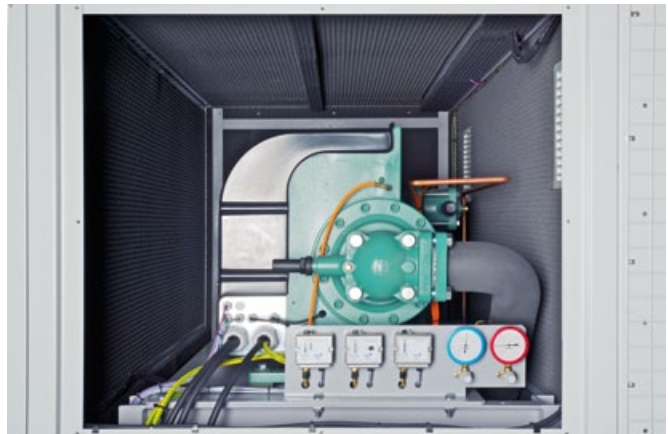


# Design

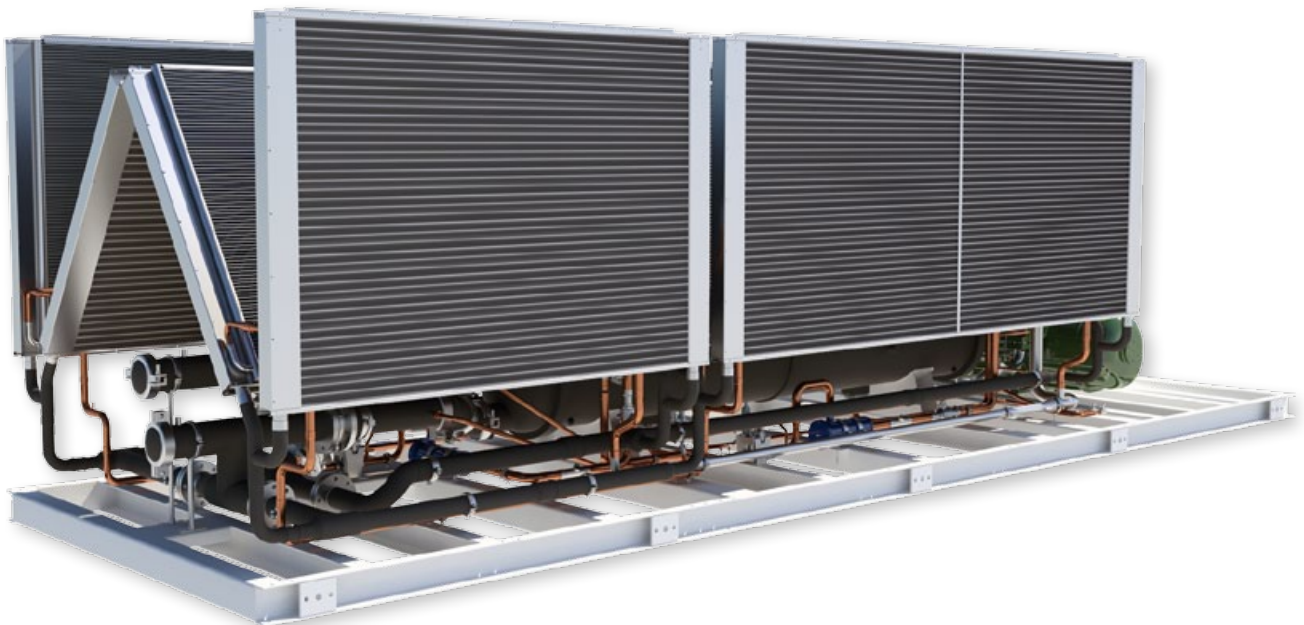
## Quality without compromise

High-quality materials and components are part and parcel of all STULZ units. This naturally also applies to the design of the CyberCool 2

- Performance-optimized unit design for use in data centers
- Sturdy base frame made of welded U-profile steel
- Encapsulated compressor chamber for reduced noise
- Low condenser line
- Coils designed to allow the maximum surface area
- Airflow-optimized condenser modules
  - Entire coil surface is used evenly to achieve optimum thermodynamics
  - No dead zones caused by airflow breakaway edges or turbulence
  - Air baffles ensure optimum flow to interior coil elements
- Size-maximized fans
- Compact machine design
- Easy installation and machine connection
- Generously proportioned cabinet with reserve capacity



Encapsulated compressor chamber for reduced noise level

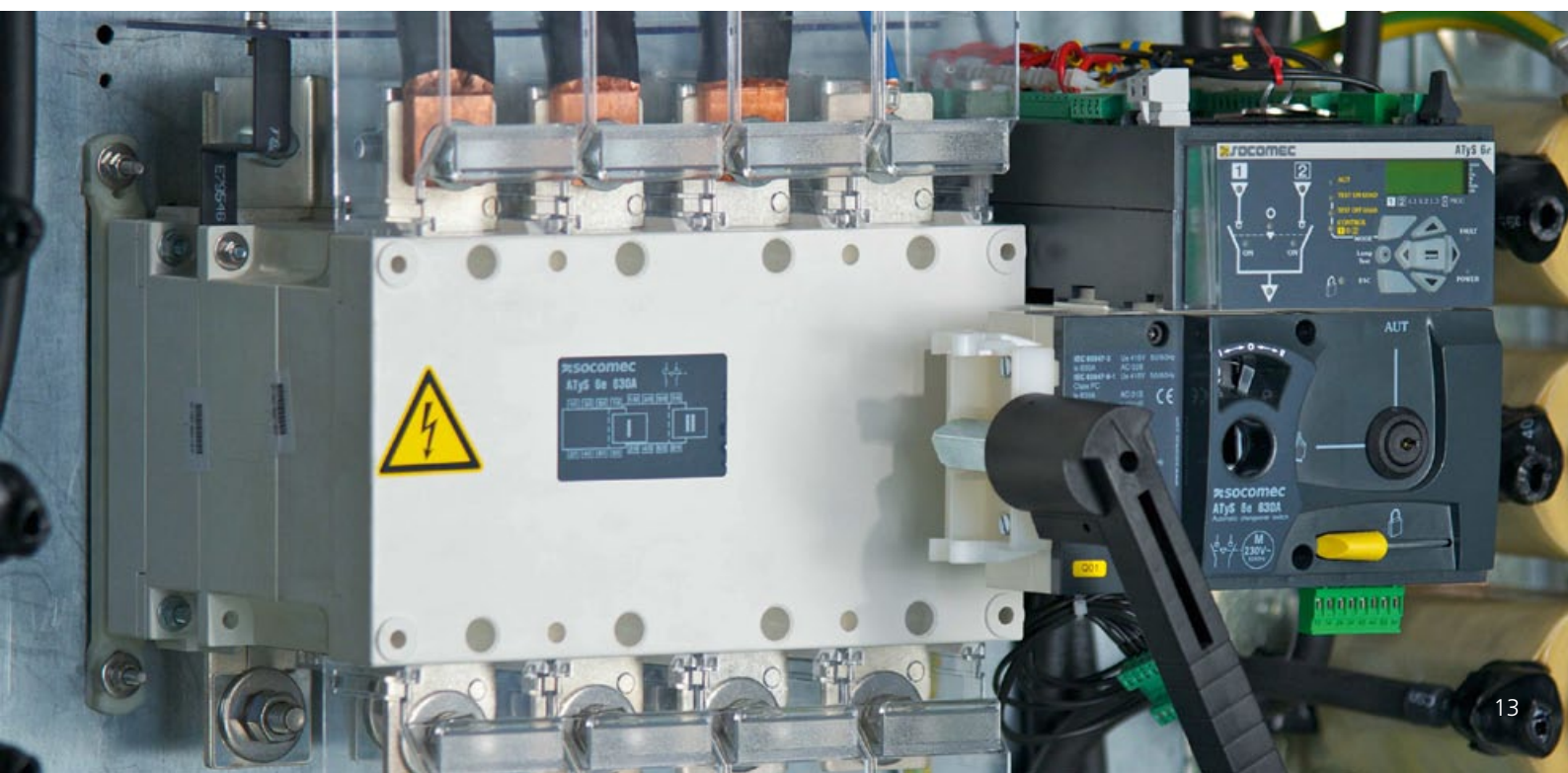


# Control

## Innovative control system

The CyberCool 2 is ideal for integration in existing systems and can be controlled to perfection by STULZ control

- Hardware and software developed by STULZ
- Possible software adaptation for specific projects
- Connection to building automation systems
  - Supports all common BMS protocols via network and fiber-optic cables or WLAN
- Centrally operates several chillers in parallel with speed controlled compressors at reduced speed
  - Compressor runs in partial load mode; integrated standby unit
  - Compressor slows down, reducing mechanical load
  - Reduced noise
  - Enhanced energy efficiency
- Sequencing for runtime compensation
- Customer-specific programming for emergency routines
- Energy efficient system operation at every operating point
- Early warning system (pre-alarm and main alarm)





# Diversity

## Numerous options

Thanks to the diverse options and equipment versions available, you can perfectly adapt the CyberCool 2 to your particular requirements

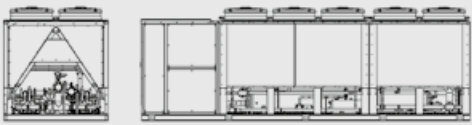
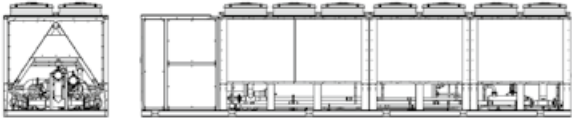
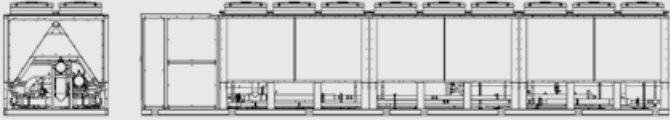
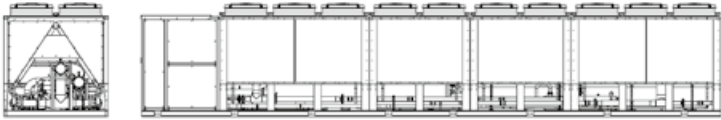
- Control with UPS buffer
- Dual power feed with automatic or manual switchover (A and B supply)
- Optional compressor quick-start routine so that the machine reaches operating point again as quickly as possible after a power failure.
  - Constant-speed compressors power back to 100 % cooling capacity after approx. 2 minutes.
  - Speed-controlled compressors start up again with no delay when power returns after an outage. As the compressors are influenced by system operation as a whole, the time until the required cooling capacity is reached varies depending on the number of compressors installed and the specific circumstances of the project.
- Fan diffuser attachment for reduced energy and noise
- Separate electrical load outputs to supply external consumers
- Internal chiller bypass switch to prevent forced flow-through of unnecessary thermodynamic parts downstream
- Soft-start option for constant-speed compressors avoids current spikes when the compressors are started
- Glycol and non-glycol versions
- Integrated pump and hydraulic modules
- Corrosion protection (e-coating, epoxy coating)
- Efficiency-preserving coil cleaning
- Extending roof
- Color options for chiller and fan diffuser attachment
  - Available for all sizes of CyberCool 2
  - All popular colors
  - For housing / protective grids / fan diffuser
  - Can be customized to your corporate design
  - Data center security
  - Can be adapted to building structure
  - CyberCool 2 standard colors
    - Housing, protective grids: RAL 7004 signal gray;
    - AxiTop: RAL 9005 black



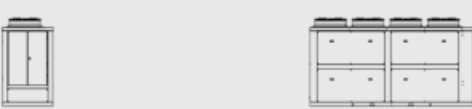
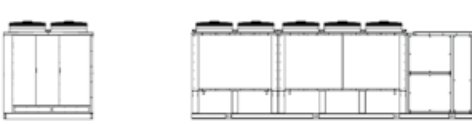


# Modular unit sizes

## CyberCool 2 – Chiller with screw compressor

|                                                                                   |                                         |
|-----------------------------------------------------------------------------------|-----------------------------------------|
|  | LxWxH (mm)<br><b>7,250x2,300x2,500</b>  |
|  | LxWxH (mm)<br><b>9,480x2,300x2,500</b>  |
|  | LxWxH (mm)<br><b>11,640x2,300x2,500</b> |
|  | LxWxH (mm)<br><b>12,785x2,300x2,500</b> |

## CyberCool 2 – Chiller with scroll compressor

|                                                                                     |                                        |
|-------------------------------------------------------------------------------------|----------------------------------------|
|  | LxWxH (mm)<br><b>4,200x1,300x2,240</b> |
|  | LxWxH (mm)<br><b>3,950x2,300x2,500</b> |
|  | LxWxH (mm)<br><b>5,030x2,300x2,500</b> |
|  | LxWxH (mm)<br><b>7,250x2,300x2,500</b> |

Height information without fan diffuser.

# Service

## STULZ – your global partner. Trust, reliability, availability

For decades, our customers all over the world have put their trust in our products and technical expertise. We continually invest in the latest technology and the qualified training of our employees and partners. From project planning to rollout, right up to maintenance and service – with STULZ you can enjoy all-round professional support.



**Close to you all over the world: with 16 subsidiaries, 6 production sites and sales and service partners in more than 120 countries.**



## CyberCool 2 service in detail

When developing the CyberCool 2, we had already thought about how chiller maintenance could be performed efficiently and economically. The result of these considerations is reflected in many solutions – solutions that help achieve safety during maintenance, save time and therefore reduce the downtime required for maintenance.

### Identical refrigerant circuits

The identical refrigerant circuits make it possible to standardize maintenance intervals better and shorten maintenance times. Besides, they also bring advantages in procurement and stocking of spare parts. In the event of a fault at any time, troubleshooting is easier for identical refrigerant circuits.

### Extending roof with dual function (optional)

The switchgear cabinet houses delicate electronic and control systems and maintenance in this area is one of the most critical processes. In the worst case, moisture and other interfering factors can lead to major damage. To make sure that service technicians can work and carry out maintenance on the switchgear cabinet properly in any weather conditions, we have developed an extending roof, which is located above the compressor chamber. In addition, when retracted the extending roof acts as a sunshade for the compressor chamber when it would otherwise be exposed to strong sunlight.



## A well thought-out design benefits customers

CyberCool 2 chillers have a compact design, no matter what the size, and ensure an uncomplicated assembly, easy installation and economical and efficient maintenance. In addition, personnel involved with the planning and installation receive comprehensive technical documentation.



### Foldaway fans

The microchannel coils are like the lungs of a chiller and can only work efficiently when the blades are not blocked. The foldaway fan enables thorough, quick and function-preserving cleaning against the airflow. Residue-free cleaning of the coils is possible thanks to improved access. Also, the dirt does not spread throughout the interior.

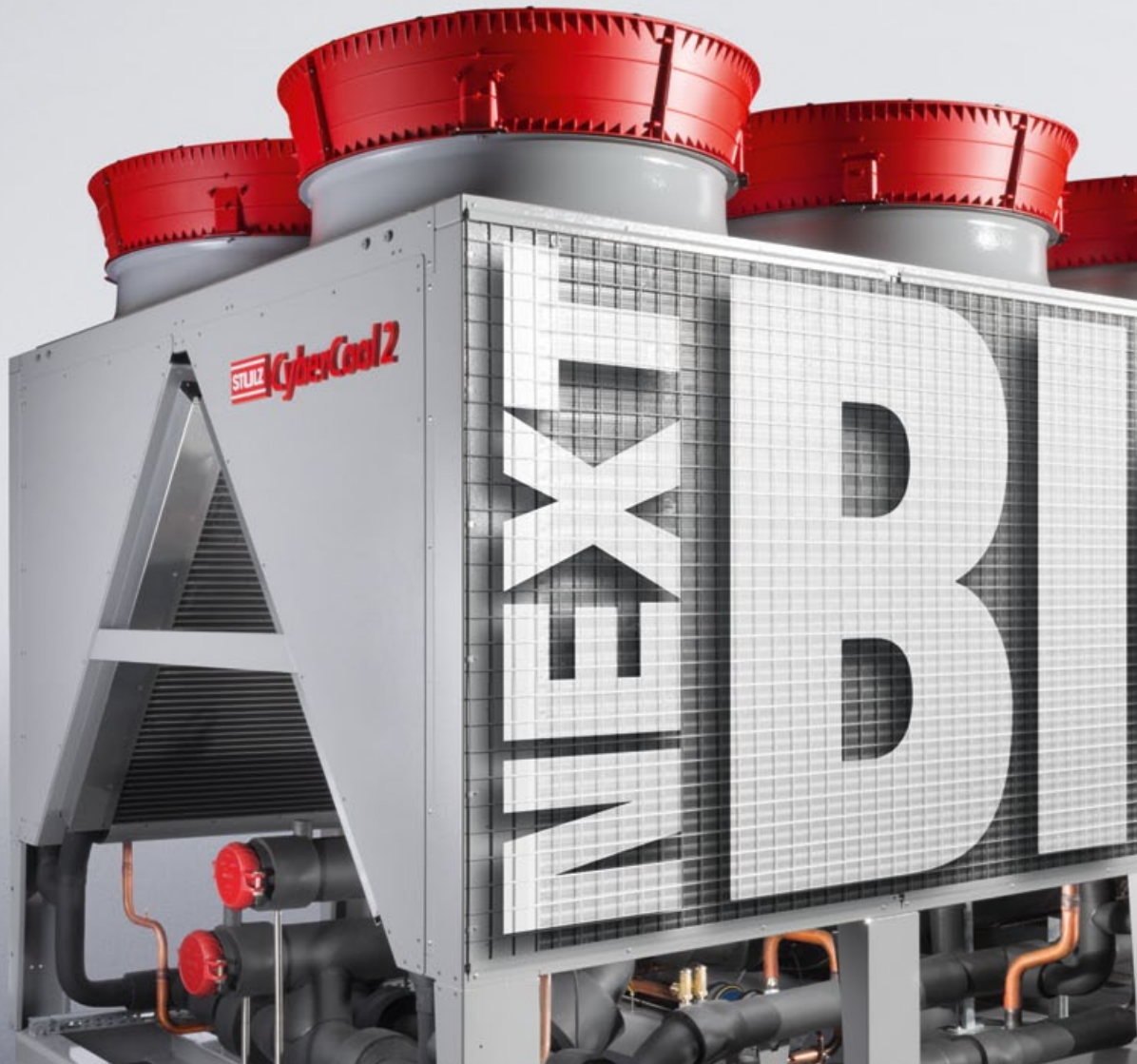
## Technical data – ESO ... ASF

| Model                                                      |       | 4702  | 5102     | 6002  | 6602  | 7402   | 8002     | 8702   | 9602   | 10202  | 11102    | 11502  | 12602  | 13102    | 14102  |
|------------------------------------------------------------|-------|-------|----------|-------|-------|--------|----------|--------|--------|--------|----------|--------|--------|----------|--------|
| <b>Operating point 18 °C/12 °C<sup>(1)</sup></b>           |       |       |          |       |       |        |          |        |        |        |          |        |        |          |        |
| Cooling capacity                                           | kW    | 492   | 515      | 591   | 620   | 752    | 780      | 875    | 935    | 1,022  | 1,071    | 1,144  | 1,208  | 1,296    | 1,354  |
| Total power consumption                                    | kW    | 129   | 134      | 162   | 168   | 198    | 206      | 246    | 261    | 276    | 286      | 315    | 332    | 358      | 372    |
| EER                                                        |       | 3.81  | 3.84     | 3.65  | 3.69  | 3.80   | 3.79     | 3.56   | 3.58   | 3.70   | 3.74     | 3.63   | 3.64   | 3.62     | 3.64   |
| Total power consumption <sup>(6)</sup>                     | kW    | 125   | 130      | 159   | 165   | 193    | 200      | 241    | 256    | 269    | 279      | 309    | 326    | 350      | 365    |
| EER <sup>(6)</sup>                                         |       | 3.94  | 3.96     | 3.72  | 3.76  | 3.90   | 3.90     | 3.63   | 3.65   | 3.80   | 3.84     | 3.70   | 3.71   | 3.70     | 3.71   |
| Cooling capacity (Free Cooling) <sup>(4)</sup>             | kW    | 425   | 433      | 454   | 460   | 608    | 615      | 639    | 651    | 830    | 842      | 859    | 872    | 934      | 946    |
| Temperature for 100 % Free Cooling                         | °C    | 4.2   | 3.8      | 2.5   | 2.0   | 3.3    | 2.9      | 1.7    | 1.0    | 3.3    | 2.8      | 2.1    | 1.5    | 1.5      | 1.0    |
| <b>Operating point 12 °C/7 °C<sup>(5)</sup></b>            |       |       |          |       |       |        |          |        |        |        |          |        |        |          |        |
| Cooling capacity                                           | kW    | 404   | 433      | 491   | 523   | 621    | 656      | 726    | 788    | 845    | 902      | 947    | 1,017  | 1,076    | 1,141  |
| Total power consumption                                    | kW    | 124   | 130      | 154   | 161   | 190    | 197      | 232    | 248    | 261    | 273      | 298    | 315    | 336      | 352    |
| EER                                                        |       | 3.26  | 3.33     | 3.19  | 3.25  | 3.27   | 3.33     | 3.13   | 3.18   | 3.24   | 3.30     | 3.18   | 3.23   | 3.20     | 3.24   |
| Total power consumption <sup>(6)</sup>                     | kW    | 120   | 126      | 151   | 157   | 185    | 192      | 227    | 242    | 254    | 266      | 291    | 308    | 329      | 345    |
| EER <sup>(6)</sup>                                         |       | 3.37  | 3.44     | 3.25  | 3.33  | 3.36   | 3.42     | 3.20   | 3.26   | 3.33   | 3.39     | 3.25   | 3.30   | 3.27     | 3.31   |
| Cooling capacity (Free Cooling) <sup>(4)</sup>             | kW    | 208   | 213      | 223   | 228   | 298    | 304      | 315    | 323    | 409    | 417      | 423    | 432    | 460      | 468    |
| Temperature for 100 % Free Cooling                         | °C    | 0.5   | 0.0      | -1.0  | -1.6  | -0.3   | -0.8     | -1.7   | -2.4   | -0.4   | -0.9     | -1.3   | -2.0   | -1.8     | -2.4   |
| <b>Conditions for both operating points</b>                |       |       |          |       |       |        |          |        |        |        |          |        |        |          |        |
| Airflow                                                    | m³/h  |       | 220,000  |       |       |        | 308,000  |        |        |        | 396,000  |        |        | 440,000  |        |
| Capacity control                                           | %     |       | 12.5-100 |       |       |        | 12.5-100 |        |        |        | 12.5-100 |        |        | 12.5-100 |        |
| <b>Sound</b>                                               |       |       |          |       |       |        |          |        |        |        |          |        |        |          |        |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) |       | 76/65    |       |       |        | 77/66    |        |        |        | 78/67    |        |        | 79/68    |        |
| Sound power level <sup>(3)</sup>                           | dB(A) |       | 98       |       |       |        | 99       |        |        |        | 100      |        |        | 101      |        |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) |       | 72/61    |       |       |        | 73/62    |        |        |        | 74/63    |        |        | 75/64    |        |
| Sound power level <sup>(3,6)</sup>                         | dB(A) |       | 94       |       |       |        | 95       |        |        |        | 96       |        |        | 97       |        |
| <b>Components</b>                                          |       |       |          |       |       |        |          |        |        |        |          |        |        |          |        |
| No. of compressors/circuits                                |       |       | 2/2      |       |       |        | 2/2      |        |        |        | 2/2      |        |        | 2/2      |        |
| No. of fans                                                |       |       | 10       |       |       |        | 14       |        |        |        | 18       |        |        | 20       |        |
| <b>Dimensions</b>                                          |       |       |          |       |       |        |          |        |        |        |          |        |        |          |        |
| Length                                                     | mm    |       | 7,250    |       |       |        | 9,480    |        |        |        | 11,640   |        |        | 12,785   |        |
| Width                                                      | mm    |       | 2,300    |       |       |        | 2,300    |        |        |        | 2,300    |        |        | 2,300    |        |
| Height                                                     | mm    |       | 2,500    |       |       |        | 2,500    |        |        |        | 2,500    |        |        | 2,500    |        |
| Height <sup>(6)</sup>                                      | mm    |       | 2,670    |       |       |        | 2,670    |        |        |        | 2,670    |        |        | 2,670    |        |
| Net weight                                                 | kg    | 6,848 | 6,934    | 7,540 | 7,629 | 9,203  | 9,344    | 10,182 | 10,326 | 12,114 | 12,292   | 12,331 | 12,514 | 13,262   | 13,444 |
| Operating weight                                           | kg    | 7,690 | 7,780    | 8,390 | 8,480 | 10,550 | 10,690   | 11,600 | 11,750 | 14,420 | 14,600   | 14,700 | 14,880 | 15,800   | 15,980 |

<sup>(1)</sup> Chilled water inlet/outlet: 18 °C/12 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(2)</sup> Sound pressure level at 1 m/10 m distance under free field conditions (to ISO 3744)

<sup>(3)</sup> Sound power level (to ISO 3744)



## Technical data – EQO ... ASF

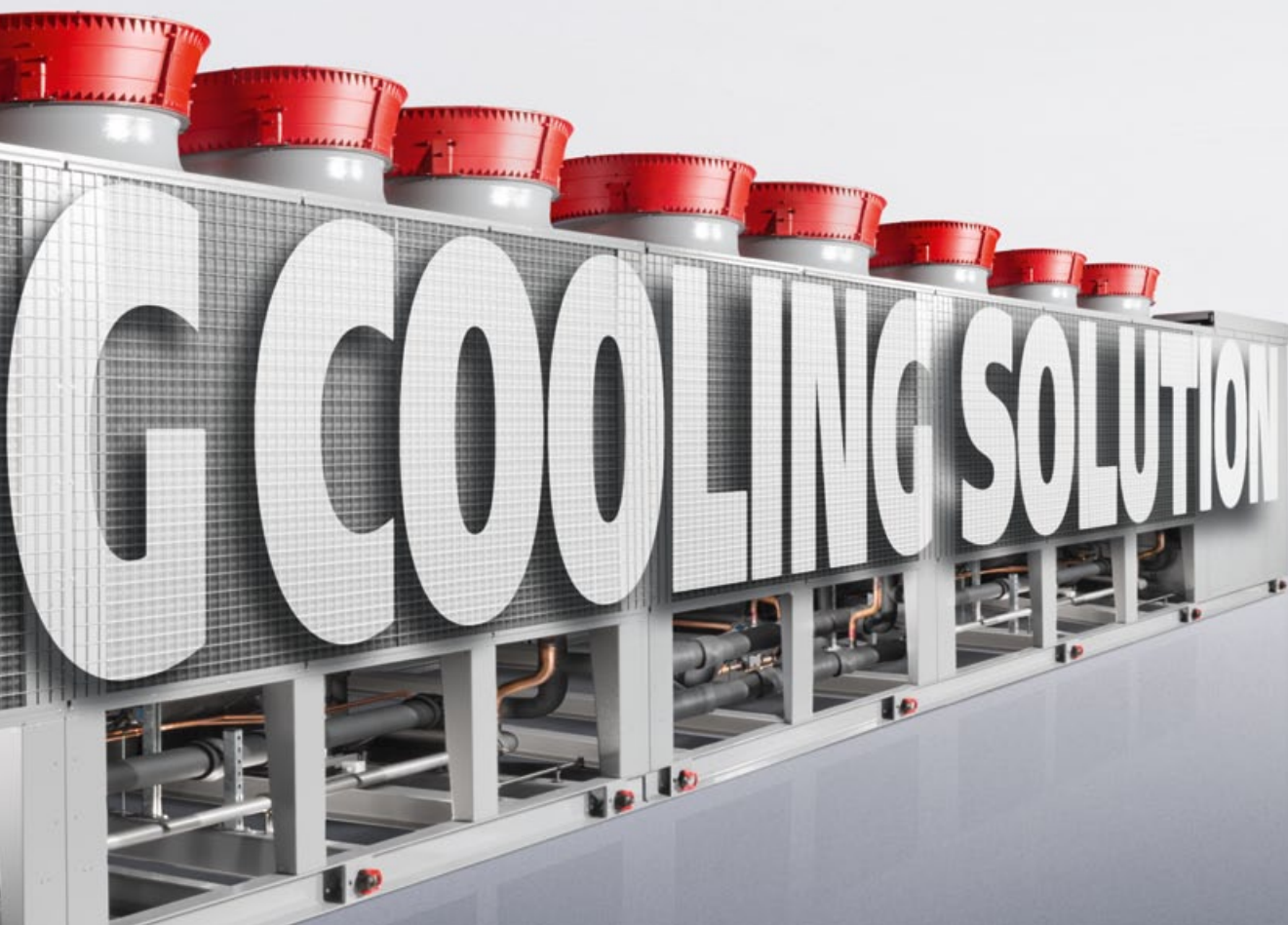
| Model                                                      |       | 3002     | 3302  | 3702  | 4002  | 4702     | 5102   | 6002   | 6602   | 7402     | 8002   | 8702   | 9602   | 10202    | 11102  |
|------------------------------------------------------------|-------|----------|-------|-------|-------|----------|--------|--------|--------|----------|--------|--------|--------|----------|--------|
| Operating point 18 °C/12 °C <sup>(1)</sup>                 |       |          |       |       |       |          |        |        |        |          |        |        |        |          |        |
| Cooling capacity                                           | kW    | 322      | 333   | 382   | 397   | 499      | 520    | 605    | 630    | 753      | 781    | 878    | 935    | 1,001    | 1,052  |
| Total power consumption                                    | kW    | 77.0     | 79.6  | 94.8  | 98.4  | 123      | 128    | 154    | 159    | 191      | 198    | 239    | 255    | 271      | 285    |
| EER                                                        |       | 4.18     | 4.18  | 4.03  | 4.03  | 4.06     | 4.06   | 3.93   | 3.96   | 3.94     | 3.94   | 3.67   | 3.67   | 3.69     | 3.69   |
| Total power consumption <sup>(6)</sup>                     | kW    | 74.9     | 77.5  | 92.7  | 96.3  | 120      | 125    | 151    | 156    | 187      | 195    | 235    | 251    | 267      | 281    |
| EER <sup>(6)</sup>                                         |       | 4.30     | 4.30  | 4.12  | 4.12  | 4.16     | 4.16   | 4.01   | 4.04   | 4.03     | 4.01   | 3.74   | 3.73   | 3.75     | 3.74   |
| Cooling capacity (Free Cooling) <sup>(4)</sup>             | kW    | 317      | 322   | 340   | 345   | 456      | 463    | 490    | 496    | 649      | 657    | 680    | 693    | 803      | 815    |
| Temperature for 100 % Free Cooling                         | °C    | 5.9      | 5.6   | 4.6   | 4.2   | 5.0      | 4.7    | 3.3    | 2.9    | 4.1      | 3.8    | 2.6    | 1.9    | 3.2      | 2.6    |
| Operating point 12 °C/7 °C <sup>(5)</sup>                  |       |          |       |       |       |          |        |        |        |          |        |        |        |          |        |
| Cooling capacity                                           | kW    | 262      | 278   | 313   | 334   | 410      | 437    | 501    | 530    | 621      | 656    | 729    | 790    | 831      | 890    |
| Total power consumption                                    | kW    | 74.5     | 77.5  | 91.5  | 95.4  | 119      | 124    | 147    | 153    | 183      | 191    | 225    | 240    | 255      | 269    |
| EER                                                        |       | 3.52     | 3.59  | 3.42  | 3.50  | 3.45     | 3.52   | 3.41   | 3.46   | 3.39     | 3.43   | 3.24   | 3.29   | 3.26     | 3.31   |
| Total power consumption <sup>(6)</sup>                     | kW    | 72.4     | 75.4  | 89.4  | 93.3  | 116      | 121    | 144    | 150    | 180      | 187    | 221    | 236    | 251      | 265    |
| EER <sup>(6)</sup>                                         |       | 3.62     | 3.69  | 3.50  | 3.58  | 3.53     | 3.61   | 3.48   | 3.53   | 3.45     | 3.51   | 3.30   | 3.35   | 3.31     | 3.36   |
| Cooling capacity (Free Cooling) <sup>(4)</sup>             | kW    | 155      | 158   | 166   | 170   | 223      | 229    | 241    | 246    | 319      | 325    | 336    | 344    | 396      | 404    |
| Temperature for 100 % Free Cooling                         | °C    | 1.9      | 1.5   | 0.8   | 0.3   | 1.1      | 0.7    | -0.3   | -0.8   | 0.4      | 0.0    | -0.9   | -1.7   | -0.4     | -1.0   |
| Conditions for both operating points                       |       |          |       |       |       |          |        |        |        |          |        |        |        |          |        |
| Airflow                                                    | m³/h  | 160,000  |       |       |       | 224,000  |        |        |        | 288,000  |        |        |        | 320,000  |        |
| Capacity control                                           | %     | 12.5-100 |       |       |       | 12.5-100 |        |        |        | 12.5-100 |        |        |        | 12.5-100 |        |
| Sound                                                      |       |          |       |       |       |          |        |        |        |          |        |        |        |          |        |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) | 67/56    |       |       |       | 68/57    |        |        |        | 69/58    |        |        |        | 70/59    |        |
| Sound power level <sup>(3)</sup>                           | dB(A) | 89       |       |       |       | 90       |        |        |        | 91       |        |        |        | 92       |        |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) | 63/52    |       |       |       | 64/53    |        |        |        | 65/54    |        |        |        | 66/55    |        |
| Sound power level <sup>(3,6)</sup>                         | dB(A) | 85       |       |       |       | 86       |        |        |        | 87       |        |        |        | 88       |        |
| Components                                                 |       |          |       |       |       |          |        |        |        |          |        |        |        |          |        |
| No. of compressors/circuits                                |       | 2/2      |       |       |       | 2/2      |        |        |        | 2/2      |        |        |        | 2/2      |        |
| No. of fans                                                |       | 10       |       |       |       | 14       |        |        |        | 18       |        |        |        | 20       |        |
| Dimensions                                                 |       |          |       |       |       |          |        |        |        |          |        |        |        |          |        |
| Length                                                     | mm    | 7,250    |       |       |       | 9,480    |        |        |        | 11,640   |        |        |        | 12,785   |        |
| Width                                                      | mm    | 2,300    |       |       |       | 2,300    |        |        |        | 2,300    |        |        |        | 2,300    |        |
| Height                                                     | mm    | 2,500    |       |       |       | 2,500    |        |        |        | 2,500    |        |        |        | 2,500    |        |
| Height <sup>(6)</sup>                                      | mm    | 2,670    |       |       |       | 2,670    |        |        |        | 2,670    |        |        |        | 2,670    |        |
| Net weight                                                 | kg    | 6,707    | 6,787 | 6,790 | 6,880 | 8,793    | 8,993  | 10,423 | 10,573 | 11,879   | 12,059 | 12,075 | 12,265 | 13,106   | 13,286 |
| Operating weight                                           | kg    | 7,480    | 7,560 | 7,560 | 7,650 | 9,890    | 10,030 | 11,560 | 11,710 | 13,580   | 13,760 | 13,850 | 14,040 | 15,650   | 15,830 |

<sup>(4)</sup> Outside temperature: 6 °C

<sup>(5)</sup> Chilled water inlet/outlet: 12 °C/7 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(6)</sup> with optional fan diffuser

Technical data subject to change without notice.





## Technical data – ESO ... ASN

| Model                                                      |       | 4702  | 5102     | 6002  | 6602  | 7402  | 8002     | 8702  | 9602  | 10202  | 11102    | 11502  | 12602  | 13102    | 14102  |
|------------------------------------------------------------|-------|-------|----------|-------|-------|-------|----------|-------|-------|--------|----------|--------|--------|----------|--------|
| <b>Operating point 18 °C/12 °C<sup>(1)</sup></b>           |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Cooling capacity                                           | kW    | 492   | 515      | 591   | 620   | 752   | 780      | 875   | 935   | 1,022  | 1,071    | 1,144  | 1,208  | 1,296    | 1,354  |
| Total power consumption                                    | kW    | 125   | 130      | 158   | 164   | 192   | 200      | 240   | 255   | 268    | 278      | 308    | 325    | 349      | 364    |
| EER                                                        |       | 3.94  | 3.96     | 3.74  | 3.78  | 3.92  | 3.90     | 3.65  | 3.67  | 3.81   | 3.85     | 3.71   | 3.72   | 3.71     | 3.72   |
| Total power consumption <sup>(6)</sup>                     | kW    | 122   | 127      | 155   | 161   | 188   | 196      | 237   | 252   | 263    | 274      | 303    | 320    | 344      | 358    |
| EER <sup>(6)</sup>                                         |       | 4.03  | 4.06     | 3.81  | 3.85  | 4.00  | 3.98     | 3.69  | 3.71  | 3.89   | 3.91     | 3.78   | 3.78   | 3.77     | 3.78   |
| <b>Operating point 12 °C/7 °C<sup>(5)</sup></b>            |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Cooling capacity                                           | kW    | 404   | 432      | 491   | 523   | 621   | 656      | 726   | 788   | 845    | 902      | 947    | 1,017  | 1,076    | 1,141  |
| Total power consumption                                    | kW    | 120   | 126      | 150   | 157   | 184   | 191      | 226   | 242   | 253    | 265      | 290    | 307    | 327      | 344    |
| EER                                                        |       | 3.37  | 3.43     | 3.27  | 3.33  | 3.38  | 3.43     | 3.21  | 3.26  | 3.34   | 3.40     | 3.27   | 3.31   | 3.29     | 3.32   |
| Total power consumption <sup>(6)</sup>                     | kW    | 117   | 123      | 147   | 154   | 180   | 188      | 223   | 238   | 249    | 261      | 286    | 302    | 322      | 338    |
| EER <sup>(6)</sup>                                         |       | 3.45  | 3.51     | 3.34  | 3.40  | 3.45  | 3.49     | 3.26  | 3.31  | 3.39   | 3.46     | 3.31   | 3.37   | 3.34     | 3.38   |
| <b>Conditions for both operating points</b>                |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Airflow                                                    | m³/h  |       | 220,000  |       |       |       | 308,000  |       |       |        | 396,000  |        |        | 440,000  |        |
| Capacity control                                           | %     |       | 12.5-100 |       |       |       | 12.5-100 |       |       |        | 12.5-100 |        |        | 12.5-100 |        |
| <b>Sound</b>                                               |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) |       | 74/63    |       |       |       | 75/64    |       |       |        | 76/65    |        |        | 77/66    |        |
| Sound power level <sup>(3)</sup>                           | dB(A) |       | 96       |       |       |       | 97       |       |       |        | 98       |        |        | 99       |        |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) |       | 71/60    |       |       |       | 72/61    |       |       |        | 73/62    |        |        | 74/63    |        |
| Sound power level <sup>(3,6)</sup>                         | dB(A) |       | 93       |       |       |       | 94       |       |       |        | 95       |        |        | 96       |        |
| <b>Components</b>                                          |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| No. of compressors/circuits                                |       |       | 2/2      |       |       |       | 2/2      |       |       |        | 2/2      |        |        | 2/2      |        |
| No. of fans                                                |       |       | 10       |       |       |       | 14       |       |       |        | 18       |        |        | 20       |        |
| <b>Dimensions</b>                                          |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Length                                                     | mm    |       | 7,250    |       |       |       | 9,480    |       |       |        | 11,640   |        |        | 12,785   |        |
| Width                                                      | mm    |       | 2,300    |       |       |       | 2,300    |       |       |        | 2,300    |        |        | 2,300    |        |
| Height                                                     | mm    |       | 2,500    |       |       |       | 2,500    |       |       |        | 2,500    |        |        | 2,500    |        |
| Height <sup>(6)</sup>                                      | mm    |       | 2,670    |       |       |       | 2,670    |       |       |        | 2,670    |        |        | 2,670    |        |
| Net weight                                                 | kg    | 5,852 | 5,937    | 6,544 | 6,633 | 7,761 | 7,903    | 8,740 | 8,884 | 10,288 | 10,467   | 10,505 | 10,688 | 11,129   | 11,311 |
| Operating weight                                           | kg    | 6,349 | 6,435    | 7,048 | 7,136 | 8,565 | 8,706    | 9,616 | 9,760 | 11,824 | 12,003   | 12,101 | 12,284 | 12,790   | 12,972 |

## Technical data – EQO ... ASN

| Model                                                      |       | 3002  | 3302     | 3702  | 4002  | 4702  | 5102     | 6002  | 6602  | 7402   | 8002     | 8702   | 9602   | 10202    | 11102  |
|------------------------------------------------------------|-------|-------|----------|-------|-------|-------|----------|-------|-------|--------|----------|--------|--------|----------|--------|
| <b>Operating point 18 °C/12 °C<sup>(1)</sup></b>           |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Cooling capacity                                           | kW    | 322   | 333      | 382   | 397   | 499   | 520      | 605   | 630   | 753    | 781      | 878    | 935    | 1,001    | 1,052  |
| Total power consumption                                    | kW    | 74.1  | 76.7     | 91.1  | 95.5  | 119   | 124      | 150   | 155   | 186    | 193      | 234    | 250    | 266      | 280    |
| EER                                                        |       | 4.35  | 4.34     | 4.19  | 4.16  | 4.19  | 4.19     | 4.03  | 4.06  | 4.05   | 4.05     | 3.75   | 3.74   | 3.76     | 3.76   |
| Total power consumption <sup>(6)</sup>                     | kW    | 72.7  | 75.3     | 90.5  | 94.0  | 117   | 122      | 148   | 153   | 183    | 191      | 231    | 247    | 263      | 277    |
| EER <sup>(6)</sup>                                         |       | 4.43  | 4.42     | 4.22  | 4.22  | 4.26  | 4.26     | 4.09  | 4.12  | 4.11   | 4.09     | 3.80   | 3.79   | 3.81     | 3.80   |
| <b>Operating point 12 °C/7 °C<sup>(5)</sup></b>            |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Cooling capacity                                           | kW    | 262   | 278      | 313   | 334   | 410   | 437      | 501   | 530   | 621    | 656      | 729    | 790    | 831      | 890    |
| Total power consumption                                    | kW    | 71.6  | 74.6     | 88.6  | 92.5  | 115   | 120      | 143   | 149   | 178    | 186      | 220    | 235    | 250      | 263    |
| EER                                                        |       | 3.66  | 3.73     | 3.53  | 3.61  | 3.57  | 3.64     | 3.50  | 3.56  | 3.49   | 3.53     | 3.31   | 3.36   | 3.32     | 3.38   |
| Total power consumption <sup>(6)</sup>                     | kW    | 70.2  | 73.2     | 87.1  | 91.0  | 113   | 118      | 141   | 147   | 176    | 183      | 217    | 232    | 247      | 261    |
| EER <sup>(6)</sup>                                         |       | 3.73  | 3.80     | 3.59  | 3.67  | 3.63  | 3.70     | 3.55  | 3.61  | 3.53   | 3.58     | 3.36   | 3.41   | 3.36     | 3.41   |
| <b>Conditions for both operating points</b>                |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Airflow                                                    | m³/h  |       | 160,000  |       |       |       | 224,000  |       |       |        | 288,000  |        |        | 320,000  |        |
| Capacity control                                           | %     |       | 12.5-100 |       |       |       | 12.5-100 |       |       |        | 12.5-100 |        |        | 12.5-100 |        |
| <b>Sound</b>                                               |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) |       | 66/55    |       |       |       | 67/56    |       |       |        | 68/57    |        |        | 69/58    |        |
| Sound power level <sup>(3)</sup>                           | dB(A) |       | 88       |       |       |       | 89       |       |       |        | 90       |        |        | 91       |        |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) |       | 63/52    |       |       |       | 64/53    |       |       |        | 65/54    |        |        | 66/55    |        |
| Sound power level <sup>(3,6)</sup>                         | dB(A) |       | 85       |       |       |       | 86       |       |       |        | 87       |        |        | 88       |        |
| <b>Components</b>                                          |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| No. of compressors/circuits                                |       |       | 2/2      |       |       |       | 2/2      |       |       |        | 2/2      |        |        | 2/2      |        |
| No. of fans                                                |       |       | 10       |       |       |       | 14       |       |       |        | 18       |        |        | 20       |        |
| <b>Dimensions</b>                                          |       |       |          |       |       |       |          |       |       |        |          |        |        |          |        |
| Length                                                     | mm    |       | 7,250    |       |       |       | 9,480    |       |       |        | 11,640   |        |        | 12,785   |        |
| Width                                                      | mm    |       | 2,300    |       |       |       | 2,300    |       |       |        | 2,300    |        |        | 2,300    |        |
| Height                                                     | mm    |       | 2,500    |       |       |       | 2,500    |       |       |        | 2,500    |        |        | 2,500    |        |
| Height <sup>(6)</sup>                                      | mm    |       | 2,670    |       |       |       | 2,670    |       |       |        | 2,670    |        |        | 2,670    |        |
| Net weight                                                 | kg    | 5,740 | 5,830    | 5,823 | 5,913 | 7,398 | 7,538    | 9,028 | 9,168 | 10,117 | 10,287   | 10,313 | 10,503 | 11,044   | 11,224 |
| Operating weight                                           | kg    | 6,140 | 6,220    | 6,230 | 6,310 | 7,910 | 8,050    | 9,580 | 9,720 | 10,990 | 11,150   | 11,260 | 11,450 | 12,650   | 12,830 |

<sup>(1)</sup> Chilled water inlet/outlet: 18 °C/12 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(2)</sup> Sound pressure level at 1 m/10 m distance under free field conditions (to ISO 3744)

<sup>(3)</sup> Sound power level (to ISO 3744)

<sup>(4)</sup> Outside temperature: 6 °C

<sup>(5)</sup> Chilled water inlet/outlet: 12 °C/7 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(6)</sup> with optional fan diffuser

Technical data subject to change without notice.

## Technical data – ESO ... AHN

| Model                                                      |       | 4702     | 5102  | 6002  | 6602  | 7402     | 8002  | 8702  | 9602  | 10202    | 11102  | 11502  | 12602  | 13102    | 14102  |
|------------------------------------------------------------|-------|----------|-------|-------|-------|----------|-------|-------|-------|----------|--------|--------|--------|----------|--------|
| Operating point 18 °C/12 °C <sup>(1)</sup>                 |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Cooling capacity                                           | kW    | 491      | 518   | 585   | 630   | 757      | 806   | 861   | 934   | 1,014    | 1,074  | 1,134  | 1,218  | 1,295    | 1,369  |
| Total power consumption                                    | kW    | 128      | 137   | 158   | 175   | 199      | 217   | 234   | 261   | 266      | 290    | 303    | 334    | 342      | 373    |
| EER                                                        |       | 3.84     | 3.78  | 3.70  | 3.60  | 3.80     | 3.71  | 3.68  | 3.58  | 3.81     | 3.70   | 3.74   | 3.65   | 3.79     | 3.67   |
| Total power consumption <sup>(6)</sup>                     | kW    | 126      | 135   | 156   | 173   | 196      | 213   | 230   | 257   | 262      | 286    | 299    | 330    | 337      | 368    |
| EER <sup>(6)</sup>                                         |       | 3.90     | 3.84  | 3.75  | 3.64  | 3.86     | 3.78  | 3.74  | 3.63  | 3.87     | 3.76   | 3.79   | 3.69   | 3.84     | 3.72   |
| Operating point 12 °C/7 °C <sup>(5)</sup>                  |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Cooling capacity                                           | kW    | 404      | 437   | 488   | 537   | 625      | 680   | 716   | 790   | 841      | 909    | 945    | 1,029  | 1,077    | 1,158  |
| Total power consumption                                    | kW    | 120      | 130   | 147   | 165   | 185      | 204   | 219   | 246   | 249      | 274    | 281    | 312    | 319      | 349    |
| EER                                                        |       | 3.37     | 3.36  | 3.32  | 3.25  | 3.38     | 3.33  | 3.27  | 3.21  | 3.38     | 3.32   | 3.36   | 3.30   | 3.38     | 3.32   |
| Total power consumption <sup>(6)</sup>                     | kW    | 117      | 128   | 145   | 162   | 182      | 200   | 215   | 242   | 245      | 269    | 277    | 308    | 314      | 344    |
| EER <sup>(6)</sup>                                         |       | 3.45     | 3.41  | 3.37  | 3.31  | 3.43     | 3.40  | 3.33  | 3.26  | 3.43     | 3.38   | 3.41   | 3.34   | 3.43     | 3.37   |
| Conditions for both operating points                       |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Airflow                                                    | m³/h  | 220,000  |       |       |       | 308,000  |       |       |       | 396,000  |        |        |        | 440,000  |        |
| Capacity control                                           | %     | 12.5-100 |       |       |       | 12.5-100 |       |       |       | 12.5-100 |        |        |        | 12.5-100 |        |
| Sound                                                      |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) | 74/63    |       |       |       | 75/64    |       |       |       | 76/65    |        |        |        | 77/66    |        |
| Sound power level <sup>(3)</sup>                           | dB(A) | 96       |       |       |       | 97       |       |       |       | 98       |        |        |        | 99       |        |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) | 71/60    |       |       |       | 72/61    |       |       |       | 73/62    |        |        |        | 74/63    |        |
| Sound power level <sup>(3,6)</sup>                         | dB(A) | 93       |       |       |       | 94       |       |       |       | 95       |        |        |        | 96       |        |
| Components                                                 |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| No. of compressors/circuits                                |       | 2/2      |       |       |       | 2/2      |       |       |       | 2/2      |        |        |        | 2/2      |        |
| No. of fans                                                |       | 10       |       |       |       | 14       |       |       |       | 18       |        |        |        | 20       |        |
| Dimensions                                                 |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Length                                                     | mm    | 7,250    |       |       |       | 9,480    |       |       |       | 11,640   |        |        |        | 12,785   |        |
| Width                                                      | mm    | 2,300    |       |       |       | 2,300    |       |       |       | 2,300    |        |        |        | 2,300    |        |
| Height                                                     | mm    | 2,500    |       |       |       | 2,500    |       |       |       | 2,500    |        |        |        | 2,500    |        |
| Height <sup>(6)</sup>                                      | mm    | 2,670    |       |       |       | 2,670    |       |       |       | 2,670    |        |        |        | 2,670    |        |
| Net weight                                                 | kg    | 5,852    | 5,937 | 6,544 | 6,633 | 7,761    | 7,903 | 8,740 | 8,884 | 10,288   | 10,467 | 10,505 | 10,688 | 11,129   | 11,311 |
| Operating weight                                           | kg    | 6,349    | 6,435 | 7,048 | 7,136 | 8,565    | 8,706 | 9,616 | 9,760 | 11,824   | 12,003 | 12,101 | 12,284 | 12,790   | 12,972 |

## Technical data – EQO ... AHN

| Model                                                      |       | 3002     | 3302  | 3702  | 4002  | 4702     | 5102  | 6002  | 6602  | 7402     | 8002   | 8702   | 9602   | 10202    | 11102  |
|------------------------------------------------------------|-------|----------|-------|-------|-------|----------|-------|-------|-------|----------|--------|--------|--------|----------|--------|
| Operating point 18 °C/12 °C <sup>(1)</sup>                 |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Cooling capacity                                           | kW    | 333      | 354   | 375   | 395   | 498      | 523   | 598   | 638   | 759      | 807    | 864    | 934    | 992      | 1,060  |
| Total power consumption                                    | kW    | 81.3     | 88.7  | 93.4  | 100   | 123      | 131   | 151   | 166   | 193      | 211    | 227    | 255    | 263      | 289    |
| EER                                                        |       | 4.10     | 3.99  | 4.01  | 3.95  | 4.05     | 3.99  | 3.96  | 3.84  | 3.93     | 3.82   | 3.81   | 3.66   | 3.77     | 3.67   |
| Total power consumption <sup>(6)</sup>                     | kW    | 79.9     | 87.3  | 91.9  | 98.9  | 121      | 129   | 149   | 164   | 190      | 208    | 225    | 253    | 260      | 286    |
| EER <sup>(6)</sup>                                         |       | 4.17     | 4.05  | 4.08  | 3.99  | 4.12     | 4.05  | 4.01  | 3.89  | 3.99     | 3.88   | 3.84   | 3.69   | 3.82     | 3.71   |
| Operating point 12 °C/7 °C <sup>(5)</sup>                  |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Cooling capacity                                           | kW    | 271      | 297   | 308   | 332   | 410      | 440   | 495   | 543   | 625      | 680    | 718    | 790    | 824      | 898    |
| Total power consumption                                    | kW    | 76.0     | 83.9  | 87.5  | 95.5  | 115      | 124   | 142   | 156   | 180      | 198    | 212    | 240    | 245      | 271    |
| EER                                                        |       | 3.57     | 3.54  | 3.52  | 3.48  | 3.57     | 3.55  | 3.49  | 3.48  | 3.47     | 3.43   | 3.39   | 3.29   | 3.36     | 3.31   |
| Total power consumption <sup>(6)</sup>                     | kW    | 74.6     | 82.5  | 86.1  | 94.1  | 113      | 122   | 140   | 154   | 178      | 196    | 210    | 238    | 242      | 268    |
| EER <sup>(6)</sup>                                         |       | 3.63     | 3.60  | 3.58  | 3.53  | 3.63     | 3.61  | 3.54  | 3.53  | 3.51     | 3.47   | 3.42   | 3.32   | 3.40     | 3.35   |
| Conditions for both operating points                       |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Airflow                                                    | m³/h  | 160,000  |       |       |       | 224,000  |       |       |       | 288,000  |        |        |        | 320,000  |        |
| Capacity control                                           | %     | 12.5-100 |       |       |       | 12.5-100 |       |       |       | 12.5-100 |        |        |        | 12.5-100 |        |
| Sound                                                      |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) | 66/55    |       |       |       | 67/56    |       |       |       | 68/57    |        |        |        | 69/58    |        |
| Sound power level <sup>(3)</sup>                           | dB(A) | 88       |       |       |       | 89       |       |       |       | 90       |        |        |        | 91       |        |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) | 63/52    |       |       |       | 64/53    |       |       |       | 65/54    |        |        |        | 66/55    |        |
| Sound power level <sup>(3,6)</sup>                         | dB(A) | 85       |       |       |       | 86       |       |       |       | 87       |        |        |        | 88       |        |
| Components                                                 |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| No. of compressors/circuits                                |       | 2/2      |       |       |       | 2/2      |       |       |       | 2/2      |        |        |        | 2/2      |        |
| No. of fans                                                |       | 10       |       |       |       | 14       |       |       |       | 18       |        |        |        | 20       |        |
| Dimensions                                                 |       |          |       |       |       |          |       |       |       |          |        |        |        |          |        |
| Length                                                     | mm    | 7,250    |       |       |       | 9,480    |       |       |       | 11,640   |        |        |        | 12,785   |        |
| Width                                                      | mm    | 2,300    |       |       |       | 2,300    |       |       |       | 2,300    |        |        |        | 2,300    |        |
| Height                                                     | mm    | 2,500    |       |       |       | 2,500    |       |       |       | 2,500    |        |        |        | 2,500    |        |
| Height <sup>(6)</sup>                                      | mm    | 2,670    |       |       |       | 2,670    |       |       |       | 2,670    |        |        |        | 2,670    |        |
| Net weight                                                 | kg    | 5,740    | 5,830 | 5,823 | 5,913 | 7,398    | 7,538 | 9,028 | 9,168 | 10,117   | 10,287 | 10,313 | 10,503 | 11,044   | 11,224 |
| Operating weight                                           | kg    | 6,140    | 6,220 | 6,230 | 6,310 | 7,910    | 8,050 | 9,580 | 9,720 | 10,990   | 11,150 | 11,260 | 11,450 | 12,650   | 12,830 |

<sup>(1)</sup> Chilled water inlet/outlet: 18 °C/12 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(2)</sup> Sound pressure level at 1 m/10 m distance under free field conditions (to ISO 3744)

<sup>(3)</sup> Sound power level (to ISO 3744)

<sup>(4)</sup> Outside temperature: 6 °C

<sup>(5)</sup> Chilled water inlet/outlet: 12 °C/7 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(6)</sup> with optional fan diffuser

Technical data subject to change without notice.

## Technical data – CSO ... ASN

| Model                                                      |       | 1102   | 1302  | 1602   | 1902  | 2402  | 2802    | 3702  | 4002    | 4602    | 5002    | 5902    |
|------------------------------------------------------------|-------|--------|-------|--------|-------|-------|---------|-------|---------|---------|---------|---------|
| Operating point 18 °C/12 °C <sup>(1)</sup>                 |       |        |       |        |       |       |         |       |         |         |         |         |
| Cooling capacity                                           | kW    | 115    | 132   | 175    | 202   | 245   | 299     | 373   | 398     | 490     | 531     | 610     |
| Total power consumption                                    | kW    | 29.3   | 34.2  | 43.7   | 50.6  | 67.0  | 77.1    | 103   | 112     | 126     | 139     | 165     |
| EER                                                        |       | 3.92   | 3.86  | 4.00   | 3.99  | 3.66  | 3.88    | 3.62  | 3.55    | 3.89    | 3.82    | 3.70    |
| Total power consumption <sup>(6)</sup>                     | kW    | 28.5   | 33.4  | 42.8   | 49.6  | 66.1  | 75.4    | 101   | 110     | 123     | 137     | 162     |
| EER <sup>(6)</sup>                                         |       | 4.04   | 3.95  | 4.09   | 4.07  | 3.71  | 3.97    | 3.69  | 3.62    | 3.98    | 3.88    | 3.77    |
| Operating point 12 °C/7 °C <sup>(5)</sup>                  |       |        |       |        |       |       |         |       |         |         |         |         |
| Cooling capacity                                           | kW    | 96.7   | 112   | 147    | 171   | 208   | 252     | 316   | 338     | 413     | 451     | 519     |
| Total power consumption                                    | kW    | 28.2   | 33.0  | 42.4   | 49.0  | 64.1  | 74.4    | 97.7  | 106     | 121     | 132     | 157     |
| EER                                                        |       | 3.43   | 3.39  | 3.47   | 3.49  | 3.24  | 3.39    | 3.23  | 3.19    | 3.41    | 3.42    | 3.31    |
| Total power consumption <sup>(6)</sup>                     | kW    | 27.4   | 32.2  | 41.5   | 48.0  | 63.2  | 72.7    | 95.7  | 104     | 118     | 130     | 154     |
| EER <sup>(6)</sup>                                         |       | 3.53   | 3.48  | 3.54   | 3.56  | 3.29  | 3.47    | 3.30  | 3.25    | 3.50    | 3.47    | 3.37    |
| Conditions for both operating points                       |       |        |       |        |       |       |         |       |         |         |         |         |
| Airflow                                                    | m³/h  | 50,000 |       | 88,000 |       |       | 132,000 |       | 132,000 | 220,000 | 220,000 | 220,000 |
| Capacity control                                           | %     | 25-100 |       | 17-100 |       |       | 17-100  |       | 25-100  | 17-100  | 25-100  | 17-100  |
| Sound                                                      |       |        |       |        |       |       |         |       |         |         |         |         |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) | 75/62  |       | 75/63  |       |       | 75/63   |       | 75/63   |         |         |         |
| Sound power level <sup>(3)</sup>                           | dB(A) | 94     |       | 95     |       |       | 95      |       | 96      |         |         |         |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) | 72/59  |       | 72/60  |       |       | 72/60   |       | 72/60   |         |         |         |
| Sound power level <sup>(3,6)</sup>                         | dB(A) | 91     |       | 92     |       |       | 92      |       | 93      |         |         |         |
| Components                                                 |       |        |       |        |       |       |         |       |         |         |         |         |
| No. of compressors/circuits                                |       | 4/2    |       | 6/2    |       |       | 6/2     |       | 4/2     | 6/2     | 4/2     | 6/2     |
| No. of fans                                                |       | 4      |       | 4      |       |       | 6       |       | 6       | 10      | 10      | 10      |
| Dimensions                                                 |       |        |       |        |       |       |         |       |         |         |         |         |
| Length                                                     | mm    | 4,200  |       | 3,950  |       |       | 5,030   |       | 7,250   |         |         |         |
| Width                                                      | mm    | 1,300  |       | 2,300  |       |       | 2,300   |       | 2,300   |         |         |         |
| Height                                                     | mm    | 2,240  |       | 2,500  |       |       | 2,500   |       | 2,500   |         |         |         |
| Height <sup>(6)</sup>                                      | mm    | 2,410  |       | 2,670  |       |       | 2,670   |       | 2,670   |         |         |         |
| Net weight                                                 | kg    | 1,592  | 1,612 | 3,303  | 3,318 | 3,333 | 3,589   | 3,973 | 3,835   | 4,908   | 4,828   | 5,130   |
| Operating weight                                           | kg    | 1,633  | 1,668 | 3,362  | 3,395 | 3,416 | 3,719   | 4,147 | 4,020   | 5,177   | 5,101   | 5,425   |

## Technical data – CQO ... ASN

| Model                                                      |       | 1102   | 1302   | 1602   | 1902  | 2402  | 2802   | 3702  | 4002    | 4602  | 5002    |
|------------------------------------------------------------|-------|--------|--------|--------|-------|-------|--------|-------|---------|-------|---------|
| Operating point 18 °C/12 °C <sup>(1)</sup>                 |       |        |        |        |       |       |        |       |         |       |         |
| Cooling capacity                                           | kW    | 110    | 137    | 169    | 193   | 250   | 286    | 352   | 390     | 471   | 508     |
| Total power consumption                                    | kW    | 30.1   | 33.0   | 43.8   | 51.7  | 65.4  | 78.3   | 107   | 98.6    | 127   | 141     |
| EER                                                        |       | 3.65   | 4.15   | 3.86   | 3.73  | 3.82  | 3.65   | 3.29  | 3.96    | 3.71  | 3.60    |
| Total power consumption <sup>(6)</sup>                     | kW    | 29.7   | 32.4   | 43.1   | 51.0  | 64.4  | 77.3   | 106   | 96.9    | 125   | 139     |
| EER <sup>(6)</sup>                                         |       | 3.70   | 4.23   | 3.92   | 3.78  | 3.88  | 3.70   | 3.32  | 4.02    | 3.77  | 3.65    |
| Operating point 12 °C/7 °C <sup>(5)</sup>                  |       |        |        |        |       |       |        |       |         |       |         |
| Cooling capacity                                           |       | 93.2   | 115    | 143    | 164   | 212   | 244    | 301   | 328     | 399   | 433     |
| Total power consumption                                    |       | 28.8   | 32.2   | 42.1   | 49.7  | 62.9  | 74.8   | 101   | 94.8    | 122   | 138     |
| EER                                                        |       | 3.24   | 3.57   | 3.40   | 3.30  | 3.37  | 3.26   | 2.98  | 3.46    | 3.27  | 3.14    |
| Total power consumption <sup>(6)</sup>                     | kW    | 28.4   | 31.6   | 41.4   | 49.0  | 61.9  | 73.8   | 100   | 93.1    | 120   | 136     |
| EER <sup>(6)</sup>                                         |       | 3.28   | 3.64   | 3.45   | 3.35  | 3.42  | 3.31   | 3.01  | 3.52    | 3.33  | 3.18    |
| Conditions for both operating points                       |       |        |        |        |       |       |        |       |         |       |         |
| Airflow                                                    | m³/h  | 36,000 | 64,000 | 64,000 |       |       | 96,000 |       | 160,000 |       | 160,000 |
| Capacity control                                           | %     | 25-100 | 25-100 | 17-100 |       |       | 17-100 |       | 17-100  |       | 25-100  |
| Sound                                                      |       |        |        |        |       |       |        |       |         |       |         |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) | 65/52  |        | 66/54  |       |       | 67/55  |       | 67/55   |       |         |
| Sound power level <sup>(3)</sup>                           | dB(A) | 84     |        | 86     |       |       | 87     |       | 88      |       |         |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) | 62/49  |        | 63/51  |       |       | 64/52  |       | 64/52   |       |         |
| Sound power level <sup>(3,6)</sup>                         | dB(A) | 81     |        | 83     |       |       | 84     |       | 85      |       |         |
| Components                                                 |       |        |        |        |       |       |        |       |         |       |         |
| No. of compressors/circuits                                |       | 4/2    |        | 6/2    |       |       | 6/2    |       | 6/2     |       | 4/2     |
| No. of fans                                                |       | 4      |        | 4      |       |       | 6      |       | 10      |       | 10      |
| Dimensions                                                 |       |        |        |        |       |       |        |       |         |       |         |
| Length                                                     | mm    | 4,200  |        | 3,950  |       |       | 5,030  |       | 7,250   |       |         |
| Width                                                      | mm    | 1,300  |        | 2,300  |       |       | 2,300  |       | 2,300   |       |         |
| Height                                                     | mm    | 2,240  |        | 2,500  |       |       | 2,500  |       | 2,500   |       |         |
| Height <sup>(6)</sup>                                      | mm    | 2,410  |        | 2,670  |       |       | 2,670  |       | 2,670   |       |         |
| Net weight                                                 | kg    | 1,612  |        | 3,303  | 3,318 | 3,333 | 3,589  | 3,589 | 3,973   | 4,788 | 4,908   |
| Operating weight                                           | kg    | 1,651  |        | 3,356  | 3,374 | 3,406 | 3,668  | 3,714 | 4,139   | 4,965 | 5,164   |
|                                                            |       |        |        |        |       |       |        |       |         | 5,089 |         |

<sup>(1)</sup> Chilled water inlet/outlet: 18 °C/12 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(2)</sup> Sound pressure level at 1 m/10 m distance under free field conditions (to ISO 3744)

<sup>(3)</sup> Sound power level (to ISO 3744)

<sup>(4)</sup> Outside temperature: 6 °C

<sup>(5)</sup> Chilled water inlet/outlet: 12 °C/7 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(6)</sup> with optional fan diffuser

Technical data subject to change without notice.



## Technical data – CSO ... ASF

| Model                                                      |       | 1102   | 1302  | 1602   | 1902  | 2402  | 2802    | 3702  | 4002    | 4602    | 5002    | 5902    |
|------------------------------------------------------------|-------|--------|-------|--------|-------|-------|---------|-------|---------|---------|---------|---------|
| Operating point 18 °C/12 °C <sup>(1)</sup>                 |       |        |       |        |       |       |         |       |         |         |         |         |
| Cooling capacity                                           | kW    | 115    | 132   | 175    | 202   | 245   | 299     | 373   | 398     | 490     | 531     | 611     |
| Total power consumption                                    | kW    | 30.5   | 35.5  | 45.5   | 52.3  | 68.8  | 79.7    | 105   | 114     | 130     | 144     | 169     |
| EER                                                        |       | 3.77   | 3.72  | 3.85   | 3.86  | 3.56  | 3.75    | 3.55  | 3.49    | 3.77    | 3.69    | 3.62    |
| Total power consumption <sup>(6)</sup>                     | kW    | 29.6   | 34.5  | 44.0   | 50.8  | 67.3  | 77.5    | 103   | 112     | 126     | 140     | 165     |
| EER <sup>(6)</sup>                                         |       | 3.89   | 3.83  | 3.98   | 3.98  | 3.64  | 3.86    | 3.62  | 3.55    | 3.89    | 3.79    | 3.70    |
| Cooling capacity (Free Cooling) <sup>(4)</sup>             | kW    | 109    | 114   | 155    | 164   | 176   | 265     | 285   | 290     | 425     | 438     | 459     |
| Temperature for 100 % Free Cooling                         | °C    | 5.3    | 4.2   | 4.4    | 3.2   | 1.4   | 4.5     | 2.3   | 1.6     | 4.3     | 3.6     | 2.2     |
| Operating point 12 °C/7 °C <sup>(5)</sup>                  |       |        |       |        |       |       |         |       |         |         |         |         |
| Cooling capacity                                           | kW    | 96.7   | 112   | 147    | 171   | 208   | 252     | 316   | 338     | 413     | 451     | 519     |
| Total power consumption                                    | kW    | 29.5   | 34.3  | 44.2   | 50.8  | 65.9  | 77.0    | 100   | 109     | 126     | 137     | 161     |
| EER                                                        |       | 3.28   | 3.27  | 3.33   | 3.37  | 3.16  | 3.27    | 3.16  | 3.10    | 3.28    | 3.29    | 3.22    |
| Total power consumption <sup>(6)</sup>                     | kW    | 28.6   | 33.3  | 42.7   | 49.3  | 64.4  | 74.8    | 98.0  | 107     | 122     | 133     | 157     |
| EER <sup>(6)</sup>                                         |       | 3.38   | 3.36  | 3.44   | 3.47  | 3.23  | 3.37    | 3.22  | 3.16    | 3.39    | 3.39    | 3.31    |
| Cooling capacity (Free Cooling) <sup>(4)</sup>             | kW    | 54     | 57    | 76     | 81    | 87    | 131     | 141   | 144     | 210     | 217     | 228     |
| Temperature for 100 % Free Cooling                         | °C    | 1.2    | 0.2   | 0.4    | -0.6  | -2.3  | 0.5     | -1.3  | -2.0    | 0.3     | -0.3    | -1.5    |
| Conditions for both operating points                       |       |        |       |        |       |       |         |       |         |         |         |         |
| Airflow                                                    | m³/h  | 50,000 |       | 88,000 |       |       | 132,000 |       | 132,000 | 220,000 | 220,000 | 220,000 |
| Capacity control                                           | %     | 25-100 |       | 17-100 |       |       | 17-100  |       | 25-100  | 17-100  | 25-100  | 17-100  |
| Sound                                                      |       |        |       |        |       |       |         |       |         |         |         |         |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) | 77/64  |       | 77/65  |       |       | 77/65   |       |         |         | 77/65   |         |
| Sound power level <sup>(3)</sup>                           | dB(A) | 96     |       | 97     |       |       | 97      |       |         |         | 98      |         |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) | 73/60  |       | 73/61  |       |       | 73/61   |       |         |         | 73/61   |         |
| Sound power level <sup>(3,6)</sup>                         | dB(A) | 92     |       | 93     |       |       | 93      |       |         |         | 94      |         |
| Components                                                 |       |        |       |        |       |       |         |       |         |         |         |         |
| No. of compressors/circuits                                |       | 4/2    |       | 6/2    |       |       | 6/2     |       | 4/2     | 6/2     | 4/2     | 6/2     |
| No. of fans                                                |       | 4      |       | 4      |       |       | 6       |       | 6       | 10      | 10      | 10      |
| Dimensions                                                 |       |        |       |        |       |       |         |       |         |         |         |         |
| Length                                                     | mm    | 4,200  |       | 3,950  |       |       | 5,030   |       |         |         | 7,250   |         |
| Width                                                      | mm    | 1,300  |       | 2,300  |       |       | 2,300   |       |         |         | 2,300   |         |
| Height                                                     | mm    | 2,240  |       | 2,500  |       |       | 2,500   |       |         |         | 2,500   |         |
| Height <sup>(6)</sup>                                      | mm    | 2,410  |       | 2,670  |       |       | 2,670   |       |         |         | 2,670   |         |
| Net weight                                                 | kg    | 1,737  | 1,757 | 3,607  | 3,622 | 3,637 | 4,037   | 4,421 | 4,283   | 5,660   | 5,580   | 5,882   |
| Operating weight                                           | kg    | 1,885  | 1,919 | 3,784  | 3,817 | 3,838 | 4,338   | 4,765 | 4,639   | 6,217   | 6,142   | 6,466   |

## Technical data – CQO ... ASF

| Model                                                      |       | 1102   | 1302   | 1602   | 1902  | 2402   | 2802  | 3702    | 4002  | 4602    | 5002  |
|------------------------------------------------------------|-------|--------|--------|--------|-------|--------|-------|---------|-------|---------|-------|
| Operating point 18 °C/12 °C <sup>(1)</sup>                 |       |        |        |        |       |        |       |         |       |         |       |
| Cooling capacity                                           | kW    | 110    | 137    | 169    | 193   | 250    | 286   | 352     | 390   | 471     | 508   |
| Total power consumption                                    | kW    | 30.5   | 34.5   | 45.3   | 53.2  | 67.6   | 80.5  | 110     | 102   | 131     | 145   |
| EER                                                        |       | 3.61   | 3.97   | 3.73   | 3.63  | 3.70   | 3.55  | 3.20    | 3.82  | 3.60    | 3.50  |
| Total power consumption <sup>(6)</sup>                     | kW    | 30.1   | 33.5   | 44.3   | 52.2  | 66.1   | 79.0  | 109     | 100   | 129     | 143   |
| EER <sup>(6)</sup>                                         |       | 3.65   | 4.09   | 3.81   | 3.70  | 3.78   | 3.62  | 3.23    | 3.90  | 3.65    | 3.55  |
| Cooling capacity (Free Cooling) <sup>(4)</sup>             | kW    | 92     | 124    | 134    | 141   | 216    | 225   | 238     | 342   | 364     | 372   |
| Temperature for 100 % Free Cooling                         | °C    | 3.7    | 4.7    | 3.0    | 1.6   | 4.1    | 2.8   | 0.4     | 4.4   | 2.6     | 1.8   |
| Operating point 12 °C/7 °C <sup>(5)</sup>                  |       |        |        |        |       |        |       |         |       |         |       |
| Cooling capacity                                           | kW    | 93.2   | 115    | 143    | 164   | 212    | 244   | 301     | 328   | 399     | 433   |
| Total power consumption                                    | kW    | 29.2   | 33.6   | 43.6   | 51.1  | 65.1   | 77.0  | 103     | 98.4  | 125     | 137   |
| EER                                                        |       | 3.19   | 3.42   | 3.28   | 3.21  | 3.26   | 3.17  | 2.92    | 3.33  | 3.19    | 3.16  |
| Total power consumption <sup>(6)</sup>                     | kW    | 28.8   | 32.6   | 42.6   | 50.1  | 63.6   | 75.5  | 102     | 96.4  | 123     | 135   |
| EER <sup>(6)</sup>                                         |       | 3.24   | 3.53   | 3.36   | 3.27  | 3.33   | 3.23  | 2.95    | 3.40  | 3.24    | 3.21  |
| Cooling capacity (Free Cooling) <sup>(4)</sup>             | kW    | 46     | 61     | 66     | 70    | 107    | 112   | 119     | 169   | 180     | 185   |
| Temperature for 100 % Free Cooling                         | °C    | -0.2   | 0.6    | -0.9   | -2.0  | 0.2    | -1.0  | -3.0    | 0.5   | -1.1    | -1.9  |
| Conditions for both operating points                       |       |        |        |        |       |        |       |         |       |         |       |
| Airflow                                                    | m³/h  | 36,000 | 64,000 | 64,000 |       | 96,000 |       | 160,000 |       | 160,000 |       |
| Capacity control                                           |       | 25-100 | 25-100 | 17-100 |       | 17-100 |       | 17-100  |       | 25-100  |       |
| Sound                                                      |       |        |        |        |       |        |       |         |       |         |       |
| Sound pressure level at 1 m/10 m distance <sup>(2)</sup>   | dB(A) | 67/54  | 68/56  |        | 69/57 |        | 69/57 |         | 69/57 |         |       |
| Sound power level <sup>(3)</sup>                           | dB(A) | 86     | 88     |        | 89    |        | 90    |         | 90    |         |       |
| Sound pressure level at 1 m/10 m distance <sup>(2,6)</sup> | dB(A) | 64/51  | 64/52  |        | 65/53 |        | 65/53 |         | 65/53 |         |       |
| Sound power level <sup>(3,6)</sup>                         | dB(A) | 83     | 84     |        | 85    |        | 86    |         | 86    |         |       |
| Components                                                 |       |        |        |        |       |        |       |         |       |         |       |
| No. of compressors/circuits                                |       | 4/2    |        | 6/2    |       | 6/2    |       | 6/2     |       | 4/2     |       |
| No. of fans                                                |       | 4      |        | 4      |       | 6      |       | 10      |       | 10      |       |
| Dimensions                                                 |       |        |        |        |       |        |       |         |       |         |       |
| Length                                                     | mm    | 4,200  |        | 3,950  |       | 5,030  |       | 7,250   |       | 7,250   |       |
| Width                                                      | mm    | 1,300  |        | 2,300  |       | 2,300  |       | 2,300   |       | 2,300   |       |
| Height                                                     | mm    | 2,240  |        | 2,500  |       | 2,500  |       | 2,500   |       | 2,500   |       |
| Height <sup>(6)</sup>                                      | mm    | 2,410  |        | 2,670  |       | 2,670  |       | 2,670   |       | 2,670   |       |
| Net weight                                                 | kg    | 1,757  | 3,607  | 3,622  | 3,637 | 4,037  | 4,037 | 4,421   | 5,540 | 5,660   | 5,580 |
| Operating weight                                           | kg    | 1,909  | 3,771  | 3,803  | 3,824 | 4,317  | 4,363 | 4,751   | 6,066 | 6,193   | 6,119 |

<sup>(1)</sup> Chilled water inlet/outlet: 18 °C/12 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(2)</sup> Sound pressure level at 1 m/10 m distance under free field conditions (to ISO 3744)

<sup>(3)</sup> Sound power level (to ISO 3744)

<sup>(4)</sup> Outside temperature: 6 °C

<sup>(5)</sup> Chilled water inlet/outlet: 12 °C/7 °C, outside temperature: 35 °C, glycol content: 30 %

<sup>(6)</sup> with optional fan diffuser

Technical data subject to change without notice.

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