

**From mass production to small batches.** Cooling is a crucial part of production. It is responsible for ensuring appropriate temperatures for the tool, workpiece and the machine itself. The timings and service lives for the entire production process depend on the degree to which the cooling system provides ideal operating temperatures. If everything is sufficiently cooled, the production process runs like clockwork. And that we ensure by providing individual solutions for efficient and precise cooling. Exactly to the point and completely according to your needs.

Riedel



**Glen  
Dimplex**  
Thermal  
Solutions

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Cooling systems  
for industrial  
applications.

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## Quality assurance at Riedel with ISO 9001.

# Riedel in any case

Whether you're looking for a series-production device for a standard application or you need someone to develop a customised unit for you: you'll find what you're looking for at Riedel. Our two comprehensive series with refrigeration capacities of up to 226 kW cover most application requirements. If not, we use a structured working process to develop your own customised OEM cooling device.

Structured to obtain the optimum cooling solution for each customer. From the first contact to a product ready for series production, there are only a few steps. Riedel Quality Management will be there every stage to ensure that your customised product is commissioned as quickly as possible. Our After Sales Service then accompanies the life of your cooling solution.

## Quality management in the standard and project business.

**1** Request / quotation  
incl. technical specification



**2** Order, technical implementation,  
manufacture on production line, testing



**3** GDTS Service

## Quality management in the OEM development process.

**1** Customer request



**2** Development  
(Test laboratory and prototypes)



**3** Series production



**4** Series testing



**5** GDTS Service



**Reliable cooling for top performance  
and efficiency in production.**

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# Let's talk about your objectives.

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## **From mass production to small batches**

Cooling is a crucial part of production. It is responsible for ensuring appropriate temperatures for the tool, workpiece and the machine itself. The timings and service lives for the entire production process depend on the degree to which the cooling system provides ideal operating temperatures. If everything is sufficiently cooled, the production process runs like clockwork.

## **Standard chiller or OEM solution**

Riedel standard chillers are perfect for these tasks. They offer a wide performance range, offering reliable cooling for individual machines through to an entire production line. There are two series to choose from, with refrigeration capacities ranging from 1 to 230 kW. These standard models are easily modified to meet specific customer requirements to ensure your production system receives precisely the level of performance required.

Riedel also offers new developments for OEM units. Whether you need space-saving ideas or specific technical parameters – our engineers work together with customers to develop a customised cooling solution capable of cooling the machine at the relevant points and ensuring maximum performance.

Riedel applies its entire wealth of development expertise to tackling extreme and challenging operating conditions. All chillers adapted to specific customer requirements undergo thorough testing in our on-site laboratories and environmental chambers. Our test conditions can simulate extreme ambient temperatures and various levels of high air

humidity – precisely tuned to reflect the exact environmental conditions the equipment will face in its subsequent operation. As life cycle costs (LCC) are a key consideration in modern production businesses, we seek to achieve optimum energy efficiency in all of our developments.

## **Riedel chillers - Made in Germany**

Riedel has been producing its devices in Germany for over 40 years. Aspects essential to quality such as precision, dependability and reliable delivery are firmly embedded in our work philosophy. These values are what make Riedel a professional partner and preferred supplier all over the world. Our cooling devices are now used all over the globe; this has allowed us to build up an immense wealth of experience that we apply to each and every request.

As a company within the international Glen Dimplex Group, we are able to care for our customers quickly and effectively no matter where they are in the world. We can draw on a network of contacts, experiences and references, a highly innovative research and development group and last, but not least, a cost-efficient production environment with the highest quality standards. Our on-site presence demonstrates time and again our ability to offer our customers high performance. We can also offer them much, much more.

**Laser applications**

Riedel chillers are ideal for all types of laser systems available. We can configure the optimum cooling system for the benefits of the laser application in question.

# Precision cooling.

## Gas and solid-state lasers

Lasers with a capacity up to 40 kW can be constantly cooled at the source of the laser beam within applications.

Riedel cooling systems can comprise many different cooling circuits for the following applications:

- Gas lasers (CO<sub>2</sub>-Lasers)
- Solid-state lasers (fibre lasers or disc lasers)

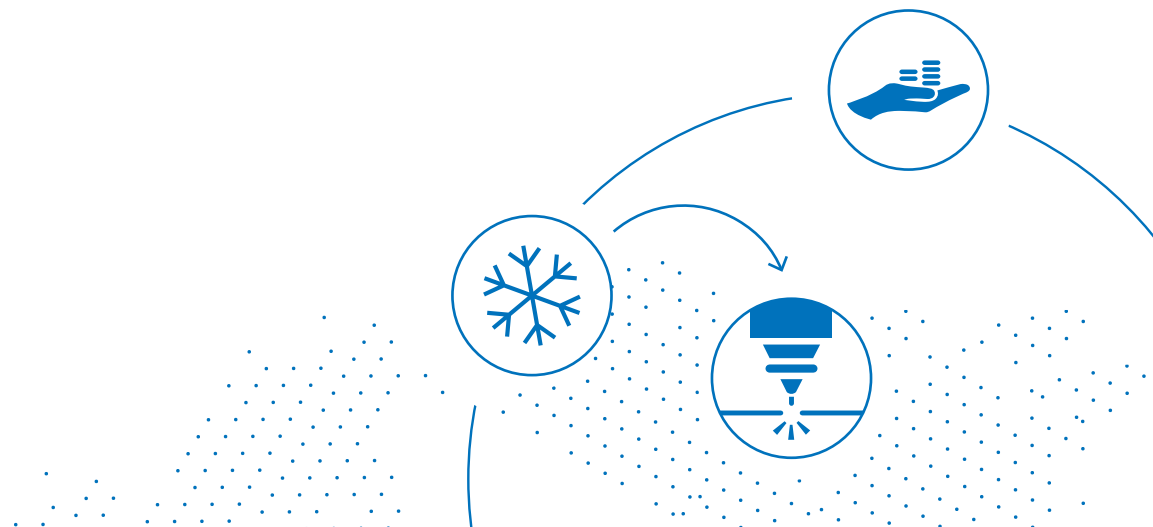
There is a huge range of requirements in terms of material specifications, required refrigeration capacity and accuracy (temperature, volume flow, water pressure) of the water circuit depending on the laser and the application. That's why Riedel chillers for lasers are always specifically designed with the application in mind.

## Energy Saving Solutions

Glen Dimplex Thermal Solutions offers individual Energy Saving Solutions for both new equipment and retrofits. "Free cooling" is one of the solutions to save energy. It saves a significant amount of money over the course of the year by releasing the waste heat from the laser into the cooler outside air without the use of a compressor.

However, if the waste heat from the laser can be put to good use, you can use heat recovery systems to boost your heating. Whether a new build or relocation into new, larger production facilities: wherever the waste heat can feasibly be integrated into the heating system, Riedel offers customer-specific heat transfer systems providing fully automated heat management.

Riedel also offers both standard and bespoke solutions for low-performance applications.



# Designed for high speed and precision.

## **Cutting machine tools:**

Our cooling solutions focus on machining centres with high-speed spindles. Main spindle motors are cooled, as are bearings, coolant and also control cabinets. One specific requirement of the cooling system is the tracking of the coolant temperature, which depends on the temperature of the machine bed and / or the hall.

## **Non-cutting machine tools:**

Riedel chillers can be used for a whole host of processing procedures. The non-conductor can be effectively cooled during electrical erosion, and coolant can be used to prevent the workpiece from overheating during grinding. Cooling for lapping and polishing machines has specific technical requirements, as the lapping granules / polish residue must be separated by upstream filters prior to cooling.

## **Coating machines:**

Electro-coating machinery requires cooling in order to maintain the temperature of the dip by means of a heat exchanger. Plasma coatings with extreme heating of the burner pose a greater challenge. Cooling is achieved by means of high water pressure and efficient cooling capacity.

## **Paint lines:**

Dipping machines for surface cleaning indirectly maintain the temperature of the cleaning agent via a finned heat exchanger. Gaseous solvents and other impurities are disposed of in an environmentally friendly manner after condensation. We supply units with outstanding cooling capacity for wet-paint dipping machines. While the paint is merely kept at the right temperature in spray-paint machines, high-performance finned heat exchangers are used here too to ensure the condensation of gaseous solvents released into the air.



## **Mechanical engineering and coating machinery**

Riedel offers standard and machinery-specific chillers and system solutions for a whole variety of cooling requirements within mechanical engineering. Riedel chillers demonstrate their performance capabilities day after day in even the toughest of environments, e.g. in South-East Asia, offering outstanding performance around the clock without compromise. We have chillers suited to a range of voltages and frequencies for use around the globe.

**Plastics industry**

Tools and hydraulic oils in particular need to be cooled as a result of the heat from the liquid plastic and the lubricant pump. Maximising tool life and reducing production waste and operating costs help ensure the production is economically efficient.

Riedel chillers set themselves apart by their high level of reliability and precision cooling for all relevant functions.

# Well cooled – well formed.

**Injection moulding procedures:**

Riedel chillers ensure reliable cooling for tools and hydraulics during injection moulding. The powerful chillers enable short cycle times, a stable removal-from-mould process and high process reliability.

Within the hydraulic oil, the heat input from the pump must be reliably diverted away. This often requires a separate, passive cooling system. If it is not possible to separate moulding cooling and tool cooling, the entire system is operated via a process chiller.

**Hot-forming machines:**

Small containers, yoghurt pots and hard shells for suitcases are typical deep-draw products. As the moulds often simultaneously serve as cutting tools for the set material, they must be kept at a constant temperature. Any distortion of the tools considerably reduces their service life.

**Blow-moulding machines:**

The moulding process for items such as PET bottles, pipes and containers uses cooling from the material moulding through to setting. Cooling of a compressor used during the moulding process is also applied where required.

**Extruder:**

The water bath used in the extrusion of pipes, cables etc. for material cooling and setting is kept at a constant temperature through circuit cooling. As well as the water bath, the machine's tool / moulding nozzles also need to be cooled. The closed cooling circuit operates without fresh water. Calcification of the cooling lines is prevented and operating costs reduced.





### Everything under control

Riedel trusts in its own controller series for the reliable and safe regulation of its chillers. The controllers register all the relevant parameters and regulate cooling devices within preset limit values. The electronics continuously record operating points, which can then be evaluated using the Studio-ST software included in the scope of supply. Error messages and operating statuses can

be sent immediately to smartphones or PCs which are connected via either Ethernet or Internet.

You are therefore always up to date, and know what is going on with your cooling system. If there is a fault, you can react to it immediately.



# Intelligent controls: intuitive user guidance.

## Top-level communication

The intelligent Riedel controllers feature a microprocessor board and operating display. They control the efficient operation of the individual devices and significantly increase the operational safety of the system.

The controller can be programmed in any way you like in accordance with the required functionality and level of operator comfort. The Riedel control board is affixed to the mounting plate of the control cabinet. The intuitive display is located in the control cabinet door. An RJ45 cable enables communication.

Just one control panel can control individual or networked chillers, which can be operated with various refrigerants as required, e.g. R134a, R407C etc.

Secure communication between the system and peripheral devices is assured through 20 analogue channels, a digital / analogue converter and pulse inputs, which are designed for fast flowmeter signals. An ST BUS cross-linking is also provided. Optionally Riedel offers connections to various Bus systems or networks, for example Profibus, CAN-Bus, Ethernet etc.

## Riedel controllers: for extra safety and operator comfort

The new controller series sets itself apart with a whole host of innovative functions to enhance operational safety and ensure quick response times in the event of a fault. They offer operator comfort and boost the energy efficiency of the cooling systems by the applied rules management.

- Individual control of up to four compressors
- Pump control in up to three water circuits
- Fan control
- Regulation for fixed-setpoints and differential control
- 100% monitoring of operating statuses,
- e.g. temperature, pressure, water level, volume flow etc.
- Error messages (clear text or icons)

## Riedel controller boards:

RCB1: Controller for basic applications

RCB2: Industrial applications

RCB3: Controller for complex system control

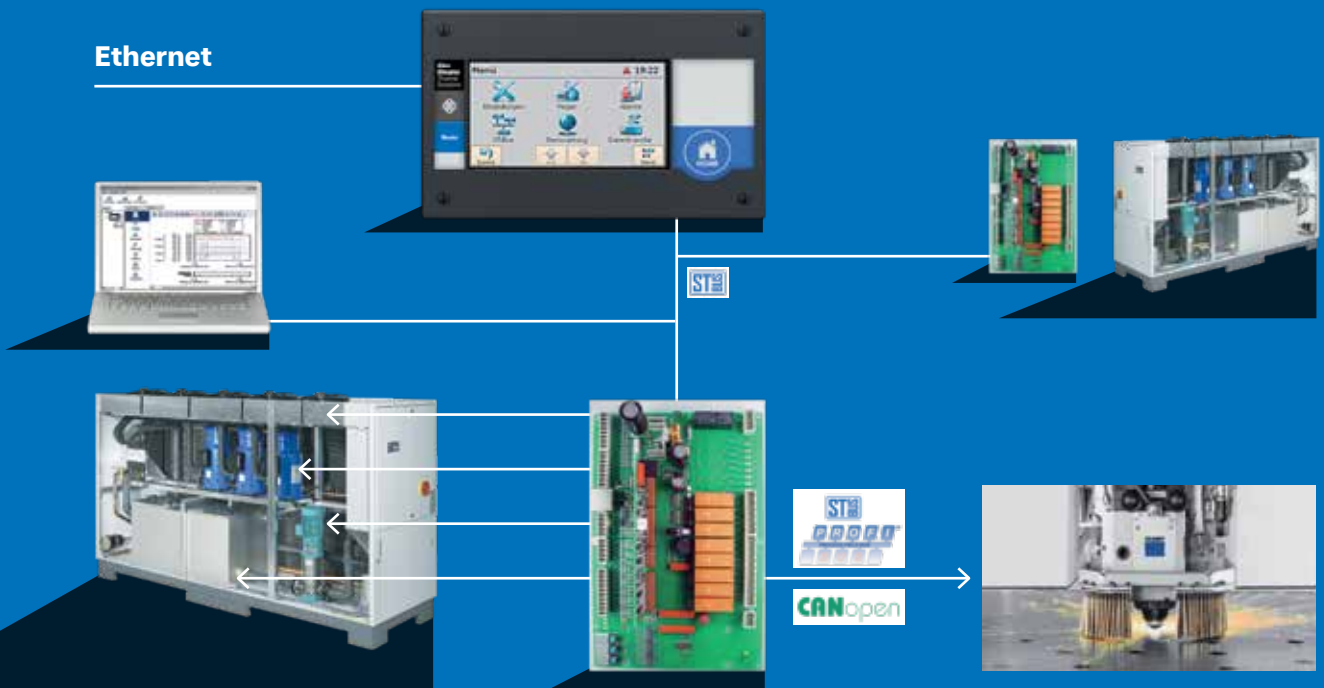
## Riedel display variants:

RD2: Display with four-digit LED display

RD3C: 4.3" TFT colour touchscreen

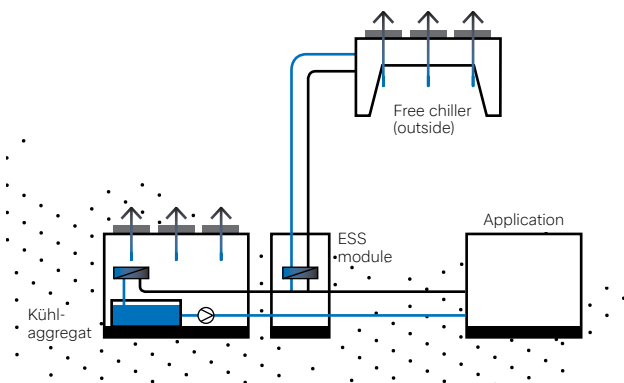


## Ethernet



# Energy Saving Solutions to reduce operating costs and CO<sub>2</sub> emissions.

## Energy Saving System (ESS)



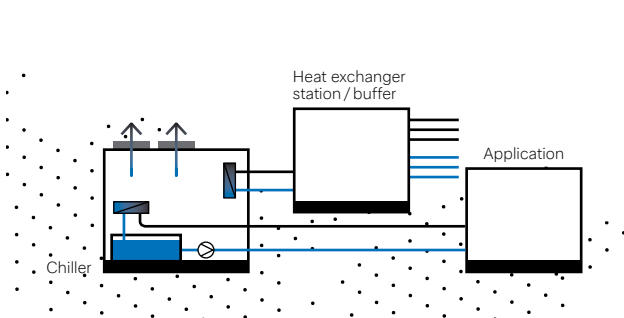
## The degree of efficiency is the crucial factor

Glen Dimplex has worked to obtain maximum energy efficiency of its cold water equipment from day one. Every part of our R&D is based on the following guiding principle: Minimum operating costs with maximum performance, precision and reliability.

The chillers have been extensively equipped to ensure their optimisation:

- Refrigerant optimisation
- Optimisation of your application under the agreed operating conditions (temperature and air humidity) in the environmental chambers
- Energy-efficient components in both full-load and partial-load operation
- Suitable system configurations and optimisation through Riedel controllers to ensure your application runs in an economically efficient manner
- The best possible degree of efficiency by minimising pressure drop, process temperature selection and chiller insulation
- Maximum utilisation of the Energy Saving System (here with free cooling), to minimise the proportion of active chilling.

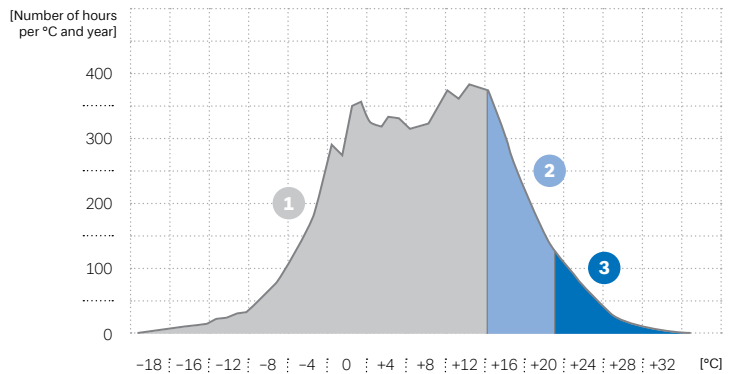
## Heat recovery



## Annual load graph using the city of Munich as an example

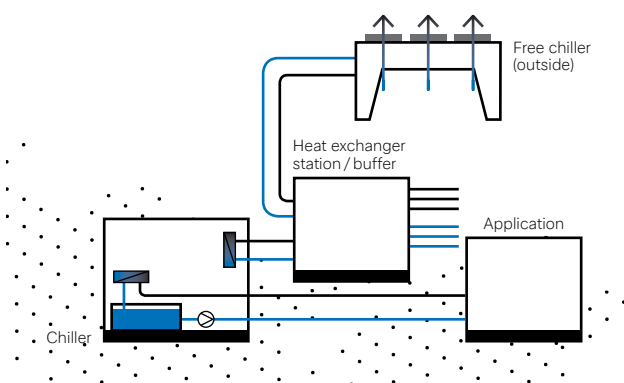
The utilisation of free cooling via the Energy Saving System (ESS) depends on the operating temperatures in the cooling circuit and the local outside temperatures. Employment of an ESS can reduce the runtime of the compressors by up to 75%.

## Correlation of the air temperature in Munich over 24 hours per day



- 1: 100% cooling via Energy Saving System
- 2: 50% via compressors 50% via ESS-Module (25.5%)
- 3: 100% cooling via compressors (6.3%)

## Heating connection



The Energy Saving Systems can also be combined with other products, from Glen Dimplex Thermal Solutions (GDTS) e.g. heat pumps.

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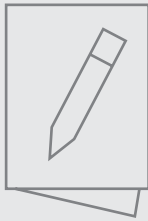
# Our services.

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## Consultation

**We start with a really detailed consultation onsite: Which requirements have to be met and what technical options are available to meet these requirements?** The goal is to optimise your plant to create a highly efficient system: for resource-saving operation and lasting reduction in energy costs.



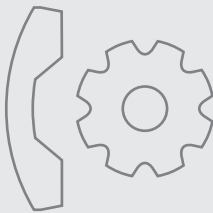
## Conception and planning

**In a really precise design phase, our ESS experts identify the exact cooling requirements for your processes and develop an individually tailored system solution.** Options range from the use of outside air for direct cooling to new technology like the ultra energy-efficient HybridChiller.



## Implementation

**The next step is the really individual implementation of your energy-saving system.** We work with qualified suppliers where necessary to deliver the optimal solution. We coordinate all the involved areas on your behalf. This ensures that we can guarantee the perfect pipework and connection technology. An experienced installation team guarantees optimal commissioning.



## Service

**GDTS also stays at your side in the future: With our really reliable service.** In addition to annual maintenance, our monitoring provides for the trouble-free operation of your cooling system. In case of need, our service technicians will be on site in just a few hours. Our hotline is available around the clock to help with any questions or issues.

**There's a cooling device for all applications**

With two full product series, you'll be able to find the right cooling device for you at Riedel. If you require a few modifications for your application, we can make cost-effective and reproducible adaptations to the standard equipment.

All cooling block systems are compact, factory-assembled condensing units suitable for an immense range of industrial applications. All devices comply with multiple regulations, including EC directives, standards and provisions: ISO 9001, EN 378, VDE and BGV

**SC series**

The cost-effective basic range for standard applications or cooling systems with slightly raised requirements. In stock with refrigeration capacities from 1.7 to 13.3 kW.

**PC series**

The professional series for all applications, demonstrating distinctively high reliability. This series offers refrigeration capacities of up to 230 kW and an extensive range of additional functions and options.

# Riedel SC series Standard chiller.

The SC chiller is a plug-in universal solution from Riedel which provides precise, economical cooling for a wide range of processes. The unit is extremely versatile and compact. The devices are equipped with a tank and a pump, and can be installed in the immediate vicinity of your machine. All models within the SC series are in stock ready for delivery.



## Technical data

SC	11	21	31	51	71	101	121
Net refrigeration capacity <sup>1</sup>	1.7 kW	2.2 kW	3.9 kW	5.8 kW	7.6 kW	10.9 kW	13.3 kW
Pump power loss	0.6 kW	0.6 kW	0.9 kW	0.9 kW	0.9 kW	1.1 kW	1.2 kW
Refrigerant	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Coolant fluid <sup>2</sup>	Water	Water	Water	Water	Water	Water	Water
Ambient temperature	+15 to +45 °C	+15 to +40 °C	+15 to +45 °C	+15 to +45 °C	+15 to +45 °C	+15 to +45 °C	+15 to +45 °C
Coolant outlet temperatur	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C
Setpoint stability	±1 K	±1 K	±1 K	±1 K	±1 K	±1 K	±1 K
Quantity of coolant in circulation	0.2 m <sup>3</sup> /h	0.3 m <sup>3</sup> /h	0.4 m <sup>3</sup> /h	0.8 m <sup>3</sup> /h	1.3 m <sup>3</sup> /h	1.6 m <sup>3</sup> /h	2.1 m <sup>3</sup> /h
Free pump pressure	3 bar	3 bar	5 – 6 bar	5 – 6 bar	5 – 6 bar	5 – 6 bar	5 – 6 bar
Tank volume	25 l	25 l	40 l	80 l	80 l	150 l	150 l
Sound pressure level <sup>3</sup>	44 dB(A)	44 dB(A)	54 dB(A)	54 dB(A)	54 dB(A)	63 dB(A)	61 dB(A)
Voltage supply	1 Ph / 230 V / 50 Hz	1 Ph / 230 V / 50 Hz	3 Ph / 400 V / 50 Hz	3 Ph / 400 V / 50 Hz	3 Ph / 400 V / 50 Hz	3 Ph / 400 V / 50 Hz	3 Ph / 400 V / 50 Hz
Maximum power consumption	1.7 kW	1.9 kW	2.6 kW	3.8 kW	4.6 kW	6.0 kW	7.5 kW
Power consumption in <sup>1</sup>	1.5 kW	1.7 kW	2.1 kW	2.9 kW	3.5 kW	4.6 kW	5.3 kW
Maximum current consumption	8.0 A	9.8 A	5.2 A	8.0 A	9.0 A	11.5 A	14.5 A
Water connections	½" Rp	½" Rp	½" Rp	¾" Rp	¾" Rp	1" Rp	1" Rp
Weight (net)	56 kg	64 kg	105 kg	156 kg	159.5 kg	189 kg	193.5 kg
Dimensions width x height x depth	475 x 390 x 780 mm	475 x 390 x 780 mm	540 x 1,050 x 700 mm	620 x 1,230 x 880 mm	620 x 1,230 x 880 mm	720 x 1,396 x 1,080 mm	720 x 1,396 x 1,080 mm

<sup>1</sup> At a coolant outlet temperature of 20°C and ambient temperature of 32°C

<sup>2</sup> Ethylene glycol proportion can be up to 35 vol %

<sup>3</sup> Half sound field without reflection at a 5 m distance from the operator side at operating point as per 1

# Riedel PC series.

## Refrigeration capacity of **1 to 7 kW.**

### Options available: 1 to 7 kW refrigeration capacity

- Flow rate monitor
- Overflow valve to ensure minimum flow
- Plastic tubing
- Insulation for pump, water tubing and suction refrigeration line at a water outlet temperature of < 12°C
- VA evaporator (Ni brazed) for deionised water
- Digital display (actual coolant temperature)
- Power regulation by hot gas bypass valve for high temperature accuracy of up to ± 1 K by microprocessor-controlled temperature controller with digital setpoint and actual value display
- Remote control, floating or switching voltage
- Floating group fault messaging
- Paintwork (RAL colour) as per customer request
- Castors
- Dust filter (accessory)
- Check valve / solenoid valve (accessory)

### Specs in brief: standard 1 to 7 kW version

- Compact casing, powder-coated RAL 7035 / 5010; easy to service as all components can be accessed
- For indoor installation, degree of protection = IP 44
- Fully hermetic compressor with built-in motor protection
- CFC-free R134a refrigerant and also R407C (PC51 / 69)
- Evaporator as plate heat exchanger in VA, Cu brazed with cold insulation
- Prescribed monitoring and safety equipment in refrigerant circuit
- Thermostatic expansion valve with MOP to restrict evaporation pressure
- Air-cooled liquefier with axial fan (quiet and maintenance-free)
- Air circuit with front intake, blows upwards
- One-way air filter in air intake
- Copper piping in coolant circuit, stainless steel coolant circulation pump
- Insulated stainless steel tank with level switch for monitoring (plastic on PC12 / 19)
- Filling and draining port with level indicator

- Temperature accuracy in coolant outlet of up to ± 1 K
- Brine limit protection control
- Operating switch with light / main switch
- General fault display
- Ready-made 6 m connection cable with plug on PC12 and PC19 (230V / 50 Hz); without plug on PC19 (230V / 60 Hz) and PC31 / PC41 (230V / 50 Hz)
- Rubber buffers



### Technical data

PC	12	19	31	41	51	69	51	69
Net refrigeration capacity <sup>1</sup>	1.2 kW	1.9 kW	3.1 kW	4.1 kW	5.1 kW	6.9 kW	4.6 kW	6.4 kW
Free pump pressure	3.8 bar	3.7 bar	2.9 / 3.8 bar <sup>6</sup>	2.2 / 3.3 bar <sup>6</sup>	3.6 bar	3.3 bar	3.6 bar	3.3 bar
Refrigerant	<b>R134a</b>	<b>R134a</b>	<b>R134a</b>	<b>R134a</b>	<b>R134a</b>	<b>R134a</b>	<b>R407C</b>	<b>R407C</b>
Nominal volume flow	0.30 m³/h	0.30 m³/h	0.69 m³/h	0.96 m³/h	0.96 m³/h	1.44 m³/h	0.96 m³/h	1.44 m³/h
Minimum volume flow	0.15 m³/h	0.15 m³/h	0.35 m³/h	0.48 m³/h	0.48 m³/h	0.72 m³/h	0.48 m³/h	0.72 m³/h
Air volume flow <sup>2</sup>	1,500 m³/h	1,500 m³/h	2,400 m³/h	2,000 m³/h	3,500 m³/h	3,500 m³/h	3,500 m³/h	3,500 m³/h
Voltage supply	230 V 50 - 60 Hz	230 V / 50 Hz or 230 V / 60 Hz	400 V / 50 Hz or 460 V / 60 Hz		400 V / 50 Hz or 460 V / 60 Hz		400 V / 50 Hz or 460 V / 60 Hz	
Power consumption <sup>2</sup> , without pump	0.7 kW	1.3 kW	1.3 kW	1.5 kW	1.8 kW	2.5 kW	1.3 kW	1.5 kW
Operating range, ambient temperatures	+15 to +45 °C	+15 to +45 °C	+15 to +45 °C	+15 to +45 °C	+15 to +45 °C	+15 to +45 °C	+15 to +40 °C	+15 to +40 °C
Operating range, coolant outlet temperature	+10 to +25 °C	+10 to +25 °C	+10 to +25 °C	+10 to +25 °C	+10 to +25 °C	+10 to +25 °C	+12 to +20 °C	+12 to +20 °C
Setpoint tolerance	±2 / ±1 K <sup>3</sup>	±2 / ±1 K <sup>3</sup>	±2 / ±1 K <sup>3</sup>	±2 / ±1 K <sup>3</sup>	±2 / ±1 K <sup>3</sup>	±2 / ±1 K <sup>3</sup>	±2 / ±1 K <sup>3</sup>	±2 / ±1 K <sup>3</sup>
Coolant connections	½" Rp internal	½" Rp internal	½" Rp internal	½" Rp internal	¾" Rp internal	¾" Rp internal	¾" Rp internal	¾" Rp internal
Tank volume	20 l	20 l	25 l	25 l	50 l	50 l	50 l	50 l
Sound pressure level <sup>5</sup>	60 dB(A)	60 dB(A)	62 dB(A)	62 dB(A)	61 dB(A)	61 dB(A)	61 dB(A)	61 dB(A)
Weight (net)	75 kg		80 kg	85 kg	140 kg	145 kg	135 kg	140 kg
Dimensions width x height <sup>4</sup> x depth	445 x 717 x 708 mm		640 x 835 x 708 mm		770 x 1,045 x 810 mm		770 x 1,045 x 810 mm	

<sup>1</sup> Refrigeration capacity without pump power loss, coolant outlet temperature +15°C, ambient temperature +32°C, coolant nominal volume flow, all data relates to 50 Hz operation  
<sup>2</sup> See 1 for operating conditions

<sup>3</sup> With power regulation  
<sup>4</sup> With adjustable feet  
<sup>5</sup> Half sound field without reflection, 5 m distance, operator side, see 1 for operating conditions  
<sup>6</sup> At 400 V / 3 / PE

## Refrigeration capacity of **15 to 230 kW**.

### Options available: 15 to 230 kW refrigeration capacity

- Outdoor installation
- Liquefier protection screen, air filter mat
- Air filter mat monitoring
- Radial fans
- Continuously variable speed control for fans
- Reduced noise
- Overflow valve
- Fixed bypass
- Cold pressure gauge
- Coolant outlet temperature < +8°C
- flow monitors
- Dirt filter
- Isolation valves (check valves / solenoid valves)
- Pressure-free external tank filling
- Automatic water refill
- Tank heating for temperature control
- Pump switch-off
- more options on request

- Stainless steel water circuit, or PVC for deionised water
- Flow rate monitoring
- Guide value monitoring
- Two-circuit system
- Water-cooled design
- Heat recovery (systems)
- Remote control 24 V AC / DC
- Special voltages and frequencies
- Digital thermometer
- Limit value monitoring
- Differential temperature regulation
- Control cabinet heating, control cabinet fan
- Bus connection
- Individual fault display

### Specs in brief: standard 15 to 230 kW version

- Compact casing for indoor installation, zinc-plated and powder-coated
- Air-cooled liquefier for CFC-free R134a and R407C refrigerant
- Crescent-shape axial fan(s), extremely quiet and maintenance-free
- Pressure-controlled fans
- Fully hermetic compressor, 100% suction gas cooled
- Evaporator as plate heat exchanger
- Thermostatic expansion valve
- High and low pressure control
- Water circuit with tank and pump, in accordance with specific application requirements
- Corrosion-resistant fixed piping in water circuit made from copper or plastic, plus stainless steel pumps
- Switches and controls completely wired
- Remote control and group fault messaging
- Microprocessor-controlled temperature controller with digital setpoint / actual value display



# Refrigeration capacity of **15 to 75 kW.**

## Technical data

<b>PC (50 Hz)</b>	<b>161</b>	<b>201</b>	<b>251</b>	<b>321</b>	<b>401</b>	<b>501</b>	<b>631</b>	<b>801</b>
Net refrigeration capacity <sup>1</sup>	15.8 kW	19.6 kW	25.6 kW	31.1 kW	37.6 kW	49.0 kW	62.8 kW	73.0 kW
Power consumption <sup>2</sup> , with 3 bar pump	6.9 kW	8.4 kW	10.3 kW	12.3 kW	14.8 kW	17.9 kW	24.1 kW	27.3 kW
Refrigerant	R407C	R407C	R407C	R407C	R407C	R407C	R407C	R407C
Operating range, ambient temperatures	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +38 °C
Operating range, coolant outlet temperature	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C
Setpoint tolerance	±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K	
Weight (net)	300 kg	320 kg	390 kg	460 kg	600 kg	650 kg	750 kg	800 kg
Net refrigeration capacity <sup>1</sup>	16.7 kW	20.9 kW	24.4 kW	32.2 kW	43.0 kW	50.2 kW	65.4 kW	74.2 kW
Power consumption <sup>2</sup> , with 3 bar pump	7.6 kW	9.1 kW	11.1 kW	13.5 kW	18.4 kW	20.6 kW	26.5 kW	29.9 kW
Refrigerant	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Operating range, ambient temperatures	+5 to +47 °C	+5 to +47 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C
Operating range, coolant outlet temperature	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C
Setpoint tolerance	±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K		±2/±1/±0.5 K	
Weight (net)	300 kg	330 kg	440 kg	480 kg	670 kg	710 kg	780 kg	850 kg
Tank volume	125 l	125 l	200 l	200 l	300 l	300 l	200 l / 400 l	200 l / 400 l
Available pump pressure	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar
Nominal volume flow	2.2 m <sup>3</sup> /h	2.9 m <sup>3</sup> /h	3.6 m <sup>3</sup> /h	4.5 m <sup>3</sup> /h	5.6 m <sup>3</sup> /h	7.0 m <sup>3</sup> /h	9.0 m <sup>3</sup> /h	11.0 m <sup>3</sup> /h
Minimum volume flow	1.3 m <sup>3</sup> /h	1.7 m <sup>3</sup> /h	2.2 m <sup>3</sup> /h	2.7 m <sup>3</sup> /h	3.4 m <sup>3</sup> /h	4.2 m <sup>3</sup> /h	5.4 m <sup>3</sup> /h	6.6 m <sup>3</sup> /h
Air volume flow <sup>2</sup>	7,150 m <sup>3</sup> /h	6,650 m <sup>3</sup> /h	13,100 m <sup>3</sup> /h	11,700 m <sup>3</sup> /h	15,000 m <sup>3</sup> /h	14,700 m <sup>3</sup> /h	21,900 m <sup>3</sup> /h	21,300 m <sup>3</sup> /h
Sound pressure level <sup>3</sup>	59 dB(A)	59 dB(A)	62 dB(A)	63 dB(A)	63 dB(A)	63 dB(A)	65 dB(A)	65 dB(A)
Voltage supply	3x400 V / 50 Hz		3x400 V / 50 Hz		3x400 V / 50 Hz		3x400 V / 50 Hz	
Coolant connections	1" Rp internal		1 ¼" Rp internal		1 ½" Rp internal		2" Rp internal	
Dimensions width x height x depth	1,186 x 1,755 x 874 mm		1,541 x 1,755 x 874 mm		1,872 x 2,005 x 874 mm		2,220 x 2,005 x 874 mm	
<b>PC (60 Hz)</b>	<b>161</b>	<b>201</b>	<b>251</b>	<b>321</b>	<b>401</b>	<b>501</b>	<b>631</b>	<b>801</b>
Net refrigeration capacity <sup>1</sup>	14.6 kW	19.2 kW	24.2 kW	29.8 kW	39.7 kW	46.8 kW	59.8 kW	77.5 kW
Power consumption <sup>2</sup> , with 3 bar pump	7.9 kW	8.4 kW	11.8 kW	13.1 kW	16.0 kW	18.2 kW	23.0 kW	29.0 kW
Refrigerant	R407C	R407C	R407C	R407C	R407C	R407C	R407C	R407C
Operating range, ambient temperatures	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +38 °C
Operating range, coolant outlet temperature	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C
Setpoint tolerance	±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K		±2/±1/±0.5 K	
Weight (net)	300 kg	320 kg	390 kg	460 kg	600 kg	650 kg	750 kg	800 kg
Net refrigeration capacity <sup>1</sup>	16.8 kW	20.6 kW	26.6 kW	30.6 kW	40.2 kW	52.7 kW	62.1 kW	79.2 kW
Power consumption <sup>2</sup> , with 3 bar pump	8.2 kW	9.2 kW	12.5 kW	13.8 kW	17.6 kW	22.3 kW	26.2 kW	32.2 kW
Refrigerant	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Operating range, ambient temperatures	+5 to +47 °C	+5 to +47 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C
Operating range, coolant outlet temperature	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C
Setpoint tolerance	±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K <sup>4</sup>		±2/±1/±0.5 K	
Weight (net)	300 kg	330 kg	440 kg	480 kg	670 kg	710 kg	780 kg	850 kg
Tank volume	125 l	125 l	200 l	200 l	300 l	300 l	400 l	200 l / 400 l
Available pump pressure	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar	3 bar / 5 bar
Nominal volume flow	2.2 m <sup>3</sup> /h	2.9 m <sup>3</sup> /h	3.6 m <sup>3</sup> /h	4.5 m <sup>3</sup> /h	5.6 m <sup>3</sup> /h	7.0 m <sup>3</sup> /h	9.0 m <sup>3</sup> /h	11.0 m <sup>3</sup> /h
Minimum volume flow	1.3 m <sup>3</sup> /h	1.7 m <sup>3</sup> /h	2.2 m <sup>3</sup> /h	2.7 m <sup>3</sup> /h	3.4 m <sup>3</sup> /h	4.2 m <sup>3</sup> /h	5.4 m <sup>3</sup> /h	6.6 m <sup>3</sup> /h
Air volume flow <sup>2</sup>	8,200 m <sup>3</sup> /h	7,550 m <sup>3</sup> /h	13,500 m <sup>3</sup> /h	13,500 m <sup>3</sup> /h	17,200 m <sup>3</sup> /h	16,900 m <sup>3</sup> /h	25,500 m <sup>3</sup> /h	24,200 m <sup>3</sup> /h
Sound pressure level <sup>3</sup>	62 dB(A)	62 dB(A)	65 dB(A)	66 dB(A)	66 dB(A)	66 dB(A)	68 dB(A)	68 dB(A)
Voltage supply	3x460 V / 60 Hz		3x460 V / 60 Hz		3x460 V / 60 Hz		3x460 V / 60 Hz	
Coolant connections	1" Rp internal		1 ¼" Rp internal		1 ½" Rp internal		2" Rp internal	
Dimensions width x height x depth	1,186 x 1,755 x 874 mm		1,541 x 1,755 x 874 mm		1,872 x 2,005 x 874 mm		2,220 x 2,005 x 874 mm	

<sup>1</sup> Refrigeration capacity without pump power loss, ambient temperature +32°C, coolant outlet temperature +20°C, coolant nominal volume flow, all data relates to 400 / 3 / 50 Hz / PE operation or 460 / 3 / 60 Hz / PE operation

<sup>2</sup> See 1 for operating conditions

<sup>3</sup> Half sound field without reflection, 5 m distance, operator side, see 1 for operating conditions

<sup>4</sup> Special specifications required



# Refrigeration capacity of **90 to 230 kW**.

## Technical data

<b>PC (50 Hz)</b>	<b>1001</b>	<b>1121</b>	<b>1401</b>	<b>1601</b>	<b>1801</b>	<b>2001</b>	<b>2241</b>
Net refrigeration capacity <sup>1</sup>	94.3 kW	107.0 kW	141.0 kW	159.0 kW	183.0 kW	207.0 kW	226.0 kW
Power consumption <sup>2</sup> , with 3 bar pump	35.2 kW	40.8 kW	51.5 kW	59.9 kW	68.2 kW	79.4 kW	86.9 kW
Refrigerant	R407C	R407C	R407C	R407C	R407C	R407C	R407C
Operating range, ambient temperatures	+5 to +38 °C	+5 to +38 °C	+5 to +38 °C	+5 to +36 °C	+5 to +36 °C	+5 to +36 °C	+5 to +36 °C
Operating range, coolant outlet temperature	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C
Setpoint tolerance	±2/±1/±0.5 K	±2/±1/±0.5 K	±2/±1/±0.75 K	±2/±1/±0.75 K	±2/±1/±0.75 K	±2/±1/±0.75 K	±2/±1/±0.75 K
Weight (net)	1,060 kg	1,160 kg	1,420 kg	1,550 kg	1,780 kg	1,910 kg	2,400 kg
Net refrigeration capacity <sup>1</sup>	96.9 kW	110.0 kW	132.0 kW	148.0 kW	-	-	-
Power consumption <sup>2</sup> , with 3 bar pump	39.2 kW	44.3 kW	52.0 kW	58.8 kW	-	-	-
Refrigerant	R134a	R134a	R134a	R134a	-	-	-
Operating range, ambient temperatures	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	-	-	-
Operating range, coolant outlet temperature	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	-	-	-
Setpoint tolerance	±2/±1/±0.5 K	±2/±1/±0.5 K	±2/±1/±0.75 K	±2/±1/±0.75 K	-	-	-
Weight (net)	1,160 kg	1,260 kg	1,510 kg	1,650 kg	-	-	-
Tank volume	300 l/400 l/600 l		400 l/600 l/800 l		600 l/800 l		
Available pump pressure	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar
Nominal volume flow	14.0 m³/h	16.0 m³/h	20.0 m³/h	23.0 m³/h	28.0 m³/h	32.0 m³/h	35.0 m³/h
Minimum volume flow	8.4 m³/h	9.6 m³/h	12.0 m³/h	13.8 m³/h	16.8 m³/h	19.2 m³/h	21.0 m³/h
Air volume flow <sup>2</sup>	31,600 m³/h	30,800 m³/h	38,750 m³/h	38,000 m³/h	46,800 m³/h	45,300 m³/h	51,200 m³/h
Sound pressure level <sup>3</sup>	65 dB(A)	65 dB(A)	66 dB(A)	66 dB(A)	67 dB(A)	67 dB(A)	68 dB(A)
Voltage supply	3x400 V/50 Hz	3x400 V/50 Hz	3x400 V/50 Hz	3x400 V/50 Hz	3x400 V/50 Hz	3x400 V/50 Hz	3x400 V/50 Hz
Coolant connections	2 ½" Rp internal		Loose flange DN65/PN10		Loose flange DN80/PN10		
Dimensions width x height x depth	2,930 x 2,070 x 1,285 mm		3,630 x 2,070 x 1,285 mm		4,330 x 2,070 x 1,285 mm		5,042 x 2,070 x 1,285 mm

<b>PC (60 Hz)</b>	<b>1001</b>	<b>1121</b>	<b>1401</b>	<b>1601</b>	<b>1801</b>	<b>2001</b>	<b>2241</b>
Net refrigeration capacity <sup>1</sup>	93.3 kW	115.0 kW	134.0 kW	170.0 kW	192.0 kW	222.0 kW	243.0 kW
Power consumption <sup>2</sup> , with 3 bar pump	37.3 kW	44.3 kW	52.6 kW	63.0 kW	78.8 kW	85.7 kW	93.8 kW
Refrigerant	R407C	R407C	R407C	R407C	R407C	R407C	R407C
Operating range, ambient temperatures	+5 to +38 °C	+5 to +38 °C	+5 to +38 °C	+5 to +36 °C	+5 to +36 °C	+5 to +36 °C	+5 to +36 °C
Operating range, coolant outlet temperature	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C	+12 to +20 °C
Setpoint tolerance	±2/±1/±0.5 K				±2/±1/±0.75 K		±2/±1/±0.75 K
Weight (net)	1,060 kg	1,160 kg	1,420 kg	1,550 kg	1,780 kg	1,910 kg	2,400 kg
Net refrigeration capacity <sup>1</sup>	91.2 kW	118.0 kW	137.0 kW	159.0 kW	-	-	-
Power consumption <sup>2</sup> , with 3 bar pump	40.3 kW	49.4 kW	57.0 kW	64.0 kW	-	-	-
Refrigerant	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Operating range, ambient temperatures	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	+5 to +50 °C	-	-	-
Operating range, coolant outlet temperature	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	+8 to +25 °C	-	-	-
Setpoint tolerance	±2/±1/±0.5 K	±2/±1/±0.5 K	±2/±1/±0.75 K	±2/±1/±0.5 K	-	-	-
Weight (net)	1,160 kg	1,260 kg	1,510 kg	1,650 kg	-	-	-
Tank volume	300 l/400 l/600 l		400 l/600 l/800 l		600 l/800 l	600 l/800 l	600 l/800 l
Available pump pressure	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar	3 bar/5 bar
Nominal volume flow	14.0 m³/h	16.0 m³/h	20.0 m³/h	23.0 m³/h	28.0 m³/h	32.0 m³/h	35.0 m³/h
Minimum volume flow	8.4 m³/h	9.6 m³/h	12.0 m³/h	13.8 m³/h	16.8 m³/h	19.2 m³/h	21.0 m³/h
Air volume flow <sup>2</sup>	36,800 m³/h	36,000 m³/h	45,500 m³/h	44,250 m³/h	54,600 m³/h	53,000 m³/h	58,900 m³/h
Sound pressure level <sup>3</sup>	68 dB(A)	68 dB(A)	69 dB(A)	69 dB(A)	70 dB(A)	70 dB(A)	71 dB(A)
Voltage supply	3x460 V/60 Hz	3x460 V/60 Hz	3x460 V/60 Hz	3x460 V/60 Hz	3x460 V/60 Hz	3x460 V/60 Hz	3x460 V/60 Hz
Coolant connections	2 1½" Rp innen		Loose flange DN65/PN10		Loose flange DN80/PN10		
Dimensions width x height x depth	2,930 x 2,070 x 1,285 mm		3,630 x 2,070 x 1,285 mm		4,330 x 2,070 x 1,285 mm		5,042 x 2,070 x 1,285 mm

<sup>1</sup> Refrigeration capacity without pump power loss, ambient temperature +32°C, coolant outlet temperature +20°C, coolant nominal volume flow, all data relates to 400/3/50 Hz/PE operation or 460/3/60 Hz/PE operation

<sup>2</sup> See 1 for operating conditions

<sup>3</sup> Half sound field without reflection, 5 m distance, operator side, see 1 for operating conditions

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