NECS

HFC R-410A

0202T - 0612T
53 - 159 kW

Air-cooled water chillers with axial fans

(The photo of the unit is indicative and may change depending on the model)

- Two independent circuits
- Shell & tube heat exchanger
- Selection of pumping assembly with low or high head

CLIMAVENETA

SUMMARY

NECS
0202T - 0612T

CE

TÜV MANAGEMENT SERVICE ISO 9001

Company quality system
certified to UNI EN ISO 9001

Liability disclaimer

This bulletin is not exhaustive about: installation, use, safety precautions, handling and transport. Refer to "General Manual for Installation" for further informations.
This bulletin refers to standard executions, in particular for dimension, weight, electric, hydraulic, aeraulic and refrigerant connections (whereas applicable). Contact Climaveneta Commercial Office for further drawings and schemes.

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1. PRODUCT PRESENTATION

This section contains general information on the NECS range of products. For detailed information refer to the specific sections in this bulletin.

NECS units
NECS 0202T-0612T is a range of air-cooled liquid chillers, scroll type rotary compressors with R410A operating on two separate and independent circuits, and a shell & tube heat exchanger.
This new NECS series has been designed to satisfy specific application requirements where it is necessary to ensure continuous operation.

1.1 Maximum reliability
Unit with dual-circuit chilling section designed to ensure maximum efficiency at full load, ensuring continuity without interruption of operation in the event of breakage of one of the 2 circuits.

1.2 Efficiency
Condensation control with continuous adjustment of the fan speed by means of a phase-cut device for the supply voltage.
This allows the optimisation of energy consumption, adaption condensation to any environmental condition, while at the same time guaranteeing the minimum noise level of the ventilation assembly.

1.3 Hydronic unit
The integrated hydronic assembly includes the main hydraulic components, with a low- or high-head pump. Shut-off valves upstream and downstream from each pump to facilitate replacement operations without having to drain the hydraulic system.
Automatic pump rotation system in the event of a breakdown without interrupting operation (only in units with a dual pump).

1.4 Demand limit
Digital input allowing activation of the function that limits the maximum power supplied by the unit to a predetermined value.
The function may be used as a load protection system or as an energy saving function.

1.5 Low noise versions
Two noise reduction versions are available for all sizes: low noise (LN) and super low noise (SL). Low noise levels are achieved by reducing fan speed while the circuitry has been optimised and the coils generously sized to ensure the unit works correctly.

1.6 Energy indices IPLV and ESEER
Increasingly closer attention is being paid towards the power consumption of air-conditioning equipment, both in Europe and elsewhere.
For many years in the United States, reference has not just been made to efficiency at rated conditions. A valuation index is used which considers marginal operation of the unit at rated conditions as well as the increased usage when the separation stages of the cooling compressors are used.

The valuation index adopted in the United States is called IPLV (Integrated Part Load Value) and is defined in the regulations issued by ARI (American Refrigeration Institute).

ARI Standard

$$IPLV_{ARI} = (1*EER_{100\%} + 42*EER_{75\%} + 45*EER_{50\%} + 12*EER_{25\%}) /100$$

Where $EER_{100\%}$, $EER_{75\%}$, $EER_{50\%}$, $EER_{25\%}$ are the efficiencies of the chiller in the various load conditions (100% - 75% - 50% and 25% respectively), calculated in the external air temperature conditions shown below. The temperature of the water leaving the evaporator is considered constant at 6.7°C in all load conditions, with a delta of 5°C in the full load condition.
The multipliers 1, 42, 45 e 12 are the cooling performance coefficients in various load conditions statistically calculated by ARI on the basis of surveys conducted, for various types of buildings and operating conditions, in 29 American cities.

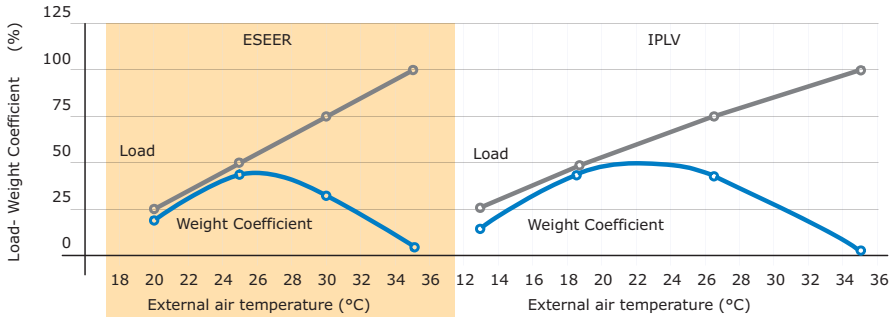
Evaporator temp. leaving	6,7°C constant			
Evaporator dirtying factor	0,018 m² °C/kW			
DeltaT full load	5°C			
Load	100%	75%	50%	25%
Cond. water temp.	35°C	26,7°C	18,3°C	12,8°C

In Europe there is a proposal for EECCAC (Energy Efficiency and Certification of Central Air Conditioner).

Proposal EECCAC

$$ESEER = (3*EER_{100\%} + 33*EER_{75\%} + 41*EER_{50\%} + 23*EER_{25\%})/100$$

Evaporator temp. leaving	7°C constant			
DeltaT full load	5°C			
Load	100%	75%	50%	25%
Cond. water temp.	35°C	30°C	25°C	20°C



Load	Air Temp.	Weight Coefficient	Air Temp.	Weight Coefficient
100%	35°C	3%	35°C	1%
75%	30°C	33%	26,7°C	42%
50%	25°C	41%	18,3°C	45%
25%	20°C	23%	12,8°C	12%

Weight= quantity of energy produced in the respective load conditions

Using the energy indices

After establishing which index to use and estimating the total power required by the system in the summer mode (in kWh), we can calculate seasonal electricity consumption (in kWh) using the following formula:

Power absorbed = Power requested / Index of efficiency

The real power calculation can be obtained more correctly in a “dynamic” form, that is, considering the load performance curve at different external temperatures, the location and the reference number of operating hours.
These figures will allow plant consultants and designers to make their evaluations depending on the type of building, the place of installation and the type of heat load. etc.. They can also determine the energy index using the method that best reflects plant requirements and can make comparisons between similar or equivalent systems using the same reference unit.

SIZE	VERSION	ESEER
0202	B	3.72
	LN	3.50
	HT	4.07
	SL	3.13
0252	B	3.47
	LN	3.51
	HT	3.81
	SL	3.19
0302	B	3.52
	LN	3.37
	HT	3.93
	SL	3.00
0352	B	3.49
	LN	3.22
	HT	3.76
	SL	3.25
0412	B	3.41
	HT	3.33
	LN	3.87
	SL	3.30
0452	B	3.59
	HT	3.36
	LN	3.76
	SL	3.14
0512	B	3.65
	HT	3.38
	LN	3.86
	SL	3.14
0552	B	3.66
	LN	3.34
0612	B	3.44
	LN	3.11

2. UNIT DESCRIPTION

NECS. State of the art system
NECS is a new series of water chillers which are ideal for low-to-medium power air-conditioning systems and particularly suitable for installations with a limited water content. NECS is a step beyond other systems thanks to its exclusive QuickMind control system, specifically developed by Climaveneta.
Thanks to the innovative QuickMind control, the NECS system has been designed to work on plants with a low water content where, unlike traditional controls, it minimises the variations in inlet water temperature even in extremely variable load conditions. It is a highly professional alternative to the installation of storage tanks.
NECS assures a precise water temperature control even at just 2.5 litres/kW. Technical start-up and operating times have been reduced. During the start-up phase, just the temperature set point needs setting.
The possibility integration of the hydronic-pump-group inside the unit simplifies the water and electrical power circuits of the system.
QuickMind continuously adapts its system settings to the various requirements of the plant.

Air-cooled water chillers
Outdoor unit for the production of chilled water with dedicated hermetic rotary scroll compressors for the use of R410A, axial fans, condensation coil with copper pipes and aluminium fins, shell & tube exchanger and thermostatic expansion valve. External panelling in peraluman and structure of aluminium sections. The range comprises units equipped with two compressors on two circuits.

2.1 Standard unit composition

Structure
Specific structure for outdoor installation, made with a hot-galvanised sheet steel base of adequate thickness, painted with polyester powders, perimeter structure composed of aluminium sections.

Panelling
Specific panelling for outdoor installation in aluminium alloy which ensures total resistance to atmospheric agents, easily removable, made in such a way as to allow total access to the internal components to facilitate inspection and maintenance work.

Compressors
Hermetic scroll compressors complete with an oil sump heater, electronic overheating protection with centralised manual reset and a two-pole electric motor.

Plant-side heat exchanger
Direct expansion shell & tube exchanger, with asymmetrical refrigerant side flows for maintaining the correct speed of the refrigerant in the tubes when passing from the liquid to the gas phase. Steel shell with foamed closed-cell elastomer anti-condensation lining. The shell & tube is manufactured using copper tubes with internal grooves for favouring heat exchange and mechanically expanded onto the tube plates.

Source heat exchanger
Finned coil exchanger made by copper tubes mechanically bounded to aluminium fins. The aluminium fins are correctly spaced to guarantee optimum heat exchange efficiency.

Fans
Axial electric fans, with IP 54 protection class, with external rotor and plastic-coated aluminium blades. Housed in aerodynamic hoods complete with safety grille. 6 - pole electric motor with built-in thermal protection. The fan chamber is divided into two sections for the independent management of defrosting cycles in the two circuits (only models with heat pump). Condensation control by means of a device for continuous adjustment of the fan rotation speed.

Pumps (where present)
Horizontal one-piece centrifugal pump with one impeller, axial suction and radial delivery, DIN GG20 cast iron body and AISI 316L stainless steel or cast iron impeller. The section of the shaft in contact with the liquid is made by stainless steel. Mechanical seal with components in ceramics, carbon and NBR elastomers. Three-phase electric motor with IP55 protection class, insulation class F, suitable for continuous service. Shut-off valves upstream and downstream from each pump to facilitate replacement operations without having to drain the hydraulic system. Automatic pump rotation system in the event of a breakdown without interrupting operation (only in units with a dual pump).

2.2 Controller
Electronic controls fitted on board the unit and provided with an operator panel to allow navigation of the programming and diagnostics menus. Access to the machine functions ensured at different levels by a protection password for the User (machine functions) and another password for the Service Centres (advanced functions and diagnostic services). IP65 front panel protection class. Compressor regulating algorithms of the proportional, proportional/integral or QuickMind type in the dead area with self-adapting logic to reduce the amount of water in the system. Integrated compressor rotation logic based on operating hours.
Control logic with functions of:
• optimisation of system running on full power
• minimising discharge line temperature oscillations compared with the set point.
• Choice of regulating parameters, based both on the system return temperature and on the delivery temperature.
• optimisation of compressor activation in the presence of reduced loads.
• detecting and reporting a large series of events such as: insufficient water content in the plant; low/high water flow in the plant; low/high inlet water temperature; pump and compressor maintenance times; refrigerant circuit integrity alarm.
Condensation control with continuous adjustment of the fan speed by means of a phase-cut device for the supply voltage based on the condensation pressure detected by dedicated pressure transducers. Voltage-free digital input for remote switching off and on of the unit.
Set-up for installing remote operator panel. Set-up for connecting to supervision systems using ModBus, Bacnet and Echelon LonTalkprotocols. Set-up for multilingual local and/or remote keyboard for remote control of the unit, Demand Limit input for limiting the supplied power, and 4..20mA analogue input for varying the working set-point of the unit.

2.3 Reference standards
The machine complies with the following directives and their amendments:
• 2006/42/CE Machinery Directive.
• E.C.D. 89/336/EEC + 2004/108/EC.
• 2006/95/EC Low Voltage Directive.
• 97/23/EC Pressure Equipment Directive . Module A1. TÜV-Italia 0948

2.4 Unit's test
Tests carried out along the all productive process as imposed by ISO9001. Possibility to have performance and acoustical witness tests, with the support of qualified technical operators.
Performance tests give the possibility to measure:
- electric data,
- waterflows,
- operating temperature,
- absorbed and given power, both at full load and partial load condition.
It's even possible to have a simulation of the most common alarm states and the pressure drops (water side) measurements. The acoustical tests allow to verify level of sound emissions of the unit according to ISO3744.

2.5 Available versions
B-Base
Standard model.

HT- High temperatures
This configuration features special soundproofing for the compressor chamber, reduced fan speed, an oversized condensing section. Fan speed is automatically increased if environmental conditions are particularly tough.

LN- Low noise
Low noise version. This configuration features special soundproofing for the compressor chamber and reduced fan speed. Fan speed is automatically increased if environmental conditions are particularly tough.

SL- Super low noise
Super low noise version. This configuration features special soundproofing for the compressor chamber, reduced fan speed, an oversized condensing section. Fan speed is automatically increased if environmental conditions are particularly tough.

2.6 Accessories

- Remote phase-sequence control
  Relay for controlling the phase-sequence of mains.
  Protects loads against faults due to incorrect connection of the electric line.

- *Compressors' on/off signal*
  Auxiliary contacts providing a voltage-free signal.
  Allows remote signalling of compressor's activation or remote control of any auxiliary loads.

- ModBUS connectivity
  Interface module for ModBUS protocols
  Allows integration with BMS operating with ModBUS protocol.

- BACnet connectivity
  Interface module for BACnet protocols.
  Allows integration with BMS operating with BACnet protocol.

- Echelon connectivity
  Interface module for Echelon systems.
  Allows integration with BMS operating with LonWorks procotls.

- Aux 4-20mA remote D L.C.
  4..20mA analogue input, voltage-free digitale input. Allows to change the operating set-point according to value of current applied to 4..20mA input and to limit the unit's power (by activating the digital input).
  Enforce Energy Saving policy, ensure safety operation.

- HP and LP gauges
  High and low pressure gauges.
  Allows immediate reading of the pressure values on both low and high pressure circuits.

- Compressor suction valve
  Shut-off solenoid valve on compressor's suction circuit.
  Simplifies maintenance activities.

- Compressors. discharge line valve
  Shut-off solenoid valve on compressor discharge circuit.
  Simplifies maintenance activities.

- Condensing coils with epoxy-coated fins
  Painted air-refrigerant heat exchanger.
  Recommended for applications in medium level pollution atmospheres.

- Cu/Cu condensing coils
  Air-refrigerant heat exchanger with copper fins and tubes.
  Recommended for applications in corrosive atmospheres.

- Condensing coils with Fin Guard Silver treatment
  Air-refrigerant heat exchanger with epoxidic treatment on coils and fins.
  Recommended for marine exposure conditions, with an high level of pollution or other aggressive atmospheres.

- Condensing coil protection net
  Coil protecting net.
  Protects against the intrusion of solid bodies with medium-large dimensions.

- Var. fan speed low amb. control (standard on SL units)
  Acoustic encolsure on both compressor and pump sections (when applicable).
  Noise emission reduction.

- W3000 compact visual display
  LCD display keyboard type W3000 Compact.
  Easy of use, multi-language user interface, remote unit's control.

- Prearrangement for remote
  LCD display keyboard type W3000 Compact.
  Easy of use, multi-language user interface, remote unit's control.

- Hydronic kit with one low-head pump
  See dedicated section.
  Simplifies installation.

- Hydronic kit with two low-head pumps
  See dedicated section.
  Simplifies installation, allows operating safety.

- Hydronic kit with one high-head pump
  See dedicated section.
  Simplifies installation.

- Hydronic kit with two high-head pumps
  See dedicated section.
  Simplifies installation, allows operating safety.

- Soft start
  Electronic device adopted to manage the inrush current.
  Break down of the inrush current as soon as the electrical motor is switch on, lower motor's mechanical wear, favourable sizing for the electrical system.

- Remote keyboard
  Remote operator panel (see dedicated section).
  Allows programming and display of machine status in remote mode.

- Remote signal double SP
  Allows to activate the Energy Saving set-point.
  Enforce Energy Saving policy.

- Multi-units control devices (sequencer, Manager3000, FWS3000).
  Separately supplied

- Multilingual user interface (only with W3000 COMPACT keyboard
  Special control unit programming (see dedicated section).
  Interface in English, French, German, Spanish and Swedish.

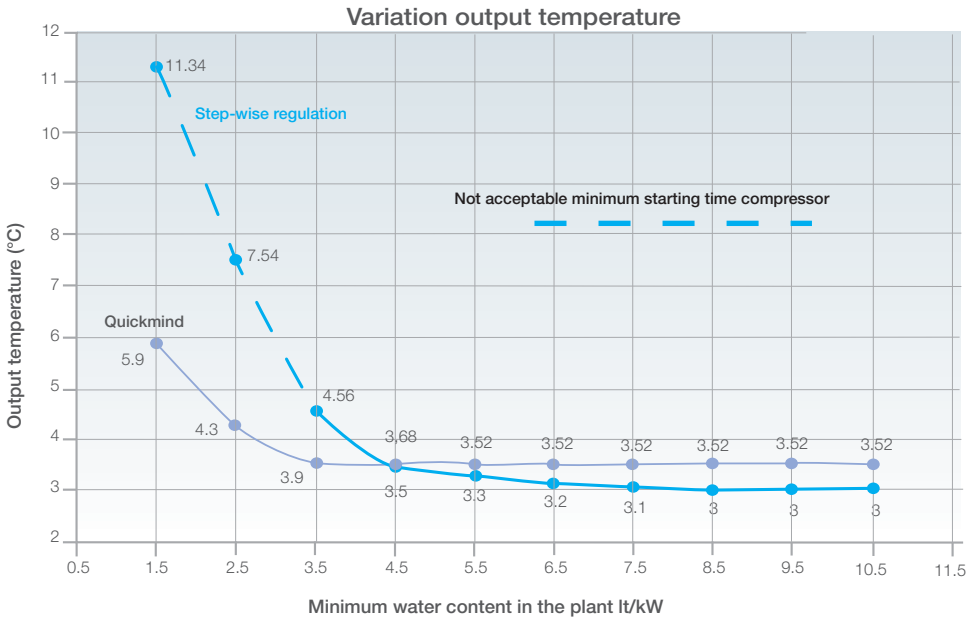
3. ELECTRONIC CONTROLLER

Control unit with LCD display (standard)
The new “W3000 Base” control unit is installed on all units.

Main functions: QuickMind, local and remote FWS supervision, dual setpoint management, etc., confirm Climaveneta’s commitment to continually developing its electronics technology. The heat pumps, moreover, are fitted with the original Climaveneta defrosting control system called “Autotuning Defrost” which considerably reduces defrosting times, thus improving the energy performance of the unit. Interfaces with BMS systems: METASYS®, MODBUS®, LONWORKS®, SIEMENS®, TREND®.

Black Box logs data relative to 200 alarm events which can be printed with a personal computer.

QuickMind is a special control unit which monitors the main operating parameters, predicts system behaviour and anticipates unit settings in order to constantly optimise performance; it allows both return and delivery water temperatures to be chosen as adjustment parameters. It can reduce outlet temperature fluctuations even with a small amount of water in the system. When, for dual-compressor chillers featuring a maximum of 12 start-ups per hour and using a traditional adjustment system, the minimum recommended water content is 5.5 l/kW, QuickMind ensures the same chiller operates correctly even with a water content of just 2.5 l/kW and considerably reduces outlet temperature fluctuations. The following graph shows that outlet temperature fluctuations with QuickMind are limited to 4.3 °C as opposed to 7.45 °C if the traditional adjustment system were used, without even ensuring an acceptable minimum compressor start time.



Control unit with LCD display (optional) - Remote keyboard

As an alternative to the standard keyboard, the NECS has a W3000 Compact operator panel with liquid crystal display. (LCD)

This keyboard employs a user interface with 3 European languages that may be selected by the user, two of which are preset, and a further language of choice which may be French, German, Spanish, Swedish or Russian (to be specified on order). This allows the control unit interface to be chosen to suit the country of destination or, thanks to English, to be completely independent for all geographical areas.

This same type of operator panel is also available as a remote keyboard, to be connected to the unit by means of a serial connection up to a maximum distance of 200 metres without power supply (in this case power is supplied by the unit), or a maximum of 500 metres with dedicated local power supply.

Note

The remote keyboard may be connected to the unit without replacing the W3000 Base operator panel originally provided on the unit. In this case the interface fitted locally on the unit is excluded, and access to the programming menus and the display of the machine status is present only the additional keyboard at remote level.

Instead, when the W3000 Base operator panel is replaced with the W3000 Compact panel, control of the unit is possible at both local and remote level. In this case the remote keyboard faithfully reproduces what is shown on the control unit on board the machine, further facilitating all the operations of configuring and controlling the unit.

4.1 GENERAL TECHNICAL DATA

SIZE		0202T	0252T	0302T	0352T	0412T	0452T	0512T
NECS								
COOLING	(1)							
Cooling capacity	**kW**	**53,0**	**58,1**	**76,0**	**86,8**	**96,9**	**112**	**127**
Total power input (unit)	kW	18,3	21,5	27,8	31,9	36,3	39,7	43,7
EER		2,90	2,70	2,73	2,72	2,67	2,83	2,90
ESEER		3,72	3,47	3,52	3,49	3,41	3,59	3,65
Heat exchanger water flow	m³/h	9,13	10,0	13,1	14,9	16,7	19,3	21,8
Heat exchanger pressure drop	kPa	6,25	7,64	13,1	17,2	12,8	17,2	15,7
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	2
Number of capacity	N°.	2	2	2	2	2	2	2
Number of circuits	N°.	2	2	2	2	2	2	2
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Minimum capacity steps	%	50	50	50	50	50	50	50
Type of refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	kg.	10,3	10,3	12,6	13,7	16,2	17,8	21,4
Oil charge	kg.	6	6	6	8	9	11	14
FANS								
Number	N°.	6	6	6	6	6	8	10
Air flow	m³/s	7,92	7,92	7,63	7,35	7,85	9,88	13,1
Singol power input	kW	0,25	0,25	0,25	0,25	0,25	0,25	0,25
NOISE LEVELS	(2)							
Total sound power	dB(A)	85	85	85	86	86	86	87
Total sound pressure	dB(A)	53	53	53	54	54	54	55
DIMENSIONS AND WEIGHTS	(3)							
Length	mm.	2195	2195	2195	2195	2745	2745	3245
Width	mm.	1120	1120	1120	1120	1120	1120	1120
Height	mm.	1420	1420	1420	1420	1420	1420	1620
Weight	kg.	625	625	665	765	920	990	1135

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
2 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level
3 Standard configuration
- Not available

GENERAL TECHNICAL DATA

SIZE		0552T	0612T					
NECS								
COOLING	(1)							
Cooling capacity	**kW**	**145**	**159**					
Total power input (unit)	kW	50,2	58,6					
EER		2,89	2,71					
ESEER		3,66	3,44					
Heat exchanger water flow	m³/h	24,9	27,3					
Heat exchanger pressure drop	kPa	21,7	25,9					
COMPRESSORS								
Number	N°.	2	2					
Number of capacity	N°.	2	2					
Number of circuits	N°.	2	2					
Type of regulation		STEPS	STEPS					
Minimum capacity steps	%	50	50					
Type of refrigerant		R410A	R410A					
Refrigerant charge	kg.	25,1	22,9					
Oil charge	kg.	13	13					
FANS								
Number	N°.	10	10					
Air flow	m³/s	12,8	12,8					
Singol power input	kW	0,25	0,25					
NOISE LEVELS	(2)							
Total sound power	dB(A)	87	87					
Total sound pressure	dB(A)	55	55					
DIMENSIONS AND WEIGHTS	(3)							
Length	mm.	3245	3245					
Width	mm.	1120	1120					
Height	mm.	1620	1620					
Weight	kg.	1180	1155					

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
2 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level
3 Standard configuration
- Not available

GENERAL TECHNICAL DATA

NECS HT

SIZE		0202T	0252T	0302T	0352T	0412T	0452T	0512T
NECS								
COOLING	(1)							
Cooling capacity	**kW**	**55,0**	**61,6**	**80,6**	**91,4**	**104**	**116**	**130**
Total power input (unit)	kW	17,3	20,3	25,9	30,5	33,7	38,6	42,2
EER		3,18	3,03	3,11	3,00	3,09	3,00	3,08
ESEER		4,07	3,81	3,93	3,76	3,87	3,76	3,86
Heat exchanger water flow	m³/h	9,46	10,6	13,9	15,7	18,0	19,9	22,4
Heat exchanger pressure drop	kPa	6,72	8,58	14,7	19,1	14,9	18,3	16,5
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	2
Number of capacity	N°.	2	2	2	2	2	2	2
Number of circuits	N°.	2	2	2	2	2	2	2
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Minimum capacity steps	%	50	50	50	50	50	50	50
Type of refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	kg.	12,6	11,9	14,9	17	20,5	20,5	21,4
Oil charge	kg.	6	6	6	8	9	11	14
FANS								
Number	N°.	6	8	8	10	10	10	10
Air flow	m³/s	7,63	10,6	10,2	13,5	13,1	13,1	12,8
Singol power input	kW	0,25	0,25	0,25	0,25	0,25	0,25	0,25
NOISE LEVELS	(2)							
Total sound power	dB(A)	85	86	86	87	87	87	87
Total sound pressure	dB(A)	53	54	54	55	55	55	55
DIMENSIONS AND WEIGHTS	(3)							
Length	mm.	2195	2745	2745	3245	3245	3245	3245
Width	mm.	1120	1120	1120	1120	1120	1120	1120
Height	mm.	1420	1420	1420	1620	1620	1620	1620
Weight	kg.	650	700	750	915	1050	1075	1115

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
2 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level
3 Standard configuration
- Not available

GENERAL TECHNICAL DATA

SIZE		0202T	0252T	0302T	0352T	0412T	0452T	0512T
NECS								
COOLING	(1)							
Cooling capacity	**kW**	**50,7**	**57,6**	**74,2**	**84,4**	**96,4**	**109**	**122**
Total power input (unit)	kW	18,9	21,2	28,6	33,7	37,1	41,4	45,9
EER		2,68	2,72	2,59	2,50	2,60	2,63	2,66
ESEER		3,5	3,51	3,37	3,22	3,33	3,36	3,38
Heat exchanger water flow	m³/h	8,72	9,92	12,8	14,5	16,6	18,7	21,0
Heat exchanger pressure drop	kPa	5,70	7,50	12,5	16,3	12,7	16,2	14,6
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	2
Number of capacity	N°.	2	2	2	2	2	2	2
Number of circuits	N°.	2	2	2	2	2	2	2
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Minimum capacity steps	%	50	50	50	50	50	50	50
Type of refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	kg.	10,3	12,6	11,9	14,8	17,8	19,6	21,4
Oil charge	kg.	6	6	6	8	9	11	14
FANS								
Number	N°.	6	6	8	8	8	8	10
Air flow	m³/s	6,04	5,73	8,16	9,03	8,77	8,55	11,0
Singol power input	kW	0,16	0,16	0,16	0,25	0,25	0,25	0,25
NOISE LEVELS	(2)							
Total sound power	dB(A)	80	80	81	83	83	83	84
Total sound pressure	dB(A)	48	48	49	51	51	51	52
DIMENSIONS AND WEIGHTS	(3)							
Length	mm.	2195	2195	2745	2745	2745	2745	3245
Width	mm.	1120	1120	1120	1120	1120	1120	1120
Height	mm.	1420	1420	1420	1620	1620	1620	1620
Weight	kg.	625	650	715	840	965	1025	1135

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
2 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level
3 Standard configuration
- Not available

GENERAL TECHNICAL DATA

NECS
LN

SIZE		0552T	0612T					
NECS								
COOLING	(1)							
Cooling capacity	**kW**	**139**	**151**					
Total power input (unit)	kW	53,1	62,4					
EER		2,61	2,42					
ESEER		3,34	3,11					
Heat exchanger water flow	m³/h	23,9	26,0					
Heat exchanger pressure drop	kPa	19,9	23,5					
COMPRESSORS								
Number	N°.	2	2					
Number of capacity	N°.	2	2					
Number of circuits	N°.	2	2					
Type of regulation		STEPS	STEPS					
Minimum capacity steps	%	50	50					
Type of refrigerant		R410A	R410A					
Refrigerant charge	kg.	25,1	22,9					
Oil charge	kg.	13	13					
FANS								
Number	N°.	10	10					
Air flow	m³/s	10,7	10,7					
Singol power input	kW	0,25	0,25					
NOISE LEVELS	(2)							
Total sound power	dB(A)	84	84					
Total sound pressure	dB(A)	52	52					
DIMENSIONS AND WEIGHTS	(3)							
Length	mm.	3245	3245					
Width	mm.	1120	1120					
Height	mm.	1620	1620					
Weight	kg.	1180	1155					

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
2 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level
3 Standard configuration
- Not available

GENERAL TECHNICAL DATA

SIZE		0202T	0252T	0302T	0352T	0412T	0452T	0512T
NECS								
COOLING	(1)							
Cooling capacity	**kW**	**47,8**	**55,5**	**69,9**	**85,4**	**96,8**	**106**	**117**
Total power input (unit)	kW	20,3	22,6	30,9	33,6	37,3	43,2	48,1
EER		2,35	2,46	2,26	2,54	2,60	2,46	2,44
ESEER		3,13	3,19	3	3,25	3,3	3,14	3,14
Heat exchanger water flow	m³/h	8,23	9,55	12,0	14,7	16,7	18,3	20,2
Heat exchanger pressure drop	kPa	5,08	6,95	11,1	16,7	12,8	15,4	13,5
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	2
Number of capacity	N°.	2	2	2	2	2	2	2
Number of circuits	N°.	2	2	2	2	2	2	2
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Minimum capacity steps	%	50	50	50	50	50	50	50
Type of refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	kg.	12,6	11,9	14,9	17	20,5	20,5	21,4
Oil charge	kg.	6	6	6	8	9	11	14
FANS								
Number	N°.	6	8	8	10	10	10	10
Air flow	m³/s	3,98	5,73	5,42	9,03	8,81	8,81	8,59
Singol power input	kW	0,16	0,16	0,16	0,25	0,25	0,25	0,25
NOISE LEVELS	(2)							
Total sound power	dB(A)	77	78	78	81	81	81	82
Total sound pressure	dB(A)	45	46	46	49	49	49	50
DIMENSIONS AND WEIGHTS	(3)							
Length	mm.	2195	2745	2745	3245	3245	3245	3245
Width	mm.	1100	1100	1100	1100	1100	1100	1100
Height	mm.	1420	1420	1420	1620	1620	1620	1620
Weight	kg.	650	700	750	915	1050	1075	1115

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
2 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level
3 Standard configuration
- Not available

4.2 COOLING CAPACITY PERFORMANCE

0202T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**58,1**	**55,0**	**53,6**	**51,5**	**47,6**	**45,9**	**59,8**	**56,6**	**55,2**	**53,0**	**49,0**	**47,3**	**61,5**	**58,2**	**56,8**	**54,6**	**50,5**	**48,8**
Pat	14,8	16,4	17,1	18,1	20,1	20,9	14,9	16,5	17,2	18,3	20,3	21,1	15,0	16,6	17,3	18,4	20,4	21,2
Qev	10,00	9,46	9,23	8,86	8,19	7,90	10,3	9,75	9,51	9,13	8,44	8,15	10,6	10,0	9,79	9,40	8,70	8,40
Dpev	7,49	6,71	6,39	5,89	5,03	4,68	7,95	7,12	6,78	6,25	5,35	4,98	8,41	7,55	7,18	6,63	5,67	5,29
Tev				**9**						**10**						**11**		
Pf	**63,2**	**59,9**	**58,4**	**56,1**	**52,0**	**50,2**	**64,9**	**61,5**	**60,0**	**57,7**	**53,4**	**51,6**	**66,6**	**63,1**	**61,6**	**59,2**	**54,9**	**53,0**
Pat	15,2	16,8	17,5	18,6	20,5	21,4	15,3	16,9	17,6	18,7	20,7	21,5	15,4	17,0	17,7	18,8	20,8	21,6
Qev	10,9	10,3	10,1	9,67	8,95	8,64	11,2	10,6	10,3	9,94	9,21	8,89	11,5	10,9	10,6	10,2	9,46	9,14
Dpev	8,88	7,98	7,60	7,01	6,01	5,60	9,37	8,42	8,02	7,41	6,36	5,93	9,86	8,87	8,46	7,82	6,71	6,27

0252T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**63,9**	**60,4**	**58,9**	**56,5**	**52,2**	**50,3**	**65,8**	**62,2**	**60,6**	**58,1**	**53,7**	**51,7**	**67,7**	**64,0**	**62,3**	**59,8**	**55,1**	**53,1**
Pat	17,5	19,4	20,1	21,3	23,5	24,5	17,7	19,5	20,3	21,5	23,7	24,6	17,9	19,7	20,4	21,7	23,8	24,8
Qev	11,0	10,4	10,1	9,72	8,98	8,67	11,3	10,7	10,4	10,0	9,24	8,91	11,7	11,0	10,7	10,3	9,49	9,15
Dpev	9,24	8,25	7,84	7,21	6,16	5,73	9,80	8,75	8,31	7,64	6,51	6,05	10,4	9,26	8,79	8,08	6,87	6,38
Tev				**9**						**10**						**11**		
Pf	**69,6**	**65,7**	**64,1**	**61,4**	**56,5**	**54,5**	**71,5**	**67,5**	**65,8**	**63,0**	**57,9**	**55,8**	**73,4**	**69,3**	**67,5**	**64,6**	**59,3**	**57,1**
Pat	18,0	19,8	20,6	21,8	24,0	24,9	18,1	19,9	20,7	21,9	24,1	25,0	18,3	20,1	20,9	22,1	24,2	25,2
Qev	12,0	11,3	11,0	10,6	9,74	9,38	12,3	11,6	11,3	10,9	9,98	9,61	12,6	11,9	11,6	11,1	10,2	9,83
Dpev	11,0	9,78	9,29	8,53	7,23	6,71	11,6	10,3	9,79	8,99	7,60	7,04	12,2	10,9	10,3	9,45	7,97	7,38

0302T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**83,5**	**78,9**	**76,9**	**73,8**	**68,2**	**65,9**	**85,8**	**81,2**	**79,2**	**76,0**	**70,3**	**67,9**	**88,1**	**83,4**	**81,4**	**78,2**	**72,5**	**70,0**
Pat	22,5	24,9	25,9	27,6	30,6	31,9	22,7	25,1	26,2	27,8	30,9	32,2	22,9	25,4	26,4	28,1	31,2	32,5
Qev	14,4	13,6	13,2	12,7	11,7	11,3	14,8	14,0	13,6	13,1	12,1	11,7	15,2	14,4	14,0	13,5	12,5	12,1
Dpev	15,8	14,1	13,4	12,4	10,6	9,83	16,7	14,9	14,2	13,1	11,2	10,5	17,6	15,8	15,0	13,9	11,9	11,1
Tev				**9**						**10**						**11**		
Pf	**90,4**	**85,6**	**83,6**	**80,3**	**74,6**	**72,2**	**92,7**	**87,8**	**85,8**	**82,5**	**76,7**	**74,3**	**95,0**	**90,0**	**87,9**	**84,7**	**78,9**	**-**
Pat	23,2	25,6	26,7	28,4	31,5	32,8	23,4	25,8	26,9	28,6	31,7	33,1	23,6	26,1	27,1	28,9	32,0	-
Qev	15,6	14,7	14,4	13,8	12,8	12,4	16,0	15,1	14,8	14,2	13,2	12,8	16,4	15,5	15,2	14,6	13,6	-
Dpev	18,6	16,6	15,8	14,6	12,6	11,8	19,5	17,5	16,7	15,5	13,4	12,5	20,5	18,4	17,6	16,3	14,1	-

0352T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**95,6**	**90,1**	**87,9**	**84,3**	**78,0**	**75,4**	**98,3**	**92,8**	**90,4**	**86,8**	**80,4**	**77,8**	**101**	**95,4**	**93,0**	**89,3**	**82,9**	**80,2**
Pat	25,9	28,6	29,7	31,5	34,9	36,3	26,2	28,9	30,0	31,9	35,3	36,7	26,5	29,2	30,4	32,2	35,6	37,1
Qev	16,5	15,5	15,1	14,5	13,4	13,0	16,9	16,0	15,6	14,9	13,8	13,4	17,4	16,4	16,0	15,4	14,3	13,8
Dpev	20,9	18,6	17,6	16,2	13,9	13,0	22,1	19,7	18,7	17,2	14,8	13,8	23,3	20,8	19,8	18,2	15,7	14,7
Tev				**9**						**10**						**11**		
Pf	**104**	**98,0**	**95,6**	**91,9**	**85,4**	**82,7**	**106**	**101**	**98,1**	**94,4**	**87,9**	**85,2**	**109**	**103**	**101**	**96,9**	**90,4**	**-**
Pat	26,8	29,5	30,7	32,6	36,0	37,4	27,1	29,8	31,0	32,9	36,3	37,8	27,4	30,1	31,3	33,2	36,7	-
Qev	17,9	16,9	16,5	15,8	14,7	14,2	18,3	17,3	16,9	16,3	15,1	14,7	18,8	17,8	17,4	16,7	15,6	-
Dpev	24,6	22,0	20,9	19,3	16,7	15,6	25,9	23,1	22,0	20,4	17,7	16,6	27,3	24,4	23,2	21,5	18,7	-

0412T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**107**	**101**	**98,1**	**94,1**	**87,1**	**84,2**	**110**	**104**	**101**	**96,9**	**89,8**	**86,9**	**113**	**107**	**104**	**99,8**	**92,6**	**89,6**
Pat	29,6	32,5	33,8	35,9	39,5	41,1	30,0	33,0	34,3	36,3	40,0	41,6	30,3	33,4	34,7	36,7	40,5	42,1
Qev	18,4	17,3	16,9	16,2	15,0	14,5	19,0	17,9	17,4	16,7	15,5	15,0	19,5	18,4	17,9	17,2	15,9	15,4
Dpev	15,7	13,9	13,1	12,1	10,4	9,68	16,6	14,7	13,9	12,8	11,0	10,3	17,5	15,5	14,8	13,6	11,7	11,0
Tev				**9**						**10**						**11**		
Pf	**116**	**110**	**107**	**103**	**95,4**	**92,4**	**119**	**113**	**110**	**106**	**98,2**	**-**	**122**	**116**	**113**	**108**	**101**	**-**
Pat	30,7	33,7	35,1	37,2	40,9	42,5	31,0	34,1	35,5	37,6	41,4	-	31,4	34,5	35,9	38,0	41,8	-
Qev	20,0	18,9	18,4	17,7	16,4	15,9	20,6	19,4	18,9	18,2	16,9	-	21,1	19,9	19,4	18,7	17,4	-
Dpev	18,5	16,4	15,6	14,4	12,4	11,7	19,5	17,3	16,5	15,2	13,2	-	20,5	18,3	17,4	16,1	14,0	-

Ta [°C] - Air temperature
Tev [°C] - Plant (side) cooling exchanger output water temperature
Pf [kW] - Cooling capacity
Pat [kW] - Total power input
Qev [m³/h] - Plant (side) heat exchanger water flow
Dpev [kPa] - Plant (side) cooling exchanger pressure drop
'-' Conditions outside the operating range
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

0452T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**123**	**116**	**114**	**109**	**101**	**98,0**	**127**	**120**	**117**	**112**	**104**	**101**	**131**	**123**	**120**	**116**	**107**	**104**
Pat	32,5	35,7	37,1	39,3	43,2	44,9	32,9	36,1	37,5	39,7	43,6	45,3	33,3	36,5	37,9	40,1	44,0	45,7
Qev	21,2	20,0	19,5	18,8	17,4	16,9	21,9	20,6	20,1	19,3	18,0	17,4	22,5	21,2	20,7	19,9	18,5	17,9
Dpev	20,8	18,5	17,6	16,3	14,0	13,1	22,0	19,6	18,7	17,2	14,9	13,9	23,3	20,8	19,8	18,2	15,8	14,8
Tev				**9**						**10**						**11**		
Pf	**134**	**127**	**124**	**119**	**110**	**107**	**138**	**130**	**127**	**122**	**113**	**-**	**141**	**133**	**130**	**125**	**116**	**-**
Pat	33,6	36,9	38,3	40,5	44,4	46,1	34,0	37,2	38,6	40,8	44,8	-	34,3	37,6	39,0	41,2	45,2	-
Qev	23,1	21,8	21,3	20,5	19,0	18,4	23,7	22,4	21,9	21,0	19,5	-	24,3	23,0	22,4	21,6	20,1	-
Dpev	24,6	21,9	20,9	19,3	16,7	15,6	25,9	23,1	22,0	20,4	17,6	-	27,3	24,4	23,2	21,4	18,6	-

0512T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**139**	**131**	**128**	**123**	**114**	**111**	**143**	**135**	**132**	**127**	**118**	**114**	**147**	**139**	**135**	**130**	**121**	**117**
Pat	36,0	39,5	41,0	43,3	47,6	49,4	36,4	39,9	41,4	43,7	48,0	49,8	36,8	40,3	41,8	44,1	48,3	50,1
Qev	23,9	22,6	22,0	21,2	19,7	19,1	24,6	23,2	22,7	21,8	20,3	19,6	25,3	23,9	23,3	22,4	20,8	20,2
Dpev	18,8	16,9	16,1	14,8	12,8	12,0	20,0	17,9	17,0	15,7	13,6	12,7	21,1	18,9	18,0	16,6	14,4	13,5
Tev				**9**						**10**						**11**		
Pf	**151**	**143**	**139**	**134**	**124**	**120**	**155**	**146**	**143**	**137**	**127**	**123**	**159**	**150**	**146**	**141**	**131**	**127**
Pat	37,1	40,6	42,1	44,5	48,7	50,5	37,5	41,0	42,5	44,9	49,1	50,8	37,8	41,4	42,9	45,2	49,4	51,1
Qev	26,0	24,6	24,0	23,0	21,4	20,7	26,7	25,2	24,6	23,6	22,0	21,3	27,3	25,9	25,2	24,3	22,5	21,8
Dpev	22,3	20,0	19,0	17,6	15,2	14,2	23,5	21,0	20,0	18,5	16,0	15,0	24,8	22,1	21,1	19,5	16,8	15,7

0552T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**159**	**150**	**146**	**141**	**131**	**127**	**163**	**155**	**151**	**145**	**135**	**130**	**168**	**159**	**155**	**149**	**138**	**134**
Pat	41,2	45,2	46,9	49,7	54,6	56,7	41,6	45,7	47,4	50,2	55,1	57,2	42,1	46,1	47,9	50,6	55,6	57,7
Qev	27,3	25,8	25,2	24,2	22,5	21,8	28,1	26,6	26,0	24,9	23,2	22,4	28,9	27,4	26,7	25,7	23,8	23,1
Dpev	26,1	23,3	22,2	20,5	17,7	16,6	27,6	24,7	23,5	21,7	18,7	17,6	29,2	26,1	24,9	23,0	19,8	18,6
Tev				**9**						**10**						**11**		
Pf	**173**	**163**	**159**	**153**	**142**	**138**	**177**	**168**	**163**	**157**	**146**	**141**	**182**	**172**	**168**	**161**	**150**	**-**
Pat	42,5	46,6	48,4	51,1	56,0	58,1	42,9	47,0	48,8	51,6	56,5	58,6	43,4	47,5	49,2	52,0	56,9	-
Qev	29,7	28,1	27,4	26,4	24,5	23,7	30,5	28,9	28,2	27,1	25,1	24,3	31,3	29,6	28,9	27,8	25,8	-
Dpev	30,9	27,6	26,3	24,3	20,9	19,6	32,6	29,1	27,7	25,6	22,1	20,7	34,3	30,6	29,1	26,9	23,2	-

0612T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**175**	**165**	**161**	**154**	**143**	**138**	**180**	**170**	**165**	**159**	**147**	**142**	**185**	**174**	**170**	**163**	**151**	**146**
Pat	48,0	52,8	54,8	58,0	63,8	66,2	48,6	53,4	55,4	58,6	64,4	66,8	49,1	53,9	56,0	59,2	65,0	67,5
Qev	30,1	28,4	27,7	26,5	24,6	23,8	31,0	29,2	28,5	27,3	25,3	24,5	31,8	30,0	29,3	28,1	26,0	25,1
Dpev	31,5	28,0	26,6	24,5	21,0	19,7	33,4	29,7	28,2	25,9	22,3	20,8	35,3	31,4	29,8	27,4	23,5	22,0
Tev				**9**						**10**						**11**		
Pf	**190**	**179**	**174**	**167**	**155**	**150**	**195**	**184**	**179**	**172**	**159**	**154**	**200**	**188**	**184**	**176**	**163**	**-**
Pat	49,7	54,5	56,6	59,9	65,7	68,1	50,2	55,1	57,2	60,4	66,3	68,7	50,8	55,7	57,8	61,0	66,9	-
Qev	32,7	30,8	30,0	28,8	26,7	25,8	33,6	31,6	30,8	29,6	27,4	26,5	34,4	32,5	31,6	30,3	28,1	-
Dpev	37,2	33,1	31,4	28,9	24,8	23,2	39,2	34,9	33,1	30,5	26,1	24,4	41,3	36,7	34,8	32,0	27,5	-

Ta [°C] - Air temperature
Tev [°C] - Plant (side) cooling exchanger output water temperature
Pf [kW] - Cooling capacity
Pat [kW] - Total power input
Qev [m³/h] - Plant (side) heat exchanger water flow
Dpev [kPa] - Plant (side) cooling exchanger pressure drop
'-' Conditions outside the operating range
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

0202T

Ta	25	30	35	40	43	46	25	30	35	40	43	46	25	30	35	40	43	46
Tev				**6**						**7**						**8**		
Pf	**59,6**	**56,7**	**53,3**	**49,6**	**47,2**	**44,6**	**61,4**	**58,4**	**55,0**	**51,2**	**48,7**	**46,0**	**63,1**	**60,1**	**56,6**	**52,7**	**50,2**	**47,5**
Pat	14,0	15,5	17,2	19,1	20,3	21,6	14,1	15,6	17,3	19,2	20,4	21,7	14,2	15,7	17,4	19,3	20,6	21,8
Qev	10,3	9,75	9,18	8,54	8,12	7,68	10,6	10,0	9,46	8,81	8,38	7,93	10,9	10,3	9,75	9,08	8,64	8,18
Dpev	7,89	7,13	6,32	5,46	4,94	4,42	8,37	7,57	6,72	5,82	5,27	4,71	8,86	8,03	7,13	6,18	5,60	5,01
Tev				**9**						**10**						**11**		
Pf	**64,9**	**61,8**	**58,3**	**54,3**	**51,7**	**48,9**	**66,6**	**63,5**	**59,9**	**55,8**	**53,2**	**50,4**	**68,4**	**65,2**	**61,5**	**57,4**	**54,7**	**51,8**
Pat	14,3	15,8	17,6	19,5	20,7	22,0	14,4	16,0	17,7	19,6	20,8	22,1	14,5	16,1	17,8	19,7	20,9	22,2
Qev	11,2	10,6	10,0	9,35	8,90	8,43	11,5	10,9	10,3	9,62	9,16	8,68	11,8	11,2	10,6	9,89	9,43	8,93
Dpev	9,37	8,50	7,55	6,56	5,94	5,33	9,89	8,97	7,98	6,94	6,30	5,65	10,4	9,47	8,43	7,34	6,66	5,99

0252T

Ta	25	30	35	40	43	46	25	30	35	40	43	46	25	30	35	40	43	46
Tev				**6**						**7**						**8**		
Pf	**66,6**	**63,4**	**59,7**	**55,7**	**53,1**	**50,4**	**68,7**	**65,3**	**61,6**	**57,4**	**54,7**	**51,9**	**70,7**	**67,3**	**63,4**	**59,1**	**56,3**	**53,4**
Pat	16,7	18,3	20,2	22,2	23,6	25,0	16,8	18,5	20,3	22,4	23,7	25,1	16,9	18,6	20,4	22,5	23,8	25,2
Qev	11,5	10,9	10,3	9,59	9,14	8,67	11,8	11,2	10,6	9,89	9,42	8,93	12,2	11,6	10,9	10,2	9,70	9,19
Dpev	10,0	9,08	8,07	7,02	6,38	5,74	10,7	9,65	8,58	7,46	6,77	6,09	11,3	10,2	9,10	7,90	7,17	6,44
Tev				**9**						**10**						**11**		
Pf	**72,7**	**69,2**	**65,2**	**60,8**	**57,9**	**54,8**	**74,7**	**71,2**	**67,1**	**62,5**	**59,4**	**56,2**	**76,7**	**73,1**	**68,9**	**64,1**	**61,0**	**57,6**
Pat	17,0	18,7	20,5	22,6	23,9	25,3	17,1	18,8	20,6	22,7	24,0	25,4	17,3	18,9	20,7	22,8	24,1	25,5
Qev	12,5	11,9	11,2	10,5	9,97	9,44	12,9	12,3	11,6	10,8	10,2	9,69	13,2	12,6	11,9	11,0	10,5	9,93
Dpev	12,0	10,8	9,64	8,36	7,58	6,80	12,6	11,5	10,2	8,83	8,00	7,16	13,3	12,1	10,8	9,31	8,42	7,52

0302T

Ta	25	30	35	40	43	46	25	30	35	40	43	46	25	30	35	40	43	46
Tev				**6**						**7**						**8**		
Pf	**87,0**	**82,9**	**78,3**	**73,1**	**69,8**	**66,2**	**89,5**	**85,3**	**80,6**	**75,4**	**72,0**	**68,4**	**92,0**	**87,7**	**82,9**	**77,6**	**74,2**	**70,5**
Pat	21,1	23,2	25,7	28,5	30,3	32,2	21,3	23,4	25,9	28,7	30,5	32,5	21,5	23,6	26,1	28,9	30,7	32,7
Qev	15,0	14,3	13,5	12,6	12,0	11,4	15,4	14,7	13,9	13,0	12,4	11,8	15,8	15,1	14,3	13,4	12,8	12,1
Dpev	17,2	15,6	13,9	12,1	11,0	9,94	18,2	16,5	14,7	12,9	11,7	10,6	19,2	17,5	15,6	13,7	12,5	11,3
Tev				**9**						**10**						**11**		
Pf	**94,5**	**90,1**	**85,3**	**79,9**	**76,4**	**72,8**	**97,0**	**92,5**	**87,6**	**82,1**	**78,7**	**-**	**99,4**	**94,9**	**89,9**	**84,4**	**80,9**	**-**
Pat	21,7	23,8	26,3	29,1	31,0	32,9	21,8	24,0	26,5	29,3	31,1	-	22,0	24,2	26,7	29,5	31,3	-
Qev	16,3	15,5	14,7	13,8	13,2	12,5	16,7	15,9	15,1	14,2	13,6	-	17,1	16,3	15,5	14,5	13,9	-
Dpev	20,3	18,4	16,5	14,5	13,3	12,0	21,3	19,4	17,4	15,3	14,0	-	22,5	20,4	18,3	16,2	14,9	-

0352T

Ta	25	30	35	40	43	46	25	30	35	40	43	46	25	30	35	40	43	46
Tev				**6**						**7**						**8**		
Pf	**99,4**	**94,3**	**88,7**	**82,8**	**79,0**	**75,1**	**102**	**97,1**	**91,4**	**85,4**	**81,5**	**77,5**	**105**	**99,9**	**94,1**	**88,0**	**84,1**	**-**
Pat	25,1	27,5	30,3	33,3	35,4	37,5	25,4	27,8	30,5	33,6	35,7	37,8	25,6	28,0	30,8	33,9	36,0	-
Qev	17,1	16,2	15,3	14,2	13,6	12,9	17,6	16,7	15,7	14,7	14,0	13,3	18,1	17,2	16,2	15,1	14,5	-
Dpev	22,6	20,3	18,0	15,7	14,3	12,9	23,9	21,5	19,1	16,7	15,2	13,7	25,3	22,8	20,2	17,7	16,2	-
Tev				**9**						**10**						**11**		
Pf	**108**	**103**	**96,8**	**90,6**	**86,7**	**-**	**111**	**105**	**99,5**	**93,2**	**89,3**	**-**	**114**	**108**	**102**	**95,8**	**91,9**	**-**
Pat	25,8	28,3	31,1	34,2	36,3	-	26,1	28,5	31,4	34,5	36,6	-	26,3	28,8	31,6	34,8	36,8	-
Qev	18,6	17,7	16,7	15,6	14,9	-	19,1	18,2	17,1	16,1	15,4	-	19,6	18,6	17,6	16,5	15,8	-
Dpev	26,7	24,1	21,4	18,8	17,2	-	28,2	25,4	22,6	19,9	18,2	-	29,7	26,8	23,9	21,0	19,3	-

0412T

Ta	25	30	35	40	43	46	25	30	35	40	43	46	25	30	35	40	43	46
Tev				**6**						**7**						**8**		
Pf	**113**	**107**	**101**	**94,5**	**90,3**	**86,1**	**117**	**111**	**104**	**97,5**	**93,3**	**88,9**	**120**	**114**	**107**	**101**	**96,2**	**91,8**
Pat	27,8	30,4	33,3	36,7	38,8	41,1	28,1	30,7	33,7	37,0	39,2	41,5	28,4	31,0	34,0	37,4	39,5	41,9
Qev	19,5	18,5	17,4	16,3	15,5	14,8	20,1	19,1	18,0	16,8	16,1	15,3	20,7	19,6	18,5	17,3	16,6	15,8
Dpev	17,6	15,8	14,0	12,2	11,1	10,1	18,7	16,8	14,9	13,0	11,9	10,8	19,8	17,8	15,8	13,8	12,7	11,5
Tev				**9**						**10**						**11**		
Pf	**124**	**117**	**111**	**104**	**99,2**	**94,7**	**127**	**120**	**114**	**107**	**102**	**-**	**130**	**124**	**117**	**110**	**105**	**-**
Pat	28,6	31,3	34,3	37,7	39,9	42,2	28,9	31,6	34,6	38,0	40,2	-	29,1	31,8	34,9	38,3	40,6	-
Qev	21,3	20,2	19,0	17,8	17,1	16,3	21,9	20,8	19,6	18,4	17,6	-	22,5	21,3	20,1	18,9	18,1	-
Dpev	20,9	18,8	16,7	14,7	13,5	12,3	22,1	19,9	17,7	15,5	14,3	-	23,3	21,0	18,7	16,5	15,2	-

Ta [°C] - Air temperature
Tev [°C] - Plant (side) cooling exchanger output water temperature
Pf [kW] - Cooling capacity
Pat [kW] - Total power input
Qev [m³/h] - Plant (side) heat exchanger water flow
Dpev [kPa] - Plant (side) cooling exchanger pressure drop
'-' Conditions outside the operating range
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

0452T																		
Ta	**25**	**30**	**35**	**40**	**43**	**46**	**25**	**30**	**35**	**40**	**43**	**46**	**25**	**30**	**35**	**40**	**43**	**46**
Tev			**6**						**7**						**8**			
Pf	**126**	**119**	**112**	**105**	**99,9**	**94,9**	**130**	**123**	**116**	**108**	**103**	**97,8**	**134**	**127**	**119**	**111**	**106**	**-**
Pat	31,8	34,8	38,2	42,0	44,4	47,0	32,1	35,2	38,6	42,4	44,8	47,4	32,4	35,5	38,9	42,7	45,2	-
Qev	21,7	20,6	19,3	18,0	17,2	16,3	22,4	21,2	19,9	18,6	17,7	16,8	23,0	21,8	20,5	19,1	18,3	-
Dpev	21,7	19,5	17,2	15,0	13,6	12,3	23,1	20,7	18,3	15,9	14,5	13,1	24,4	21,9	19,4	16,9	15,4	-
Tev			**9**						**10**						**11**			
Pf	**137**	**130**	**122**	**114**	**109**	**-**	**141**	**134**	**126**	**117**	**112**	**-**	**145**	**137**	**129**	**121**	**115**	**-**
Pat	32,8	35,8	39,3	43,1	45,5	-	33,1	36,2	39,6	43,4	45,9	-	33,4	36,5	40,0	43,8	46,2	-
Qev	23,7	22,4	21,1	19,7	18,8	-	24,3	23,0	21,7	20,2	19,3	-	24,9	23,6	22,2	20,8	19,9	-
Dpev	25,8	23,1	20,5	17,8	16,3	-	27,2	24,4	21,6	18,9	17,2	-	28,7	25,7	22,8	19,9	18,2	-

0512T																		
Ta	**25**	**30**	**35**	**40**	**43**	**46**	**25**	**30**	**35**	**40**	**43**	**46**	**25**	**30**	**35**	**40**	**43**	**46**
Tev			**6**						**7**						**8**			
Pf	**141**	**134**	**126**	**118**	**112**	**107**	**146**	**138**	**130**	**121**	**115**	**110**	**150**	**142**	**134**	**125**	**119**	**-**
Pat	34,8	38,1	41,8	46,0	48,7	51,5	35,1	38,5	42,2	46,4	49,0	51,8	35,5	38,8	42,6	46,7	49,4	-
Qev	24,3	23,1	21,7	20,2	19,3	18,3	25,1	23,8	22,4	20,8	19,9	18,9	25,8	24,4	23,0	21,4	20,4	-
Dpev	19,6	17,6	15,6	13,6	12,3	11,1	20,8	18,7	16,5	14,4	13,1	11,8	22,0	19,8	17,5	15,2	13,8	-
Tev			**9**						**10**						**11**			
Pf	**154**	**146**	**137**	**128**	**122**	**-**	**158**	**150**	**141**	**131**	**125**	**-**	**162**	**154**	**145**	**135**	**129**	**-**
Pat	35,8	39,2	42,9	47,0	49,7	-	36,1	39,5	43,3	47,4	50,0	-	36,4	39,9	43,6	47,7	50,3	-
Qev	26,5	25,1	23,6	22,0	21,0	-	27,2	25,8	24,3	22,6	21,6	-	27,9	26,5	24,9	23,2	22,2	-
Dpev	23,3	20,9	18,5	16,1	14,6	-	24,5	22,1	19,5	17,0	15,4	-	25,9	23,2	20,6	17,9	16,3	-

Ta [°C] - Air temperature
Tev [°C] - Plant (side) cooling exchanger output water temperature
Pf [kW] - Cooling capacity
Pat [kW] - Total power input
Qev [m³/h] - Plant (side) heat exchanger water flow
Dpev [kPa] - Plant (side) cooling exchanger pressure drop
'-' Conditions outside the operating range
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

0202T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**56,3**	**52,9**	**51,5**	**49,2**	**45,1**	**43,3**	**57,9**	**54,5**	**53,0**	**50,7**	**46,4**	**44,6**	**59,5**	**56,0**	**54,5**	**52,1**	**47,8**	**45,9**
Pat	15,2	16,9	17,6	18,7	20,8	21,7	15,3	17,0	17,8	18,9	21,0	21,9	15,5	17,2	17,9	19,1	21,2	22,0
Qev	9,68	9,11	8,86	8,47	7,76	7,45	9,97	9,38	9,12	8,72	7,99	7,68	10,2	9,65	9,39	8,97	8,23	7,91
Dpev	7,03	6,22	5,89	5,38	4,51	4,17	7,45	6,60	6,24	5,70	4,79	4,43	7,88	6,98	6,61	6,04	5,08	4,69
Tev				**9**						**10**						**11**		
Pf	**61,1**	**57,6**	**56,0**	**53,6**	**49,1**	**-**	**62,7**	**59,1**	**57,5**	**55,0**	**50,5**	**-**	**64,3**	**60,6**	**59,0**	**56,4**	**51,8**	**-**
Pat	15,6	17,4	18,1	19,3	21,3	-	15,8	17,5	18,3	19,4	21,5	-	15,9	17,7	18,4	19,6	21,6	-
Qev	10,5	9,91	9,65	9,22	8,46	-	10,8	10,2	9,91	9,48	8,70	-	11,1	10,4	10,2	9,72	8,93	-
Dpev	8,31	7,37	6,98	6,38	5,37	-	8,76	7,77	7,36	6,73	5,67	-	9,21	8,18	7,75	7,09	5,98	-

0252T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**63,6**	**60,0**	**58,4**	**56,0**	**51,6**	**49,7**	**65,5**	**61,8**	**60,1**	**57,6**	**53,0**	**51,1**	**67,3**	**63,5**	**61,8**	**59,2**	**54,4**	**52,4**
Pat	17,2	19,0	19,8	21,1	23,3	24,3	17,3	19,2	20,0	21,2	23,5	24,4	17,5	19,3	20,1	21,4	23,6	24,6
Qev	10,9	10,3	10,1	9,64	8,88	8,56	11,3	10,6	10,4	9,92	9,13	8,79	11,6	10,9	10,6	10,2	9,37	9,02
Dpev	9,14	8,13	7,72	7,09	6,01	5,59	9,69	8,62	8,18	7,50	6,36	5,90	10,3	9,12	8,65	7,93	6,70	6,21
Tev				**9**						**10**						**11**		
Pf	**69,2**	**65,2**	**63,5**	**60,8**	**55,8**	**53,7**	**71,1**	**67,0**	**65,2**	**62,4**	**57,2**	**54,9**	**72,9**	**68,7**	**66,9**	**63,9**	**58,5**	**-**
Pat	17,6	19,5	20,3	21,5	23,8	24,7	17,8	19,6	20,4	21,7	23,9	24,8	17,9	19,8	20,6	21,8	24,0	-
Qev	11,9	11,2	10,9	10,5	9,61	9,25	12,2	11,5	11,2	10,7	9,85	9,47	12,6	11,8	11,5	11,0	10,1	-
Dpev	10,8	9,64	9,13	8,36	7,05	6,52	11,4	10,2	9,63	8,80	7,40	6,84	12,0	10,7	10,1	9,25	7,76	-

0302T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**82,0**	**77,3**	**75,3**	**72,1**	**66,3**	**-**	**84,3**	**79,5**	**77,4**	**74,2**	**68,4**	**-**	**86,6**	**81,7**	**79,6**	**76,3**	**70,5**	**-**
Pat	23,0	25,5	26,6	28,3	31,4	-	23,2	25,8	26,9	28,6	31,7	-	23,5	26,0	27,1	28,9	32,1	-
Qev	14,1	13,3	13,0	12,4	11,4	-	14,5	13,7	13,3	12,8	11,8	-	14,9	14,1	13,7	13,1	12,1	-
Dpev	15,2	13,5	12,8	11,8	9,98	-	16,1	14,3	13,6	12,5	10,6	-	17,0	15,1	14,4	13,2	11,3	-
Tev				**9**						**10**						**11**		
Pf	**88,8**	**83,8**	**81,7**	**78,4**	**-**	**-**	**91,0**	**86,0**	**83,9**	**80,5**	**-**	**-**	**93,3**	**88,2**	**86,0**	**82,7**	**-**	**-**
Pat	23,8	26,3	27,4	29,2	-	-	24,0	26,6	27,7	29,4	-	-	24,2	26,8	27,9	29,7	-	-
Qev	15,3	14,4	14,1	13,5	-	-	15,7	14,8	14,4	13,9	-	-	16,1	15,2	14,8	14,2	-	-
Dpev	17,9	16,0	15,2	14,0	-	-	18,8	16,8	16,0	14,7	-	-	19,8	17,7	16,8	15,5	-	-

0352T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**93,5**	**87,9**	**85,6**	**82,0**	**78,7**	**76,1**	**96,1**	**90,5**	**88,1**	**84,4**	**81,1**	**78,5**	**98,8**	**93,0**	**90,6**	**86,9**	**83,6**	**81,0**
Pat	27,4	30,2	31,4	33,3	35,0	36,4	27,7	30,5	31,7	33,7	35,4	36,8	28,1	30,9	32,1	34,0	35,7	37,2
Qev	16,1	15,1	14,7	14,1	13,5	13,1	16,5	15,6	15,2	14,5	14,0	13,5	17,0	16,0	15,6	15,0	14,4	13,9
Dpev	20,0	17,7	16,7	15,3	14,1	13,2	21,1	18,7	17,7	16,3	15,0	14,1	22,3	19,8	18,8	17,2	16,0	15,0
Tev				**9**						**10**						**11**		
Pf	**101**	**95,5**	**93,1**	**89,3**	**86,1**	**-**	**104**	**98,0**	**95,6**	**95,1**	**88,6**	**-**	**107**	**101**	**98,1**	**97,6**	**91,2**	**-**
Pat	28,4	31,2	32,5	34,4	36,1	-	28,7	31,6	32,8	33,1	36,4	-	29,0	31,9	33,2	33,4	36,8	-
Qev	17,5	16,5	16,0	15,4	14,8	-	17,9	16,9	16,5	16,4	15,3	-	18,4	17,3	16,9	16,8	15,7	-
Dpev	23,5	20,9	19,8	18,2	17,0	-	24,7	22,0	20,9	20,7	18,0	-	26,0	23,1	22,0	21,8	19,0	-

0412T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**107**	**100**	**97,6**	**93,5**	**90,2**	**87,4**	**110**	**103**	**100**	**96,4**	**93,0**	**90,2**	**113**	**106**	**103**	**99,2**	**95,9**	**93,0**
Pat	30,3	33,3	34,6	36,6	38,4	39,9	30,7	33,7	35,0	37,1	38,8	40,3	31,1	34,1	35,4	37,5	39,2	40,7
Qev	18,3	17,2	16,8	16,1	15,5	15,0	18,9	17,8	17,3	16,6	16,0	15,5	19,4	18,3	17,8	17,1	16,5	16,0
Dpev	15,5	13,7	13,0	12,0	11,1	10,4	16,4	14,5	13,8	12,7	11,8	11,1	17,4	15,4	14,6	13,5	12,6	11,8
Tev				**9**						**10**						**11**		
Pf	**116**	**109**	**106**	**102**	**98,8**	**95,9**	**119**	**112**	**109**	**105**	**102**	**98,8**	**122**	**115**	**112**	**108**	**105**	**102**
Pat	31,4	34,5	35,9	37,9	39,6	41,1	31,8	34,9	36,3	38,4	40,0	41,6	32,2	35,3	36,7	38,8	40,4	42,0
Qev	19,9	18,8	18,3	17,6	17,0	16,5	20,5	19,3	18,8	18,1	17,5	17,0	21,0	19,8	19,3	18,6	18,0	17,5
Dpev	18,3	16,3	15,4	14,2	13,3	12,6	19,3	17,2	16,3	15,1	14,2	13,3	20,3	18,1	17,2	15,9	15,0	14,2

Ta [°C] - Air temperature
Tev [°C] - Plant (side) cooling exchanger output water temperature
Pf [kW] - Cooling capacity
Pat [kW] - Total power input
Qev [m³/h] - Plant (side) heat exchanger water flow
Dpev [kPa] - Plant (side) cooling exchanger pressure drop
'-' Conditions outside the operating range
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

0452T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**120**	**113**	**110**	**106**	**102**	**99,1**	**124**	**117**	**113**	**109**	**105**	**102**	**127**	**120**	**117**	**112**	**109**	**105**
Pat	33,9	37,2	38,7	41,0	42,6	44,3	34,3	37,7	39,1	41,4	43,0	44,7	34,7	38,1	39,5	41,8	43,4	45,1
Qev	20,7	19,5	19,0	18,2	17,6	17,1	21,3	20,1	19,5	18,7	18,2	17,6	21,9	20,6	20,1	19,3	18,7	18,1
Dpev	19,8	17,5	16,6	15,3	14,3	13,4	21,0	18,6	17,6	16,2	15,2	14,3	22,1	19,6	18,6	17,1	16,1	15,1
Tev				**9**						**10**						**11**		
Pf	**131**	**123**	**120**	**115**	**112**	**108**	**134**	**126**	**123**	**118**	**115**	**111**	**137**	**129**	**126**	**126**	**118**	**114**
Pat	35,1	38,5	40,0	42,3	43,8	45,5	35,5	38,9	40,4	42,7	44,2	45,9	35,8	39,3	40,8	40,6	44,5	46,2
Qev	22,5	21,2	20,6	19,8	19,2	18,6	23,1	21,7	21,2	20,3	19,8	19,2	23,7	22,3	21,7	21,8	20,3	19,7
Dpev	23,4	20,7	19,6	18,0	17,0	16,0	24,6	21,8	20,7	19,0	18,0	16,9	25,9	22,9	21,8	21,9	19,0	17,9

0512T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**135**	**127**	**124**	**119**	**114**	**111**	**139**	**131**	**127**	**122**	**118**	**114**	**142**	**134**	**131**	**125**	**121**	**117**
Pat	37,7	41,4	43,0	45,5	47,6	49,4	38,2	41,9	43,4	45,9	48,0	49,8	38,6	42,3	43,9	46,3	48,3	50,1
Qev	23,2	21,9	21,3	20,4	19,7	19,1	23,9	22,5	21,9	21,0	20,3	19,6	24,5	23,1	22,5	21,6	20,8	20,2
Dpev	17,8	15,8	15,0	13,8	12,8	12,0	18,9	16,7	15,9	14,6	13,6	12,7	19,9	17,7	16,8	15,4	14,4	13,5
Tev				**9**						**10**						**11**		
Pf	**146**	**138**	**134**	**129**	**124**	**120**	**150**	**141**	**138**	**132**	**127**	**123**	**154**	**145**	**141**	**135**	**131**	**127**
Pat	39,0	42,7	44,3	46,7	48,7	50,5	39,4	43,1	44,7	47,1	49,1	50,8	39,8	43,5	45,1	47,5	49,4	51,1
Qev	25,2	23,7	23,1	22,2	21,4	20,7	25,9	24,3	23,7	22,7	22,0	21,3	26,5	25,0	24,3	23,3	22,5	21,8
Dpev	21,0	18,6	17,7	16,2	15,2	14,2	22,1	19,6	18,6	17,1	16,0	15,0	23,3	20,6	19,6	18,0	16,8	15,7

0552T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**154**	**145**	**141**	**135**	**131**	**127**	**158**	**149**	**145**	**139**	**135**	**130**	**162**	**153**	**149**	**143**	**138**	**134**
Pat	43,5	47,8	49,6	52,5	54,6	56,7	44,0	48,3	50,2	53,1	55,1	57,2	44,5	48,9	50,7	53,6	55,6	57,7
Qev	26,5	24,9	24,2	23,2	22,5	21,8	27,2	25,6	24,9	23,9	23,2	22,4	28,0	26,3	25,6	24,5	23,8	23,1
Dpev	24,4	21,6	20,5	18,8	17,7	16,6	25,9	22,9	21,7	19,9	18,7	17,6	27,3	24,2	22,9	21,0	19,8	18,6
Tev				**9**						**10**						**11**		
Pf	**167**	**157**	**153**	**146**	**142**	**138**	**171**	**161**	**157**	**157**	**146**	**141**	**175**	**165**	**161**	**161**	**150**	**145**
Pat	45,0	49,4	51,2	54,2	56,0	58,1	45,5	49,9	51,8	51,6	56,5	58,6	46,0	50,4	52,3	52,0	56,9	59,0
Qev	28,7	27,0	26,3	25,2	24,5	23,7	29,5	27,7	27,0	27,1	25,1	24,3	30,2	28,4	27,7	27,8	25,8	25,0
Dpev	28,8	25,5	24,2	22,2	20,9	19,6	30,3	26,8	25,4	25,6	22,1	20,7	31,9	28,2	26,7	26,9	23,2	21,8

0612T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**168**	**158**	**154**	**147**	**143**	**-**	**173**	**162**	**158**	**151**	**147**	**-**	**178**	**167**	**162**	**163**	**151**	**-**
Pat	51,1	56,2	58,3	61,7	63,8	-	51,7	56,8	59,0	62,4	64,4	-	52,4	57,5	59,7	59,2	65,0	-
Qev	29,0	27,2	26,4	25,3	24,6	-	29,8	27,9	27,2	26,0	25,3	-	30,6	28,7	27,9	28,1	26,0	-
Dpev	29,2	25,7	24,3	22,2	21,0	-	30,9	27,2	25,7	23,5	22,3	-	32,6	28,7	27,1	27,4	23,5	-
Tev				**9**						**10**						**11**		
Pf	**182**	**171**	**166**	**167**	**155**	**-**	**187**	**175**	**170**	**172**	**159**	**-**	**192**	**180**	**175**	**176**	**-**	**-**
Pat	53,0	58,2	60,4	59,9	65,7	-	53,6	58,8	61,1	60,4	66,3	-	54,3	59,5	61,7	61,0	-	-
Qev	31,4	29,5	28,6	28,8	26,7	-	32,2	30,2	29,4	29,6	27,4	-	33,0	30,9	30,1	30,3	-	-
Dpev	34,3	30,2	28,5	28,9	24,8	-	36,1	31,7	30,0	30,5	26,1	-	37,9	33,3	31,5	32,0	-	-

Ta [°C] - Air temperature
Tev [°C] - Plant (side) cooling exchanger output water temperature
Pf [kW] - Cooling capacity
Pat [kW] - Total power input
Qev [m³/h] - Plant (side) heat exchanger water flow
Dpev [kPa] - Plant (side) cooling exchanger pressure drop
'-' Conditions outside the operating range
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

0202T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**54,1**	**50,5**	**48,9**	**46,5**	**47,1**	**45,4**	**55,6**	**51,9**	**50,3**	**47,8**	**48,5**	**46,8**	**57,2**	**53,4**	**51,7**	**54,1**	**50,0**	**48,2**
Pat	16,3	18,1	18,9	20,1	19,8	20,6	16,5	18,3	19,1	20,3	20,0	20,8	16,6	18,5	19,3	18,1	20,1	21,0
Qev	9,31	8,69	8,42	8,00	8,10	7,81	9,58	8,94	8,66	8,23	8,35	8,05	9,84	9,19	8,90	9,32	8,61	8,30
Dpev	6,51	5,66	5,32	4,80	4,93	4,58	6,88	5,99	5,63	5,08	5,24	4,87	7,27	6,33	5,95	6,52	5,55	5,16
Tev				**9**						**10**						**11**		
Pf	**58,7**	**54,8**	**53,1**	**55,7**	**51,4**	**49,6**	**60,2**	**56,2**	**54,5**	**57,2**	**52,9**	**51,0**	**61,7**	**57,6**	**55,8**	**58,7**	**54,3**	**52,4**
Pat	16,8	18,7	19,5	18,3	20,3	21,1	17,0	18,9	19,7	18,4	20,4	21,3	17,2	19,1	19,8	18,5	20,5	21,4
Qev	10,1	9,43	9,14	9,59	8,86	8,54	10,4	9,68	9,38	9,86	9,11	8,79	10,6	9,92	9,62	10,1	9,36	9,03
Dpev	7,66	6,67	6,27	6,90	5,88	5,47	8,06	7,03	6,60	7,29	6,22	5,79	8,47	7,38	6,94	7,68	6,57	6,11

0252T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**61,9**	**58,1**	**56,5**	**54,0**	**53,6**	**51,8**	**63,7**	**59,8**	**58,1**	**55,5**	**55,2**	**53,3**	**65,4**	**61,4**	**59,7**	**56,9**	**56,7**	**54,8**
Pat	18,4	20,3	21,1	22,4	22,6	23,5	18,5	20,5	21,3	22,6	22,7	23,7	18,7	20,7	21,5	22,8	22,9	23,8
Qev	10,7	10,0	9,73	9,29	9,22	8,92	11,0	10,3	10,0	9,55	9,50	9,17	11,3	10,6	10,3	9,80	9,76	9,43
Dpev	8,66	7,64	7,22	6,58	6,49	6,06	9,17	8,08	7,63	6,95	6,88	6,42	9,69	8,53	8,06	7,33	7,27	6,78
Tev				**9**						**10**						**11**		
Pf	**67,2**	**63,0**	**61,2**	**58,4**	**58,2**	**56,2**	**69,0**	**64,6**	**62,8**	**59,8**	**59,7**	**57,6**	**70,7**	**66,2**	**64,3**	**66,3**	**61,2**	**59,0**
Pat	18,9	20,8	21,7	22,9	23,0	23,9	19,1	21,0	21,8	23,1	23,1	24,0	19,2	21,1	22,0	21,1	23,2	24,1
Qev	11,6	10,9	10,5	10,1	10,0	9,68	11,9	11,1	10,8	10,3	10,3	9,93	12,2	11,4	11,1	11,4	10,6	10,2
Dpev	10,2	9,00	8,49	7,71	7,68	7,15	10,8	9,46	8,92	8,09	8,08	7,52	11,3	9,94	9,36	9,97	8,50	7,90

0302T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**78,8**	**73,6**	**71,4**	**68,0**	**69,2**	**66,8**	**80,9**	**75,7**	**73,4**	**69,9**	**71,3**	**68,9**	**83,0**	**77,7**	**75,5**	**79,1**	**73,4**	**71,0**
Pat	24,7	27,5	28,6	30,5	29,9	31,2	25,0	27,8	29,0	30,9	30,2	31,5	25,3	28,1	29,3	27,4	30,4	31,7
Qev	13,6	12,7	12,3	11,7	11,9	11,5	13,9	13,0	12,6	12,0	12,3	11,9	14,3	13,4	13,0	13,6	12,6	12,2
Dpev	14,1	12,3	11,6	10,5	10,8	10,1	14,8	13,0	12,2	11,1	11,5	10,8	15,6	13,7	12,9	14,2	12,2	11,4
Tev				**9**						**10**						**11**		
Pf	**85,2**	**79,8**	**77,5**	**81,3**	**75,6**	**73,2**	**87,3**	**81,8**	**79,5**	**83,5**	**77,7**	**-**	**89,4**	**83,9**	**81,6**	**85,7**	**79,9**	**-**
Pat	25,6	28,4	29,7	27,6	30,7	32,0	25,9	28,8	30,0	27,9	30,9	-	26,2	29,1	30,3	28,1	31,2	-
Qev	14,7	13,7	13,3	14,0	13,0	12,6	15,0	14,1	13,7	14,4	13,4	-	15,4	14,5	14,1	14,8	13,8	-
Dpev	16,5	14,4	13,6	15,0	13,0	12,1	17,3	15,2	14,4	15,8	13,7	-	18,1	16,0	15,1	16,7	14,5	-

0352T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**94,4**	**88,8**	**86,5**	**82,9**	**82,8**	**80,3**	**97,0**	**91,4**	**89,0**	**85,4**	**85,4**	**82,8**	**99,7**	**94,0**	**91,6**	**87,9**	**88,0**	**85,4**
Pat	27,5	30,2	31,4	33,3	33,3	34,7	27,8	30,6	31,7	33,6	33,6	35,0	28,1	30,9	32,1	34,0	33,9	35,3
Qev	16,2	15,3	14,9	14,3	14,2	13,8	16,7	15,7	15,3	14,7	14,7	14,3	17,2	16,2	15,8	15,1	15,1	14,7
Dpev	20,3	18,0	17,1	15,7	15,7	14,7	21,5	19,1	18,1	16,7	16,7	15,7	22,7	20,2	19,2	17,6	17,7	16,7
Tev				**9**						**10**						**11**		
Pf	**102**	**96,5**	**94,1**	**90,4**	**90,6**	**88,0**	**105**	**99,1**	**96,6**	**92,8**	**93,2**	**90,6**	**108**	**102**	**99,1**	**102**	**95,8**	**93,2**
Pat	28,4	31,2	32,4	34,4	34,2	35,6	28,7	31,6	32,8	34,7	34,5	35,9	29,0	31,9	33,1	31,6	34,8	36,1
Qev	17,6	16,6	16,2	15,6	15,6	15,2	18,1	17,1	16,6	16,0	16,1	15,6	18,5	17,5	17,1	17,6	16,5	16,1
Dpev	24,0	21,3	20,3	18,7	18,8	17,7	25,2	22,5	21,4	19,7	19,9	18,8	26,5	23,6	22,5	23,9	21,0	19,9

0412T

Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev				**6**						**7**						**8**		
Pf	**107**	**101**	**98,0**	**94,0**	**94,5**	**91,7**	**110**	**104**	**101**	**96,8**	**97,5**	**94,7**	**113**	**107**	**104**	**99,7**	**101**	**97,7**
Pat	30,6	33,6	34,9	36,9	36,7	38,1	31,0	34,0	35,3	37,3	37,0	38,4	31,4	34,4	35,7	37,8	37,4	38,8
Qev	18,4	17,3	16,9	16,2	16,3	15,8	19,0	17,8	17,4	16,7	16,8	16,3	19,5	18,4	17,9	17,2	17,3	16,8
Dpev	15,6	13,8	13,1	12,1	12,2	11,5	16,6	14,7	13,9	12,8	13,0	12,2	17,5	15,5	14,7	13,6	13,8	13,0
Tev				**9**						**10**						**11**		
Pf	**116**	**110**	**107**	**103**	**104**	**101**	**119**	**112**	**110**	**105**	**107**	**104**	**122**	**115**	**113**	**108**	**110**	**107**
Pat	31,7	34,8	36,1	38,2	37,7	39,1	32,1	35,2	36,5	38,6	38,0	39,5	32,4	35,6	36,9	39,0	38,3	39,8
Qev	20,0	18,9	18,4	17,7	17,8	17,3	20,6	19,4	18,9	18,2	18,4	17,9	21,1	19,9	19,4	18,7	18,9	18,4
Dpev	18,5	16,4	15,6	14,4	14,7	13,9	19,5	17,3	16,5	15,2	15,5	14,7	20,5	18,2	17,4	16,1	16,5	15,6

Ta [°C] - Air temperature
Tev [°C] - Plant (side) cooling exchanger output water temperature
Pf [kW] - Cooling capacity
Pat [kW] - Total power input
Qev [m³/h] - Plant (side) heat exchanger water flow
Dpev [kPa] - Plant (side) cooling exchanger pressure drop
'-' Conditions outside the operating range
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
NOTE: Data on grey background: unit switched to non-silenced operation

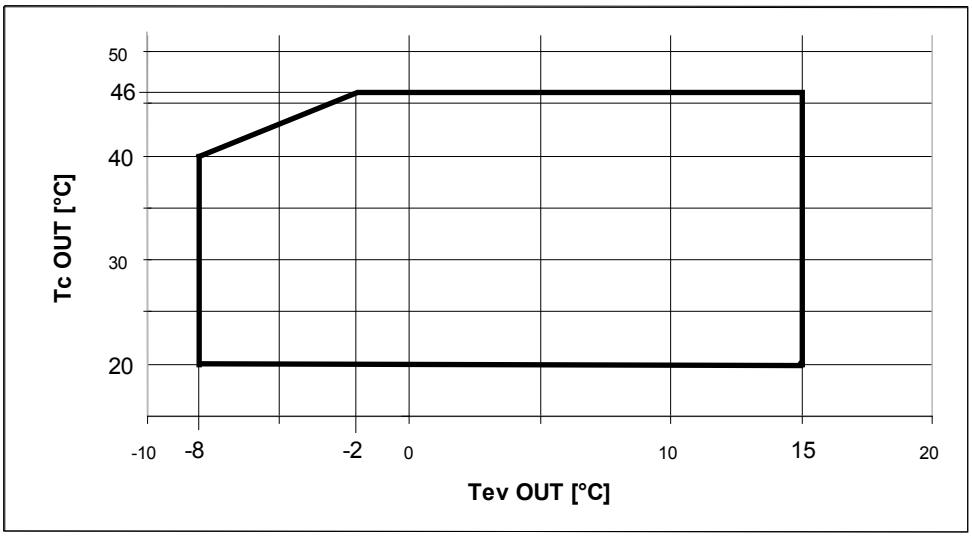
COOLING CAPACITY PERFORMANCE

0452T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**118**	**111**	**108**	**103**	**105**	**101**	**121**	**114**	**111**	**106**	**108**	**105**	**125**	**117**	**114**	**119**	**111**	**108**
Pat	35,4	38,9	40,4	42,7	42,0	43,6	35,9	39,4	40,9	43,2	42,4	44,0	36,3	39,8	41,3	38,9	42,7	44,3
Qev	20,3	19,1	18,6	17,8	18,0	17,5	20,9	19,6	19,1	18,3	18,6	18,0	21,5	20,2	19,6	20,5	19,1	18,5
Dpev	19,0	16,8	15,9	14,5	15,0	14,1	20,1	17,8	16,8	15,4	15,9	14,9	21,3	18,8	17,8	19,4	16,9	15,9
Tev				**9**						**10**						**11**		
Pf	**128**	**120**	**117**	**122**	**114**	**111**	**131**	**123**	**120**	**126**	**117**	**114**	**135**	**126**	**123**	**129**	**121**	**117**
Pat	36,7	40,3	41,8	39,3	43,1	44,7	37,2	40,7	42,2	39,6	43,4	45,1	37,6	41,1	42,7	40,0	43,8	45,4
Qev	22,1	20,7	20,2	21,1	19,7	19,1	22,6	21,2	20,7	21,7	20,2	19,6	23,2	21,8	21,2	22,2	20,8	20,2
Dpev	22,4	19,8	18,7	20,5	17,8	16,8	23,6	20,8	19,7	21,6	18,9	17,8	24,8	21,9	20,7	22,8	19,9	18,8

0512T																		
Ta	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**	**25**	**30**	**32**	**35**	**40**	**42**
Tev				**6**						**7**						**8**		
Pf	**131**	**123**	**120**	**114**	**118**	**114**	**135**	**127**	**123**	**117**	**121**	**117**	**139**	**130**	**126**	**134**	**125**	**121**
Pat	39,4	43,3	45,0	47,6	46,0	47,7	39,9	43,8	45,5	48,1	46,4	48,1	40,3	44,3	45,9	42,6	46,7	48,5
Qev	22,6	21,2	20,6	19,7	20,2	19,6	23,2	21,8	21,2	20,2	20,8	20,2	23,9	22,4	21,7	23,0	21,4	20,8
Dpev	16,9	14,9	14,0	12,8	13,6	12,7	17,9	15,7	14,8	13,5	14,4	13,5	18,8	16,6	15,6	17,5	15,2	14,3
Tev				**9**						**10**						**11**		
Pf	**142**	**133**	**129**	**137**	**128**	**124**	**146**	**137**	**133**	**141**	**131**	**127**	**149**	**140**	**136**	**145**	**135**	**131**
Pat	40,8	44,7	46,4	42,9	47,0	48,8	41,2	45,2	46,8	43,3	47,4	49,1	41,7	45,6	47,2	43,6	47,7	49,4
Qev	24,5	22,9	22,3	23,6	22,0	21,4	25,1	23,5	22,9	24,3	22,6	21,9	25,7	24,1	23,4	24,9	23,2	22,5
Dpev	19,8	17,4	16,5	18,5	16,1	15,1	20,9	18,3	17,3	19,5	17,0	15,9	21,9	19,2	18,1	20,6	17,9	16,8

Ta [°C] - Air temperature
Tev [°C] - Plant (side) cooling exchanger output water temperature
Pf [kW] - Cooling capacity
Pat [kW] - Total power input
Qev [m³/h] - Plant (side) heat exchanger water flow
Dpev [kPa] - Plant (side) cooling exchanger pressure drop
'-' Conditions outside the operating range
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
NOTE: Data on grey background: unit switched to non-silenced operation

5. OPERATING RANGE



Tc OUT [°C]: Heat exchanger temperature on source side (out)
Tev OUT [°C]: Cold exchanger temperature on user side (out)

Limits to exchanger water temperature are valid within the minimum - maximum water flow range indicated in the Hydraulic.
Data section.

ETHYLENE GLYCOL MIXTURE

Ethylene glycol and water mixtures, used as a heat-conveying fluid, cause a variation in unit performance. For correct data, use the factors indicated in the following table.

	Freezing point (°C)							
	0	-5	-10	-15	-20	-25	-30	-35
	Ethylene glycol percentage by weight							
	0	12%	20%	30%	35%	40%	45%	50%
cPf	1	0,985	0,98	0,974	0,97	0,965	0,964	0,96
cQ	1	1,02	1,04	1,075	1,11	1,14	1,17	1,2
cdp	1	1,07	1,11	1,18	1,22	1,24	1,27	1,3

cPf: cooling capacity correction factor
cQ: flow correction factor
cdp: pressure drop correction factor

For data concerning other kind of anti-freeze solutions (e.g. propylene glycol) please contact our Sales Department.

FOULING FACTORS

Performances are based on clean condition of tubes (fouling factor =1).
For different fouling values, performance should be adjusted using the correction factors shown in the following table.

Fouling factors	Evaporator			Heat recovery			Desuperheater		
	f1	fk1	fx1	f2	fk2	fx2	f3	fk3	fx3
(m^2°C/W) 4,4 x 10^{-5}	1	1	1	0,99	1,03	1,03	0,99	1,03	1,03
(m^2 °C/W) 0,86 x 10^{-4}	0,96	0,99	0,99	0,98	1,04	1,04	0,98	1,04	1,04
(m^2 °C/W) 1,72 x 10^{-4}	0,93	0,98	0,98	0,95	1,06	1,06	0,95	1,06	1,06

f1 - f2 - f3: capacity correction factors
fk1 - fk2 - fk3: compressor power input correction factors
fx1 - fx2 - fx3: total power input correction factors

6. HYDRAULIC DATA

6.1 Water flow and pressure drop

Water flow in the heat exchangers is given by:
Q=Px0,86/Dt
Q: water flow (m^3/h)
Dt: difference between inlet and outlet water temp. (°C)
P: heat exchanger capacity (kW)

Pressure drop is given by:
$Dp= K \times Q^2/1000$
Q: water flow (m^3/h)
Dp: pressure drop (kPa)
K: unit size ratio

SIZE	Evaporator			
	K	Q min m^3/h	Q max m^3/h	W.c. min m^3
0202	75.0	7,5	15,3	0,13
0252	76,3	7,9	16,8	0,15
0302	76,5	8,1	21,9	0,19
0352	77,1	9,2	25.0	0,22
0412	46,1	12,8	27,9	0,24
0452	46,1	12,8	32,3	0,28
0512	33,1	13,5	36,4	0,32
0552	34,9	15,5	41,6	0,36
0612	34,8	16,9	45,6	0,40

Q min: minimum water flow admitted to the heat exchanger.
Q max: maximum water flow admitted to the heat exchanger.
W.c. min: minimum water content admitted in the plant, using traditional control logic.

7. HYDRONIC GROUPS (Optional)

The units can be supplied with a hydronic group. This houses all the main hydraulic components, thereby optimising hydraulic and electric installation space, time and cost. The innovative QuickMind control tted to the units in the NECS system, has been designed to work on systems with a low water content, offering highly professional alternatives to the installation of systems featuring storage units.

Available con gurations:

CENTRIFUGAL PUMP
Hydronic kit with one 2-pole low-head pump
Hydronic kit with one 2-pole high-head pump
Hydronic kit with two 2-pole low-head pumps
Hydronic kit with two 2-pole high-head pumps

2-pole low head pump
Centrifugal electric pumps with hydraulic parts in AISI 304/316, insulated pump impeller and differential pressure switch on the evaporator. Pump shut-off valves tted on both delivery and suction of a check valve for each pump installed. Hydronic kit equipped with safety valve, water pressure gauge and air vents.

2-pole high-head pump
All versions of the hydronic unit can be supplied with a high-head pump. In these cases, the pump features a two-pole motor even in the low noise versions.

Second pump
A second stand-by pump for high or low pressures is available on request. The pumps are automatically exchanged on the basis of a rotation programme and the stand-by pump cuts in automatically if the primary pump fails.

GENERAL CHARACTERISTICS

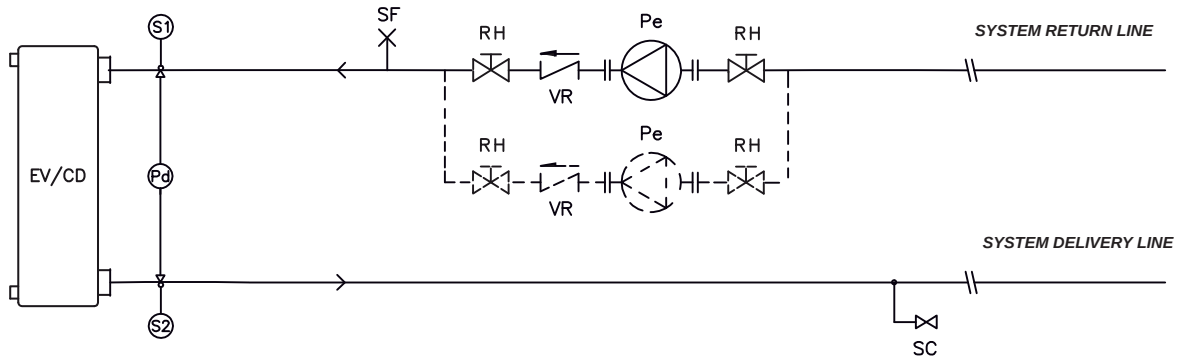
Water connections
In units without a pump, in the standard version, the water inlet and outlet connections in both the evaporator and the desuperheater are always ush with the machine.

Water-side mechanical filter (optional)
Y- lter designed and built to capture the impurities in the hydraulic circuit. It is tted with a 0.9 mm stainless steel mesh cartridge which can be replaced without removing the valve body from the piping.

Additional components
The supply does not include the following accessories though these are recommended to ensure correct system operation:
- MA Pressure gauges upline and downline from the unit
- GF Flexible joints on piping
- RI On-off valves
- T Outlet control thermometer

CONFIGURATION OF HYDRONIC UNIT WITH 1/2 ORTHOGONAL PUMPS

CIRCUITS WITH 2 OPTIONAL PUMPS



The hydronic unit comprises:

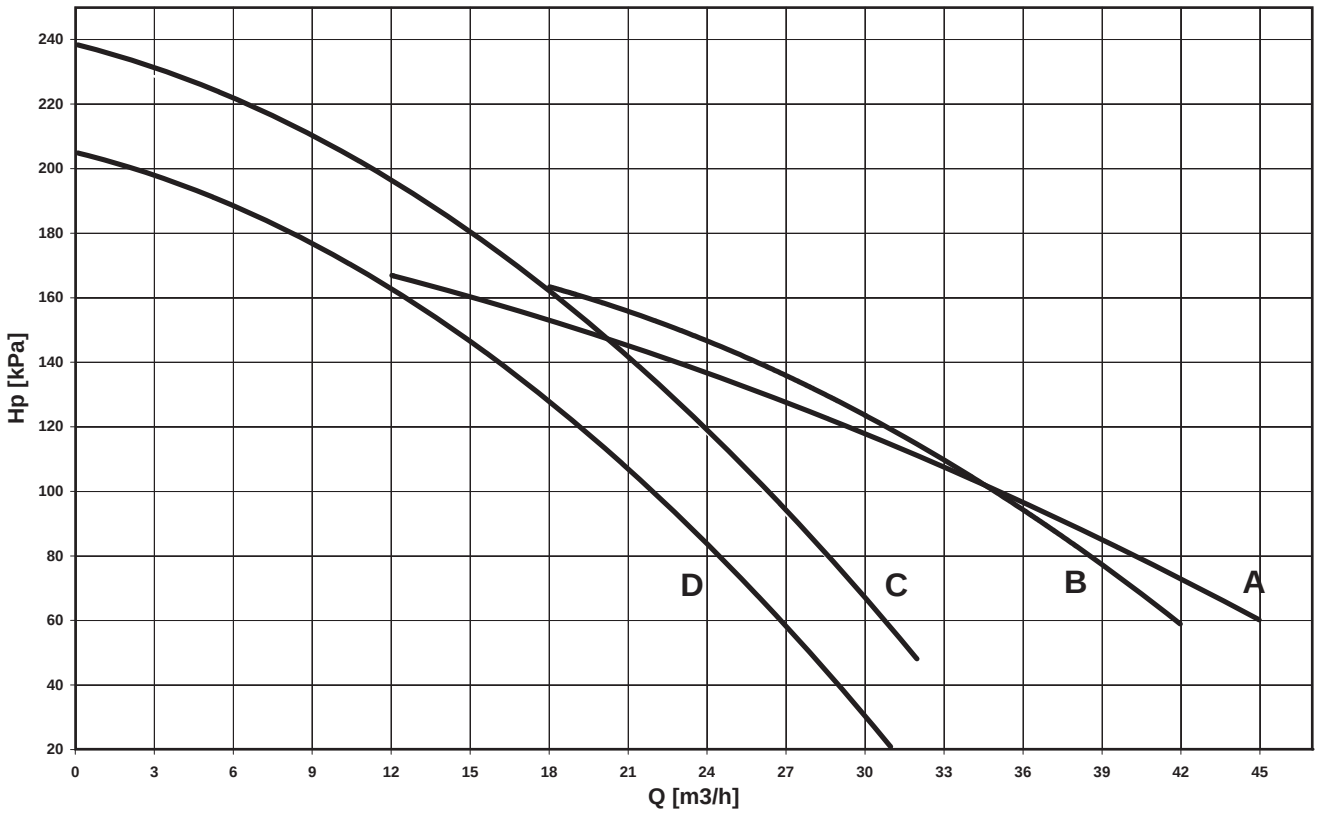
- EV User side exchanger
- PE Centrifugal pump
- Pd Differential pressure switch
- SC Discharge valve
- S1 Exchanger input water temperature probe
- S2 Exchanger outlet water temperature probe
- SF Air vent
- RH Check valves

2-POLE LOW HEAD- 1/2 PUMPS

	Pf (1) [kW]	**Q** (1) [m³/h]	**Pump Reference**	**F.L.I.** [kW]	**F.L.A.** [A]	**SA** [A]	**KP1**	**Dpu** [kPa]	**Hu** [kPa]
0202T	53.0	9.13	D	1,1	2,5	13,7	132,3	11,0	117
0252T	58.1	10.0	D	1,1	2,5	13,7	132,3	13,2	111
0302T	76.0	13.1	D	1,1	2,5	13,7	132,3	22,6	85
0352T	86.8	14.9	D	1,1	2,5	13,7	132,3	29,5	119
0412T	96.9	16.7	D	1,1	2,5	13,7	66,4	18,4	119
0452T	112	19.3	D	1,1	2,5	13,7	66,4	24,8	94
0512T	127	21.8	C	1,5	3,2	20,6	53,4	25,3	115
0552T	145	24.9	B	1,5	3,4	22,2	55,4	34,4	100
0612T	159	27.3	A	1,5	3,5	24,3	55,4	41,2	95

(1) Values refer to rated operating conditions
Pf Cooling capacity of unit
Q Evaporator water ow rate
F.L.I. Power absorbed by pump
F.L.A. Current absorbed by pump
SA Starting current by pump
KP1 Coef cients for calculating pressure drops
Unit with hydronic unit without network lter
Dpu Total pressure drop of hydronic group
Hu Working head

PUMP CHARACTERISTICS

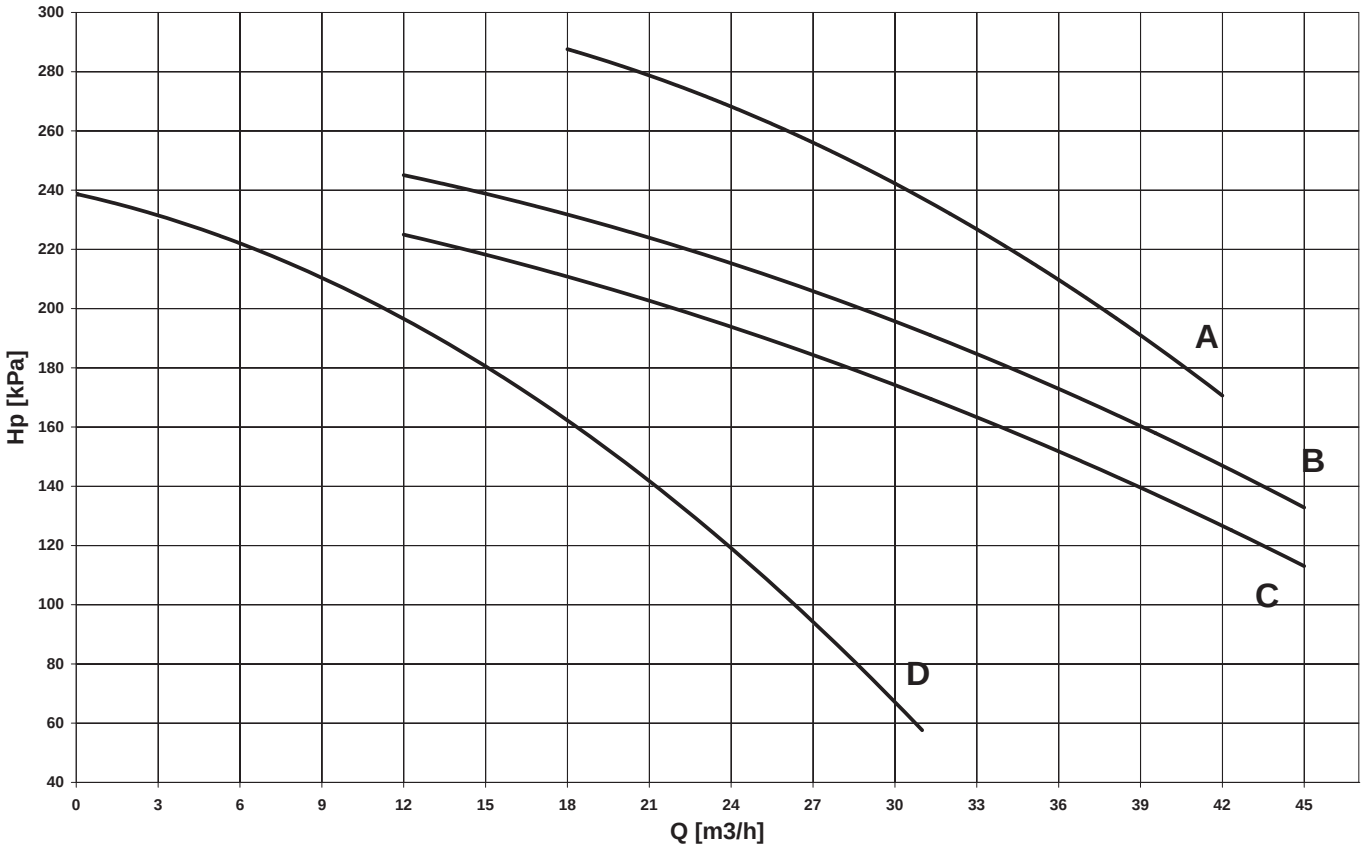


2-POLE HIGH HEAD - 1/2 PUMPS

	Pf (1) [kW]	**Q** (1) [m3/h]	**Pump Reference**	**F.L.I.** [kW]	**F.L.A.** [A]	**SA** [A]	**KP**	**Dpu** [kPa]	**Hu** [kPa]
0202T	53.0	9.13	D	1,5	3,2	20,6	132,3	11	197
0252T	58.1	10.0	D	1,5	3,2	20,6	132,3	13	191
0302T	76.0	13.1	C	2,2	4,8	37,3	132,3	23	201
0352T	86.8	14.9	C	2,2	4,8	37,3	132,3	29	190
0412T	96.9	16.7	C	2,2	4,8	37,3	66,4	18	197
0452T	112	19.3	B	3	5,6	57,6	66,4	25	205
0512T	127	21.8	B	3	5,6	57,6	53,4	25	198
0552T	145	24.9	A	3	6,3	51,6	55,4	34	234
0612T	159	27.3	A	3	6,3	51,6	55,4	41	216

(1) Values refer to rated operating conditions
Pf Cooling capacity of unit
Q Evaporator water ow rate
F.L.I. Power absorbed by pump
F.L.A. Current absorbed by pump
SA Starting current by pump
KP Coef cients for calculating pressure drops
Unit with hydronic unit without network lter
Dpu Total pressure drop of hydronic group
Hu Working head

PUMP CHARACTERISTICS



8. ELECTRICAL DATA

Maximum values									
Size	n	Compressor			Fan motors (1)		Total unit (1) (2)		
		F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A. [A]	F.L.I. [kW]	F.L.A. [A]	S.A. [A]
0202	2	2x11.8	2x20.4	2x118	0.25	1.1	25.1	47.4	145
0252	2	2x13.2	2x22.6	2x118	0.25	1.1	27.9	51.8	147.2
0302	2	2x17	2x30.5	2x173	0.25	1.1	35.5	67.6	210.1
0352	2	17+22.3	30.5+36.1	173+225	0.25	1.1	40.8	73.2	262.1
0412	2	2x22.3	2x36.1	2x225	0.25	1.1	46.1	78.8	267.7
0452	2	22.3+27.4	36.1+45.8	225+272	0.25	1.1	51.7	90.7	316.9
0512	2	2x27.4	2x45.8	2x272	0.25	1.1	57.3	102.6	328.8
0552	2	27.4+35.8	45.8+58.9	272+310	0.25	1.1	65.7	115.7	366.8
0612	2	2x35.8	2x58.9	2x310	0.25	1.1	74.1	128.8	379.9

F.L.I. Full load power input at max admissible condition
F.L.A. Full load current at max admissible condition
L.R.A. Locked rotor amperes for single compressor
S.A. Starting current

(1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current
(2) Safety values to be considered when cabling the unit for power supply and line-protections

Power supply: 400/3/50
Voltage tolerance: 10%
Maximum voltage unbalance: 3%

9. FULL LOAD SOUND LEVEL

SOUND POWER									
SIZE	Octave band [Hz]								**Total sound level**
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
	Sound power level dB(A)								
0202T	84	82	86	83	79	77	70	69	**85**
0252T	84	82	86	83	79	77	70	69	**85**
0302T	84	82	86	83	79	77	70	69	**85**
0352T	85	83	87	84	80	78	71	70	**86**
0412T	85	83	87	84	80	78	71	70	**86**
0452T	85	83	87	84	80	78	71	70	**86**
0512T	86	84	88	85	81	79	72	71	**87**
0552T	86	84	88	85	81	79	72	71	**87**
0612T	86	84	88	85	81	79	72	71	**87**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;
in compliance with ISO 3744 for non-certified units
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 10 m								**Total sound level**
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
	Sound pressure level dB(A)								
0202T	52	50	54	51	47	45	38	37	**53**
0252T	52	50	54	51	47	45	38	37	**53**
0302T	52	50	54	51	47	45	38	37	**53**
0352T	53	51	55	52	48	46	39	38	**54**
0412T	53	51	55	52	48	46	39	38	**54**
0452T	53	51	55	52	48	46	39	38	**54**
0512T	54	52	56	53	49	47	40	39	**55**
0552T	54	52	56	53	49	47	40	39	**55**
0612T	54	52	56	53	49	47	40	39	**55**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained
from the sound power level

FULL LOAD SOUND LEVEL

SOUND POWER									
SIZE	Octave band [Hz]								**Total sound level**
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
	Sound power level dB(A)								
0202T	84	82	86	83	79	77	70	69	**85**
0252T	85	83	87	84	80	78	71	70	**86**
0302T	85	83	87	84	80	78	71	70	**86**
0352T	86	84	88	85	81	79	72	71	**87**
0412T	86	84	88	85	81	79	72	71	**87**
0452T	86	84	88	85	81	79	72	71	**87**
0512T	86	84	88	85	81	79	72	71	**87**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;
in compliance with ISO 3744 for non-certified units
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 10 m								**Total sound level**
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
	Sound pressure level dB(A)								
0202T	52	50	54	51	47	45	38	37	**53**
0252T	53	51	55	52	48	46	39	38	**54**
0302T	53	51	55	52	48	46	39	38	**54**
0352T	54	52	56	53	49	47	40	39	**55**
0412T	54	52	56	53	49	47	40	39	**55**
0452T	54	52	56	53	49	47	40	39	**55**
0512T	54	52	56	53	49	47	40	39	**55**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained
from the sound power level

FULL LOAD SOUND LEVEL

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
0202T	81	79	82	79	74	70	62	60	**80**
0252T	81	79	82	79	74	70	62	60	**80**
0302T	82	80	83	80	75	71	63	61	**81**
0352T	82	80	84	81	77	75	68	67	**83**
0412T	82	80	84	81	77	75	68	67	**83**
0452T	82	80	84	81	77	75	68	67	**83**
0512T	83	81	85	82	78	76	69	68	**84**
0552T	83	81	85	82	78	76	69	68	**84**
0612T	83	81	85	82	78	76	69	68	**84**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
0202T	49	47	50	47	42	38	30	28	**48**
0252T	49	47	50	47	42	38	30	28	**48**
0302T	50	48	51	48	43	39	31	29	**49**
0352T	50	48	52	49	45	43	36	35	**51**
0412T	50	48	52	49	45	43	36	35	**51**
0452T	50	48	52	49	45	43	36	35	**51**
0512T	51	49	53	50	46	44	37	36	**52**
0552T	51	49	53	50	46	44	37	36	**52**
0612T	51	49	53	50	46	44	37	36	**52**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

FULL LOAD SOUND LEVEL

SOUND POWER									
SIZE	Octave band [Hz]								**Total sound level**
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
	Sound power level dB(A)								
0202T	81	76	74	76	73	67	61	58	**77**
0252T	83	77	75	77	74	68	62	59	**78**
0302T	83	77	75	77	74	68	62	59	**78**
0352T	81	79	81	79	76	72	67	64	**81**
0412T	81	79	81	79	76	72	67	64	**81**
0452T	81	79	81	79	76	72	67	64	**81**
0512T	82	80	82	80	77	73	68	65	**82**

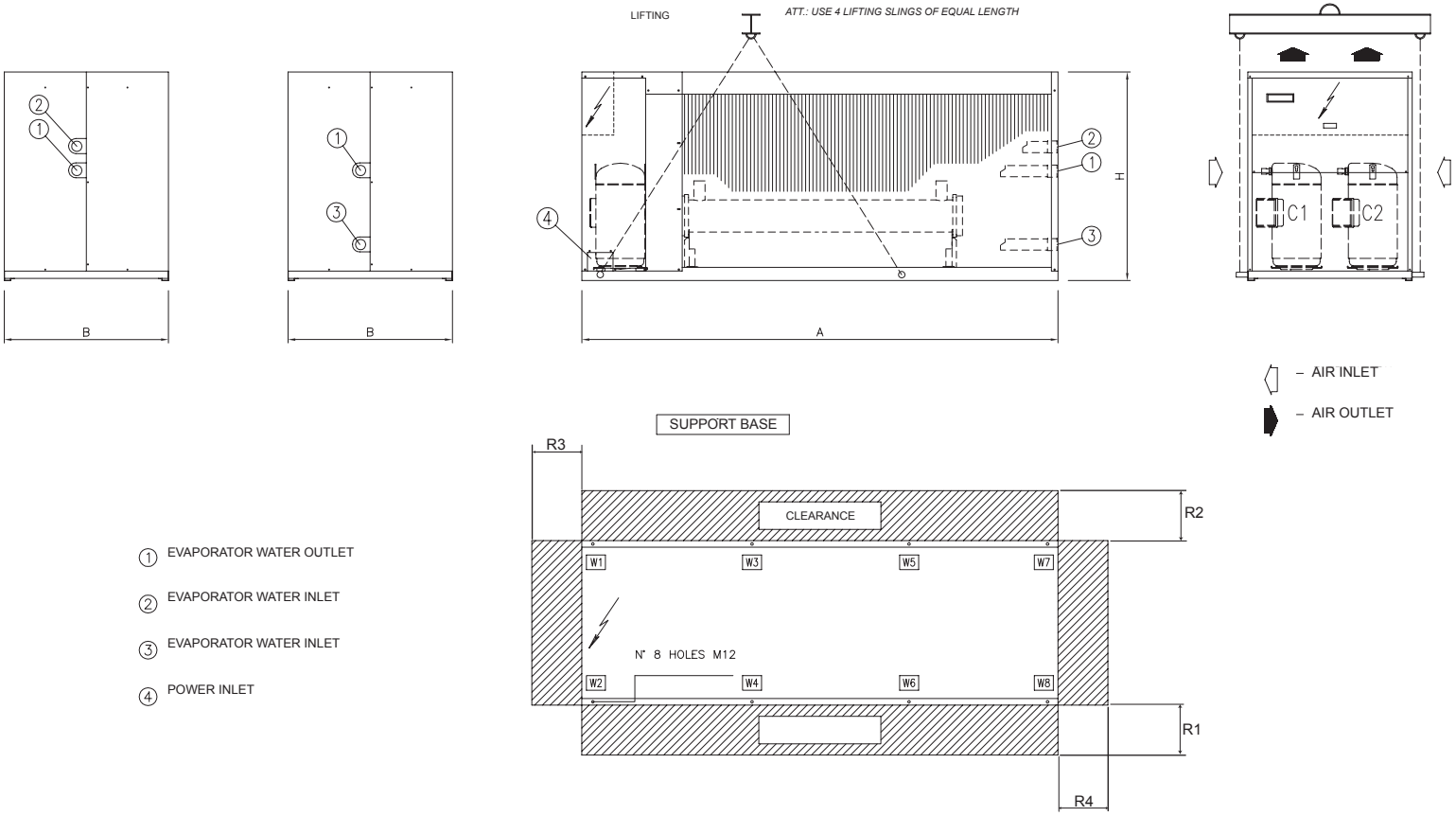
Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;
in compliance with ISO 3744 for non-certified units
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 10 m								**Total sound level**
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
	Sound pressure level dB(A)								
0202T	49	44	42	44	41	35	29	26	**45**
0252T	51	45	43	45	42	36	30	27	**46**
0302T	51	45	43	45	42	36	30	27	**46**
0352T	49	47	49	47	44	40	35	32	**49**
0412T	49	47	49	47	44	40	35	32	**49**
0452T	49	47	49	47	44	40	35	32	**49**
0512T	50	48	50	48	45	41	36	33	**50**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained
from the sound power level

10. DIMENSIONAL DRAWINGS

WITHOUT HYDRONIC KIT WITH HYDRONIC KIT



Type of connectors	0202 T	0252 T	0302 T	0352 T	0412 T	0512 T	0552 T	0612 T
UNI ISO 7/1-R	2	2	2	2	2 1/2	2 1/2	2 1/2	2 1/2

REMARKS:
For installation purposes, please refer to the documentation sent after the purchase-contract.
This technical data should be considered as indicative.

CLIMAVENETA may modify them at any moment.

B Version

Size	DIMENSIONS AND WEIGHTS				CLEARANCE			
	A [mm]	B [mm]	H [mm]	P [kg]	R1 [mm]	R2 [mm]	R3 [mm]	R4 [mm]
NECS /B /0202T	2195	1120	1420	625	1000	1000	600	600
NECS /B /0252T	2195	1120	1420	625	1000	1000	600	600
NECS /B /0302T	2195	1120	1420	665	1000	1000	600	600
NECS /B /0352T	2195	1120	1420	765	1000	1000	600	600
NECS /B /0412T	2745	1120	1420	920	1000	1000	600	600
NECS /B /0452T	2745	1120	1420	990	1000	1000	600	600
NECS /B /0512T	3245	1120	1620	1135	1000	1000	600	600
NECS /B /0552T	3245	1120	1620	1180	1000	1000	600	600
NECS /B /0612T	3245	1120	1620	1155	1000	1000	600	600

HT Version

Size	DIMENSIONS AND WEIGHTS				CLEARANCE			
	A [mm]	B [mm]	H [mm]	P [kg]	R1 [mm]	R2 [mm]	R3 [mm]	R4 [mm]
NECS /HT /0202T	2195	1120	1420	650	1000	1000	600	600
NECS /HT /0252T	2745	1120	1420	700	1000	1000	600	600
NECS /HT /0302T	2745	1120	1420	750	1000	1000	600	600
NECS /HT /0352T	3245	1120	1620	915	1000	1000	600	600
NECS /HT /0412T	3245	1120	1620	1050	1000	1000	600	600
NECS /HT /0452T	3245	1120	1620	1075	1000	1000	600	600
NECS /HT /0512T	3245	1120	1620	1115	1000	1000	600	600

LN Version

Size	DIMENSIONS AND WEIGHTS				CLEARANCE			
	A [mm]	B [mm]	H [mm]	P [kg]	R1 [mm]	R2 [mm]	R3 [mm]	R4 [mm]
NECS /LN /0202T	2195	1120	1420	625	1000	1000	600	600
NECS /LN /0252T	2195	1120	1420	650	1000	1000	600	600
NECS /LN /0302T	2745	1120	1420	715	1000	1000	600	600
NECS /LN /0352T	2745	1120	1620	840	1000	1000	600	600
NECS /LN /0412T	2745	1120	1620	965	1000	1000	600	600
NECS /LN /0452T	2745	1120	1620	1025	1000	1000	600	600
NECS /LN /0512T	3245	1120	1620	1135	1000	1000	600	600
NECS /LN /0552T	3245	1120	1620	1180	1000	1000	600	600
NECS /LN /0612T	3245	1120	1620	1155	1000	1000	600	600

SL Version

Size	DIMENSIONS AND WEIGHTS				CLEARANCE			
	A [mm]	B [mm]	H [mm]	P [kg]	R1 [mm]	R2 [mm]	R3 [mm]	R4 [mm]
NECS /SL /0202T	2195	1100	1420	650	1000	1000	600	600
NECS /SL /0252T	2745	1100	1420	700	1000	1000	600	600
NECS /SL /0302T	2745	1100	1420	750	1000	1000	600	600
NECS /SL /0352T	3245	1100	1620	915	1000	1000	600	600
NECS /SL /0412T	3245	1100	1620	1050	1000	1000	600	600
NECS /SL /0452T	3245	1100	1620	1075	1000	1000	600	600
NECS /SL /0512T	3245	1100	1620	1115	1000	1000	600	600

11. KEY TO HYDRAULIC CONNECTIONS

UNI ISO 228/1

Pipe threads where pressure-tight joints are not made on the threads - Designation, dimensions and tolerances.

Used terminology:

G: Pipe threads where pressure-tight joints are not made on the threads

A: Close tolerance class for external pipe threads where pressure-tight joints are not made on the threads

B: Wider tolerance class for external pipe threads where pressure-tight joints are not made on the threads

Internal threads: G letter followed by thread mark (only tolerance class)

External threads: G letter followed by thread mark and by A letter for A class external threads or by B letter for B class external threads.

UNI ISO 7/1

Pipe threads where pressure-tight joints are made on the threads - Designation, dimensions and tolerances.

Used terminology:

Rp: Internal cylindrical threads where pressure-tight joints are made on the threads

Rc: Internal conical threads where pressure-tight joints are made on the threads

R: External conical threads where pressure-tight joints are made on the threads

Internal cylindrical threads: R letter followed by p letter
Internal conical threads: R letter followed by c letter
External conical threads: R letter

Designation	Description
UNI ISO 7/1 - Rp 1 1/2	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional ø 1 1/2”
UNI ISO 7/1 - Rp 2 1/2	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional ø 2 1/2”
UNI ISO 7/1 - Rp 3	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional ø 3”
UNI ISO 7/1 - R 3	External conical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional ø 3”
UNI ISO 228/1 - G 4 B	Internal cylindrical threads where pressure-tight joints are not made on the threads, defined by standard UNI ISO 228/1 Tolerance class B for external thread Conventional ø 4”
DN 80 PN 16	Flange Nominal Diameter: 80 mm th. Nominal Pressure: 16 bar

Notes:

Conventional diameter value [in inches] identifies short thread designation, based upon the relative standard.
All relative values are defined by standards.
As example, here below some values:

	UNI ISO 7/1	UNI ISO 228/1
Conventional ø	1”	1”
Pitch	2.309 mm	2.309 mm
External ø	33.249 mm	33.249 mm
Core ø	30.291 mm	30.291 mm
Thread height	1.479 mm	1.479 mm

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