



NECS-N



0202T - 0612T
53 - 159 kW

Reversible unit, air source for outdoor installation



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

- Maximum reliability
- Ease of maintenance
- Efficiency
- Integrated hydronic unit

1. PRODUCT PRESENTATION

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

NECS-N units

NECS-N 0202T-0612T is a range of air-condensed reversible units with R410A rotary Scroll compressors working on two separate and independent circuits and a shell and tube heat exchanger.

This new NECS-N series has been designed to meet specific application requirements where continuity of operation needs to be ensured.

1.1 maximum reliability

Unit with dual-circuit refrigerant section designed to ensure maximum efficiency at full load, ensuring continuity without interruption of operation in the event of temporary stop of one of the 2 circuits.

1.2 Ease of maintenance

Shell and tube heat exchanger with low pressure drops, for use with very hard water. This the best solution for industrial process control applications.

1.3 Efficiency

Stepless fan speed condensation control achieved via a phase-cutting device. This optimizes power consumption by adapting condensation to any environmental condition, whilst assuring minimum noise from the ventilation unit.

1.4 Hydronic unit

The integrated hydronic unit includes the main hydraulic components, including a low- or high-head pump. Shutoff 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 for units with a dual pump).

1.5 Demand Limit

Digital input for enabling the restriction of maximum power of the unit output to a preset value. The function can be used as a load protection or energy saver system.

1.6 Low-Noise versions

The silenced version (LN) is available for all sizes. Here, low noise levels are achieved by reducing the speed of rotation of the fans and increasing the insulation of the compressor chamber.

2. UNIT DESCRIPTION

Outdoor reversible heat pump for the production of chilled/hot water with hermetic rotary Scroll compressors, axial-flow fans, shell and tubes heat exchanger and thermostatic expansion valve. External panels in Peraluman and structure in aluminium sections. The range is equipped with two compressors on two independent refrigerant 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. 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. Two independent sections for both ventilation and compressors.

Cooling circuit

Main components of the cooling circuit:

- two independent circuits
- R410A coolant
- thermostatic expansion valves
- dehydrator filter
- coolant line sight glass with humidity indicator
- high pressure safety valve
- low pressure safety valve
- high and low pressure transducers
- high pressure safety switches
- liquid receiver
- liquid line check valve (sizes 0452..0612)
- 4-way reverse cycle valves

Compressors

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

User side exchanger

Direct expansion multi-circuit shell and tube exchanger with asymmetric side coolant flows for maintaining the coolant at the correct speed inside 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. An electric antifreeze heater prevents the ice from forming inside the exchanger when the unit is not working but connected to the electrical supply. When the unit is working, it is protected by a differential pressure switch mounted on the water side.

Heat source side exchanger

Finned coil exchanger made from copper tubes and aluminium fins. The aluminium fins are correctly spaced to guarantee optimum heat exchange efficiency. The differentiated circulation suitably distributes the liquid in the coil during the expansion phase.

Electric power and control panel

Electric power and control panel, built to EN 60204-1/EC 204-1 standards, complete with:

- control circuit transformer,
- general door lock isolator,
- numbered cables,
- power contactors for compressors and fans,
- continuous fans speed management controllers,

- terminals for cumulative alarm block (BCA),
 - remote ON/OFF terminals,
 - relay for remote pumps management,
- Power input: 400V~ ±10% - 50Hz - 3N.

Heat source side fan section

Finned package heat exchanger featuring copper tubes and aluminium fins suitably spaced to optimise heat exchange performance.

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 Tests

Tests performed throughout the production process, as indicated in ISO9001. Performance or noise tests can be performed by highly qualified staff in the presence of customers.

Performance tests comprise the measurement of:

- electrical data
 - water flow rates
 - working temperatures
 - power input
 - power output
 - pressure drops on the water-side exchanger both at full load (at the conditions of selection and at the most critical conditions for the condenser) and at part load conditions.
- During performance testing it is also possible to simulate the main alarm states.
- Noise tests are performed to check noise emissions according to ISO3744.

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

Controller W3000 Base / W3000SE Compact

The controller can be chosen as:

- W3000 Base: keypad and LED display
- W3000SE Compact: the keypad features an easy-to-use interface and a complete LCD display, allowing to consult and intervene on the unit by means of a multi-level menu, with selectable language setting.

The diagnostics includes a complete alarm management, with the "black-box" and alarm logging functions for enhanced analysis of the unit operation.

Compatibility with the remote keyboard managing up to 10 units.

Availability of an internal real time clock for operation scheduling (4-day profiles with 10 hour belts).

Common features: The regulation is based on the exclusive QuickMind algorithm, including self-adaptive control logics,

beneficial in low water content systems. As alternatives the proportional- or proportional-integral regulations are also available. For multiple units' systems, the regulation of the resources, via optional proprietary devices, can be implemented. Energy metering, for both consumption and capacity, can also be developed. Supervision can be easily developed via proprietary devices or the integration in third party systems by means of the most common protocols as ModBus, Bacnet, Bacnet-over-IP, Echelon LonWorks.

The defrost adopts a proprietary self-adaptive logic, which features the monitoring of numerous operational parameters. This allows to reduce the number and duration of the defrost cycles, with a benefit for the overall energy efficiency.

2.4 Available versions

B-Base

Standard model.

LN- Low noise

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

2.5 Accessories

- Cu/Cu condensing coils

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

- Condensing coils with epoxy-coated fins

Painted air-refrigerant heat exchanger.
Recommended for applications in medium level pollution 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.

- 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 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 protocols.

- 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.

- Compr. Discharge line valve

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

- Cond. Coil protection net

Coil protecting net.
Protects against the intrusion of solid bodies with medium/large dimensions.

- Var.Fan speed low amb.Control

Acoustic enclosure 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.

- Container packing

- BACnet OVER IP connectivity

Interface module for BACnet OVER-IP protocols.
Allows to interconnect BACnet devices over Internet Protocol within wide-area networks.

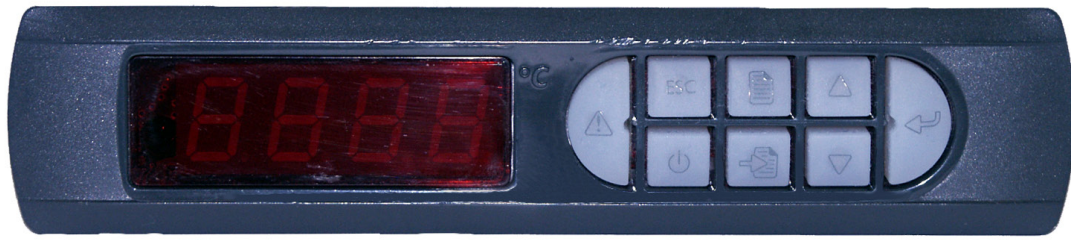
- AUX 4-20mA REMOTE D.L.C.

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.

- LT kit for low temperature

Extends the operating limits down to -10°C, applicable on LN versions only.
Allows unit operation in heating mode in strong winter conditions.

3. ELECTRONIC CONTROLLER



Control unit with LCD display (standard)

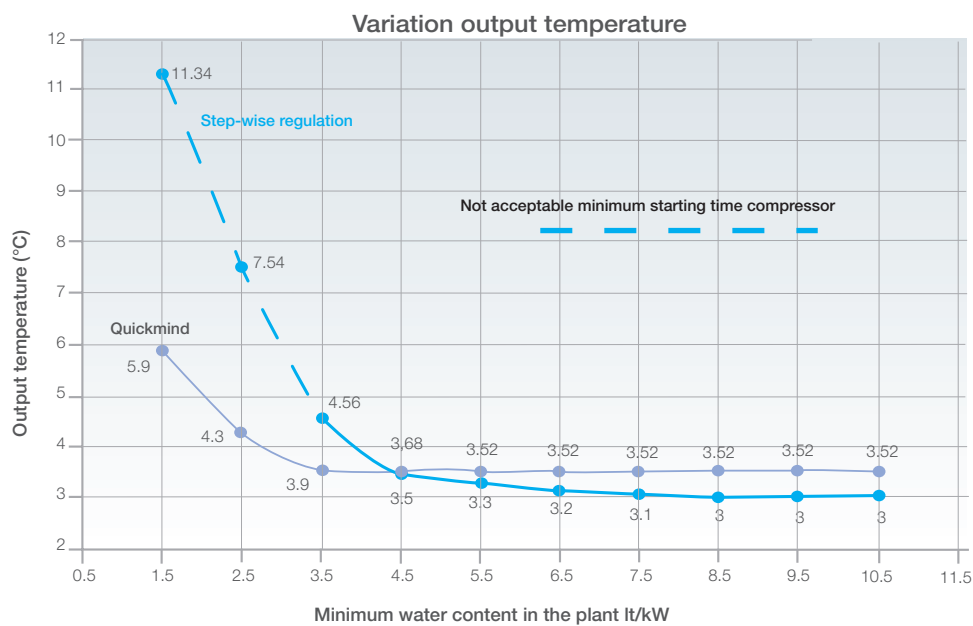
The new "W3000 Base" control unit is installed on all units.

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.



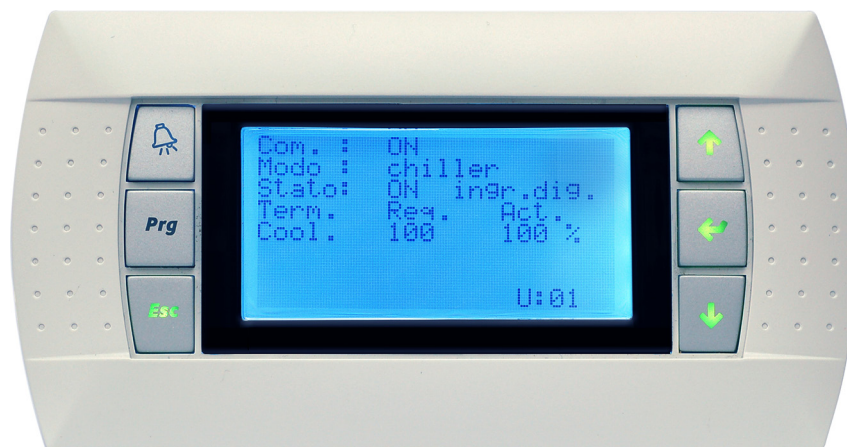
Control unit with LCD display (optional) -**Remote keyboard**

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 pre-set, and a further language of choice which may be French, German, Spanish, Swedish or Russian (to be specified on or-

der). 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.

| NECS-N / LN | | 0202T | 0252T | 0302T | 0352T | 0412T | 0452T | 0512T | 0552T | 0612T | |
|--|--------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Power supply | | V/ph/Hz 400/3/50+N 400/3/50+N 400/3/50+N 400/3/50+N 400/3/50+N 400/3/50+N 400/3/50+N 400/3/50+N 400/3/50+N 400/3/50+N | | | | | | | | | |
| PERFORMANCE | | | | | | | | | | | |
| COOLING ONLY (GROSS VALUE) | | | | | | | | | | | |
| Cooling capacity | (1) | kW | 48,0 | 54,6 | 73,2 | 83,5 | 93,9 | 103 | 119 | 132 | 143 |
| Total power input | (1) | kW | 19,0 | 21,3 | 27,2 | 31,9 | 36,0 | 41,6 | 44,6 | 53,3 | 62,7 |
| EER | (1) | | 2,53 | 2,56 | 2,69 | 2,62 | 2,61 | 2,48 | 2,67 | 2,47 | 2,28 |
| ESEER | (1) | | 3,52 | 3,31 | 3,46 | 3,33 | 3,33 | 3,17 | 3,38 | 3,16 | 2,93 |
| COOLING ONLY (EN14511 VALUE) | | | | | | | | | | | |
| Cooling capacity | (1)(2) | kW | 47,9 | 54,5 | 73,0 | 83,3 | 93,7 | 103 | 119 | 131 | 143 |
| EER | (1)(2) | | 2,51 | 2,55 | 2,67 | 2,59 | 2,59 | 2,46 | 2,64 | 2,45 | 2,26 |
| ESEER | (1)(2) | | 3,26 | 3,26 | 3,39 | 3,27 | 3,27 | 3,11 | 3,32 | 3,11 | 2,88 |
| Cooling energy class | | | D | D | D | D | D | E | D | E | F |
| HEATING ONLY (GROSS VALUE) | | | | | | | | | | | |
| Heating capacity | (3) | kW | 54,1 | 63,6 | 84,1 | 96,2 | 109 | 121 | 138 | 154 | 169 |
| Total power input | (3) | kW | 18,1 | 20,6 | 26,1 | 30,4 | 34,1 | 37,9 | 42,4 | 48,3 | 54,3 |
| COP | (3) | | 2,99 | 3,09 | 3,22 | 3,16 | 3,19 | 3,18 | 3,24 | 3,19 | 3,12 |
| HEATING ONLY (EN14511 VALUE) | | | | | | | | | | | |
| Heating capacity | (3)(2) | kW | 54,2 | 63,7 | 84,3 | 96,5 | 109 | 121 | 138 | 154 | 170 |
| COP | (3)(2) | | 2,98 | 3,07 | 3,20 | 3,14 | 3,18 | 3,16 | 3,22 | 3,16 | 3,10 |
| Cooling energy class | | | C | B | A | B | B | B | A | B | B |
| EXCHANGERS | | | | | | | | | | | |
| HEAT EXCHANGER USER SIDE IN REFRIGERATION | | | | | | | | | | | |
| Water flow | (1) | m³/h | 8,26 | 9,41 | 12,6 | 14,4 | 16,2 | 17,8 | 20,5 | 22,7 | 24,6 |
| Pressure drop | (1) | kPa | 5,11 | 6,58 | 11,9 | 15,5 | 11,9 | 14,4 | 13,8 | 17,9 | 21,2 |
| HEAT EXCHANGER USER SIDE IN HEATING | | | | | | | | | | | |
| Water flow | (3) | m³/h | 9,39 | 11,1 | 14,6 | 16,7 | 18,9 | 21,0 | 23,9 | 26,7 | 29,4 |
| Pressure drop | (3) | kPa | 6,60 | 9,09 | 16,1 | 20,9 | 16,4 | 20,0 | 18,8 | 25,0 | 30,2 |
| COMPRESSORS | | | | | | | | | | | |
| N. of compressors | | N° | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Number of capacity | | N° | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| No. of circuits | | N° | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Regulation | | | STEPS | STEPS | STEPS | STEPS | STEPS | STEPS | STEPS | STEPS | STEPS |
| Min. capacity step | | % | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Refrigerant | | | R410A | R410A | R410A | R410A | R410A | R410A | R410A | R410A | R410A |
| Refrigerant charge | | kg | 19,0 | 22,0 | 25,0 | 35,0 | 38,0 | 34,0 | 49,0 | 41,0 | 46,0 |
| Oil charge | | kg | 6,00 | 6,50 | 6,50 | 7,95 | 9,40 | 10,8 | 13,6 | 13,1 | 12,6 |
| FANS | | | | | | | | | | | |
| Quantity | | N° | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 |
| Air flow | | m³/s | 6,12 | 5,81 | 7,85 | 8,85 | 8,68 | 8,68 | 10,9 | 10,9 | 10,9 |
| Fans power | | kW | 0,16 | 0,16 | 0,16 | 0,25 | 0,25 | 0,25 | 0,25 | 0,25 | 0,25 |
| NOISE LEVEL | | | | | | | | | | | |
| Noise Pressure | (4) | dB(A) | 48 | 48 | 49 | 51 | 51 | 51 | 52 | 52 | 52 |
| Noise Power | (5) | dB(A) | 80 | 80 | 81 | 83 | 83 | 83 | 84 | 84 | 84 |
| SIZE AND WEIGHT | | | | | | | | | | | |
| A | (6) | mm | 2195 | 2195 | 2745 | 2745 | 2745 | 2745 | 3245 | 3245 | 3245 |
| B | (6) | mm | 1120 | 1120 | 1120 | 1120 | 1120 | 1120 | 1120 | 1120 | 1120 |
| H | (6) | mm | 1420 | 1420 | 1420 | 1620 | 1620 | 1620 | 1620 | 1620 | 1620 |
| Operating weight | (6) | kg | 645 | 670 | 795 | 935 | 1060 | 1065 | 1230 | 1220 | 1265 |

Notes:

1 Plant (side) cooling exchanger water (in/out) 12°C/7°C; Source (side) heat exchanger air (in) 35°C

2 Values in compliance with EN14511-3:2011

3 Plant (side) heat exchanger water (in/out) 40°C/45°C; Source (side) heat exchanger air (in) 7°C - 87% R.H.

4 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.

5 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.

6 Unit in standard configuration/execution, without optional accessories.

- Unavailable

COOLING CAPACITY PERFORMANCE

NECS-N
LN

| 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 | 53,4 | 50,2 | 48,8 | 46,6 | 42,7 | 41,0 | 54,9 | 51,7 | 50,2 | 48,0 | 43,9 | 42,2 | 56,5 | 53,1 | 51,7 | 49,4 | 45,2 | 43,5 |
| Pat | 15,3 | 17,0 | 17,7 | 18,9 | 20,9 | 21,8 | 15,4 | 17,2 | 17,9 | 19,0 | 21,1 | 22,0 | 15,6 | 17,3 | 18,1 | 19,2 | 21,3 | 22,2 |
| Qev | 9,19 | 8,64 | 8,40 | 8,02 | 7,34 | 7,05 | 9,46 | 8,89 | 8,65 | 8,26 | 7,57 | 7,27 | 9,72 | 9,15 | 8,90 | 8,50 | 7,79 | 7,48 |
| Dpev | 6,32 | 5,58 | 5,28 | 4,82 | 4,03 | 3,72 | 6,69 | 5,92 | 5,60 | 5,11 | 4,28 | 3,95 | 7,07 | 6,26 | 5,92 | 5,41 | 4,54 | 4,19 |
| Tev | 9 | | | | | | 10 | | | | | | 11 | | | | | |
| Pf | 58,0 | 54,6 | 53,1 | 50,7 | 46,5 | 44,7 | 59,5 | 56,0 | 54,5 | 52,1 | 47,8 | 45,9 | 61,0 | 57,5 | 55,9 | 53,5 | 49,0 | 47,1 |
| Pat | 15,7 | 17,5 | 18,2 | 19,4 | 21,5 | 22,3 | 15,9 | 17,6 | 18,4 | 19,6 | 21,6 | 22,5 | 16,0 | 17,8 | 18,5 | 19,7 | 21,8 | 22,7 |
| Qev | 9,99 | 9,40 | 9,14 | 8,74 | 8,01 | 7,70 | 10,3 | 9,65 | 9,39 | 8,98 | 8,23 | 7,91 | 10,5 | 9,90 | 9,63 | 9,21 | 8,45 | 8,12 |
| Dpev | 7,46 | 6,61 | 6,25 | 5,71 | 4,80 | 4,43 | 7,86 | 6,97 | 6,59 | 6,03 | 5,07 | 4,68 | 8,27 | 7,33 | 6,94 | 6,35 | 5,34 | 4,94 |
| 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 | 60,4 | 56,9 | 55,5 | 53,1 | 48,9 | 47,1 | 62,2 | 58,6 | 57,1 | 54,6 | 50,2 | 48,4 | 63,9 | 60,3 | 58,7 | 56,1 | 51,6 | 49,6 |
| Pat | 17,3 | 19,1 | 19,9 | 21,2 | 23,4 | 24,4 | 17,4 | 19,3 | 20,1 | 21,3 | 23,6 | 24,5 | 17,6 | 19,5 | 20,3 | 21,5 | 23,7 | 24,7 |
| Qev | 10,4 | 9,80 | 9,54 | 9,14 | 8,42 | 8,11 | 10,7 | 10,1 | 9,82 | 9,41 | 8,65 | 8,33 | 11,0 | 10,4 | 10,1 | 9,67 | 8,88 | 8,54 |
| Dpev | 8,04 | 7,15 | 6,78 | 6,22 | 5,27 | 4,89 | 8,52 | 7,57 | 7,18 | 6,58 | 5,57 | 5,16 | 9,02 | 8,01 | 7,59 | 6,95 | 5,87 | 5,43 |
| Tev | 9 | | | | | | 10 | | | | | | 11 | | | | | |
| Pf | 65,7 | 61,9 | 60,3 | 57,6 | 52,9 | 50,8 | 67,5 | 63,5 | 61,8 | 59,1 | 54,2 | 52,0 | 69,2 | 65,2 | 63,4 | 60,6 | 55,4 | 53,2 |
| Pat | 17,7 | 19,6 | 20,4 | 21,7 | 23,9 | 24,8 | 17,9 | 19,8 | 20,5 | 21,8 | 24,0 | 25,0 | 18,0 | 19,9 | 20,7 | 21,9 | 24,2 | 25,1 |
| Qev | 11,3 | 10,7 | 10,4 | 9,93 | 9,11 | 8,76 | 11,6 | 10,9 | 10,7 | 10,2 | 9,33 | 8,96 | 11,9 | 11,2 | 10,9 | 10,4 | 9,55 | 9,16 |
| Dpev | 9,52 | 8,46 | 8,01 | 7,33 | 6,17 | 5,70 | 10,0 | 8,92 | 8,44 | 7,72 | 6,48 | 5,98 | 10,6 | 9,39 | 8,88 | 8,11 | 6,78 | 6,25 |
| 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 | 80,1 | 75,9 | 74,0 | 71,1 | 65,8 | 63,5 | 82,4 | 78,0 | 76,1 | 73,2 | 67,8 | 65,5 | 84,6 | 80,2 | 78,3 | 75,3 | 69,8 | 67,5 |
| Pat | 21,9 | 24,2 | 25,3 | 26,9 | 29,9 | 31,2 | 22,1 | 24,5 | 25,5 | 27,2 | 30,2 | 31,5 | 22,3 | 24,7 | 25,8 | 27,4 | 30,5 | 31,8 |
| Qev | 13,8 | 13,1 | 12,7 | 12,2 | 11,3 | 10,9 | 14,2 | 13,4 | 13,1 | 12,6 | 11,7 | 11,3 | 14,6 | 13,8 | 13,5 | 13,0 | 12,0 | 11,6 |
| Dpev | 14,3 | 12,8 | 12,2 | 11,3 | 9,65 | 8,99 | 15,1 | 13,6 | 12,9 | 11,9 | 10,2 | 9,57 | 16,0 | 14,3 | 13,7 | 12,6 | 10,9 | 10,2 |
| Tev | 9 | | | | | | 10 | | | | | | 11 | | | | | |
| Pf | 86,9 | 82,3 | 80,4 | 77,3 | 71,9 | 69,6 | 89,1 | 84,5 | 82,5 | 79,4 | 74,0 | 71,7 | 91,3 | 86,6 | 84,6 | 81,5 | 76,0 | 73,7 |
| Pat | 22,5 | 25,0 | 26,0 | 27,7 | 30,7 | 32,1 | 22,8 | 25,2 | 26,2 | 27,9 | 31,0 | 32,3 | 23,0 | 25,4 | 26,5 | 28,1 | 31,2 | 32,6 |
| Qev | 15,0 | 14,2 | 13,8 | 13,3 | 12,4 | 12,0 | 15,3 | 14,6 | 14,2 | 13,7 | 12,7 | 12,3 | 15,7 | 14,9 | 14,6 | 14,0 | 13,1 | 12,7 |
| Dpev | 16,8 | 15,1 | 14,4 | 13,3 | 11,5 | 10,8 | 17,7 | 15,9 | 15,2 | 14,1 | 12,2 | 11,5 | 18,6 | 16,7 | 16,0 | 14,8 | 12,9 | 12,1 |
| 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 | 91,8 | 86,6 | 84,5 | 81,1 | 75,2 | 72,7 | 94,4 | 89,2 | 86,9 | 83,5 | 77,5 | 75,0 | 97,0 | 91,7 | 89,4 | 86,0 | 79,9 | 77,3 |
| Pat | 26,0 | 28,6 | 29,8 | 31,6 | 34,9 | 36,3 | 26,3 | 29,0 | 30,1 | 31,9 | 35,3 | 36,7 | 26,6 | 29,3 | 30,4 | 32,3 | 35,6 | 37,1 |
| Qev | 15,8 | 14,9 | 14,5 | 14,0 | 12,9 | 12,5 | 16,3 | 15,3 | 15,0 | 14,4 | 13,3 | 12,9 | 16,7 | 15,8 | 15,4 | 14,8 | 13,8 | 13,3 |
| Dpev | 18,7 | 16,7 | 15,8 | 14,6 | 12,5 | 11,7 | 19,8 | 17,6 | 16,8 | 15,5 | 13,3 | 12,5 | 20,9 | 18,7 | 17,8 | 16,4 | 14,2 | 13,3 |
| Tev | 9 | | | | | | 10 | | | | | | 11 | | | | | |
| Pf | 99,6 | 94,2 | 91,9 | 88,4 | 82,2 | 79,7 | 102 | 96,7 | 94,4 | 90,8 | 84,6 | 82,1 | 105 | 99,2 | 96,9 | 93,3 | 87,1 | 84,5 |
| Pat | 26,9 | 29,6 | 30,7 | 32,6 | 36,0 | 37,4 | 27,2 | 29,9 | 31,0 | 32,9 | 36,3 | 37,7 | 27,4 | 30,2 | 31,3 | 33,2 | 36,6 | 38,1 |
| Qev | 17,2 | 16,2 | 15,8 | 15,2 | 14,2 | 13,7 | 17,6 | 16,7 | 16,3 | 15,6 | 14,6 | 14,1 | 18,1 | 17,1 | 16,7 | 16,1 | 15,0 | 14,6 |
| Dpev | 22,1 | 19,7 | 18,8 | 17,4 | 15,0 | 14,1 | 23,2 | 20,8 | 19,8 | 18,3 | 15,9 | 15,0 | 24,4 | 21,9 | 20,9 | 19,3 | 16,9 | 15,9 |
| 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 | 103 | 97,4 | 94,9 | 91,1 | 84,5 | 81,8 | 106 | 100 | 97,8 | 93,9 | 87,2 | 84,4 | 109 | 103 | 101 | 96,7 | 89,9 | 87,1 |
| Pat | 29,4 | 32,3 | 33,5 | 35,5 | 39,1 | 40,7 | 29,8 | 32,7 | 33,9 | 36,0 | 39,6 | 41,1 | 30,1 | 33,1 | 34,3 | 36,4 | 40,0 | 41,6 |
| Qev | 17,8 | 16,8 | 16,3 | 15,7 | 14,5 | 14,1 | 18,3 | 17,3 | 16,8 | 16,2 | 15,0 | 14,5 | 18,8 | 17,8 | 17,3 | 16,6 | 15,5 | 15,0 |
| Dpev | 14,5 | 12,8 | 12,2 | 11,2 | 9,67 | 9,06 | 15,3 | 13,6 | 12,9 | 11,9 | 10,3 | 9,65 | 16,2 | 14,4 | 13,7 | 12,7 | 10,9 | 10,3 |
| Tev | 9 | | | | | | 10 | | | | | | 11 | | | | | |
| Pf | 112 | 106 | 103 | 99,5 | 92,6 | 89,8 | 115 | 109 | 106 | 102 | 95,3 | 92,5 | 118 | 112 | 109 | 105 | 98,1 | 95,2 |
| Pat | 30,4 | 33,4 | 34,7 | 36,8 | 40,5 | 42,0 | 30,8 | 33,8 | 35,1 | 37,2 | 40,9 | 42,5 | 31,1 | 34,1 | 35,5 | 37,5 | 41,3 | 42,9 |
| Qev | 19,4 | 18,3 | 17,8 | 17,1 | 15,9 | 15,5 | 19,9 | 18,8 | 18,3 | 17,6 | 16,4 | 15,9 | 20,4 | 19,3 | 18,8 | 18,1 | 16,9 | 16,4 |
| Dpev | 17,1 | 15,3 | 14,5 | 13,4 | 11,6 | 10,9 | 18,1 | 16,1 | 15,3 | 14,2 | 12,3 | 11,6 | 19,0 | 17,0 | 16,2 | 15,0 | 13,0 | 12,3 |

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



HEAT PUMP CAPACITY PERFORMANCE

NECS-N
LN

| 0202T | | | | | | | | | | | | | | | | | | |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Ta | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 |
| Tcd | 30 | | | | | | 35 | | | | | | 40 | | | | | |
| Pt | 39,6 | 45,3 | 51,7 | 54,5 | 58,9 | 66,8 | 40,2 | 45,5 | 51,7 | 54,5 | 58,8 | 66,7 | 40,8 | 45,8 | 51,7 | 54,3 | 58,6 | 66,4 |
| Qcd | 6,85 | 7,83 | 8,94 | 9,42 | 10,2 | 11,6 | 6,97 | 7,89 | 8,96 | 9,43 | 10,2 | 11,6 | 7,08 | 7,94 | 8,97 | 9,43 | 10,2 | 11,5 |
| Pcd | 3,51 | 4,58 | 5,97 | 6,63 | 7,75 | 9,98 | 3,63 | 4,66 | 6,01 | 6,66 | 7,76 | 9,99 | 3,75 | 4,72 | 6,02 | 6,64 | 7,72 | 9,92 |
| Pat | 12,5 | 12,6 | 12,8 | 12,9 | 13,0 | 13,3 | 14,1 | 14,2 | 14,3 | 14,4 | 14,6 | 14,9 | 15,8 | 15,9 | 16,1 | 16,2 | 16,3 | 16,6 |
| Ta | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 |
| Tcd | 45 | | | | | | 48 | | | | | | 50 | | | | | |
| Pt | 41,3 | 45,9 | 51,5 | 54,1 | 58,1 | 65,7 | 41,6 | 46,0 | 51,4 | 53,8 | 57,8 | 65,2 | 41,8 | 46,0 | 51,2 | 53,6 | 57,5 | 64,8 |
| Qcd | 7,18 | 7,98 | 8,95 | 9,39 | 10,1 | 11,4 | 7,24 | 8,00 | 8,94 | 9,36 | 10,1 | 11,3 | 7,29 | 8,01 | 8,92 | 9,34 | 10,0 | 11,3 |
| Pcd | 3,86 | 4,76 | 6,00 | 6,60 | 7,63 | 9,76 | 3,93 | 4,79 | 5,97 | 6,56 | 7,56 | 9,63 | 3,97 | 4,80 | 5,95 | 6,52 | 7,50 | 9,52 |
| Pat | 17,8 | 17,8 | 18,0 | 18,1 | 18,2 | 18,5 | 19,1 | 19,1 | 19,2 | 19,3 | 19,4 | 19,7 | 20,0 | 20,0 | 20,1 | 20,2 | 20,3 | 20,5 |
| 0252T | | | | | | | | | | | | | | | | | | |
| Ta | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 |
| Tcd | 30 | | | | | | 35 | | | | | | 40 | | | | | |
| Pt | 47,7 | 54,7 | 62,2 | 65,4 | 70,4 | 79,1 | 47,7 | 54,3 | 61,7 | 64,8 | 69,7 | 78,5 | 47,7 | 54,1 | 61,2 | 64,2 | 69,0 | 77,6 |
| Qcd | 8,25 | 9,45 | 10,8 | 11,3 | 12,2 | 13,7 | 8,26 | 9,41 | 10,7 | 11,2 | 12,1 | 13,6 | 8,28 | 9,38 | 10,6 | 11,1 | 12,0 | 13,5 |
| Pcd | 5,07 | 6,65 | 8,61 | 9,52 | 11,0 | 13,9 | 5,07 | 6,59 | 8,49 | 9,38 | 10,9 | 13,8 | 5,10 | 6,55 | 8,38 | 9,24 | 10,7 | 13,5 |
| Pat | 14,6 | 14,8 | 15,0 | 15,1 | 15,2 | 15,6 | 16,2 | 16,4 | 16,6 | 16,7 | 16,9 | 17,2 | 18,1 | 18,2 | 18,5 | 18,6 | 18,7 | 19,1 |
| Ta | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 |
| Tcd | 45 | | | | | | 48 | | | | | | 50 | | | | | |
| Pt | 47,8 | 53,9 | 60,7 | 63,6 | 68,2 | 76,5 | 47,9 | 53,8 | 60,4 | 63,2 | 67,7 | 75,7 | 48,0 | 53,8 | 60,2 | 63,0 | 67,3 | 75,1 |
| Qcd | 8,31 | 9,36 | 10,5 | 11,1 | 11,9 | 13,3 | 8,34 | 9,36 | 10,5 | 11,0 | 11,8 | 13,2 | 8,36 | 9,36 | 10,5 | 11,0 | 11,7 | 13,1 |
| Pcd | 5,14 | 6,52 | 8,27 | 9,09 | 10,5 | 13,1 | 5,17 | 6,52 | 8,21 | 9,00 | 10,3 | 12,9 | 5,20 | 6,52 | 8,17 | 8,94 | 10,2 | 12,7 |
| Pat | 20,2 | 20,3 | 20,5 | 20,6 | 20,8 | 21,1 | 21,6 | 21,7 | 21,9 | 22,0 | 22,1 | 22,4 | 22,6 | 22,7 | 22,8 | 22,9 | 23,0 | 23,3 |
| 0302T | | | | | | | | | | | | | | | | | | |
| Ta | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 |
| Tcd | 30 | | | | | | 35 | | | | | | 40 | | | | | |
| Pt | 62,4 | 71,8 | 82,0 | 86,3 | 93,0 | 105 | 62,6 | 71,6 | 81,5 | 85,7 | 92,2 | 104 | 62,9 | 71,5 | 80,9 | 84,9 | 91,2 | 102 |
| Qcd | 10,8 | 12,4 | 14,2 | 14,9 | 16,1 | 18,1 | 10,8 | 12,4 | 14,1 | 14,8 | 16,0 | 18,0 | 10,9 | 12,4 | 14,0 | 14,7 | 15,8 | 17,8 |
| Pcd | 8,77 | 11,6 | 15,1 | 16,7 | 19,4 | 24,7 | 8,84 | 11,6 | 15,0 | 16,6 | 19,2 | 24,2 | 8,96 | 11,6 | 14,8 | 16,3 | 18,8 | 23,8 |
| Pat | 18,7 | 18,8 | 19,1 | 19,3 | 19,5 | 20,1 | 20,5 | 20,7 | 21,0 | 21,2 | 21,5 | 22,1 | 22,4 | 22,8 | 23,3 | 23,5 | 23,8 | 24,4 |
| Ta | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 |
| Tcd | 45 | | | | | | 48 | | | | | | 50 | | | | | |
| Pt | 63,4 | 71,3 | 80,2 | 84,1 | 90,2 | 101 | 63,7 | 71,1 | 79,7 | 83,5 | 89,5 | 101 | 64,0 | 71,0 | 79,4 | 83,1 | 89,0 | 100 |
| Qcd | 11,0 | 12,4 | 13,9 | 14,6 | 15,7 | 17,6 | 11,1 | 12,4 | 13,9 | 14,5 | 15,6 | 17,5 | 11,1 | 12,4 | 13,8 | 14,5 | 15,5 | 17,4 |
| Pcd | 9,12 | 11,5 | 14,6 | 16,1 | 18,5 | 23,3 | 9,24 | 11,5 | 14,5 | 15,9 | 18,2 | 23,0 | 9,33 | 11,5 | 14,4 | 15,7 | 18,1 | 22,8 |
| Pat | 24,6 | 25,2 | 25,8 | 26,1 | 26,4 | 27,1 | 26,0 | 26,7 | 27,5 | 27,7 | 28,2 | 28,9 | 27,0 | 27,8 | 28,6 | 28,9 | 29,4 | 30,1 |
| 0352T | | | | | | | | | | | | | | | | | | |
| Ta | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 |
| Tcd | 30 | | | | | | 35 | | | | | | 40 | | | | | |
| Pt | 70,7 | 82,0 | 94,2 | 99,3 | 107 | 121 | 70,9 | 81,6 | 93,3 | 98,3 | 106 | 120 | 71,5 | 81,4 | 92,5 | 97,2 | 105 | 118 |
| Qcd | 12,2 | 14,2 | 16,3 | 17,2 | 18,5 | 21,0 | 12,3 | 14,1 | 16,2 | 17,0 | 18,4 | 20,7 | 12,4 | 14,1 | 16,0 | 16,9 | 18,2 | 20,5 |
| Pcd | 11,2 | 15,1 | 19,9 | 22,1 | 25,8 | 32,9 | 11,3 | 15,0 | 19,6 | 21,7 | 25,2 | 32,2 | 11,5 | 14,9 | 19,3 | 21,3 | 24,7 | 31,4 |
| Pat | 21,7 | 22,1 | 22,6 | 22,8 | 23,2 | 23,8 | 23,8 | 24,2 | 24,8 | 25,0 | 25,4 | 26,1 | 26,2 | 26,7 | 27,3 | 27,5 | 28,0 | 28,7 |
| Ta | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 | -5 | 0 | 5 | 7 | 10 | 15 |
| Tcd | 45 | | | | | | 48 | | | | | | 50 | | | | | |
| Pt | 72,4 | 81,3 | 91,7 | 96,2 | 103 | 117 | 73,2 | 81,4 | 91,2 | 95,5 | 103 | 116 | 73,8 | 81,4 | 90,9 | 95,1 | 102 | 115 |
| Qcd | 12,6 | 14,1 | 15,9 | 16,7 | 18,0 | 20,2 | 12,7 | 14,2 | 15,9 | 16,6 | 17,8 | 20,1 | 12,8 | 14,2 | 15,8 | 16,6 | 17,8 | 20,0 |
| Pcd | 11,9 | 15,0 | 19,0 | 20,9 | 24,2 | 30,7 | 12,1 | 15,0 | 18,8 | 20,7 | 23,9 | 30,3 | 12,4 | 15,1 | 18,7 | 20,5 | 23,6 | 30,0 |
| Pat | 29,0 | 29,5 | 30,1 | 30,4 | 30,9 | 31,7 | 30,8 | 31,4 | 32,0 | 32,3 | 32,8 | 33,7 | 32,1 | 32,7 | 33,3 | 33,7 | 34,1 | 35,1 |

Ta [°C] - Air temperature
 Tcd (°C) - Plant (side) heating exchanger output water temperature
 Pt (kW) - Heating capacity
 Qcd (m³/h) - Plant (side) heating exchanger water flow
 Dpcc (kPa) - Plant (side) heating exchanger pressure drop
 Pat (kW) - Total power input
 '-' - 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

6. HYDRAULIC DATA

NECS-N B/LN

6.1 Water flow and pressure drop

Water flow in the heat exchangers is given by: $Q=P \times 0,86/Dt$

Q: water flow (m³/h)

Dt: difference between inlet and outlet water temp. (°C)

P: heat exchanger capacity (kW)

| SIZE | PLANT SIDE COLD HEAT EXCHANGER | | | | PLANT SIDE HOT HEAT EXCHANGER | | | AUXILIARY SIDE HEAT EXCHANGER | | |
|------------------|--------------------------------|----------------------------|----------------------------|----------------------------|-------------------------------|----------------------------|----------------------------|-------------------------------|----------------------------|----------------------------|
| | K | Q min m ³ /h | Q max m ³ /h | C.a. min m ³ | K | Q min m ³ /h | Q max m ³ /h | K | Q min m ³ /h | Q max m ³ /h |
| NECS-N /B 0202T | 74,8 | 7,1 | 14,5 | 0,13 | 74,8 | 7,1 | 14,5 | - | - | - |
| NECS-N /B 0252T | 74,4 | 7,9 | 16,6 | 0,14 | 74,4 | 7,9 | 16,6 | - | - | - |
| NECS-N /B 0302T | 75,2 | 7,9 | 20,7 | 0,18 | 75,2 | 7,9 | 20,7 | - | - | - |
| NECS-N /B 0352T | 74,9 | 8,8 | 23,8 | 0,21 | 74,9 | 8,8 | 23,8 | - | - | - |
| NECS-N /B 0412T | 45,7 | 12,8 | 27 | 0,23 | 45,7 | 12,8 | 27 | - | - | - |
| NECS-N /B 0452T | 45,6 | 12,8 | 30,7 | 0,27 | 45,6 | 12,8 | 30,7 | - | - | - |
| NECS-N /B 0512T | 33 | 12,8 | 34,5 | 0,3 | 33 | 12,8 | 34,5 | - | - | - |
| NECS-N /B 0552T | 34,9 | 14,7 | 39,5 | 0,34 | 34,9 | 14,7 | 39,5 | - | - | - |
| NECS-N /B 0612T | 34,9 | 16,1 | 43,2 | 0,38 | 34,9 | 16,1 | 43,2 | - | - | - |
| NECS-N /LN 0202T | 74,8 | 7,1 | 14,5 | 0,13 | 74,8 | 7,1 | 14,5 | - | - | - |
| NECS-N /LN 0252T | 74,4 | 7,9 | 16,6 | 0,14 | 74,4 | 7,9 | 16,6 | - | - | - |
| NECS-N /LN 0302T | 75,2 | 7,9 | 20,7 | 0,18 | 75,2 | 7,9 | 20,7 | - | - | - |
| NECS-N /LN 0352T | 74,9 | 8,8 | 23,8 | 0,21 | 74,9 | 8,8 | 23,8 | - | - | - |
| NECS-N /LN 0412T | 45,7 | 12,8 | 27 | 0,23 | 45,7 | 12,8 | 27 | - | - | - |
| NECS-N /LN 0452T | 45,6 | 12,8 | 30,7 | 0,27 | 45,6 | 12,8 | 30,7 | - | - | - |
| NECS-N /LN 0512T | 33 | 12,8 | 34,5 | 0,3 | 33 | 12,8 | 34,5 | - | - | - |
| NECS-N /LN 0552T | 34,9 | 14,7 | 39,5 | 0,34 | 34,9 | 14,7 | 39,5 | - | - | - |
| NECS-N /LN 0612T | 34,9 | 16,1 | 43,2 | 0,38 | 34,9 | 16,1 | 43,2 | - | - | - |

Q min: minimum water flow admitted to the heat exchanger

Q max: maximum water flow admitted to the heat exchanger

C.a. min: minimum water content admitted in the plant, using traditional control logic

XXXXXXXXXXXXXXXXXX

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 fitted 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 configurations:

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 fitted 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 flush with the machine.

Water-side mechanical filter (optional)

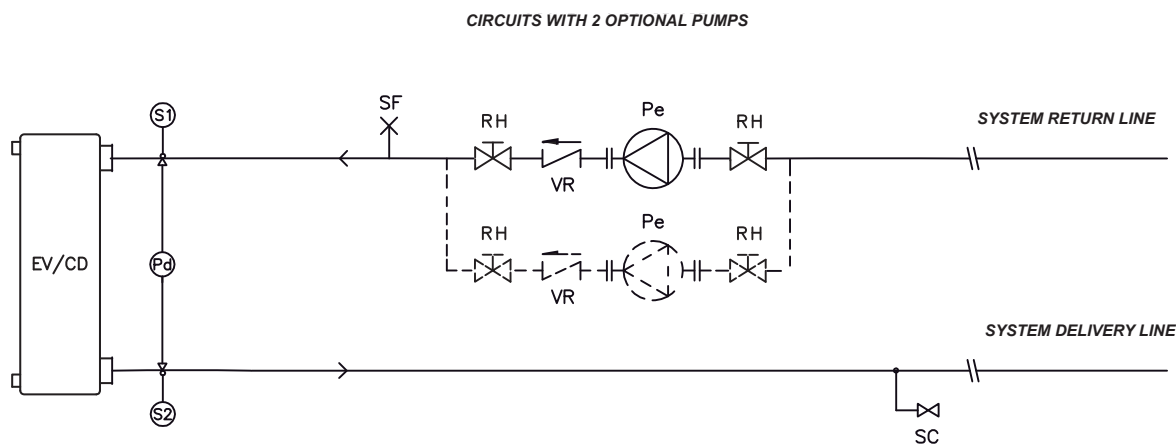
Y-filter designed and built to capture the impurities in the hydraulic circuit. It is fitted with a 0.9 mm stainless steel mesh cartridge which can be replaced without removing the valve body from the piping.

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



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

| SIZE | Maximum values | | | | | | | | |
|-------|----------------|----------------|---------------|---------------|----------------|---------------|----------------|---------------|---------------|
| | Compressor | | | | Fans (1) | | Total (1) (2) | | |
| | n | 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] | L.R.A. [A] |
| 0202T | 2 | 2x11.8 | 2x20.4 | 2x118 | 0.16 | 0.7 | 24.6 | 45 | 142.6 |
| 0252T | 2 | 2x13.2 | 2x22.6 | 2x118 | 0.16 | 0.7 | 27.4 | 49.4 | 144.8 |
| 0302T | 2 | 2x17 | 2x30.5 | 2x173 | 0.16 | 0.7 | 35.3 | 66.6 | 209.1 |
| 0352T | 2 | 17+22.3 | 30.5+36.1 | 173+225 | 0.25 | 1.1 | 41.3 | 75.4 | 264.3 |
| 0412T | 2 | 2x22.3 | 2x36.1 | 2x225 | 0.25 | 1.1 | 46.6 | 81 | 269.9 |
| 0452T | 2 | 22.3+27.4 | 36.1+45.8 | 225+272 | 0.25 | 1.1 | 51.7 | 90.7 | 316.9 |
| 0512T | 2 | 2x27.4 | 2x45.8 | 2x272 | 0.25 | 1.1 | 57.3 | 102.6 | 328.8 |
| 0552T | 2 | 27.4+35.8 | 45.8+58.9 | 272+310 | 0.25 | 1.1 | 65.7 | 115.7 | 366.8 |
| 0612T | 2 | 2x35.8 | 2x58.9 | 2x310 | 0.25 | 1.1 | 74.1 | 128.8 | 379.9 |

F.L.I.: Full load power

F.L.A.: Full load current

L.R.A.: Locked rotor amperes for single compressor

S.A.: Inrush current

(1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current

(1) (2) Safety values to be considered when cabling the unit for power supply and line-protections

Power supply: 400/3/50+N

Voltage tolerance: 10%

Maximum voltage unbalance: 3%

Give the typical operating conditions of units designed for outdoor installation, which can be associated (according to reference document IEC 60721) to the following classes:

- climatic conditions class 4K4H: air temperature range from -20 up to 55°C (*), relative humidity range from 4 up to 100%, with possible precipitations, at air pressure from 70 and 106 kPa and a maximum solar radiation of 1120 W/m²

- special climatic conditions negligible

- biological conditions class 4B1 and 4C2: locations in a generic urban area

- mechanically active substances class 4S2: locations in areas with sand or dust representative of urban areas

- mechanical conditions class 4M1: locations protected from significant vibrations or shocks

The required protection level for safe operation, according to reference document IEC 60529, is IP43XW (protection against access, to the most critical unit's parts, of external devices with diameter larger than 1 mm and rain).

The unit can be considered IP44XW protected, i.e. protected against access of external devices (with diameter larger than 1 mm) and water in general.

(*) for the unit's operating limits, see "selection limits" section