MITSUBISHI ELECTRIC
HYDRONICS & IT COOLING SYSTEMS S.p.A.

Data Book

NX2-Q-G06 0344 - 0808_202104_EN R454B
ELCA_Engine ver.4.5.3.0

4 PIPE SYSTEM

NX2-Q-G06 0344 - 0808

316-799 kW
INTEGRA unit for 4-pipe systems, air source for outdoor installation

R454B
SCROLL
SHELL & TUBES

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

- LOW GWP REFRIGERANT
- INTEGRATED HYDRONIC GROUP
- SHELL&TUBE HEAT EXCHANGER
- VARIABLE PRIMARY FLOW
- ELECTRONIC EXPANSION VALVE SUPPLIED STANDARD
- WIDE OPERATING RANGE
- WIDE CAPACITY RANGE

CLIMAVENETA®

INDEX

The units highlighted in this publication contain R454B [GWP_{100} 466] fluorinated greenhouse gases.

LEGEND

Functions

4 PIPE SYSTEM — Combined production of heating and cooling

Refrigerant

R454B — R454B

Compressors

SCROLL — Scroll compressor

Fan

AXIAL — Axial fan

Exchangers

SHELL & TUBES — Shell & Tubes

Other features

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com — Eurovent

VPF VARIABLE PRIMARY FLOW — VPF

EEV ELECTRONIC EXPANSION VALVE — Electronic Expansion Valve

1.1 Product certifications

1.2 Voluntary product certifications

Check ongoing validity of certificate:
www.eurovent-certification.com
or
www.certifl ash.com

1.3 System certifications

Quality System complying with the requirements of UNI EN ISO9001:2008 regulation

Environmental Management System complying with the requirements of UNI EN ISO14001:2004 regulation

Occupational Health and Safety Management System complying with the requirements of BS OHSAS 18001:2007

2.1 Product features

FOCUS ON: 4 PIPE SYSTEMS

This type of system is suitable for air-conditioning buildings that require separate areas to be heated and cooled at the same time.
It is combined with centralised solutions capable of producing hot and cold water in the two hydronic circuits of the system, assuring maximum comfort in every room of the building, independently and in any period of the year.
From now on, a single intelligent unit is suffi cient for the management of these complex systems: INTEGRA.

INTEGRA UNIT FOR 4-PIPE SYSTEMS, AIR SOURCE FOR OUTDOOR INSTALLATION

The series multi-use units are able to simultaneously meet hot and cold water production requests and are thus a valid alternative to traditional systems based on chillers and boilers for applications such as office blocks, pools and shopping centres. The advanced control logic, developed by MEHITS, ensures that heating and cooling loads are perfectly met. When these are simultaneous, the unit exchanges evaporation and condensation heat with the system cooling and heating circuits respectively. When heat loads are not balanced or one of the two are missing, the unit automatically switches to a third heat source which can be air or water according to the model.
This unit for outdoor installation. For these products heat is exchanged on the source side by a refrigerant air coils exchanger, it acts as a condenser or as an evaporator according to mode function.

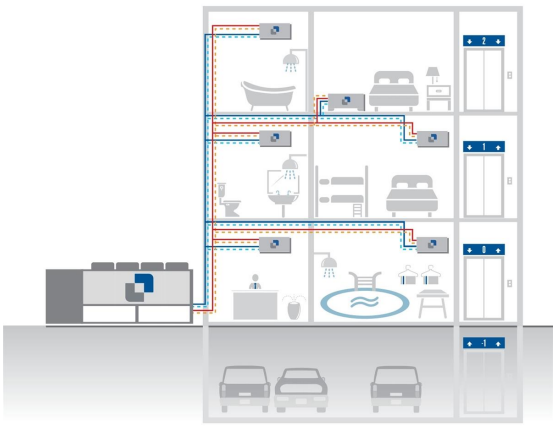
INTEGRA, THE VERSATILE AND MULTI-FUNCTIONAL HEAT PUMP FOR ALL APPLICATIONS

The INTEGRA units are used in many applications, even completely different from each other, for the versatility and flexibility that distinguishes them.
Many years of experience in these applications has led MEHITS to develop its own solution to the main challenges posed by comfort, industrial processes up to IT Cooling applications, without making any compromises.

Comfort Applications

Perfect for mixed-use buildings, residential applications, environments with complex and variable thermal loads, areas with large glass surfaces.
To cool and simultaneously heat mixed-use environments is a frequent trend in the building and constructions segment. In these cases, the use of a smart INTEGRA heat pumps is key for producing hot and cold water simultaneously and independent matching any kind of load combinations whilst ensuring optimal comfort and highest energy efficiency all year long.

- Auto adaptability to variable loads
- Highest efficiency in all load conditions
- Plant simplification and reduction of technical spaces
- A gas network is no longer needed
- Smart management of thermal energy

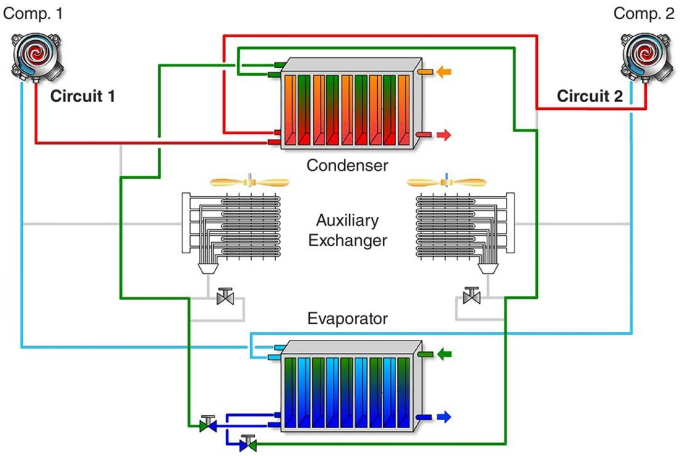


WORKING PRINCIPLE

The main feature of INTEGRA units is the ability to manage the overall capacity of both the cooling and heating side, based on the actual load requirements of the total system. The operational flexibility is total: all the combinations of heating and cooling loads can be met. A smart heat pump is a simple and integrated response to all the applications requiring independent cooling and heating simultaneously, such as air-conditioning requirements for large plants with complex loads.
Four operating modes for INTEGRA units are described below.

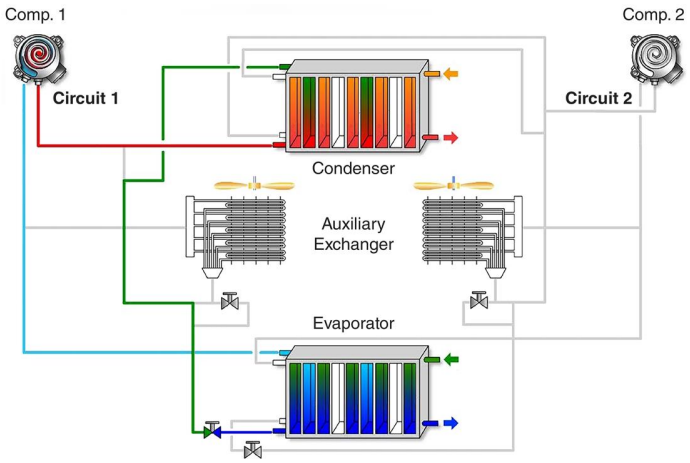
Operating mode: 100% cold side / 100% hot side

The two circuits operate at maximum power, evaporating in the cold-side exchanger and condensing in the hot-side one. The source-side heat exchanger (air coil or water exchanger, depending on the unit type) is not used, which means that in these conditions there is no energy waste.



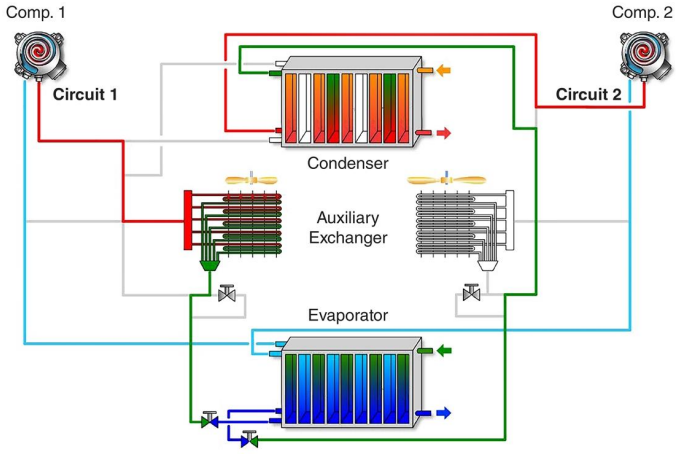
Operating mode: 50% cold side / 50% hot side

Also in this situation, the unit operates like a water-water unit, as all the evaporating and condensing energy is used for the system. Since the system only requires 50% of the total energy, each circuit operates in partial load conditions. In this particular condition, the exchangers are oversized, thus achieving even higher efficiency.



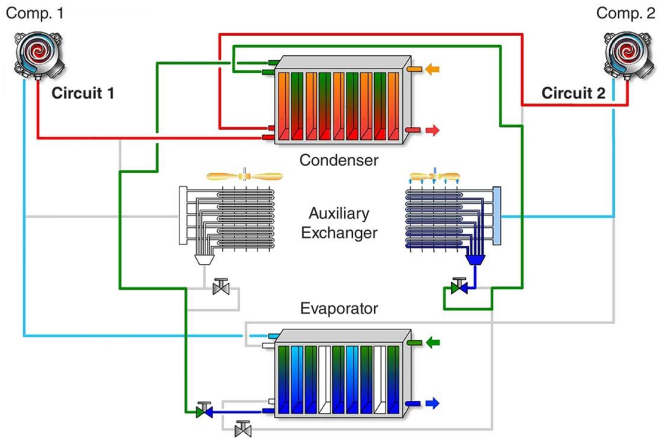
Operating mode: 100% cold side / 50% hot side

Both the circuits operate to produce the amount of energy necessary for the cooling of the plant, evaporating all the refrigerant in the cold-side heat exchanger. While one circuit carries out the condensation on the hot-side heat exchanger, thus supplying the total energy necessary to heat the building, the other circuit exchanges the remaining heating energy in the external environment by using the auxiliary source-side heat exchanger (air coil or water exchanger, depending on the unit type).



Operating mode: 50% cold side / 100% hot side

Just like the latter case, in this condition both circuits operate differently, to supply the system with the correct amount of required energy. The unit uses two sources to produce the requested hot water flow: in fact, one circuit evaporates the refrigerant in the cold-side heat exchanger, thus supplying the cold water demand, while the other uses the auxiliary source-side heat exchanger. In this way both circuits move energy in the hot-side heat exchanger, fulfilling the request for hot water flow.



3.1 Green certification relevant

FOCUS ON GREEN CERTIFICATION RELEVANT

Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., as a major player in the world HVAC market and a leading manufacturer of energy efficient, sustainable HVAC solutions, recognizes and supports the diffusion of green certification systems, as an effective way to deliver high performance buildings and improve the quality and the sustainability of the built environment.

Since the first certification system was introduced at the beginning of the 1990s, the demand for certified buildings has grown considerably, as well as the number of standards, rating and certification programs. Operating worldwide Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., has extensive experience with many of them and is active member of Green Building Council Italy.

Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A., commitment to develop responsible and sustainable HVAC solutions, is reflected by a full range of premium efficiency products and systems, designed with special care to improve building energy performance ratings, according to major certification protocols, including LEED, BREAM, GREENSTAR, BCA, NABERS, DNGB, HQE and BEAM.

To find out more about how our products contribute to enhanced green certification rating and energy performance of a building, please refer to:
https://www.melcohit.com/EN/Environment/green_certifications/

3.2 Unit Description

Multi-purpose outdoor unit for use in 4-pipe systems for the simultaneous production of hot and chilled water by means of two independent hydronic circuits. These units are able to satisfy the demand for hot and cold water simultaneously through a system that does not require seasonal switching and is therefore a valid alternative to traditional plants with chiller and boiler. This unit is equipped with hermetic rotary Scroll compressors, with R454B, axial fans, shell and tube heat exchangers and electronic expansion valve. The range is composed of units equipped with four, six, and eight compressors in a multi-circuit configuration.

3.3 Key Features

LOW GWP REFRIGERANT

The new generation refrigerant R454B is the most eco-sustainable alternative to traditional refrigerant R410A, offering a 76% reduction in terms of GWP (Global Warming Potential GWP of R454B = 467, GWP of R410A = 1924 as per IPCC rev. 5th) and zero impact on the ozone layer.

INTEGRATED HYDRONIC GROUP

The built-in hydronic module already contains the main water circuit components; it is available with single or twin in-line pump, for achieving low or high head, available for both hot and cold water distribution systems (up to 4 pumps).

SHELL&TUBE HEAT EXCHANGER

The shell and tube exchanger provides the highest flexibility for the unit’s installation, keeping the pressure drops on the hydronic side at a minimum, thus representing the best choice for all the hydronic applications.

VARIABLE PRIMARY FLOW

Energy savings due to variable pump speed management based on load demand and the variable flow ensures the units also function in critical working conditions.

ELECTRONIC EXPANSION VALVE SUPPLIED STANDARD

The use of the electronic expansion valve generates considerable benefits, especially in cases of variable demand and at different working conditions. It guarantees energy savings due to efficiency optimization in various different working conditions which translates into a reduction in operating consumption, a faster start-up of the unit and a wider extension of the operating limits.

WIDE OPERATING RANGE

Unit´s operation guaranteed with external air temperature down to -15°C during winter and up to 46°C during summer. Production of hot water up to 55°C without accessories.

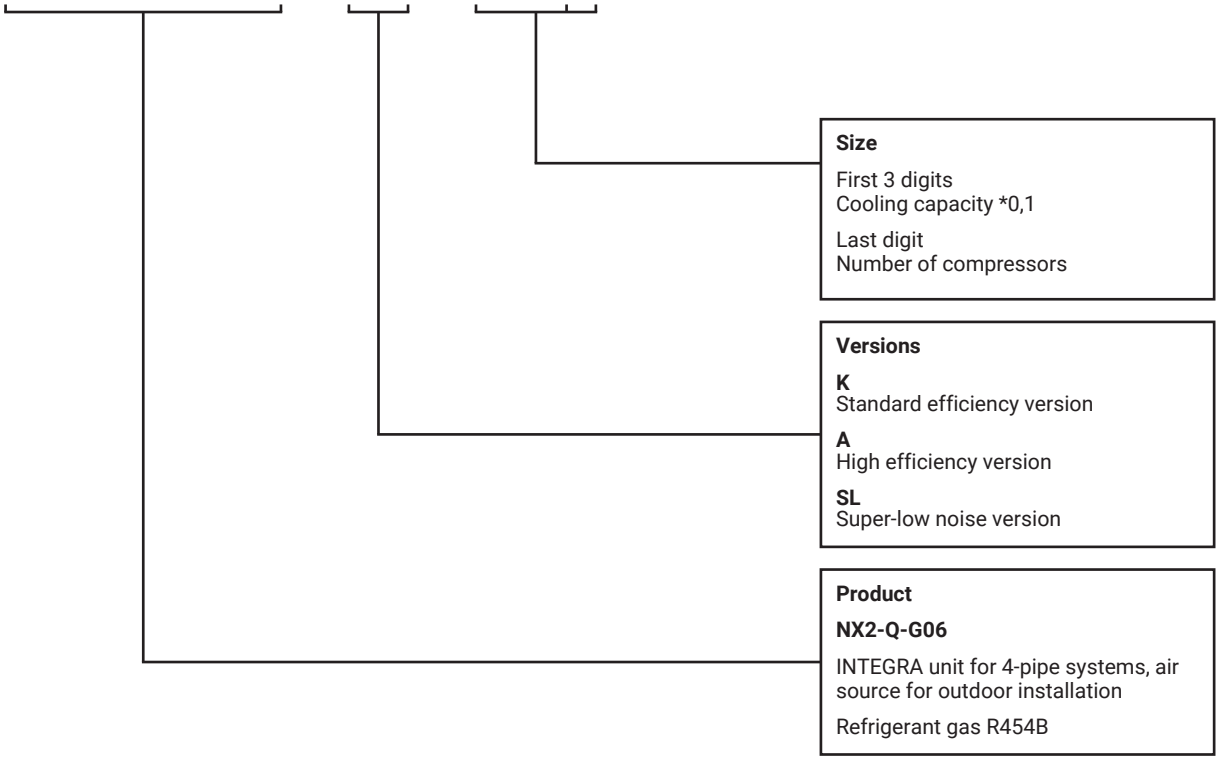
WIDE CAPACITY RANGE

Units equipped with up to 8 scroll compressors in multi-circuits configuration for a wide capacity range, up to 800 kW of cooling capacity.

PATENTED VENTILATION SECTION LAYOUT

Technological solution patented by MEHITS to ensure the independent operation of the circuits, reduce the unit's footprint and improve the efficiency at partial load both in heating mode and cooling mode.

NX2-Q-G06 / SL / 0546



5.1 Standard unit composition

INTEGRA unit for 4-pipe systems, air source for outdoor installation

Multi-purpose outdoor unit for use in 4-pipe systems for the simultaneous production of hot and chilled water by means of two independent hydronic circuits. These units are able to satisfy the demand for hot and cold water simultaneously through a system that does not require seasonal switching and is therefore a valid alternative to traditional plants with chiller and boiler. This unit is equipped with hermetic rotary Scroll compressors, with R454B, axial fans, shell and tube heat exchangers and electronic expansion valve. The range is composed of units equipped with four, six, and eight compressors in a multi-circuit configuration.

The unit is supplied fully refrigerant charged and factory tested. On site installation only requires power and hydraulic connection.

Structure

Structure specifically designed for outdoor installation. Basement and frame in hot-galvanised shaped sheet steel with a suitable thickness. All parts polyester-powder painted to assure total weather resistance.

Refrigerant circuit

Main components of the cooling circuit:

- R454B refrigerant
- two to four circuits with tandem compressors for each circuit
- multi-circuit shell and tubes heat exchangers
- anti-freeze heaters on both heat exchangers
- differential pressure switch, water side
- liquid line shut-off valve
- drier filter with replaceable cartridge
- refrigerant line sight glass with humidity indicator
- electronic expansion valve
- high and low pressure transducers
- high and low pressure gauges
- high and low pressure safety valve
- Liquid receivers
- High pressure switches
- crankcase heater on each compressor
- 4-way reverse cycle valve

R454B REFRIGERANT

The refrigerant used in these units is R454B, one of the most eco-sustainable refrigerants for replacing traditional R410A, thanks to the 76% lower GWP.
Unlike R410A, R454B is classified as A2L according to ISO 817. The first digit defines toxicity (A: NON-TOXIC), while the last digits define the flammability level (2L: MILDLY FLAMMABLE - low burning velocity). It is classified by PED Directive into Group 1.
The main characteristics of this refrigerant and some additional guidelines are reported below. Despite the minimal risk, the indications provided cannot replace a more detailed risk analysis if required, also based on any regulations in force in the installation area.
Further and more detailed guidelines are available in the dedicated area of the website www.melcohit.com (Guidelines) or in the dedicated addendum of the general installation and maintenance manual.
Main characteristics of R454B refrigerant:
- Safety classification (ASHRAE / ISO 817): A2L
- PED Group: 1
- Ozone Depletion Potential (ODP) (R11=1): 0
- AR5 (AR4) GWP (CO2=1): 467 (466)
- Composition (Wt %): 68,9% R32, 31,1% R1234yf
- LFL@23°C, 50% RH (% v/v): 11,7
- UFL@23°C, 50% RH (% v/v): 22,0
- Burning velocity (cm/s): 5,2
- Minimum Ignition Energy (mJ) (ASTM E582-13): 100-300

• All operations on the unit must be performed by trained and qualified personnel on flammable refrigerants handling, in accordance with the relevant local standards and codes of practice.
• The refrigerant is heavier than air and can stagnate, reaching a dangerous concentration. To avoid risks, maintain a safe environment by ensuring adequate ventilation.
• The units must be installed in such a way as to prevent any refrigerant leaks from flowing into the buildings or any place where it could cause damage to people, animals or properties. Pay particular attention to the presence and disposition of any external air intakes, doors, shutters, etc.
• The units are equipped with conveyed safety valves with external discharge. In case of over-pressure, refrigerant gas can escape from these valves: the discharge of these ducts must be directed towards safe areas and away from the ground or potential sources of ignition.
• Do not braze pipes and components containing refrigerant.
• Do not use flames to cut / open pipes.
• The units are equipped with a safety valve (water side). In case of breakage of the heat exchanger and resulting overpressure, refrigerant gas can escape from these valves: the discharge of these valves must be directed towards safe areas and away from the ground or potential sources of ignition.
• The hydraulic circuit must be designed in such a way as to prevent the release of refrigerant gas inside the buildings or in any case in places where it can cause damage to people, animals or properties.

Compressor

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

Plant side heat exchanger

Direct expansion multi-circuit shell and tube exchanger, it acts as an evaporator, 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. The shell & tube is manufactured using copper tubes with internal grooves for favouring heat exchange and mechanically expanded onto the tube plates. The heat exchanger may be inspected to facilitate cleaning operations when using particularly hard water (limestone). The heat exchanger is lined on the outside with 9 mm thick closed-cell neoprene lagging to prevent condensation, with a thermal conductivity of 0,33 W/mK at 0°C. The heat exchanger is fitted with a differential pressure switch to monitor the correct flow of water when the unit is operating, thus preventing ice form forming inside. An electric antifreeze heater prevents the ice from forming inside the exchanger when the unit is not working but connected to the electrical supply. The heat exchanger is provided with a safety pressure release valve (water side) (10 bar).

Plant side hot heat exchanger

Direct expansion multi-circuit shell and tube exchanger, it acts as a condenser, 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. The shell & tube is manufactured using copper tubes with internal grooves for favouring heat exchange and mechanically expanded onto the tube plates. The heat exchanger may be inspected to facilitate cleaning operations when using particularly hard water (limestone). The heat exchanger is lined on the outside with 9 mm thick closed-cell neoprene lagging to prevent condensation, with a thermal conductivity of 0,33 W/mK at 0°C. The heat exchanger is fitted with a differential pressure switch to monitor the correct flow of water when the unit is operating, thus preventing ice form forming inside. An electric antifreeze heater prevents the ice from forming inside the exchanger when the unit is not working but connected to the electrical supply. The heat exchanger is provided with a safety pressure release valve (water side) (10 bar).

Source side heat exchanger

Air-refrigerant heat exchager, working as a condenser or an evaporator depending to the specific operating mode. Made with copper tubes and aluminium fins. The aluminium fins are spaced to guarantee the best heat exchange efficiency.

Fan section source side

Axial electric fans protected to IP54 and with insulation class ´F´, featuring an external rotor and profiled blades. Housed in an aerodynamic hood complete with safety guard. The fan + outlet set satisfies the efficiency requirements provided for by EcoDesign directive 327/11.
Variable Speed low-temperature Device (DVV), as standard, to control condensation adjusting the rotational speed by phase-cut devices.

EC fans: Axial electronically commutated fans (EC fans), with external rotor, profiled die-cast aluminium blades, housed in aeodynamic hoods complete with guard grille. 6-poles electric motor with built-in thermal protection. The brushless motor, governed by a special controller, continuously adjust fans' speed to minimize energy consumption, electromagnetic noises and current's absorption even during start-up phase.
- Standard for version /A units from size 0606 to size 0808;
- Available as option for version /K units, version /SL units and all the others sizes /A.

Patented ventilation section layout

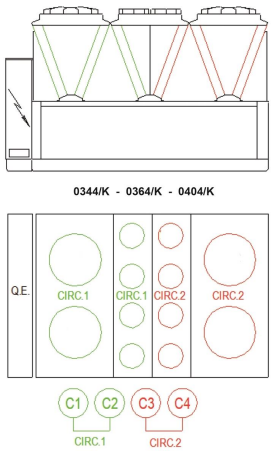
NX2-Q multiscroll units are available with a V-shaped modular frame where every module includes two finned coils.

Generally, the module is made up of a single row of 800mm-diameter fans, while in the case of NX2-Q units, to ensure the independent operation of the two coils, one or more modules can be made of two rows of 450mm-diameter fans separated by a vertical baffle.
In this way the independence of the circuits sharing the same “V” module is safeguarded during the operation at partial load and particularly during the defrost phase.

The advantages of this technological solution patented by MEHITS are:

- Increased part load efficiency both in summer and in winter
- Increased heating capacity thanks to the independent and not simultaneous defrost cycles
- Stable outlet water temperature delivered during defrosting
- Reduced footprint

This fans section configuration is available in the following NX2-Q models
Version K: 0344, 0364, 0404, 0446, 0506, 0526, 0546
Version SL: 0344, 0446, 0506, 0526
Version A: 0446



Features of the optional silenced units

Units with optional "acoustical enclosure" feature:
- Compressor enclosure with soundproofing insulation in polyester fiber mat (thickness of 30 mm on sides and on top, 15 mm on bottom)
- If the hydronic is present, the pump enclosure is acoustically insulated: 15 mm thick Fiberform (polyester fibres)

The super low noise (/SL) feature:
- Reduced fan speed
- Compressor enclosure with soundproofing insulation in polyester fiber mat (thickness of 30 mm on sides and on top, 15 mm on bottom)
- If the hydronic is present, the pump enclosure is acoustically insulated: 15 mm thick Fiberform (polyester fibres)

Electrical and control panel

Electrical and control panel built in accordance with EN60204-1 standard, complete with:

- Electronic control W3000+
- power circuit with electric bus bar distribution system
- fuses and contactors for compressors and fans
- auxiliary 4-20mA analogue input
- terminals for cumulative alarm block
- remote ON/OFF terminals
- general door lock isolator
- control circuit transformer
- Outdoor air temperature probe
- Phases sequence control
- spring-type control circuit terminal board
- Pump control relay + 0-10V modulating signal to control an external variable speed pump with the VPF.E control logic (plant-side constant ΔT for plants with primary circuit only and terminals with bypass)

Certification and applicable directives

The unit complies with the following directives and relative amendments:

- EUROVENT Certification program
- CE - Declaration of conformity certificate for the European Union
- Machinery Directive 2006/42/EC
- Pressure Equipment Directive 2014/68/EU
- 2014/30/EC EMC Directive
- ErP Directive 2009/125/EC

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 ISO9614.

5.2 Versions

/K - Key efficiency

Key efficiency units grant the best cooling capacity/footprint ratio.

/A - High efficiency

High efficiency units with minimum investment payback time. High performing heat exchangers and generous heat exchanger surfaces.

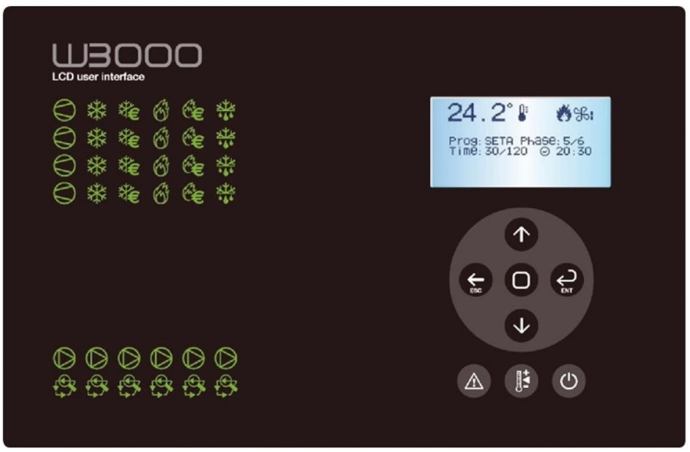
/SL - Super Low noise

This configuration features a special soundproofing for the compressor compartment and the pumps (if present), a reduced fan speed and an oversized condensing section.
The fan speed is automatically increased in case of particularly tough environmental conditions.

5.3 Electronic controller

Electronic control W3000+

The brand new W3000+ controller offers advanced functions and algorithms. The large keypad, as standard, features control function s and a complete LCD display for viewing data and activating the unit, via a multilevel menu, with settable display language. In addition to or as an alternative, KIPlink is available - Keyboard In Your Pocket - is the innovative user interface based on WiFi technology that allows one to operate on the unit directly from a smartphone or tablet. Using KIPlink, it is possible to turn the unit on and off, adjust the set-point, plot the main operating variables, monitor the status of the refrigerant circuits, the compressors, the fans and the pumps (if present) and display and reset the possible alarms. The regulation is based on the patented “Quickmind” water temperature regulation logic uses self-adapting control to maintain flow temperatures and optimise performance even in low water content scenarios. As an alternative, the proportional or proportional-integral regulations are also available. Diagnostics include complete alarm management, with “blackbox” functions (via PC) and alarm log (display or PC) for best analysis of unit behaviour. The built-in clock can be used to create an operating profile containing up to 4 typical days and 10 time bands, essential for efficient programming of energy production. Optional proprietary devices can perform the adjustment of the resources in multiple-unit systems. Consumption metering and performance measurement are possible as well. Supervision is available with different options, using proprietary devices or by integration into third party systems using Modbus, Lonworks, Bacnet MS/TP RS485, Bacnet over IP, Konnex, Modbus TCP/IP, SNMP protocols. A dedicated wall-mounted keypad can be used for remote control of all the functions.



Touch screen (option 6195)

As an alternative to the Compact keyboard, the unit can be equipped with the Touch interface, with a 7” WVGA colour display and a front USB port. The touch-screen's technology is characterized by an easy-to-access data, and it allows an effective graphical representation of the main figures protecting the access through 3 privilege levels.

KIPlink - Keyboard In your Pocket (option 6196)

KIPlink - Keyboard In Your Pocket - is the innovative user interface based on WiFi technology that allows one to operate on the unit directly from the smartphone or tablet. Using KIPlink, it is possible to turn the unit on and off, adjust the set-point, plot the main operating variables, monitor in detail the status of the refrigerant circuits, the compressors, the fans (if present) and the pumps (if present) and display and reset the possible alarms.

KIP LINK
Keyboard In your Pocket

Night mode (option 1430)

The night mode function allows to reduce the sound power of the unit, reducing the speed of the fans and the number of active compressors.

U.L.C. - User limit control (option 4960)

Guaranteed the start-up of the units with the option U.L.C. even when the critical working condition could generate an alarm.
The controller can manage a 3way mixing valve (not provided) by 0-10V signal for ensuring a dynamic control of the water temperature on user heat exchanger according to the operating limits allowed. This ensures the start-up and correct functioning of the unit into the envelope, also even critical whether condition.

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
1020 **REGULATIONS**			
1015 HEAT EXCHANGERS NSW CERTIFIED	Heat exchangers with SafeWork NSW certificate		ALL
1016 UNIT WITH PED RULES	Unit according to PED (Pressure Equipment Directive) rules		ALL
380 **NUMBERED WIRING**			
380			ALL
381 NUMBERED WIRING ON EL. BOARD	Electrical board wires are identified by numbered labels. The reference numbers are indicated in the unit's wiring scheme.	Facilitate maintainance interventions to the electrical board connections.	ALL
383 NUMBERED WIRINGS+UK REQUESTS	Electrical board wires are identified by numbered labels. The reference numbers are indicated in the unit's wiring scheme.	Facilitate maintainance interventions to the electrical board connections.	ALL
2410 **PHASE SEQUENCE RELAY**			
2411 WITH EXTERNAL PHASE SEQUENCE RELAY	Relay for checking mains phase-sequence	Protects loads against faults due to incorrect connection of mains	ALL
2412 PHASE SEQU. RELAY + OVER/UNDER VOLT. MONIT.	Relay for checking mains phase-sequence and voltage	The monitoring relay protects loads against faults due to incorrect connection of mains, and it monitors whether it exceeds or falls below a specified voltage in a three-phase network.	ALL
3410 **AUTOMATIC CIRCUIT BREAKERS**			
3412 AUTOM. CIRCUIT BREAK. ON LOADS	Over-current switch on the major electrical loads.	In case of overcurrent allows resetting of the switch without the replacement of relative fuses.	ALL
3600 **COMPRESSOR RUN STATUS SIGNAL**			
3601 COMPRESSOR OPERATION SIGNAL	Auxiliary contacts providing a voltage-free signal.	Allows remote signalling of compressor's activation or remote control of any auxiliary loads.	ALL
4180 **REMOTE CONNECTION ARRANGEMENT**			
4181 SERIAL CARD MODBUS	Interface module for ModBUS protocols.	Allows integration with BMS operating with ModBUS protocol.	ALL
4182 SERIAL CARD FOR LONWORKS	Interface module for Echelon systems.	Allows integration with BMS operating with LonWorks protocols	ALL
4184 SERIAL CARD BACNET MS/TP RS485	Interface module for BACnet protocols.	Allows integration with BMS operating with BACnet protocol.	ALL
4185 SERIAL CARD FOR BACNET OVER IP	Interface module for BACnet OVER-IP protocols.	Allows to interconnect BACnet devices over Internet Protocol within wide-area networks.	ALL
4186 SERIAL CARD FOR KONNEX	Protocol for KNX system	Allows integration with BMS operating with KNX protocol	ALL
4188 SERIAL CARD MODBUS TCP/IP	Interface module for ModBus TCP/IP protocol	Allows integration with BMS operating with ModBus TCP/IP protocol.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4189 SERIAL CARD SNMP	Interface module for SNMP protocol	Allows integration with BMS operating with SNMP protocol.	ALL
6160 **AUXILIARY INPUT**			
6161 AUXILIARY SIGNAL 4-20mA	4-20 mA analog input	Allows to change the operating set-point according to the value of current applied to the analogue input.	ALL
6162 REMOTE SIGNAL DOUBLE SP	Allows to activate the Energy Saving set-point.	Allows to change the operating set-point according to a remote switch	ALL
6170 **DEMAND LIMIT**			
6171 INPUT REMOTE DEMAND LIMIT	Digital input (voltage free)	It permits to limit the unit's power absorption for safety reasons or in temporary situation.	ALL
1470 **MULTIFUNCTION CARD**			
1431 NIGHT MODE	The option includes a related controller expansion board and dedicated terminal block.	Night mode is a system setting to limit maximum noise level of the unit. Noise level is reduced limiting maximum compressor frequency and fan speed.	ALL
1471 4951 + 1431	The option includes a related controller expansion board and dedicated terminal block.	Enables the functions corresponding to the indicated accessory codes.	ALL
1472 4951 + 1431 + 4961	The option includes a related controller expansion board and dedicated terminal block (it is necessary to install a 3 way valve).	Enables the functions corresponding to the indicated accessory codes.	ALL
1473 4951 + 4961	The option includes a related controller expansion board and dedicated terminal block (it is necessary to install a 3 way valve).	Enables the functions corresponding to the indicated accessory codes.	ALL
1474 1431 + 4961	The option includes a related controller expansion board and dedicated terminal block (it is necessary to install a 3 way valve).	Enables the functions corresponding to the indicated accessory codes.	ALL
1475 4962 + 4951	The option includes a related controller expansion board and dedicated terminal block (it is necessary to install a 3 way valve).	Enables the functions corresponding to the indicated accessory codes.	ALL
1476 4962 + 1431	The option includes a related controller expansion board and dedicated terminal block (it is necessary to install a 3 way valve).	Enables the functions corresponding to the indicated accessory codes.	ALL
1477 4962 + 4951 + 1431	The option includes a related controller expansion board and dedicated terminal block (it is necessary to install a 3 way valve).	Enables the functions corresponding to the indicated accessory codes.	ALL
4951 WITH HYDRAULIC DECOUPLER PROBE	Water temperature probe on hydraulic decoupler.	The pump activation can be set by parameter according to the water temperature on buffer tank measuring by the sensor (in the systems with the primary and secondary circuits separated by a hydraulic decoupler), thus bringing significant pump consumption reduction during unit's stand-by.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4961 U.L.C.F. - WITH OR WITHOUT FIX SPEED PUMP	Option to be selected with the unit without pump/s or with fix speed pump/s (4703,4706,4707,4711,4712). The option includes a related controller expansion board and dedicated terminal block.	Guaranteed the start-up of the units with the option U.L.C. even when the critical working condition could generate an alarm. The W3000+ controller can manage a 3 way mixing valve (not provided from MEHITS) by 0-10V signal for ensuring a dynamic control of the water temperature on user heat exchanger according to the operating limits allowed. This ensures the start-up and correct functioning of the unit into the envelope, also even critical whether condition.	ALL
4962 U.L.C.F. - WITH VARIABLE WATER FLOW	Option to be selected with the unit with variable speed pump/s (4713,4714,4717,4718,4722,4723). The option includes a related controller expansion board and dedicated terminal block.	Guaranteed the start-up of the units with the option U.L.C. even when the critical working condition could generate an alarm. The W3000+ controller can manage a 3 way mixing valve (not provided from MEHITS) by 0-10V signal for ensuring a dynamic control of the water temperature on user heat exchanger according to the operating limits allowed. This ensures the start-up and correct functioning of the unit into the envelope, also even critical whether condition.	ALL
1510 **SOFT-STARTER**			
1511 UNIT WITH SOFT-START	Electronic device adopted to manage the inrush current. The device controls 2 phases.	Break down of the inrush current compared to the direct motor start, lower motor windings' mechanical wear, avoidance of mains voltage fluctuations during starting, favourable sizing for the electrical system.	ALL
3300 **COMPRESSOR REPHASING**			
3301 COMPR.POWER FACTOR CORR.	Capacitors on the compressors' power inlet line.	The unit's average cos(phi) increases.	ALL
1440 **USER INTERFACE**			
1442 KIPlink +7 INCH TOUCH SCREEN	In addition to KIPlink, the innovative user interface based on WiFi technology, the unit is equipped with the Touch interface, with a 7" WVGA colour display and a front USB port (WARNING: with outdoor temperature below 0°C the display response time may visibly increase).		ALL
1444 KIPlink + LARGE KEYBOARD	The unit is equipped with KIPlink, the innovative user interface based on WiFi technology, and, in addition, the physical LCD keyboard.		ALL
6194 LARGE KEYBOARD	The unit is equipped with the Large keyboard with a wide LCD display and led icons.		ALL
6195 7 INCH TOUCH SCREEN	The unit is equipped with the Touch interface, with a 7" WVGA colour display and a front USB port (WARNING: with outdoor temperature below 0°C the display response time may visibly increase).	The touch-screen's technology is characterized by an easy-to-access data, and it allows an effective graphical representation of the main figures protecting the access through 3 privilege levels.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
6196 KIPlink	The unit is equipped with KIPlink, the innovative user interface based on WiFi technology		ALL
6310 **VISUAL DISPLAY PROTECTION**			
6311 WITH DISPLAY PROTECTION	Display protection sealed panel	Provide complete protection against UV rays, atmospheric agents, sand storms.	ALL
5920 **MANAGEMENT & CONTROL SYSTEMS**			
5922 ClimaPRO ModBUS RS485 - MID	This option includes the following devices on-board the unit panel: - MID certified network analyzer operating on ModBUS over RS-485 - Current transformers - Software release LA09 or later version.	This accessory allows to acquire the electrical data and the power absorbed by the unit and communicate with ClimaPRO via high level communication interface based on ModBUS over EIA RS-485. More specifically, the data collected are: power supply, current, frequency, power factor (cos), electrical power consumption, energy consumption. This specific energy meter model is MID certified and can therefore be used for billing applications. This option also ensures the compatibility between the units and ClimaPRO, thus allowing ClimaPRO to acquire all the main unit's operating variables and status by means of a high level communication interface to the controller installed onboard the unit panel.	ALL
5923 ClimaPRO BacNET over IP	This option includes the following devices on-board the unit panel: - network analyzer operating on BACnet over IP - Current transformers - Software release LA09 or later version.	This accessory allows to acquire the electrical data and the power absorbed by the unit and communicate with ClimaPRO via high level communication interface based on BACnet over IP. More specifically, the data collected are: power supply, current, frequency, power factor (cos), electrical power consumption, energy consumption. This network analyzer is not MID certified and cannot therefore be used for billing applications. This option also ensures the compatibility between the units and ClimaPRO, thus allowing ClimaPRO to acquire all the main unit's operating variables and status by means of a high level communication interface to the controller installed onboard the unit panel.	ALL
5924 ENERGY METER FOR BMS	This option includes the following devices on-board the unit panel: - network analyzer with display operating on ModBUS protocol over RS-485 (without certification MID) - current transformers.	This accesory allows to acquire the electrical data and the power absorbed by the unit and send them via RS-485 bus to the BMS for energy metering.	ALL
5925 ENERGY METER FOR W3000	This option includes all following devices on-board the unit panel: - network analyzer with display, already cabled to unit's controller - current transformers.	This option allows to acquire the electrical data and the power absorbed by the unit. The figures are accessible through the unit's W3000 interface, and be sent to the BMS via several protocols by selecting the dedicated serial card in the option list.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
5940 **SETP. COMPENSATION OUT. TEMP.**			
5941 WITH SETPOINT COMPENSATION	This option includes an outside air sensor to be installed outside the building and enable the climatic curve function.	An outside air temperature probe, available as option, controls the system water temperature set point based on heating and cooling (reversible units) climatic curves. Delivering water at different temperatures to the terminals based on the outside air temperature achieves high seasonal efficiency ratios and provides considerable savings in running costs.	ALL
3390 **ANTICONDENSATE HEATER EL.BOARD**			
3391 ELECTRIC HEATER ON EL. BOARD	Electrical heater fed directly from the unit, is automatically activated at temperatures internal QE below 30 ° C (off state at T higher than 40 ° C).	It avoids the risk of humidity condensation on the electrical panel.	ALL
3430 **REFRIGERANT LEAK DETECTOR**			
3431 REFRIG. LEAK DETECTOR	Refrigerant leak detection system, supplied factory mounted and wired in the electrical board. In case of leak detection it will raise an alarm.	It promptly detects gas leakages	ALL
3433 GAS LEAK CONTACT + COMPR. OFF	Refrigerant leak detection system, supplied factory mountedand wired in the electrical board. In case of leak detection it will raise an alarm and stop the unit.	It promptly detects gas leakages and stops the unit	ALL
1400 **HP AND LP GAUGES**			
1401 HP AND LP GAUGES	High and low pressure gauges	Allows immediate reading of the pressure values on both low and high pressure circuits	ALL
5040 **COMPRESSOR SUCTION AND DISCHARGE VALVE**			
5040 COMPRESSOR SUCTION AND DISCHARGE VALVE			ALL
5042 COMPRESSOR SUCTION AND DISCHARGE VALVE	Shut-off valve on compressor's suction and discharge circuit.	Simplifies maintenance activities	ALL
1960 **PRESSURE RELIEF VALVES**			
1961 DUAL RELIEF VALVES WITH SWITCH	Dual relief valve with switch	Allows to unselect a relief valve in order to service the unit avoiding medium or long inoperative periods	ALL
890 **CONDENSING COIL**			
880			ALL
881 Cu/Cu EXTERNAL COIL	Finned coil heat exchanger made from suitably-spaced copper tubes and fins designed to ensure maximum heat exchange efficiency.	This type of coil is not subject to galvanic corrosion, being made from just one material. For further information please refer to the Guidelines “Finned coil heat exchangers and protection against corrosion”, available in the download section of the website www.melcohit.com/EN/Download/Corporate/GUIDELINES or contact our sales department.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
894 Cu PIPES/PREPAINTED ALL. FINS	Finned coil heat exchanger made from copper tubes and aluminum fins with chemical cleaning treatment to remove impurities, and then coated with protective paint with the following characteristics: - fins treated with protective polyester resin paint; - over 1000 hours of salt spray protection as per ASTM B117 (fins without cross and protected edges); - excellent resistance to UV rays.	Provide a good resistance against corrosion. For further information please refer to the Guidelines “Finned coil heat exchangers and protection against corrosion”, available in the download section of the website www.melcohit.com/EN/Download/Corporate/GUIDELINES or contact our sales department.	ALL
895 FIN GUARD SILVER TREATM	Copper-aluminum heat exchanger coils with polyurethane paint Fin Guard Silver SB. Coil completely coated by a protective layer of polyurethane paint with the following characteristics: - polyurethane paint with metallic emulsion; - over 3000 hours of salt spray protection as per ASTM B117; - excellent resistance to UV rays; - high-pressure spray painting system.	Provides a very high resistance against corrosion, also in very aggressive environments. For further information please refer to the Guidelines “Finned coil heat exchangers and protection against corrosion”, available in the download section of the website www.melcohit.com/EN/Download/Corporate/GUIDELINES or contact our sales department.	ALL
1260 **DRAIN TRAY**			
1261 DRAIN TRAY HEATED	The option includes the drain tray equipped with an antifreeze electric heater.	This option collects condensation and avoids the water freezing with a outdoor air temperature close to 0°C or lower.	ALL
820 **FAN CONTROL**			
802 VAR.FAN SPEED LOW AMB.CONTROL	Fan speed control according to the condensing pressure; the use of this device is mandatory in case the unit operates with low evaporator leaving water temperature combined with low outdoor air temperatures	Extension of the unit operating range (see the section dedicated to the operating limits). The device allows the unit to operate in the most extreme conditions avoiding any risk of low pressure alarm intervention. The enhanced air flow management delivers also benefits in terms of both efficiency and quietness.	ALL
808 EC FANS	Electronically commutated fans (EC fans). The brushless motor, governed by a special controller, continuously adjust fans' speed.	Reduced energy consumption and minimized current's absorption during start-up phase with a connected increased efficiency. The noise reduces proportionally to the unit's partialization.	ALL
4700 **EV - HYDRONIC MODULE**			
4706 EV - 1 PUMP 2P LH (FIX SPEED)	Evaporator hydronic module, compatible with constant flow control. The unit is provided with 1 fixed speed pump, with 2-pole motor. Residual head of 100 kPa approximately. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4707 EV - 1 PUMP 2P HH (FIX SPEED)	Evaporator hydronic module, compatible with constant flow control. The unit is provided with 1 fixed speed pump, with 2-pole motor. Residual head of 200 kPa approximately. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4711 EV - 2 PUMPS 2P LH (FIX SPEED)	Evaporator hydronic module, compatible with constant flow control. The unit is provided with 2 fixed speed pumps, with 2-pole motor. Residual head of 100 kPa approximately. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4712 EV - 2 PUMPS 2P HH (FIX SPEED)	Evaporator hydronic module, compatible with constant flow control. The unit is provided with 2 fixed speed pumps, with 2-pole motor. Residual head of 200 kPa approximately. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4713 EV - RELAY 1 PUMP + 0-10V SIG	Evaporator hydronic module, compatible with constant or variable flow control. The unit is provided with 1 relay and a 0-10V signal terminal to control the activation and the speed of 1 external variable speed pump.	The hydronic module controls the external pumps with the unit controller logic.	ALL
4714 EV - RELAY 2 PUMPS + 0-10V SIG	Evaporator hydronic module, compatible with constant or variable flow control. The unit is provided with 2 relays and a 0-10V signal terminal to control the activation and the speed of 2 external variable speed pump. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure.	The hydronic module controls the external pumps with the unit controller logic.	ALL
4717 EV - 1 PUMP 2P LH (VAR SPEED)	Evaporator hydronic module, compatible with constant or variable flow control. The unit is provided with 1 variable speed pump, with 2-pole motor. Residual head of 100 kPa approximately. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4718 EV - 1 PUMP 2P HH (VAR SPEED)	Evaporator hydronic module, compatible with constant or variable flow control. The unit is provided with 1 variable speed pump, with 2-pole motor. Residual head of 200 kPa approximately. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4722 EV - 2 PUMPS 2P LH (VAR SPEED)	Evaporator hydronic module, compatible with constant or variable flow control. The unit is provided with 2 variable speed pumps, with 2-pole motor. Residual head of 100 kPa approximately. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4723 EV - 2 PUMPS 2P HH (VAR SPEED)	Evaporator hydronic module, compatible with constant or variable flow control. The unit is provided with 2 variable speed pumps, with 2-pole motor. Residual head of 200 kPa approximately. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4760 **CD - HYDRONIC MODULE**			
4766 CD - 1 PUMP 2P LH (FIX SPEED)	Condenser hydronic module, compatible with constant flow control. The unit is provided with 1 fixed speed pump, with 2-pole motor. Residual head of 100 kPa approximately. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4767 CD - 1 PUMP 2P HH (FIX SPEED)	Condenser hydronic module, compatible with constant flow control. The unit is provided with 1 fixed speed pump, with 2-pole motor. Residual head of 200 kPa approximately. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4771 CD - 2 PUMPS 2P LH (FIX SPEED)	Condenser hydronic module, compatible with constant flow control. The unit is provided with 2 fixed speed pumps, with 2-pole motor. Residual head of 100 kPa approximately. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4772 CD - 2 PUMPS 2P HH (FIX SPEED)	Condenser hydronic module, compatible with constant flow control. The unit is provided with 2 fixed speed pumps, with 2-pole motor. Residual head of 200 kPa approximately. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4773 CD - RELAY 1 PUMP + 0-10V SIG	Condenser hydronic module, compatible with constant or variable flow control. The unit is provided with 1 relay and a 0-10V signal terminal to control the activation and the speed of 1 external variable speed pump.	The hydronic module allows to control the external pumps with the unit controller logic. In case of water cooled chiller, the 0-10V signal, it allows to manage several condensing devices in order to maintain the condensing pressure in a pre-defined range in every applications: - for well water application to manage a 2 way modulating valve; - for cooling tower application to manage a 3 way modulation valve; - for dry-cooler or cooling tower application to modulate the fans' speed.	ALL
4774 CD - RELAY 2 PUMPS + 0-10V SIG	Condenser hydronic module, compatible with constant or variable flow control. The unit is provided with 2 relays and a 0-10V signal terminal to control the activation and the speed of 2 external variable speed pump. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure.	The hydronic module allows to control the external pumps with the unit controller logic. In case of water cooled chiller, the 0-10V signal, it allows to manage several condensing devices in order to maintain the condensing pressure in a pre-defined range in every applications: - for well water application to manage a 2 way modulating valve; - for cooling tower application to manage a 3 way modulation valve; - for dry-cooler or cooling tower application to modulate the fans' speed.	ALL
4777 CD - 1 PUMP 2P LH (VAR SPEED)	Condenser hydronic module, compatible with constant or variable flow control. The unit is provided with 1 variable speed pump, with 2-pole motor. Residual head of 100 kPa approximately. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4778 CD - 1 PUMP 2P HH (VAR SPEED)	Condenser hydronic module, compatible with constant or variable flow control. The unit is provided with 1 variable speed pump, with 2-pole motor. Residual head of 200 kPa approximately. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4782 CD - 2 PUMPS 2P LH (VAR SPEED)	Condenser hydronic module, compatible with constant or variable flow control. The unit is provided with 2 variable speed pumps, with 2-pole motor. Residual head of 100 kPa approximately. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4783 CD - 2 PUMPS 2P HH (VAR SPEED)	Condenser hydronic module, compatible with constant or variable flow control. The unit is provided with 2 variable speed pumps, with 2-pole motor. Residual head of 200 kPa approximately. The pumps are controlled in duty/standby, with running hours equalization and changeover on device failure. Specifications and characteristic curves are available in the dedicated bulletin section.	The hydronic module includes the pumps and the main water circuit components, thus optimizing hydraulic and electrical installation space, time and costs.	ALL
4860 **EV - PRIMARY FLOW CONTROL**			
4861 EV - CONSTANT FLOW	Evaporator water flow control (plant primary circuit): constant flow. Compatible with hydronic modules without regulation devices (no pumps, no contacts), with ON/OFF regulation devices (relays) or with fixed speed pumps (codes: 4701, 4702, 4703, 4704, 4705, 4706, 4707, 4708, 4709, 4711, 4712 - hydronic modules availability depends on unit model).	The unit is set up to operate with a constant water flow in the heat exchanger (plant primary circuit). This is the only option available in case of unit without any water flow regulation devices (no pumps, no contacts), which means with water flow control provided by others. In case of unit with ON/FF regulation devices or fixed speed pumps, the unit controller manages the pump activation to reduce pump consumption.	ALL
4862 EV - CONSTANT FLOW (PARAMETER)	Evaporator water flow control (plant primary circuit): constant flow (parameter set). Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model).	The unit is set up to operate with a constant water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides the possibility to set the pump speed with a controller parameter. Once set, the speed pump remains constant until the next parameter adjustment. The parameter set constant flow control is useful during the unit installation and commissioning, to adjust water flow and pressure head according to the real plant characteristics.	ALL
4864 EV – VPF (w/o DP)(SU, MM_PR)	Evaporator water flow control (plant primary circuit): variable flow (delta P control). Only for single unit systems or unit with option 1541 (Multi Manager - Priority Master) if available. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). The option includes: differential pressure transducer on the unit's heat exchanger and related controller expansion board, controller expansion board to read the plant side differential pressure transducer (4-20mA signal) and manage the hydraulic by-pass valve opening (0-10V signal). Compulsory equipment, supplied by others: plant side differential pressure transducer, plant side hydraulic by-pass valve.	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF (Variable Primary Flow) function. It keeps the delta P constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF function is applicable in systems with only the primary circuit. Further information available in the dedicated bulletin section.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4865 EV – VPF (w DP)(SU, MM_PR)	Evaporator water flow control (plant primary circuit): variable flow (delta P control). Only for single unit systems or unit with option 1541 (Multi Manager - Priority Master) if available. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). The option includes: differential pressure transducer on the unit's heat exchanger and related controller expansion board, plant side differential pressure transducer (installation by others), controller expansion board to read the plant side differential pressure transducer (4-20mA signal) and manage the hydraulic by-pass valve opening (0-10V signal). Compulsory equipment, supplied by others: plant side hydraulic by-pass valve.	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF (Variable Primary Flow) function. It keeps the delta P constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF function is applicable in systems with only the primary circuit. Further information available in the dedicated bulletin section.	ALL
4866 EV – VPF (M3000, CPRO, MM_N-PR)	Evaporator water flow control (plant primary circuit): variable flow (delta P control). Only for multi-unit systems with external controller (Manager3000 or ClimaPRO) or unit with option 1542 (Multi Manager - Non Priority Master) if available. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). The option includes: differential pressure transducer on the unit's heat exchanger and related controller expansion board. It shall be the customer responsibility to configure the multi-unit control system (Manager3000, ClimaPRO or Multi Manager Priority Master) with option VPF.	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF (Variable Primary Flow) function. It keeps the delta P constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF function is applicable in systems with only the primary circuit. Further information available in the dedicated bulletin section.	ALL
4867 EV - VPF.D (SU, MM_PR)	Evaporator water flow control (plant primary circuit): variable flow (delta T control). Only for single unit systems or unit with option 1541 (Multi Manager - Priority Master) if available. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). The option includes: 2 plant side NTC temperature sensors (installation by others).	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF.D (Variable Primary Flow with Decoupler) function. It keeps the delta T constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF.D function is applicable in systems with the primary and secondary circuits separated by a hydraulic decoupler. Further information available in the dedicated bulletin section.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4868 EV - VPF.D(M3000, CPRO, MM_N-PR)	Evaporator water flow control (plant primary circuit): variable flow (delta T control). Only for multi-unit systems with external controller (Manager3000 or ClimaPRO) or unit with option 1542 (Multi Manager - Non Priority Master) if available. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). It shall be the customer responsibility to configure the multi-unit control system (Manager3000, ClimaPRO or Multi Manager - Priority Master) with option VPF.D.	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF.D (Variable Primary Flow with Decoupler) function. It keeps the delta T constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF.D function is applicable in systems with the primary and secondary circuits separated by a hydraulic decoupler. Further information available in the dedicated bulletin section.	ALL
4869 EV - VPF.E	Evaporator water flow control (plant primary circuit): variable flow (delta T control). Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model).	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF.E function. It keeps the delta T constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF.E function is applicable in systems with only the primary circuit and with the hydraulic terminals equipped 3 way valve (by-pass). Further information available in the dedicated bulletin section.	ALL
4890 **CD - PRIMARY FLOW CONTROL**			
4891 CD - CONSTANT FLOW	Condenser water flow control (plant primary circuit): constant flow. Compatible with hydronic modules without regulation devices (no pumps, no contacts), with ON/OFF regulation devices (relays) or with fixed speed pumps (codes: 4701, 4702, 4703, 4704, 4705, 4706, 4707, 4708, 4709, 4711, 4712 - hydronic modules availability depends on unit model).	The unit is set up to operate with a constant water flow in the heat exchanger (plant primary circuit). This is the only option available in case of unit without any water flow regulation devices (no pumps, no contacts), which means with water flow control provided by others. In case of unit with ON/FF regulation devices or fixed speed pumps, the unit controller manages the pump activation to reduce pump consumption.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4892 CD - CONSTANT FLOW (PARAMETER)	Condenser water flow control (plant primary circuit): constant flow (parameter set). Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model).	The unit is set up to operate with a constant water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides the possibility to set the pump speed with a controller parameter. Once set, the speed pump remains constant until the next parameter adjustment. The parameter set constant flow control is useful during the unit installation and commissioning, to adjust water flow and pressure head according to the real plant characteristics.	ALL
4894 CD - VPF (plant DP trans excl)	Condenser water flow control (plant primary circuit): 2 pump speeds. Only for free-cooling units. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model).	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF (Variable Primary Flow) function. It keeps the delta P constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF function is applicable in systems with only the primary circuit. Further information available in the dedicated bulletin section.	ALL
4895 CD - VPF (plant DP trans incl)	Condenser water flow control (plant primary circuit): variable flow (delta P control). Only for single unit systems. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). The option includes: differential pressure transducer on the unit's heat exchanger and related controller expansion board, controller expansion board to read the plant side differential pressure transducer (4-20mA signal) and manage the hydraulic by-pass valve opening (0-10V signal). Compulsory equipment, supplied by others: plant side differential pressure transducer, plant side hydraulic by-pass valve.	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF (Variable Primary Flow) function. It keeps the delta P constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF function is applicable in systems with only the primary circuit. Further information available in the dedicated bulletin section.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4896 CD - VPF MULTI-UNIT SYSTEM	Condenser water flow control (plant primary circuit): variable flow (delta P control). Only for single unit systems. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). The option includes: differential pressure transducer on the unit's heat exchanger and related controller expansion board, plant side differential pressure transducer (installation by others), controller expansion board to read the plant side differential pressure transducer (4-20mA signal) and manage the hydraulic by-pass valve opening (0-10V signal). Compulsory equipment, supplied by others: plant side hydraulic by-pass valve.	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF (Variable Primary Flow) function. It keeps the delta P constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF function is applicable in systems with only the primary circuit. Further information available in the dedicated bulletin section.	ALL
4897 CD - VPF.D	Condenser water flow control (plant primary circuit): variable flow (delta P control). Only for multi-unit systems. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). The option includes: differential pressure transducer on the unit's heat exchanger and related controller expansion board. It shall be the customer responsibility to configure the multi-unit control system (Manager3000 or ClimaPRO) with option VPF.	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF.D (Variable Primary Flow with Decoupler) function. It keeps the delta T constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF.D function is applicable in systems with the primary and secondary circuits separated by a hydraulic decoupler. Further information available in the dedicated bulletin section.	ALL
4898 CD - VPF.D MULTI-UNIT SYSTEM	Condenser water flow control (plant primary circuit): variable flow (delta T control). Only for single unit systems. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). The option includes: 2 plant side NTC temperature sensors (installation by others).	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF.D (Variable Primary Flow with Decoupler) function. It keeps the delta T constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF.D function is applicable in systems with the primary and secondary circuits separated by a hydraulic decoupler. Further information available in the dedicated bulletin section.	ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
4899 CD - VPF.E	Condenser water flow control (plant primary circuit): variable flow (delta T control). Only for multi-unit systems. Compatible with hydronic modules with modulating regulation devices (0-10V signal) or with variable speed pumps (codes: 4713, 4714, 4715, 4716, 4717, 4718, 4719, 4721, 4722, 4723 - hydronic modules availability depends on unit model). It shall be the customer responsibility to configure the multi-unit control system (Manager3000 or ClimaPRO) with option VPF.D.	The unit is set up to operate with a variable water flow in the heat exchanger (plant primary circuit). The unit controller manages the pump activation to reduce pump consumption. The pump speed is adjusted via 0-10V signal. The option provides a pump speed management based on the VPF.E function. It keeps the delta T constant on the plant side (primary circuit), thus bringing significant pump consumption reduction during part load operation. The VPF.E function is applicable in systems with only the primary circuit and with the hydraulic terminals equipped 3 way valve (by-pass). Further information available in the dedicated bulletin section.	ALL
2020 **ANTI-INTRUSION GRILLS**			
2021 ANTI-INTRUSION GRILLS	Anti-intrusions grills	Avoid the intrusion of solid bodies into the unit's structure.	ALL
2290 **UNIT ENCLOSURE**			
2311 UNIT WITH ENCLOSURE	Compressor enclosure and pump group enclosure (if present)	Protects the main components of the unit	ALL
2312 UNIT WITH ACOUSTICAL ENCLOSURE	Compressor enclosure with soundproofing insulation in polyester fiber mat (thickness of 30 mm on sides and on top, 15 mm on bottom) If the hydronic is present, the pump enclosure is acoustically insulated: 15 mm thick Fiberform (polyester fibres)	Protects the main components of the unit and reduces the noise emissions	ALL
1980 **ENCLOSURE PANELS**			
1981 SIDE PANELS ON THE COILS	Metallic panels on the side of the coils that cover piping and headers.	Improve protection and aesthetics.	ALL
1970 **LONG DISTANCE TRANSPORTATION**			
1971 REINFORCING BARS	Bars used to reinforce the structure	Improve resistance during long transportation	ALL
9970 **PACKING**			
9971 WITHOUT PACKAGING	Unit provided with plastic supports		ALL
9972 WOODEN BOX PACKING	Unit provided with wooden box		ALL
9973 WOODEN CAGE PACKING	Unit provided with wooden cage		ALL
9974 MARINE PACKING	Unit provided with barrier bag and wooden cage		ALL
9979 CONTAINER PACKING	Unit provided with container slides and covered with nylon		ALL
9996 CONTAINER SLIDES	Unit provided with container slides		ALL
9999 SUPPORTS AND NYLON	Unit provided with plastic supports and covered with nylon		ALL

OPTIONS	DESCRIPTIONS	BENEFITS	AVAILABLE FOR MODELS
AC01 **ACCESSOR. SUPPLIED SEPARATELY**			
AC01 EVAPORATOR WATER FLOWSWITCH	Flow switch with stainless scoop AISI 316L and IP65 protection suitable for installation in industrial plant pipes. It should be installed in a straight pipe without filters, valves, etc., long at least 5 times its diameter, both upstream and downstream.	Signaling of lack of or excessive reduction of flow, it generates an alarm that is in automatic or manual reset depending on n ° alarms per hour and the maximum time of operation of the pump under conditions of low flow rate.	ALL
AC04 RUBBER TYPE ANTIVIBR.MOUNTING			ALL
AC05 SPRING TYPE ANTIVIBR.MOUNTING			ALL

6.2 Options - Additional information

2312 - Unit with acoustical enclosure

Compressor compartment soundproofing insulation characteristics: polyester fiber mat (thickness of 30 mm on sides and on top, 15 mm on bottom). Pump/s soundproofing insulation characteristics:
15 mm thick Fiberform (polyester fibers).
Noise power reduction: -2 dB(A).

3301 – Compressor power factor correction
1511 – Soft starter

There is a mutual exclusion rule between the compressor rephasing condensers and the soft start device. When both accessories are required together, a feasibility analysis is needed. If the configuration is available as a special execution, an extra-price may be quoted.

3431 – Refrigerant leak detector
3433 – Refrigerant leak detector + compressors off

The purpose of these options is to check and raise an alarm whether a leak occurs; they should not be considered as safety devices.

4951 – With hydraulic decoupler probe
4961 – U.L.C.F. - with or without fix speed pump
4962 – U.L.C.F. - with variable water flow

The accessories are available both at the cold side and hot side.

1431 – Night mode

With factory settings, the noise reduction achieved is: -3 dB(A).

808 – EC Fans
9979 – Container packing
9996 – Container slides

The selection of option 808 - EC fans implies an increasing of the unit's height for the following sizes:
Version K: 0344, 0364, 0404, 0446, 0506, 0526, 0546
Version SL: 0344, 0446, 0506, 0526
Version A: 0446
The final height including container slides is 2565mm.

1261 – Drain tray heated

The selection of this option is mandatory when the outdoor air temperature is ≤0°C.

Chiller Plant Control with Active Optimization System

ClimaPRO System Manager

ClimaPRO System Manager represents the state-of-the-art platform for chiller plant management and control.
ClimaPRO ensures to actively optimize the entire chiller plant by managing and adjusting each component directly involved in the production and the distribution of the heating and the cooling energies, therefore involving chillers and heat pumps, pumping groups as well as the source-side devices like, for example, the cooling towers.

In particular, ClimaPRO measures in real-time all the operating variables from the field, for each individual device and each of the main system branche, by using serial communication lines as well as dedicated analogue signals.

The acquired data are then compared with the design data of each single unit at any different working conditions, thus allowing to implement control strategies based on dynamic algorithms which take into account the real operating conditions.

On the basis of these values, an advanced diagnostic module also allows to assess the level of efficiency for each individual unit, translating data into easy-to-read information in order to simplify and optimize the maintenance activities.

The “Chart Builder” software module allows to display the trends of the main operating variables. The “Reporting” module allows to send reports to selected users, including data and system’s status of the main devices as well as to perform calculation of the energy indexes for each single unit and for the entire chiller plant.

The accessibility to ClimaPRO System Manager is ensured by an integrated web server that makes it visible from any computer equipped with a web browser, either locally or remotely.

[SI System]

NX2-Q-G06 / K			0344	0364	0404	0446	0506	0526	0546
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	**kW**	**334,7**	**355,0**	**382,4**	**430,6**	**475,7**	**516,4**	**533,6**
Total power input	(1)	kW	122,8	126,2	141,6	163,0	175,4	183,7	189,4
EER	(1)	kW/kW	2,726	2,813	2,701	2,642	2,712	2,811	2,817
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	334,3	354,7	382,0	430,2	475,1	515,9	533,1
EER	(1)(2)	kW/kW	2,690	2,780	2,670	2,620	2,680	2,780	2,790
HEATING ONLY (GROSS VALUE)									
Total heating capacity	(3)	**kW**	**366,5**	**388,4**	**417,0**	**471,8**	**515,3**	**563,0**	**582,8**
Total power input	(3)	kW	119,3	124,9	134,8	155,5	168,4	181,7	186,9
COP	(3)	kW/kW	3,072	3,110	3,093	3,034	3,060	3,099	3,118
HEATING ONLY (EN14511 VALUE)									
Total heating capacity	(2)(3)	kW	367,0	388,9	417,5	472,3	515,9	563,5	583,4
COP	(2)(3)	kW/kW	3,030	3,080	3,060	3,000	3,020	3,060	3,080
COOLING WITH HEAT RECOVERY (EN 14511 VALUE)									
Cooling capacity	(2)(4)	kW	346,9	366,8	403,0	451,8	494,3	533,0	550,6
Total power input	(2)(4)	kW	107,0	110,3	121,3	140,3	151,2	160,6	166,5
Recovery heat exchanger capacity	(2)(4)	**kW**	**445,5**	**468,8**	**514,9**	**581,4**	**633,4**	**681,2**	**704,1**
TER		kW/kW	7,406	7,573	7,565	7,362	7,458	7,560	7,534
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN COOLING									
Water flow	(1)	l/s	16,01	16,98	18,29	20,59	22,75	24,70	25,52
Pressure drop at the heat exchanger	(1)	kPa	48,1	38,5	44,7	43,4	53,0	43,5	46,4
HEAT EXCHANGER USER SIDE IN HEATING									
Water flow	(3)	l/s	17,69	18,75	20,13	22,77	24,87	27,17	28,13
Pressure drop at the heat exchanger	(3)	kPa	58,8	46,9	54,1	53,1	63,3	52,6	56,4
REFRIGERANT CIRCUIT									
Compressors nr.		N°	4	4	4	6	6	6	6
Number of capacity steps		N°	4	4	4	6	6	6	6
No. Circuits		N°	2	2	2	3	3	3	3
Regulation			STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Min. capacity step		%	25	25	25	17	17	17	17
Refrigerant			R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge		kg	77,4	93,6	93,6	97,2	108	124	125
Oil charge		kg	32,0	33,0	33,0	48,0	47,0	49,0	50,0
Rc (ASHRAE)	(5)	kg/kW	0,23	0,27	0,25	0,23	0,23	0,24	0,24
FANS									
Quantity		N°	12	12	12	10	18	18	18
Air flow		m³/s	35,95	34,59	34,59	39,52	53,07	51,13	51,88
Fans power input		kW	2,00	2,00	2,00	2,00	2,00	2,00	2,00
NOISE LEVEL									
Total sound Pressure	(6)	dB(A)	64	64	64	64	65	65	65
Total sound power level in cooling	(7)(8)	dB(A)	96	96	96	96	97	97	97
Sound power level in heating	(7)(9)	dB(A)	96	96	96	96	97	97	97
SIZE AND WEIGHT									
A	(10)	mm	3905	3905	3905	4515	5690	5690	5690
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2450	2450	2450	2450	2450	2450	2450
Operating weight	(10)	kg	3400	3490	3530	4670	5030	5170	5230

Notes:
1 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
2 Values in compliance with EN14511
3 Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C; Source (side) heat exchanger air (in) 7,0°C - 87% R.H.
4 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C.
5 Rated in accordance with AHRI Standard 550/590
6 Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
7 Sound power on the basis of measurements taken in compliance with ISO 9614.
8 Sound power level in cooling, outdoors.
9 Sound power level in heating, outdoors.
10 Unit in standard configuration, without optional accessories.
- Not available
Data certified in EUROVENT

[SI System]

NX2-Q-G06 / SL			0344	0364	0404	0446	0506	0526	0546
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	**kW**	**316,4**	**336,8**	**370,6**	**409,4**	**444,0**	**486,6**	**506,1**
Total power input	(1)	kW	128,4	132,8	144,6	170,3	184,7	194,0	199,4
EER	(1)	kW/kW	2,464	2,536	2,563	2,404	2,404	2,508	2,538
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	316,0	336,4	370,2	409,0	443,6	486,1	505,7
EER	(1)(2)	kW/kW	2,440	2,510	2,540	2,380	2,380	2,490	2,510
HEATING ONLY (GROSS VALUE)									
Total heating capacity	(3)	**kW**	**363,8**	**381,0**	**422,2**	**473,2**	**513,6**	**554,8**	**571,6**
Total power input	(3)	kW	114,1	120,5	131,1	150,6	162,1	174,2	180,3
COP	(3)	kW/kW	3,188	3,162	3,220	3,142	3,168	3,185	3,170
HEATING ONLY (EN14511 VALUE)									
Total heating capacity	(2)(3)	kW	364,3	381,5	422,7	473,7	514,2	555,4	572,2
COP	(2)(3)	kW/kW	3,150	3,130	3,180	3,100	3,120	3,150	3,130
COOLING WITH HEAT RECOVERY (EN 14511 VALUE)									
Cooling capacity	(2)(4)	kW	346,9	366,8	403,0	451,8	494,3	533,0	550,5
Total power input	(2)(4)	kW	106,8	110,2	121,3	140,1	150,9	160,3	166,2
Recovery heat exchanger capacity	(2)(4)	**kW**	**445,4**	**468,8**	**514,9**	**581,4**	**633,4**	**681,2**	**704,0**
TER		kW/kW	7,420	7,585	7,571	7,372	7,474	7,573	7,547
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN COOLING									
Water flow	(1)	l/s	15,13	16,11	17,72	19,58	21,23	23,27	24,20
Pressure drop at the heat exchanger	(1)	kPa	43,0	34,6	41,9	39,2	46,2	38,6	41,8
HEAT EXCHANGER USER SIDE IN HEATING									
Water flow	(3)	l/s	17,56	18,39	20,38	22,84	24,79	26,78	27,59
Pressure drop at the heat exchanger	(3)	kPa	57,9	45,2	55,4	53,4	62,9	51,1	54,3
REFRIGERANT CIRCUIT									
Compressors nr.		N°	4	4	4	6	6	6	6
Number of capacity steps		N°	4	4	4	6	6	6	6
No. Circuits		N°	2	2	2	3	3	3	3
Regulation			STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Min. capacity step		%	25	25	25	17	17	17	17
Refrigerant			R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge		kg	87,3	92,7	107	113	128	128	128
Oil charge		kg	32,0	33,0	33,0	48,0	47,0	49,0	50,0
Rc (ASHRAE)	(5)	kg/kW	0,28	0,28	0,29	0,28	0,29	0,27	0,25
FANS									
Quantity		N°	10	8	8	18	18	14	12
Air flow		m³/s	27,28	30,33	29,48	35,07	33,16	42,86	45,49
Fans power input		kW	1,00	1,00	1,00	1,00	1,00	1,00	1,00
NOISE LEVEL									
Total sound Pressure	(6)	dB(A)	56	56	56	57	57	57	57
Total sound power level in cooling	(7)(8)	dB(A)	88	88	88	89	89	90	90
Sound power level in heating	(7)(9)	dB(A)	89	89	89	90	90	91	91
SIZE AND WEIGHT									
A	(10)	mm	4515	5080	5080	5690	5690	6865	7430
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2450	2450	2450	2450	2450	2450	2450
Operating weight	(10)	kg	3700	3840	4010	5280	5390	5690	5800

Notes:
1 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
2 Values in compliance with EN14511
3 Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C; Source (side) heat exchanger air (in) 7,0°C - 87% R.H.
4 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C.
5 Rated in accordance with AHRI Standard 550/590
6 Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
7 Sound power on the basis of measurements taken in compliance with ISO 9614.
8 Sound power level in cooling, outdoors.
9 Sound power level in heating, outdoors.
10 Unit in standard configuration, without optional accessories.
- Not available
Data certified in EUROVENT

[SI System]

NX2-Q-G06 / A			0344	0364	0404	0446	0506	0526	0546	0606	0708	0738
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE												
COOLING ONLY (GROSS VALUE)												
Cooling capacity	(1)	**kW**	**345,3**	**361,5**	**399,8**	**446,5**	**500,0**	**525,8**	**543,5**	**599,3**	**696,6**	**724,8**
Total power input	(1)	kW	116,8	121,4	133,4	152,0	168,8	177,0	182,1	196,5	228,7	238,0
EER	(1)	kW/kW	2,956	2,978	2,997	2,938	2,962	2,971	2,985	3,050	3,046	3,045
COOLING ONLY (EN14511 VALUE)												
Cooling capacity	(1)(2)	kW	344,9	361,1	399,3	446,0	499,5	525,3	543,0	598,8	696,0	724,2
EER	(1)(2)	kW/kW	2,920	2,950	2,960	2,900	2,920	2,940	2,950	3,010	3,010	3,010
HEATING ONLY (GROSS VALUE)												
Total heating capacity	(3)	**kW**	**378,2**	**399,2**	**428,8**	**495,0**	**533,6**	**576,4**	**599,0**	**640,0**	**752,7**	**794,7**
Total power input	(3)	kW	116,4	123,0	131,8	153,1	164,1	177,1	184,0	193,6	227,6	239,7
COP	(3)	kW/kW	3,249	3,246	3,253	3,233	3,252	3,255	3,255	3,306	3,307	3,315
HEATING ONLY (EN14511 VALUE)												
Total heating capacity	(2)(3)	kW	378,7	399,7	429,4	495,5	534,2	577,0	599,6	640,6	753,4	795,3
COP	(2)(3)	kW/kW	3,200	3,210	3,210	3,190	3,200	3,210	3,210	3,260	3,260	3,280
COOLING WITH HEAT RECOVERY (EN 14511 VALUE)												
Cooling capacity	(2)(4)	kW	346,9	366,8	403,0	451,8	494,3	533,0	550,6	605,6	695,7	734,1
Total power input	(2)(4)	kW	107,2	110,5	121,6	140,7	151,6	160,8	166,8	181,5	212,1	221,4
Recovery heat exchanger capacity	(2)(4)	**kW**	**445,5**	**468,9**	**515,0**	**581,4**	**633,4**	**681,3**	**704,1**	**772,6**	**890,9**	**938,6**
TER		kW/kW	7,391	7,563	7,551	7,346	7,437	7,550	7,523	7,594	7,480	7,555
EXCHANGERS												
HEAT EXCHANGER USER SIDE IN COOLING												
Water flow	(1)	l/s	16,51	17,29	19,12	21,35	23,91	25,14	25,99	28,66	33,31	34,66
Pressure drop at the heat exchanger	(1)	kPa	51,2	39,9	48,8	46,7	58,5	45,1	48,2	51,1	50,3	40,5
HEAT EXCHANGER USER SIDE IN HEATING												
Water flow	(3)	l/s	18,26	19,27	20,70	23,89	25,76	27,83	28,91	30,89	36,34	38,36
Pressure drop at the heat exchanger	(3)	kPa	62,6	49,6	57,2	58,4	67,9	55,2	59,6	59,4	59,9	49,6
REFRIGERANT CIRCUIT												
Compressors nr.		N°	4	4	4	6	6	6	6	6	8	8
Number of capacity steps		N°	4	4	4	6	6	6	6	6	8	8
No. Circuits		N°	2	2	2	3	3	3	3	3	4	4
Regulation			STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Min. capacity step		%	25	25	25	17	17	17	17	17	12.5	12.5
Refrigerant			R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B	R454B
Refrigerant charge		kg	99,9	101	107	128	128	137	142	142	178	190
Oil charge		kg	32,0	33,0	33,0	48,0	47,0	49,0	50,0	50,0	64,0	66,0
Rc (ASHRAE)	(5)	kg/kW	0,29	0,28	0,27	0,29	0,26	0,26	0,26	0,24	0,26	0,26
FANS												
Quantity		N°	8	8	8	16	12	12	12	12	16	16
Air flow		m³/s	47,93	46,12	46,12	56,58	70,76	68,18	69,18	69,18	95,87	92,24
Fans power input		kW	2,00	2,00	2,00	2,00	2,00	2,00	2,00	1,70	1,70	1,70
NOISE LEVEL												
Total sound Pressure	(6)	dB(A)	65	65	65	64	65	65	65	66	66	67
Total sound power level in cooling	(7)(8)	dB(A)	97	97	97	97	98	98	98	99	99	100
Sound power level in heating	(7)(9)	dB(A)	97	97	97	97	98	98	98	0	0	0
SIZE AND WEIGHT												
A	(10)	mm	5080	5080	5080	6255	7430	7430	7430	7430	9780	9780
B	(10)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(10)	mm	2450	2450	2450	2450	2450	2450	2450	2450	2450	2450
Operating weight	(10)	kg	3720	3820	3860	5290	5530	5700	5780	5840	7440	7640

Notes:
1 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
2 Values in compliance with EN14511
3 Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C; Source (side) heat exchanger air (in) 7,0°C - 87% R.H.
4 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C.
5 Rated in accordance with AHRI Standard 550/590
6 Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
7 Sound power on the basis of measurements taken in compliance with ISO 9614.
8 Sound power level in cooling, outdoors.
9 Sound power level in heating, outdoors.
10 Unit in standard configuration, without optional accessories.
- Not available
Data certified in EUROVENT

[SI System]

NX2-Q-G06 / A			0768	0808
Power supply		V/ph/Hz	400/3/50	400/3/50
PERFORMANCE				
COOLING ONLY (GROSS VALUE)				
Cooling capacity	(1)	**kW**	**762,0**	**799,2**
Total power input	(1)	kW	248,8	262,0
EER	(1)	kW/kW	3,063	3,050
COOLING ONLY (EN14511 VALUE)				
Cooling capacity	(1)(2)	kW	761,4	798,6
EER	(1)(2)	kW/kW	3,030	3,020
HEATING ONLY (GROSS VALUE)				
Total heating capacity	(3)	**kW**	**825,4**	**853,3**
Total power input	(3)	kW	250,1	258,1
COP	(3)	kW/kW	3,300	3,306
HEATING ONLY (EN14511 VALUE)				
Total heating capacity	(2)(3)	kW	826,0	854,1
COP	(2)(3)	kW/kW	3,260	3,260
COOLING WITH HEAT RECOVERY (EN 14511 VALUE)				
Cooling capacity	(2)(4)	kW	769,7	807,2
Total power input	(2)(4)	kW	232,1	241,8
Recovery heat exchanger capacity	(2)(4)	**kW**	**983,8**	**1030**
TER		kW/kW	7,554	7,598
EXCHANGERS				
HEAT EXCHANGER USER SIDE IN COOLING				
Water flow	(1)	l/s	36,44	38,22
Pressure drop at the heat exchanger	(1)	kPa	44,7	49,2
HEAT EXCHANGER USER SIDE IN HEATING				
Water flow	(3)	l/s	39,84	41,19
Pressure drop at the heat exchanger	(3)	kPa	53,5	57,2
REFRIGERANT CIRCUIT				
Compressors nr.		N°	8	8
Number of capacity steps		N°	8	8
No. Circuits		N°	4	4
Regulation			STEPS	STEPS
Min. capacity step		%	12.5	12.5
Refrigerant			R454B	R454B
Refrigerant charge		kg	190	190
Oil charge		kg	66,0	66,0
Rc (ASHRAE)	(5)	kg/kW	0,25	0,24
FANS				
Quantity		N°	16	16
Air flow		m³/s	92,24	92,24
Fans power input		kW	1,70	1,70
NOISE LEVEL				
Total sound Pressure	(6)	dB(A)	67	67
Total sound power level in cooling	(7)(8)	dB(A)	100	100
Sound power level in heating	(7)(9)	dB(A)	0	0
SIZE AND WEIGHT				
A	(10)	mm	9780	9780
B	(10)	mm	2260	2260
H	(10)	mm	2450	2450
Operating weight	(10)	kg	7680	7720

Notes:
1 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
2 Values in compliance with EN14511
3 Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C; Source (side) heat exchanger air (in) 7,0°C - 87% R.H.
4 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C.
5 Rated in accordance with AHRI Standard 550/590
6 Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
7 Sound power on the basis of measurements taken in compliance with ISO 9614.
8 Sound power level in cooling, outdoors.
9 Sound power level in heating, outdoors.
10 Unit in standard configuration, without optional accessories.
- Not available
Data certified in EUROVENT

[SI System]

NX2-Q-G06 / K - LOW TEMPERATURE application			0344	0364	0404	0446	0506	0526
Power supply		(V/ph/Hz)	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
WEATHER CONDITIONS - AVERAGE								
Rated heat output at Tdesignh	(1)(2)	kW	269	295	325	371	390	364
Bivalent temperature	(1)(2)	°C	-7	-7	-7	-7	-7	-10
SCOP	(1)(2)		3,68	3,76	3,78	3,73	3,64	3,49
Seasonal space heating energy efficiency	(1)(2)	%	144	148	148	146	143	137
Seasonal space heating energy efficiency class	(1)(2)		-	-	-	-	-	-

1 Seasonal space heating energy efficiency class LOW TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Tipo di calcolo con portata variabile e temperatura variabile.

NX2-Q-G06 / K - LOW TEMPERATURE application			0546
Power supply		(V/ph/Hz)	400/3/50
WEATHER CONDITIONS - AVERAGE			
Rated heat output at Tdesignh	(1)(2)	kW	375
Bivalent temperature	(1)(2)	°C	-10
SCOP	(1)(2)		3,54
Seasonal space heating energy efficiency	(1)(2)	%	138
Seasonal space heating energy efficiency class	(1)(2)		-

1 Seasonal space heating energy efficiency class LOW TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Tipo di calcolo con portata variabile e temperatura variabile.

TECHNICAL DATA SEASONAL EFFICIENCY IN HEATING (EN14825 VALUE)

[SI System]

NX2-Q-G06 / SL - LOW TEMPERATURE application			0344	0364	0404	0446	0506	0526
Power supply		(V/ph/Hz)	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
WEATHER CONDITIONS - AVERAGE								
Rated heat output at Tdesignh	(1)(2)	kW	228	254	321	296	392	358
Bivalent temperature	(1)(2)	°C	-7	-7	-7	-7	-7	-7
SCOP	(1)(2)		3,82	3,84	3,88	3,74	3,80	3,82
Seasonal space heating energy efficiency	(1)(2)	%	150	151	152	147	149	150
Seasonal space heating energy efficiency class	(1)(2)		-	-	-	-	-	-

1 Seasonal space heating energy efficiency class LOW TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Tipo di calcolo con portata variabile e temperatura variabile.

NX2-Q-G06 / SL - LOW TEMPERATURE application			0546
Power supply		(V/ph/Hz)	400/3/50
WEATHER CONDITIONS - AVERAGE			
Rated heat output at Tdesignh	(1)(2)	kW	380
Bivalent temperature	(1)(2)	°C	-7
SCOP	(1)(2)		3,79
Seasonal space heating energy efficiency	(1)(2)	%	149
Seasonal space heating energy efficiency class	(1)(2)		-

1 Seasonal space heating energy efficiency class LOW TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Tipo di calcolo con portata variabile e temperatura variabile.

TECHNICAL DATA SEASONAL EFFICIENCY IN HEATING (EN14825 VALUE)

[SI System]

NX2-Q-G06 / A - LOW TEMPERATURE application			0344	0364	0404	0446	0506	0526
Power supply		(V/ph/Hz)	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
WEATHER CONDITIONS - AVERAGE								
Rated heat output at Tdesignh	(1)(2)	kW	273	297	322	370	388	357
Bivalent temperature	(1)(2)	°C	-7	-7	-7	-7	-7	-10
SCOP	(1)(2)		3,89	3,95	3,96	3,96	3,88	3,89
Seasonal space heating energy efficiency	(1)(2)	%	153	155	156	155	152	153
Seasonal space heating energy efficiency class	(1)(2)		-	-	-	-	-	-

1 Seasonal space heating energy efficiency class LOW TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Tipo di calcolo con portata variabile e temperatura variabile.

NX2-Q-G06 / A - LOW TEMPERATURE application			0546
Power supply		(V/ph/Hz)	400/3/50
WEATHER CONDITIONS - AVERAGE			
Rated heat output at Tdesignh	(1)(2)	kW	373
Bivalent temperature	(1)(2)	°C	-10
SCOP	(1)(2)		3,91
Seasonal space heating energy efficiency	(1)(2)	%	153
Seasonal space heating energy efficiency class	(1)(2)		-

1 Seasonal space heating energy efficiency class LOW TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Tipo di calcolo con portata variabile e temperatura variabile.

[SI System]

ENERGY EFFICIENCY

SEASONAL EFFICIENCY IN COOLING (Reg. EU 2016/2281)
Ambient refrigeration

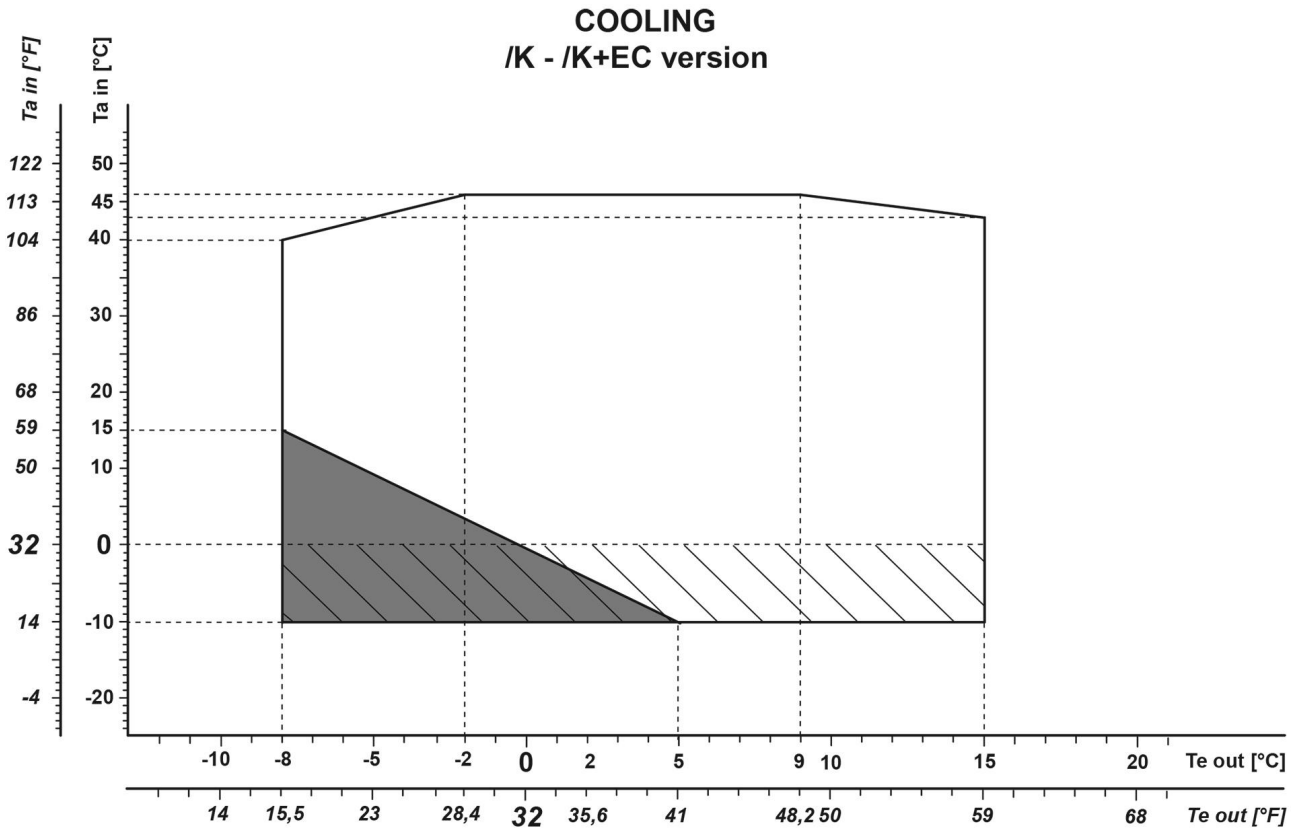
NX2-Q-G06 / K			0344	0364	0404	0446	0506	0526	0546			
Prated,c	(1)	kW	334,3	354,7	382,0	430,2	475,1	515,9	533,1			
SEER	(1) (2)	-	3,92	4,04	4,06	4,00	3,93	4,07	4,09			
Performance ηs	(1) (3)	%	154,0	159,0	160,0	157,0	154,0	160,0	161,0			

NX2-Q-G06 / SL			0344	0364	0404	0446	0506	0526	0546			
Prated,c	(1)	kW	316,0	336,4	370,2	409,0	443,6	486,1	505,7			
SEER	(1) (2)	-	4,09	4,13	4,23	4,13	4,10	4,19	4,19			
Performance ηs	(1) (3)	%	161,0	162,0	166,0	162,0	161,0	165,0	164,0			

NX2-Q-G06 / A			0344	0364	0404	0446	0506	0526	0546	0606	0708	0738
Prated,c	(1)	kW	344,9	361,1	399,3	446,0	499,5	525,3	543,0	598,8	696,0	724,2
SEER	(1) (2)	-	4,28	4,38	4,44	4,36	4,28	4,37	4,36	4,56	4,56	4,56
Performance ηs	(1) (3)	%	168,0	172,0	175,0	171,0	168,0	172,0	172,0	180,0	179,0	179,0
NX2-Q-G06 / A			0768	0808								
Prated,c	(1)	kW	761,4	798,6								
SEER	(1) (2)	-	4,58	4,56								
Performance ηs	(1) (3)	%	180,0	179,0								

Notes:
(1) Parameter calculated according to [REGULATION (EU) N. 2016/2281]
(2) Seasonal energy efficiency ratio
(3) Seasonal space cooling energy efficiency
The units highlighted in this publication contain R454B [GWP_{100} 466] fluorinated greenhouse gases.

10.1 Operating limits - Graphs



Ta in Outdoor air temperature [°C]
Te out Evaporator outlet temperature [°C]

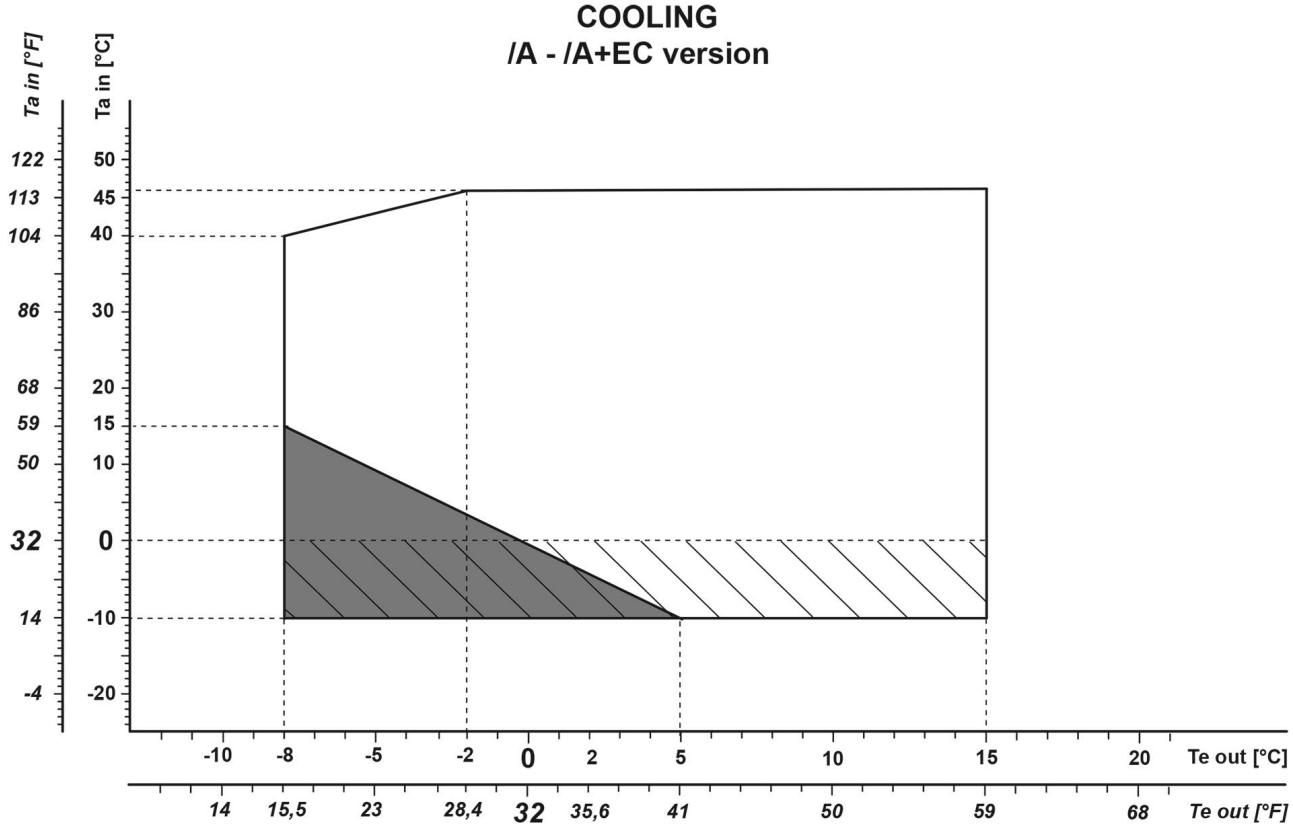
- Version STD

- EC fans option (code 808)

- Antifreeze heater on buffer tank (code 2421), if present

NOTE:
For the temperature limits of each size please refer to the selection software ElcaWorld

COOLING
/A - /A+EC version



Ta in Outdoor air temperature [°C]
Te out Evaporator outlet temperature [°C]

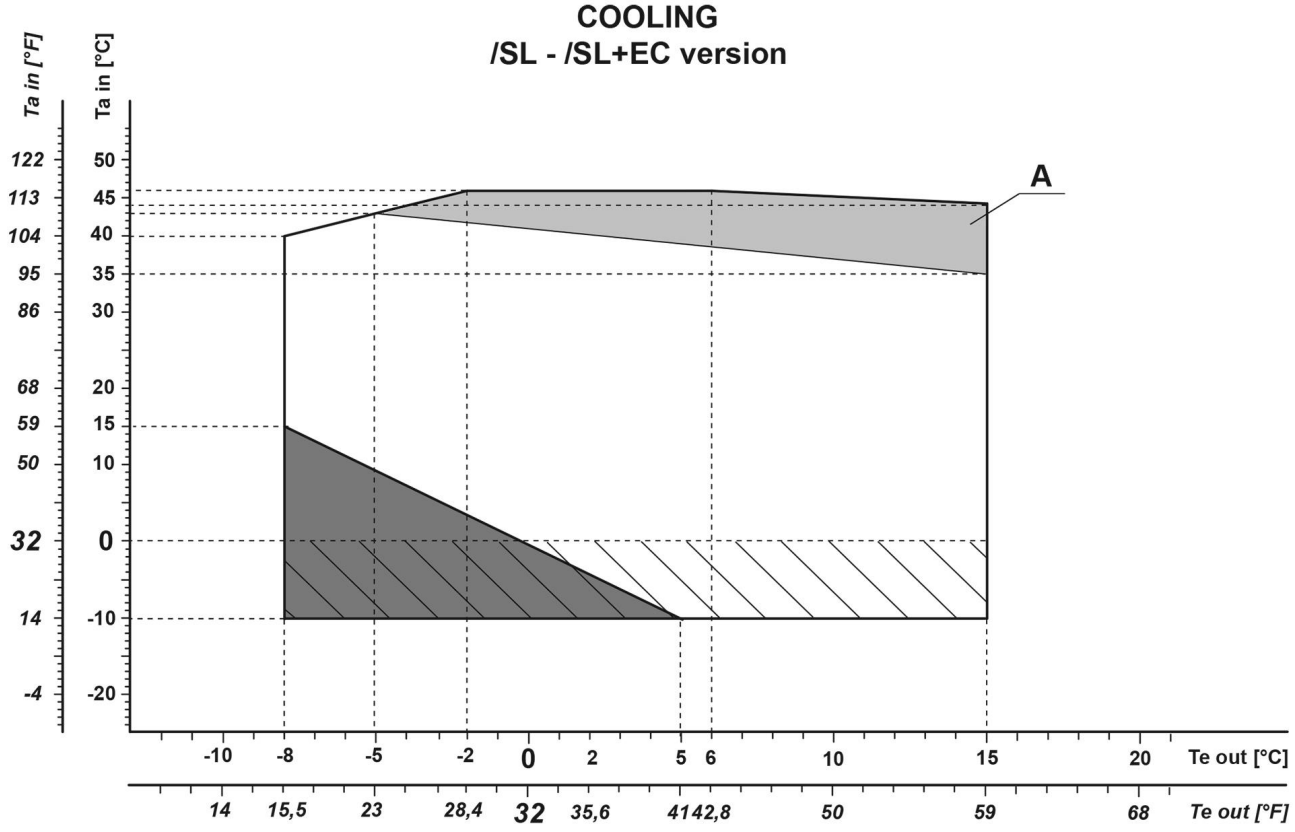
- Version STD

- EC fans: optional from size 0344 to size 0546; STD from size 0606 to size 0808

- Antifreeze heater on buffer tank (code 2421), if present

NOTE:
For the temperature limits of each size please refer to the selection software ElcaWorld

COOLING
/SL - /SL+EC version



Ta in Outdoor air temperature [°C]
Te out Evaporator outlet temperature [°C]

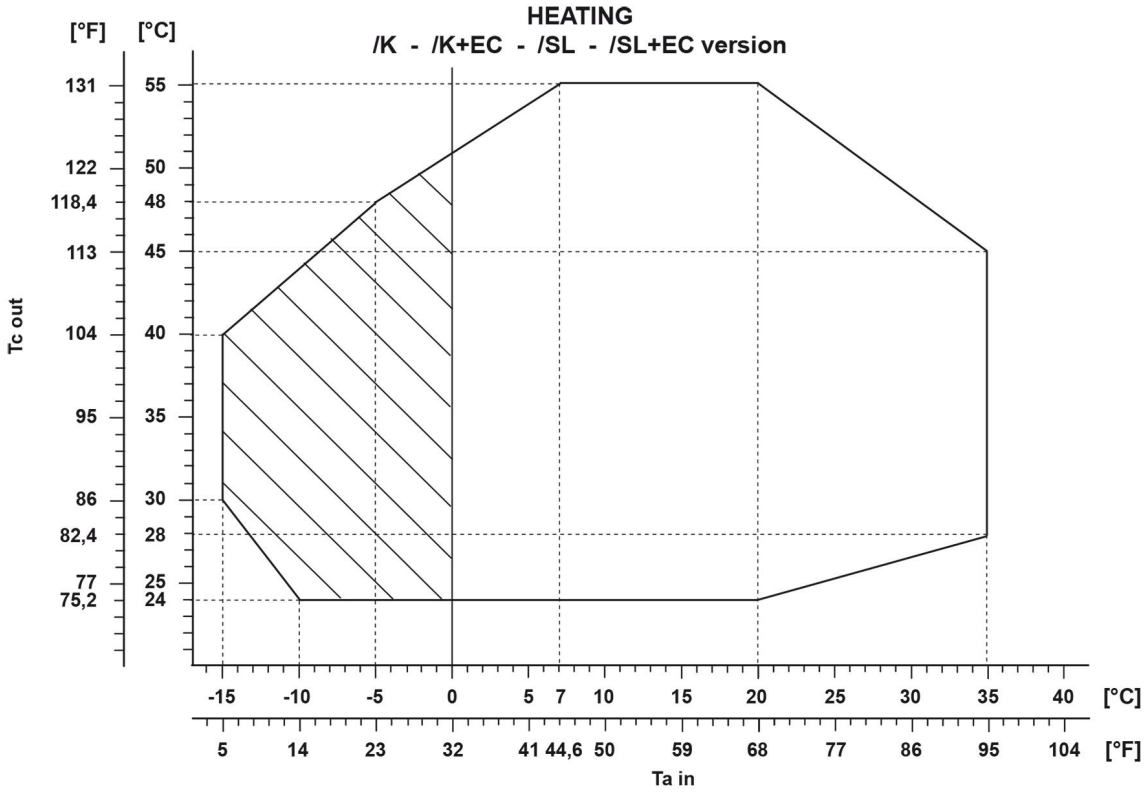
- Version STD

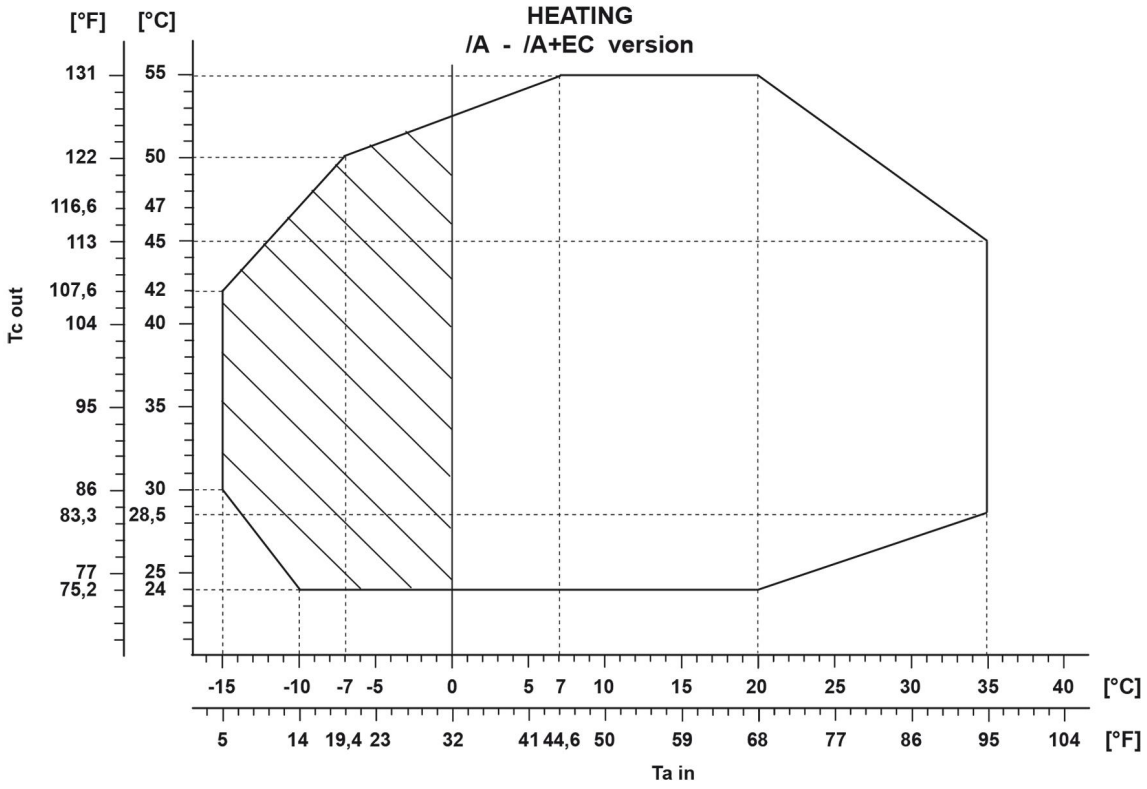
- EC fans option (code 808)

A - Version SL: non-silent-mode operating area

- Antifreeze heater on buffer tank (code 2421), if present

NOTE:
For the temperature limits of each size please refer to the selection software ElcaWorld





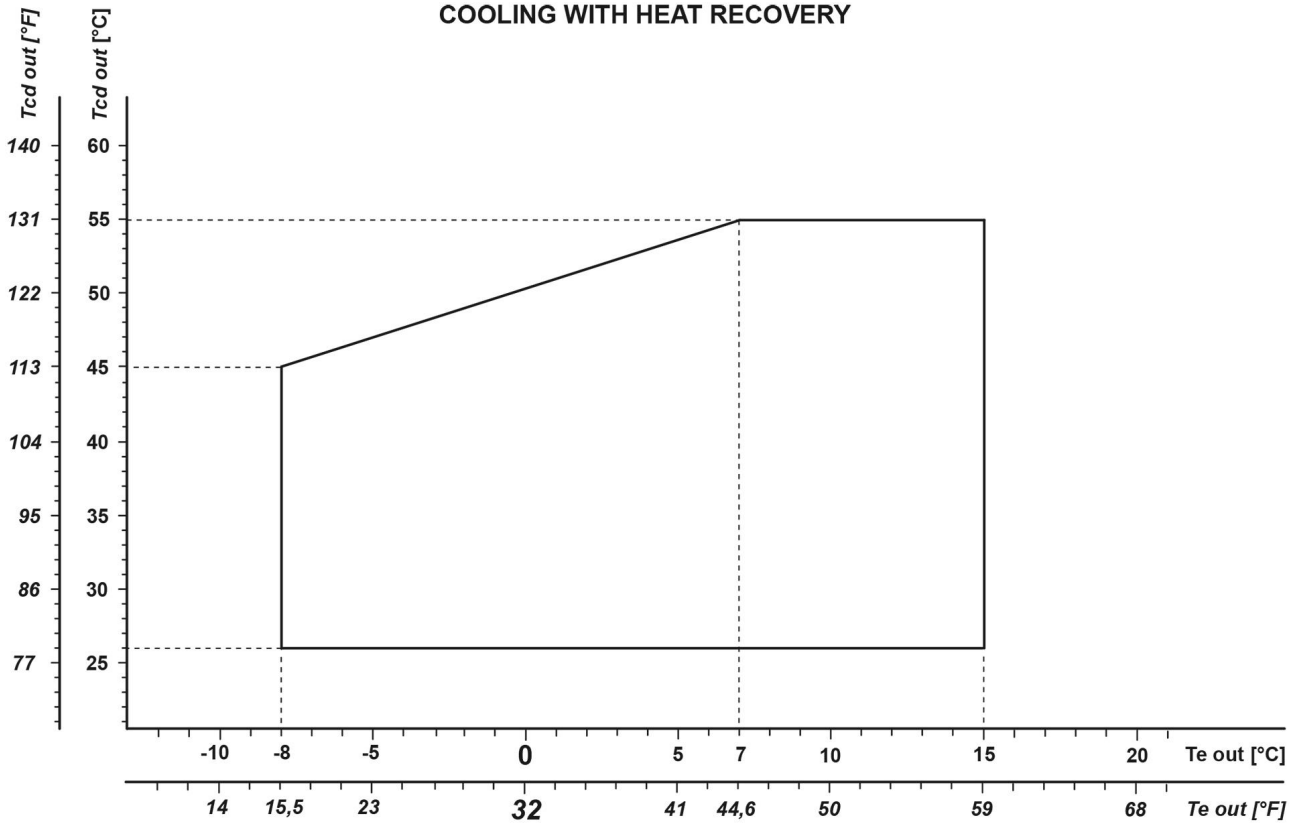
Ta in Outdoor air temperature

Tc out Plant (side) heat exchanger water

- Antifreeze heater on buffer tank (code 2421), if present

NOTE:
For the temperature limits of each size please refer to the selection software ElcaWorld

COOLING WITH HEAT RECOVERY



Tcd out Condenser leaving water temperature [°C]
Te out Evaporator outlet temperature [°C]

- Version STD

NOTE:
For the temperature limits of each size please refer to the selection software ElcaWorld

SIZE
NX2-Q-G06 /K /0344
NX2-Q-G06 /K /0364
NX2-Q-G06 /K /0404
NX2-Q-G06 /K /0446
NX2-Q-G06 /K /0506
NX2-Q-G06 /K /0526
NX2-Q-G06 /K /0546
NX2-Q-G06 /SL /0344
NX2-Q-G06 /SL /0364
NX2-Q-G06 /SL /0404
NX2-Q-G06 /SL /0446
NX2-Q-G06 /SL /0506
NX2-Q-G06 /SL /0526
NX2-Q-G06 /SL /0546
NX2-Q-G06 /A /0344
NX2-Q-G06 /A /0364
NX2-Q-G06 /A /0404
NX2-Q-G06 /A /0446
NX2-Q-G06 /A /0506
NX2-Q-G06 /A /0526
NX2-Q-G06 /A /0546
NX2-Q-G06 /A /0606
NX2-Q-G06 /A /0708
NX2-Q-G06 /A /0738
NX2-Q-G06 /A /0768
NX2-Q-G06 /A /0808

10.2 ETHYLENE GLYCOL MIXTURE

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

	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 power 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 Sale Department.

10.3 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.

SERIES	FOULING FACTORS	EVAPORATOR			CONDENSER/RECOVERY			DESUPERHEATER
	ff (m² °CW)	F1	FK1	KE [°C]	F2	FK2	KC [°C]	R3
VARIOUS	0	1,000	1,000	0,0	1,000	1,000	0,0	1,000
VARIOUS	$1{,}80 \times 10^{-5}$	1,000	1,000	0,0	1,000	1,000	0,0	1,000
VARIOUS	$4{,}40 \times 10^{-5}$	1,000	1,000	0,0	0,990	1,030	1,0	0,990
VARIOUS	$8{,}80 \times 10^{-5}$	0,960	0,990	0,7	0,980	1,040	1,5	0,980
VARIOUS	$13{,}20 \times 10^{-5}$	0,944	0,985	1,0	0,964	1,050	2,3	0,964
VARIOUS	$17{,}20 \times 10^{-5}$	0,930	0,980	1,5	0,950	1,060	3,0	0,950

ff: fouling factors
F1 - F2: potential correction factors
FK1 - FK2: compressor power input correction factors
R3: capacity correction factors
KE: minimum evaporator outlet temperature increase
KC: maximum condenser outlet temperature decrease

[SI System]

Water flow and pressure drop

Water flow in the plant (side) exchanger is given by:
Q=P/(4,186 x Dt)
Q: water flow (l/s)
Dt: difference between inlet and outlet water temp. (°C)
P: heat exchanger capacity (kW)

Pressure drop is given by:
Dp= K x (3,6 x Q)^2/1000
Q: water flow (l/s)
Dp: pressure drop (kPa)
K: unit size ratio

SIZE	Power supply V/ph/Hz	CHILLED WATER HEAT EX. USER SIDE					WARM WATER HEAT EX. USER SIDE			
		K	Q min l/s	Q max l/s	C.A.S. l	C.a. min l	K [1]	Q min [2] l/s	Q max l/s	C.A.S. l
NX2-Q-G06 /K /0344	400/3/50	14,5	10,58	27,58	79,0	890	14,5	10,58	27,58	79,0
NX2-Q-G06 /K /0364	400/3/50	10,3	11,31	26,72	67,0	930	10,3	11,31	26,72	67,0
NX2-Q-G06 /K /0404	400/3/50	10,3	12,33	29,92	67,0	1030	10,3	12,33	29,92	67,0
NX2-Q-G06 /K /0446	400/3/50	7,90	13,89	36,11	140	1150	7,90	13,89	36,11	140
NX2-Q-G06 /K /0506	400/3/50	7,90	13,89	36,11	140	1290	7,90	13,89	36,11	140
NX2-Q-G06 /K /0526	400/3/50	5,50	17,50	38,89	128	1360	5,50	17,50	38,89	128
NX2-Q-G06 /K /0546	400/3/50	5,50	17,50	38,89	128	1400	5,50	17,50	38,89	128
NX2-Q-G06 /SL /0344	400/3/50	14,5	10,58	27,58	79,0	890	14,5	10,58	27,58	79,0
NX2-Q-G06 /SL /0364	400/3/50	10,3	11,31	26,72	67,0	930	10,3	11,31	26,72	67,0
NX2-Q-G06 /SL /0404	400/3/50	10,3	12,33	29,92	67,0	1030	10,3	12,33	29,92	67,0
NX2-Q-G06 /SL /0446	400/3/50	7,90	13,89	36,11	140	1150	7,90	13,89	36,11	140
NX2-Q-G06 /SL /0506	400/3/50	7,90	13,89	36,11	140	1290	7,90	13,89	36,11	140
NX2-Q-G06 /SL /0526	400/3/50	5,50	17,50	38,89	128	1360	5,50	17,50	38,89	128
NX2-Q-G06 /SL /0546	400/3/50	5,50	17,50	38,89	128	1400	5,50	17,50	38,89	128
NX2-Q-G06 /A /0344	400/3/50	14,5	10,58	27,58	79,0	890	14,5	10,58	27,58	79,0
NX2-Q-G06 /A /0364	400/3/50	10,3	11,31	26,72	67,0	930	10,3	11,31	26,72	67,0
NX2-Q-G06 /A /0404	400/3/50	10,3	12,33	29,92	67,0	1030	10,3	12,33	29,92	67,0
NX2-Q-G06 /A /0446	400/3/50	7,90	13,89	36,11	140	1150	7,90	13,89	36,11	140
NX2-Q-G06 /A /0506	400/3/50	7,90	13,89	36,11	140	1290	7,90	13,89	36,11	140
NX2-Q-G06 /A /0526	400/3/50	5,50	17,50	38,89	128	1360	5,50	17,50	38,89	128
NX2-Q-G06 /A /0546	400/3/50	5,50	17,50	38,89	128	1400	5,50	17,50	38,89	128
NX2-Q-G06 /A /0606	400/3/50	4,80	17,50	41,67	116	1500	4,80	17,50	41,67	116
NX2-Q-G06 /A /0708	400/3/50	3,50	21,14	51,72	169	1740	3,50	21,14	51,72	169
NX2-Q-G06 /A /0738	400/3/50	2,60	22,67	56,67	157	1810	2,60	22,67	56,67	157
NX2-Q-G06 /A /0768	400/3/50	2,60	23,72	56,67	157	1900	2,60	23,72	56,67	157
NX2-Q-G06 /A /0808	400/3/50	2,60	24,69	60,36	157	2000	2,60	24,69	60,36	157

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
C.A.S.: Exchanger water content

12.1 ELECTRIC DATA

[SI System]

NX2-Q-G06 / K

SIZE	Power supply V/ph/Hz	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]	S.A. [A]
0344	400/3/50	4	3x34,5+1x42	3x55,1+1x68,4	3x326+1x298	1,900	4	156,8	257	515
0364	400/3/50	4	2x34,5+2x42	2x55,1+2x68,4	2x326+2x298	1,900	4	164,3	270	528
0404	400/3/50	4	4x42	4x68,4	4x298	1,900	4	179,3	297	526
0446	400/3/50	6	2x27+4x34,5	2x42,5+4x55,1	2x210+4x326	1,900	4	205,2	333	604
0506	400/3/50	6	6x34,5	6x55,1	6x326	1,900	4	223,9	365	636
0526	400/3/50	6	6x34,5	6x55,1	6x326	1,900	4	238,9	392	650
0546	400/3/50	6	3x34,5+3x42	3x55,1+3x68,4	3x326+3x298	1,900	4	246,4	405	663

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

Data valid for standard units without any additional option.

Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.

Voltage tolerance: 10%
Maximum voltage unbalance: 2%

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

[SI System]

NX2-Q-G06 / SL

SIZE	Power supply V/ph/Hz	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]	S.A. [A]
0344	400/3/50	4	3x34,5+1x42	3x55,1+1x68,4	3x326+1x298	1,200	2	156,8	257	515
0364	400/3/50	4	2x34,5+2x42	2x55,1+2x68,4	2x326+2x298	1,200	2	164,3	270	528
0404	400/3/50	4	4x42	4x68,4	4x298	1,200	2	179,3	297	526
0446	400/3/50	6	2x27+4x34,5	2x42,5+4x55,1	2x210+4x326	1,200	2	205,2	333	604
0506	400/3/50	6	6x34,5	6x55,1	6x326	1,200	2	223,9	365	636
0526	400/3/50	6	6x34,5	6x55,1	6x326	1,200	2	238,9	392	650
0546	400/3/50	6	3x34,5+3x42	3x55,1+3x68,4	3x326+3x298	1,200	2	246,4	405	663

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

Data valid for standard units without any additional option.

Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.

Voltage tolerance: 10%
Maximum voltage unbalance: 2%

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

[SI System]

NX2-Q-G06 / A

SIZE	Power supply V/ph/Hz	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]	S.A. [A]
0344	400/3/50	4	3x34,5+1x42	3x55,1+1x68,4	3x326+1x298	1,900	4	160,7	265	523
0364	400/3/50	4	2x34,5+2x42	2x55,1+2x68,4	2x326+2x298	1,900	4	168,2	278	536
0404	400/3/50	4	4x42	4x68,4	4x298	1,900	4	183,2	305	534
0446	400/3/50	6	2x27+4x34,5	2x42,5+4x55,1	2x210+4x326	1,900	4	210,9	344	615
0506	400/3/50	6	6x34,5	6x55,1	6x326	1,900	4	229,8	377	648
0526	400/3/50	6	6x34,5	6x55,1	6x326	1,900	4	244,8	404	662
0546	400/3/50	6	3x34,5+3x42	3x55,1+3x68,4	3x326+3x298	1,900	4	252,3	417	675
0606	400/3/50	6	6x42	6x68,4	6x298	1,700	3	272,4	443	672
0708	400/3/50	8	6x34,5+2x42	6x55,1+2x68,4	6x326+2x298	1,700	3	318,2	511	768
0738	400/3/50	8	4x34,5+4x42	4x55,1+4x68,4	4x326+4x298	1,700	3	333,2	537	795
0768	400/3/50	8	2x34,5+6x42	2x55,1+6x68,4	2x326+6x298	1,700	3	348,2	564	821
0808	400/3/50	8	8x42	8x68,4	8x298	1,700	3	363,2	590	820

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

Data valid for standard units without any additional option.

Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.

Voltage tolerance: 10%
Maximum voltage unbalance: 2%

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

12.2 Dimensions of the electrical connections to the main switch

Maximum cables/bars section connected to main switch and short time current

SIZE	TYPE	MAXIMUM CABLE SECTION CONNECTED TO MAIN SWITCH ∅ [mm²]	MAXIMUM BAR SECTION CONNECTED TO MAIN SWITCH □ [mm]	Maximum back-up fuse rating [A]	ICW (0,3 s) short time current rms [kA]	Further technical data
0344	SIRCO 400A	min 185 max 240	max 2x40x5	400	25	https://www.socomec.com/files/live/sites/systemsite/files/SCP/pdf_catalogue/GB/cat_sircosircoac_en.pdf
0364						
0404						
0446	SIRCO 500A	min 240 max 240	max 2x40x5	500		
0506						
0526	SIRCO 630A	min 2 x 150 max 2 x 300	min 2x30x5 max 2x50x5	630		
0546						
0606						
0708	SIRCO 800A	min 2 x 185 max 2 x 300	min 2x40x5 max 2x63x5	800	27	
0738						
0768						
0808						

NX2-Q-G06 / K

SOUND POWER LEVEL IN COOLING									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
0344	99	98	95	93	92	87	81	76	**96**
0364	99	98	95	93	92	87	81	76	**96**
0404	99	98	95	93	92	87	81	76	**96**
0446	99	98	95	93	92	87	81	76	**96**
0506	100	99	96	94	93	88	82	76	**97**
0526	100	99	96	94	93	88	82	76	**97**
0546	100	99	96	94	93	88	82	76	**97**

Working conditions
Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
Sound power on the basis of measurements taken in compliance with ISO 9614.
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 power level in cooling, outdoors.

NX2-Q-G06 / K

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
0344	67	66	63	61	60	55	49	44	**64**
0364	67	66	63	61	60	55	49	44	**64**
0404	67	66	63	61	60	55	49	44	**64**
0446	67	66	63	61	60	55	49	44	**64**
0506	68	67	64	62	61	56	50	44	**65**
0526	68	67	64	62	61	56	50	44	**65**
0546	68	67	64	62	61	56	50	44	**65**

Working conditions
Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.

NX2-Q-G06 / K

SOUND POWER LEVEL IN HEATING									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
0344	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**96**
0364	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**96**
0404	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**96**
0446	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**96**
0506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**97**
0526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**97**
0546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**97**

Working conditions

Sound power on the basis of measurements taken in compliance with ISO 9614.
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 power level in heating, outdoors.
N.A.: Not available

NX2-Q-G06 / K

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
0344	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**64**
0364	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**64**
0404	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**64**
0446	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**64**
0506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**
0526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**
0546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**

Working conditions

Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
N.A.: Not available

NX2-Q-G06 / SL

SOUND POWER LEVEL IN COOLING									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
0344	90	89	88	86	83	78	71	65	**88**
0364	90	89	88	86	83	78	71	65	**88**
0404	90	89	88	86	83	78	71	65	**88**
0446	91	90	89	87	84	79	72	66	**89**
0506	91	90	89	87	84	79	72	66	**89**
0526	92	91	90	88	85	80	73	67	**90**
0546	92	91	90	88	85	80	73	67	**90**

Working conditions
Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
Sound power on the basis of measurements taken in compliance with ISO 9614.
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 power level in cooling, outdoors.

NX2-Q-G06 / SL

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
0344	58	57	56	54	51	46	39	33	**56**
0364	58	57	56	54	51	46	39	33	**56**
0404	58	57	56	54	51	46	39	33	**56**
0446	59	58	57	55	52	47	40	34	**57**
0506	59	58	57	55	52	47	40	34	**57**
0526	59	58	57	55	52	47	40	34	**57**
0546	59	58	57	55	52	47	40	34	**57**

Working conditions
Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.

NX2-Q-G06 / SL

SOUND POWER LEVEL IN HEATING									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
0344	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**89**
0364	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**89**
0404	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**89**
0446	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**90**
0506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**90**
0526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**91**
0546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**91**

Working conditions

Sound power on the basis of measurements taken in compliance with ISO 9614.
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 power level in heating, outdoors.
N.A.: Not available

NX2-Q-G06 / SL

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
0344	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**57**
0364	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**57**
0404	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**57**
0446	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**58**
0506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**58**
0526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**58**
0546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**58**

Working conditions

Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
N.A.: Not available

NX2-Q-G06 / A

SOUND POWER LEVEL IN COOLING									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
0344	100	99	96	94	93	88	82	76	**97**
0364	100	99	96	94	93	88	82	76	**97**
0404	100	99	96	94	93	88	82	76	**97**
0446	100	99	96	94	93	88	82	76	**97**
0506	100	99	97	95	94	89	83	77	**98**
0526	100	99	97	95	94	89	83	77	**98**
0546	100	99	97	95	94	89	83	77	**98**
0606	101	100	98	96	95	90	84	78	**99**
0708	101	100	98	96	95	90	84	78	**99**
0738	101	101	99	97	96	91	85	78	**100**
0768	101	101	99	97	96	91	85	78	**100**
0808	101	101	99	97	96	91	85	78	**100**

Working conditions
Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
Sound power on the basis of measurements taken in compliance with ISO 9614.
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 power level in cooling, outdoors.

NX2-Q-G06 / A

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
0344	68	67	64	62	61	56	50	44	**65**
0364	68	67	64	62	61	56	50	44	**65**
0404	68	67	64	62	61	56	50	44	**65**
0446	67	66	63	61	60	55	49	43	**64**
0506	67	66	64	62	61	56	50	44	**65**
0526	67	66	64	62	61	56	50	44	**65**
0546	67	66	64	62	61	56	50	44	**65**
0606	68	67	65	63	62	57	51	45	**66**
0708	68	67	65	63	62	57	51	45	**66**
0738	68	68	66	64	63	58	52	45	**67**
0768	68	68	66	64	63	58	52	45	**67**
0808	68	68	66	64	63	58	52	45	**67**

Working conditions
Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.

NX2-Q-G06 / A

SOUND POWER LEVEL IN HEATING									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
0344	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**97**
0364	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**97**
0404	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**97**
0446	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**97**
0506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**98**
0526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**98**
0546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**98**
0606	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
0708	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
0738	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
0768	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
0808	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**

Working conditions

Sound power on the basis of measurements taken in compliance with ISO 9614.
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 power level in heating, outdoors.
N.A.: Not available

NX2-Q-G06 / A

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
0344	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**
0364	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**
0404	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**
0446	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**64**
0506	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**
0526	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**
0546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**65**
0606	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
0708	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
0738	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
0768	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
0808	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**

Working conditions

Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
N.A.: Not available

EVin Entrata acqua evaporatore / Evaporator water inlet

EVout Uscita acqua evaporatore / Evaporator water outlet

RCin Entrata acqua recuperatore di calore / Heat recovery exchanger water inlet

RCout Uscita acqua recuperatore di calore / Heat recovery exchanger water outlet

PS Ingresso linea di alimentazione elettrica (L=Sinistro, R=Destro) / Power supply cable inlet (L=Left, R=Right)

REMARKS:For installation purposes, please refer to the documentation sent after the purchase-contract. This technical data should be considered as indicative. Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A. may modify them at any moment. Data valid for standard units without any additional option.

[SI System]

SIZE	DIMENSIONS AND WEIGHTS				CLEARANCE				CHILLED WATER HEAT EX. USER SIDE		WARM WATER HEAT EX. USER SIDE	
	A	B	H	WEIGHT	R1	R2	R3	R4	IN/OUT		IN/OUT	
	[mm]	[mm]	[mm]	[kg]	[mm]	[mm]	[mm]	[mm]	TYPE	Ø	TYPE	Ø
NX2-Q-G06 /K /0344	3905	2260	2450	3400	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /K /0364	3905	2260	2450	3490	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /K /0404	3905	2260	2450	3530	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /K /0446	4515	2260	2450	4670	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /K /0506	5690	2260	2450	5030	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /K /0526	5690	2260	2450	5170	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /K /0546	5690	2260	2450	5230	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /SL /0344	4515	2260	2450	3700	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /SL /0364	5080	2260	2450	3840	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /SL /0404	5080	2260	2450	4010	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /SL /0446	5690	2260	2450	5280	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /SL /0506	5690	2260	2450	5390	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /SL /0526	6865	2260	2450	5690	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /SL /0546	7430	2260	2450	5800	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /A /0344	5080	2260	2450	3720	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /A /0364	5080	2260	2450	3820	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /A /0404	5080	2260	2450	3860	1500	2000	1500	1500	A	4"	A	4"
NX2-Q-G06 /A /0446	6255	2260	2450	5290	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /A /0506	7430	2260	2450	5530	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /A /0526	7430	2260	2450	5700	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /A /0546	7430	2260	2450	5780	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /A /0606	7430	2260	2450	5840	1500	2000	1500	1500	A	5"	A	5"
NX2-Q-G06 /A /0708	9780	2260	2450	7440	1500	2000	1500	1500	A	6"	A	6"
NX2-Q-G06 /A /0738	9780	2260	2450	7640	1500	2000	1500	1500	A	6"	A	6"
NX2-Q-G06 /A /0768	9780	2260	2450	7680	1500	2000	1500	1500	A	6"	A	6"
NX2-Q-G06 /A /0808	9780	2260	2450	7720	1500	2000	1500	1500	A	6"	A	6"

14.2 Legend of pipe connections

[A]

TYPE = A
[A] - Grooved pipe

NOMINAL PIPE SIZE	PIPE OUTSIDE DIAMETER
ø inches	ø mm
3/4	26,7
1	33,7
1 1/4	42,4
1 1/2	48,3
2	60,3
2 1/2	76,1
3	88,9
3 1/2	101,6

NOMINAL PIPE SIZE	PIPE OUTSIDE DIAMETER
ø inches	ø mm
4	114,3
4 1/2	127,0
5	139,7
6	168,3
8	219,1
10	273,0
12	323,9
14	355,6

UNI ISO 228/13
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 EN 10226-1
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

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

15.1 Hydronic groups

HYDRONIC MODULE

The units can be fitted with the hydronic module includes the main water circuit components, thus optimizing water circuit and electrical installation space, times and costs.
The built-in hydronic module is available as option with single or twin in-line pumps, for achieving low head or high head, fixed or variable speed, always installed both on the evaporator and on the condenser simultaneously.
The configurations 1 pumps on evaporator + 1 pump on condenser and 2 pumps on evaporator + 2 pumps on condenser are not available for size /K 0446.

The standard configuration of the units feature:
- terminals for external pumps control (relays + 0-10V signal)
- differential pressure switch (on heat exchanger)
- discharge valves on exchanger
- purge valve
- safety valve (10 bar)

For the hydronic modules with pumps, the factory-mounted components are:
- 1 or 2 pumps, 2 poles, low head or high head, fixed or variable speed (inverter) on evaporator +
1 or 2 pumps, 2 poles, low head or high head, fixed or variable speed (inverter) on condenser
- differential pressure switch (on heat exchanger)
- discharge valves on exchanger
- one-way valve (Clapet type for in-line pumps)
- purge valve
- safety valve (10 bar)

Each of the components of the hydraulic group has been designed to optimise hydraulic and electrical installation space, time and costs.
The second pump operates in stand-by to the first.
The relative operating hours of the two pumps are balanced. In case the operating pump breaks down, the reserve pump is automatically enabled.
The electrical panel of the unit is protected with fuses and contactors with thermals cut-out.

Suction, volute and discharge of each pump and all the water pipes are covered with an insulation lining in closed-cell reticulated foam in PE, CFC and HCFC-free.
In units /K and /A with opt. acoustical enclosure, the hydronic group is protected by a self-ventilated enclosure, acoustically insulated by a 15 mm thick lining of polyester fibers (Fiberform).

IN-LINE PUMPS
Low or high head pumps

Centrifugal pumps with in-line suction and delivery flanges, in single or twin versions. Pump body in cast iron and impeller in AISI 316L stainless steel or cast-iron, entirely laser technology welded. Mechanical seal with EPDM elastomers. Three-phase electric motor protected to IP55, insulation class F, suitable for continuous service.

OTHER COMPONENTS

The following components are excluded from the hydronic kit supply, but their use is mandatory for the correct unit and system operation.
These components are available as accessories and supplied loose, it shall be the customer responsability to install them.
- Unit inlet water filter
- Unit outlet flow-switch

It is also recommended the use of the following components:
- Unit inlet and outlet pressure gauges
- Shut-off valves
- Flexible joints on piping

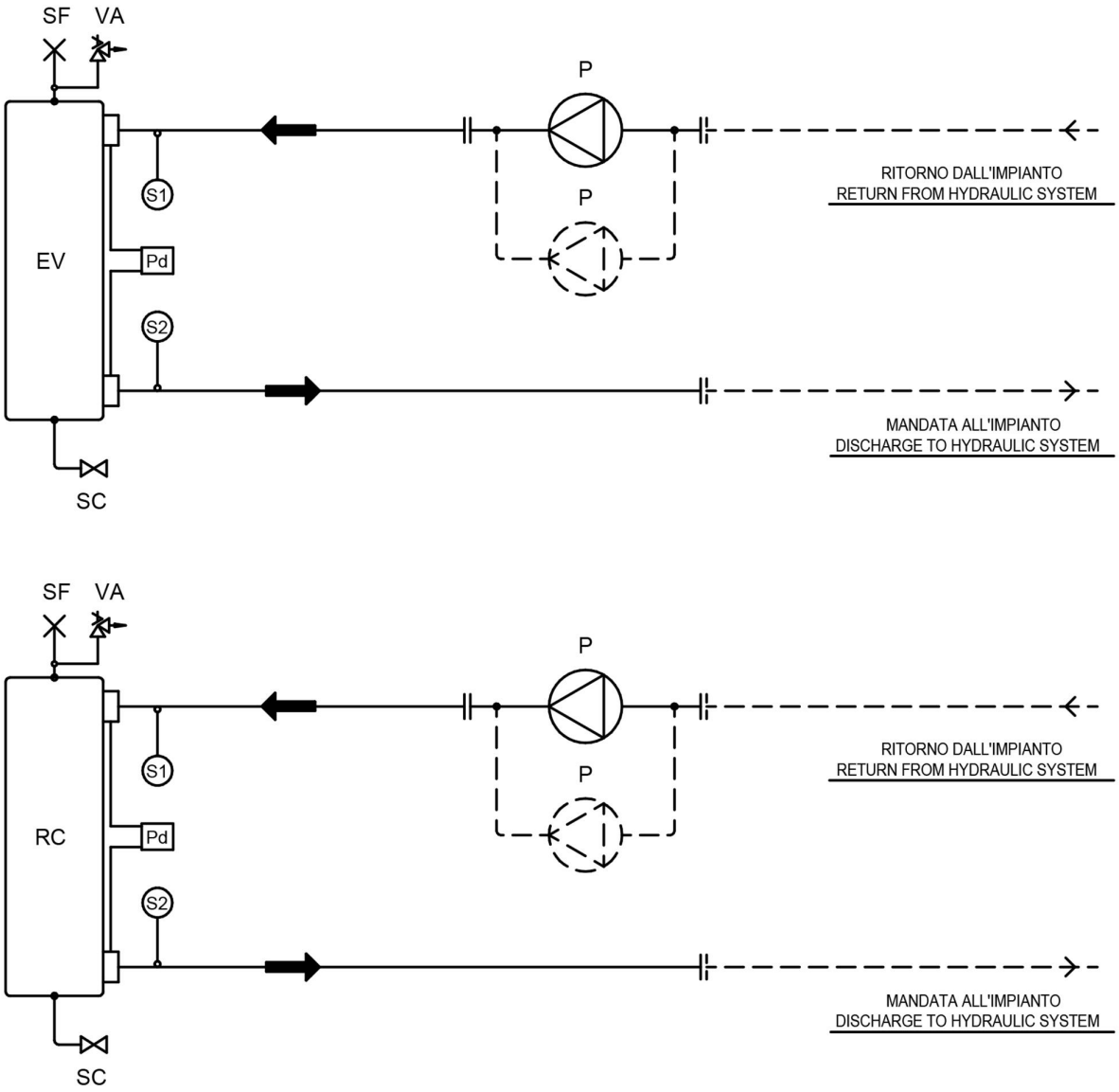
SPECIAL PUMPS

For pumps with different configurations, please contact our sales department.

Possible configurations

PUMP GROUP	Versions		
	A	K	SL
EV - 1 PUMP 2P LH (FIX SPEED)(4706)	X	X	X
EV - 1 PUMP 2P HP (FIX SPEED)(4707)	X	X	X
EV - 2 PUMPS 2P LH (FIX SPEED)(4711)	X	X	X
EV - 2 PUMPS 2P HP (FIX SPEED)(4712)	X	X	X
EV - 1 PUMP 2P LH (VAR SPEED)(4717)	X	X	X
EV - 1 PUMP 2P HH (VAR SPEED)(4718)	X	X	X
EV - 2 PUMPS 2P LH (VAR SPEED)(4722)	X	X	X
EV - 2 PUMPS 2P HH (VAR SPEED)(4723)	X	X	X
CD - 1 PUMP 2P LH (FIX SPEED)(4766)	X	X	X
CD - 1 PUMP 2P HH (FIX SPEED)(4767)	X	X	X
CD - 2 PUMPS 2P LH (FIX SPEED)(4771)	X	X	X
CD - 2 PUMPS 2P HH (FIX SPEED)(4772)	X	X	X
CD - 1 PUMP 2P BP (VAR SPEED)(4777)	X	X	X
CD - 1 POMPA 2P AP (VAR SPEED)(4778)	X	X	X
CD - 2 PUMPS 2P BP (VAR SPEED)(4782)	X	X	X
CD - 2 POMPE 2P AP (VAR SPEED)(4783)	X	X	X

SCHEMA IDRAULICO CON 1-2 POMPE
HYDRAULIC DIAGRAM WITH 1-2 PUMPS



	LEGENDA (IT)	LEGEND (ENG)
EV/RC	Evaporatore\Recuperatore di calore	Evaporator\Heat recovery heat exchanger
P	Pompa dell'acqua	Water pump
Pd	Pressostato differenziale	Differential pressure switch
SC	Valvola di drenaggio dell'acqua	Water drain valve
SF	Valvola di sfiato dell'aria	Air vent valve
S_	Sonda di temperatura	Temperature probe
VA	Valvola sicurezza	Pressure relief valve

Hydronic kit positioning

	Version	EV - 1 PUMP 2P LH (FIX SPEED) (4706)				EV - 1 PUMP 2P HP (FIX SPEED) (4707)				EV - 2 PUMPS 2P LH (FIX SPEED) (4711)				EV - 2 PUMPS 2P HP (FIX SPEED) (4712)			
		extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]
0344	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0364	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0404	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0446	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0506	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0526	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0546	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0606	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0708	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0738	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0768	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0808	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-

extra L Unit's extra length
extra W Unit's extra operating width (NOT to be considered for transport)
extra H Unit's extra height
extra WGT Unit's extra weight (pumps and piping)
EV - 1 PUMP 2P LH (FIX SPEED) EV - 1 PUMP 2P LH (FIX SPEED)
EV - 1 PUMP 2P HP (FIX SPEED) EV - 1 PUMP 2P HP (FIX SPEED)
EV - 2 PUMPS 2P LH (FIX SPEED) EV - 2 PUMPS 2P LH (FIX SPEED)
EV - 2 PUMPS 2P HP (FIX SPEED) EV - 2 PUMPS 2P HP (FIX SPEED)
- Not available

Hydronic kit positioning

	Version	EV - 1 PUMP 2P LH (VAR SPEED) (4717)				EV - 1 PUMP 2P HH (VAR SPEED) (4718)				EV - 2 PUMPS 2P LH (VAR SPEED) (4722)				EV - 2 PUMPS 2P HH (VAR SPEED) (4723)			
		extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]
0344	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0364	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0404	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0446	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0506	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0526	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0546	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0606	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0708	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0738	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0768	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0808	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-

extra L Unit's extra length
extra W Unit's extra operating width (NOT to be considered for transport)
extra H Unit's extra height
extra WGT Unit's extra weight (pumps and piping)
EV - 1 PUMP 2P LH (VAR SPEED) EV - 1 PUMP 2P LH (VAR SPEED)
EV - 1 PUMP 2P HH (VAR SPEED) EV - 1 PUMP 2P HH (VAR SPEED)
EV - 2 PUMPS 2P LH (VAR SPEED) EV - 2 PUMPS 2P LH (VAR SPEED)
EV - 2 PUMPS 2P HH (VAR SPEED) EV - 2 PUMPS 2P HH (VAR SPEED)
- Not available

Hydronic kit positioning

	Version	CD - 1 PUMP 2P LH (FIX SPEED) (4766)				CD - 1 PUMP 2P HH (FIX SPEED) (4767)				CD - 2 PUMPS 2P LH (FIX SPEED) (4771)				CD - 2 PUMPS 2P HH (FIX SPEED) (4772)			
		extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]
0344	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0364	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0404	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0446	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0506	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0526	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0546	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0606	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0708	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0738	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0768	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0808	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-

extra L	Unit's extra length
extra W	Unit's extra operating width (NOT to be considered for transport)
extra H	Unit's extra height
extra WGT	Unit's extra weight (pumps and piping)
CD - 1 PUMP 2P LH (FIX SPEED)	CD - 1 PUMP 2P LH (FIX SPEED)
CD - 1 PUMP 2P HH (FIX SPEED)	CD - 1 PUMP 2P HH (FIX SPEED)
CD - 2 PUMPS 2P LH (FIX SPEED)	CD - 2 PUMPS 2P LH (FIX SPEED)
CD - 2 PUMPS 2P HH (FIX SPEED)	CD - 2 PUMPS 2P HH (FIX SPEED)
-	Not available

Hydronic kit positioning

	Version	CD - 1 PUMP 2P BP (VAR SPEED) (4777)				CD - 1 POMPA 2P AP (VAR SPEED) (4778)				CD - 2 PUMPS 2P BP (VAR SPEED) (4782)				CD - 2 POMPE 2P AP (VAR SPEED) (4783)			
		extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]	extra L [mm]	extra W [mm]	extra H [mm]	extra WGT [kg]
0344	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0364	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0404	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0446	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0506	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0526	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0546	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	K	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
	SL	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0606	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0708	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0738	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0768	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-
0808	A	/	/	/	-	/	/	/	-	/	/	/	-	/	/	/	-

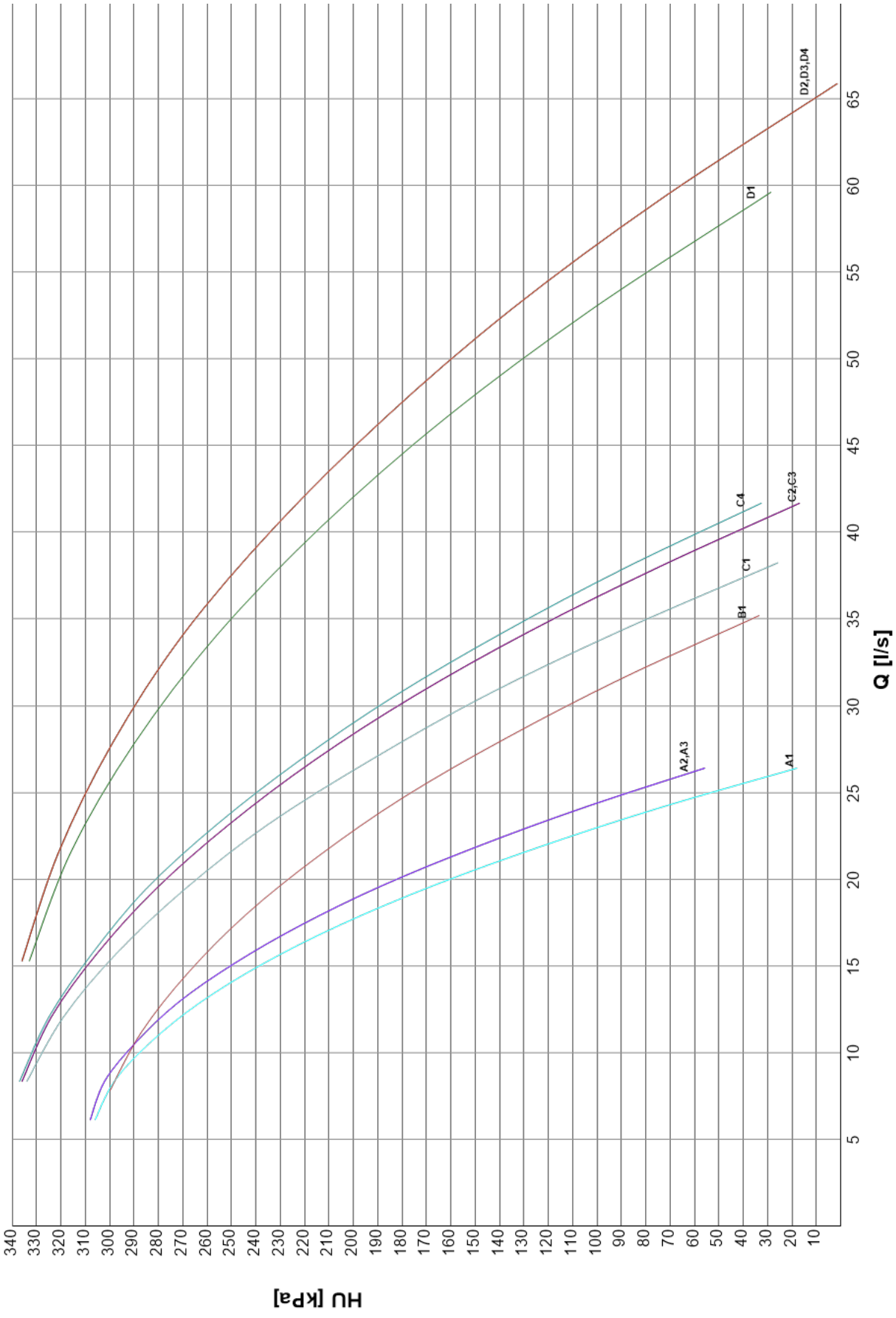
extra L	Unit's extra length
extra W	Unit's extra operating width (NOT to be considered for transport)
extra H	Unit's extra height
extra WGT	Unit's extra weight (pumps and piping)
CD - 1 PUMP 2P BP (VAR SPEED)	CD - 1 PUMP 2P BP (VAR SPEED)
CD - 1 POMPA 2P AP (VAR SPEED)	CD - 1 POMPA 2P AP (VAR SPEED)
CD - 2 PUMPS 2P BP (VAR SPEED)	CD - 2 PUMPS 2P BP (VAR SPEED)
CD - 2 POMPE 2P AP (VAR SPEED)	CD - 2 POMPE 2P AP (VAR SPEED)
-	Not available

CHILLED WATER HEAT EX. USER SIDE - EV - 1 PUMP 2P HH (VAR SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3	16,51	378,2		A1	LNEE 65-160/75/2	2	14	7,500	218	
	K	334,7	16,01	366,5							225	
	SL	316,4	15,13	363,8							237	
0364	A	361,5	17,29	399,2		A2					222	
	K	355,0	16,98	388,4							227	
	SL	336,8	16,11	381,0							238	
0404	A	399,8	19,12	428,8		A3					196	
	K	382,4	18,29	417,0							208	
	SL	370,6	17,72	422,2							216	
0446	A	446,5	21,35	495,0		B1	LNEE 80-160/92/2	2	17	9,200	214	
	K	430,6	20,59	471,8							221	
	SL	409,4	19,58	473,2							231	
0506	A	500,0	23,91	533,6		C1	LNEE 80-160/110/2	2	20	11,00	227	
	K	475,7	22,75	515,3							239	
	SL	444,0	21,23	513,6							253	
0526	A	525,8	25,14	576,4		C2					233	
	K	516,4	24,70	563,0							237	
	SL	486,6	23,27	554,8							250	
0546	A	543,5	25,99	599,0		C3					225	
	K	533,6	25,52	582,8							229	
	SL	506,1	24,20	571,6							242	
0606	A	599,3	28,66	640,0		C4					204	
0708	A	696,6	33,31	752,7		D1	LNEE 100-160/185/2	2	33	18,50	261	
0738	A	724,8	34,66	794,7		D2					267	
0768	A	762,0	36,44	825,4		D3					257	
0808	A	799,2	38,22	853,3		D4					246	

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

CHILLED WATER HEAT EX. USER SIDE - EV - 1 PUMP 2P HH (VAR SPEED)

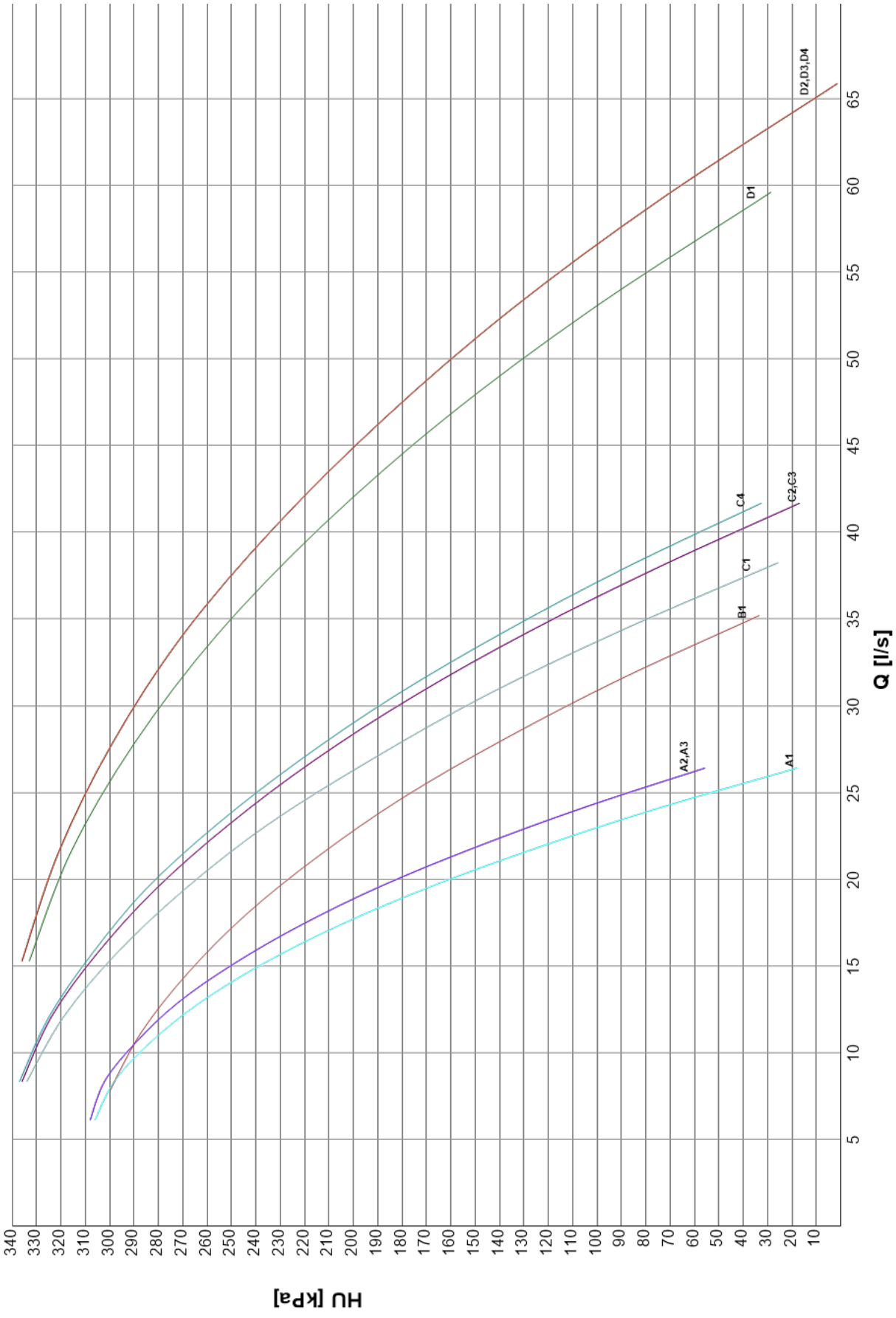


CHILLED WATER HEAT EX. USER SIDE - EV - 1 PUMP 2P HP (FIX SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3	16,51	378,2		A1	LNEE 65-160/75/2	2	14	7,500	218	
	K	334,7	16,01	366,5							225	
	SL	316,4	15,13	363,8							237	
0364	A	361,5	17,29	399,2		A2					222	
	K	355,0	16,98	388,4							227	
	SL	336,8	16,11	381,0							238	
0404	A	399,8	19,12	428,8		A3					196	
	K	382,4	18,29	417,0							208	
	SL	370,6	17,72	422,2							216	
0446	A	446,5	21,35	495,0		B1	LNEE 80-160/92/2	2	17	9,200	214	
	K	430,6	20,59	471,8							221	
	SL	409,4	19,58	473,2							231	
0506	A	500,0	23,91	533,6		C1	LNEE 80-160/110/2	2	20	11,00	227	
	K	475,7	22,75	515,3							239	
	SL	444,0	21,23	513,6							253	
0526	A	525,8	25,14	576,4		C2					233	
	K	516,4	24,70	563,0							237	
	SL	486,6	23,27	554,8							250	
0546	A	543,5	25,99	599,0		C3					225	
	K	533,6	25,52	582,8							229	
	SL	506,1	24,20	571,6							242	
0606	A	599,3	28,66	640,0		C4					204	
0708	A	696,6	33,31	752,7		D1	LNEE 100-160/185/2	2	33	18,50	261	
0738	A	724,8	34,66	794,7		D2					267	
0768	A	762,0	36,44	825,4		D3					257	
0808	A	799,2	38,22	853,3		D4					246	

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

CHILLED WATER HEAT EX. USER SIDE - EV - 1 PUMP 2P HP (FIX SPEED)

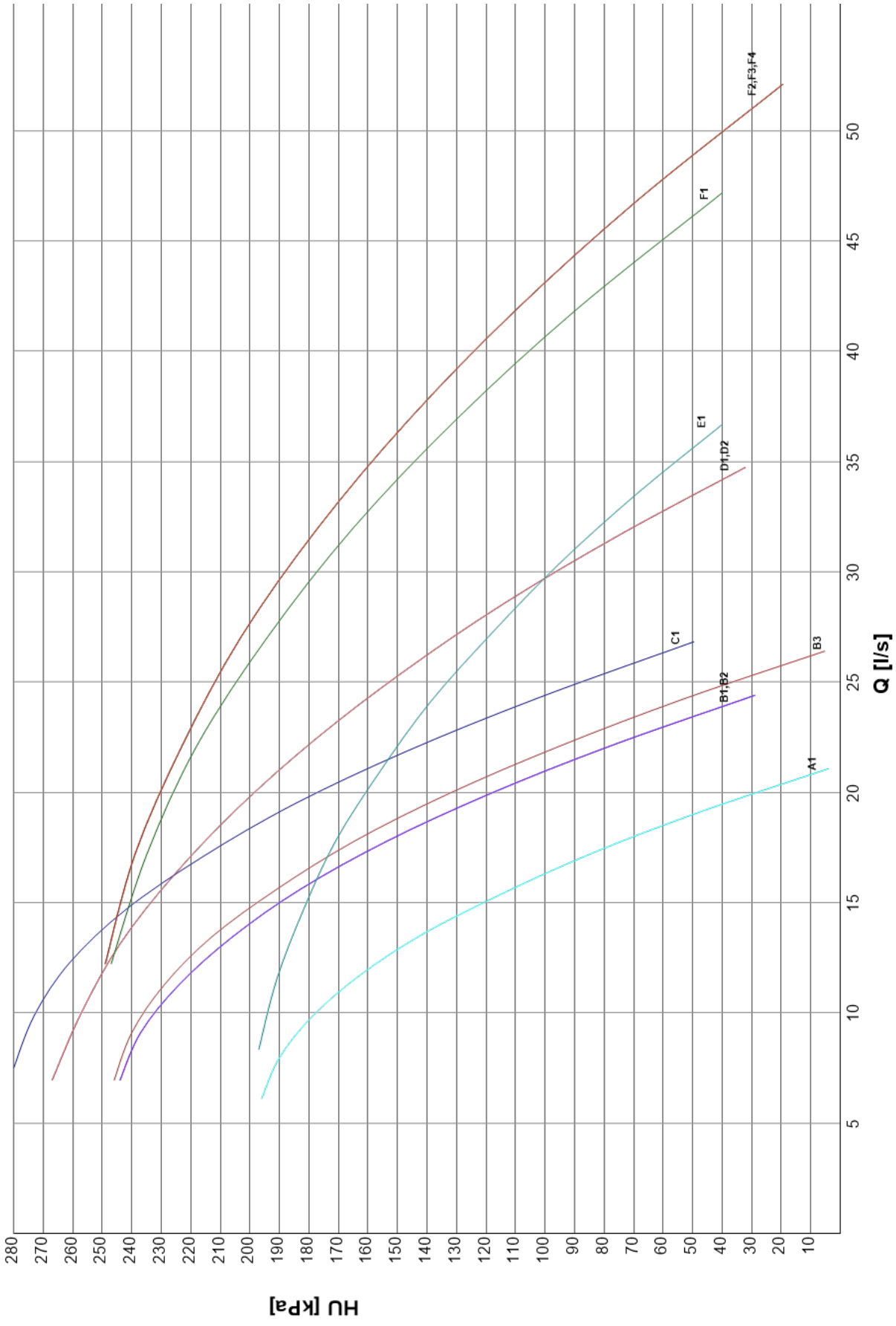


CHILLED WATER HEAT EX. USER SIDE - EV - 1 PUMP 2P LH (FIX SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3	16,51	378,2		A1	LNEE 65-125/40/2	2	8	4,000	96,9	
	K	334,7	16,01	366,5							105	
	SL	316,4	15,13	363,8							119	
0364	A	361,5	17,29	399,2		B1	LNEE 65-125/55/2	2	11	5,500	160	
	K	355,0	16,98	388,4							165	
	SL	336,8	16,11	381,0							176	
0404	A	399,8	19,12	428,8		B2					132	
	K	382,4	18,29	417,0							145	
	SL	370,6	17,72	422,2							154	
0446	A	446,5	21,35	495,0		B3					108	
	K	430,6	20,59	471,8							121	
	SL	409,4	19,58	473,2							138	
0506	A	500,0	23,91	533,6		C1	LNEE 65-125/75/2	2	14	7,500	110	
	K	475,7	22,75	515,3							132	
	SL	444,0	21,23	513,6							158	
0526	A	525,8	25,14	576,4		D1	LNEE 80-160/75/2	2	14	7,500	152	
	K	516,4	24,70	563,0							156	
	SL	486,6	23,27	554,8							170	
0546	A	543,5	25,99	599,0		D2					143	
	K	533,6	25,52	582,8							148	
	SL	506,1	24,20	571,6							161	
0606	A	599,3	28,66	640,0		E1	LNES 100-250/75/4	4	14	7,500	108	
0708	A	696,6	33,31	752,7		F1	LNEE 100-160/110/2	2	20	11,00	156	
0738	A	724,8	34,66	794,7		F2					161	
0768	A	762,0	36,44	825,4		F3					149	
0808	A	799,2	38,22	853,3		F4					137	

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

CHILLED WATER HEAT EX. USER SIDE - EV - 1 PUMP 2P LH (FIX SPEED)

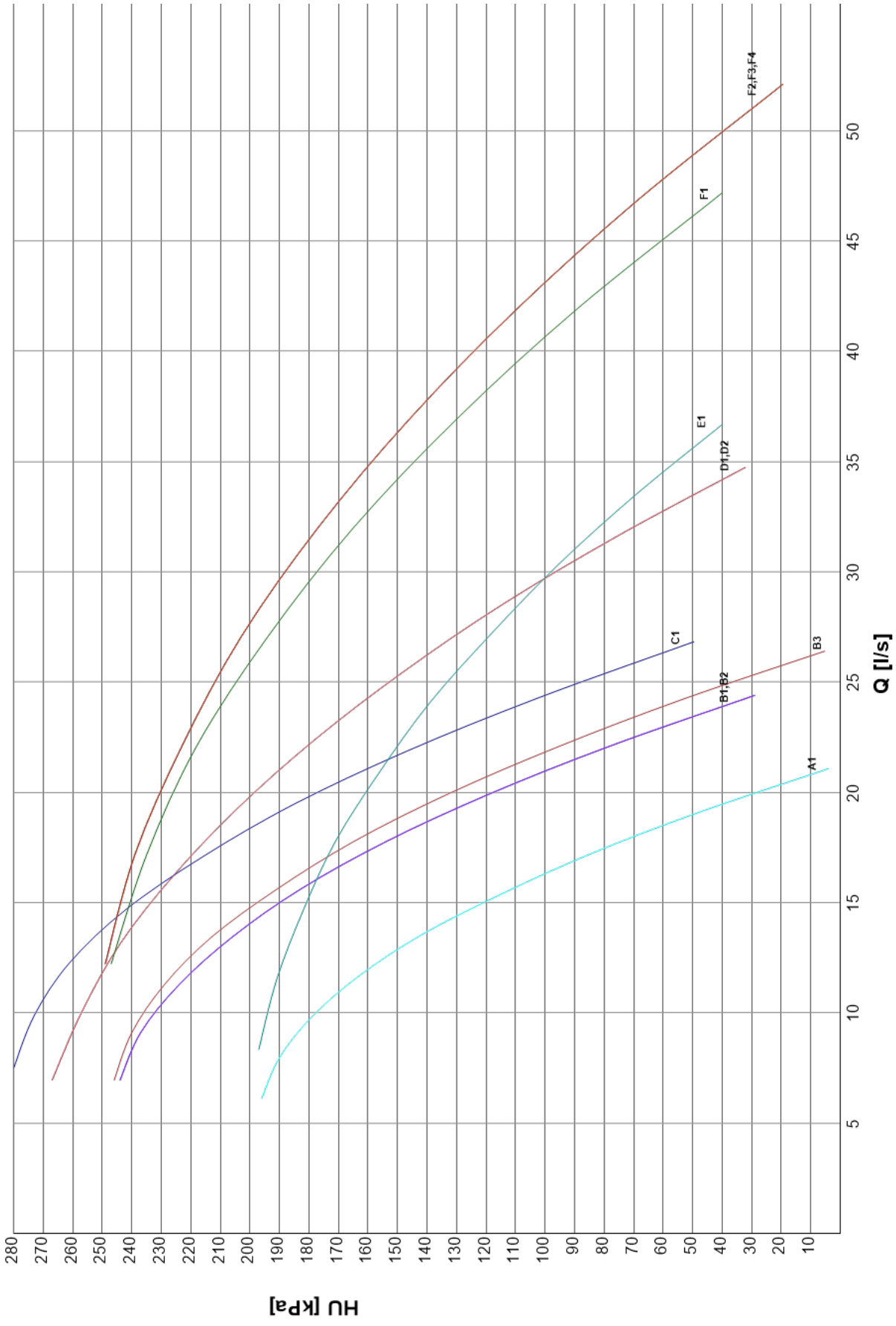


CHILLED WATER HEAT EX. USER SIDE - EV - 1 PUMP 2P LH (VAR SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3	16,51	378,2		A1	LNEE 65-125/40/2	2	8	4,000	96,9	
	K	334,7	16,01	366,5							105	
	SL	316,4	15,13	363,8							119	
0364	A	361,5	17,29	399,2		B1	LNEE 65-125/55/2	2	11	5,500	160	
	K	355,0	16,98	388,4							165	
	SL	336,8	16,11	381,0							176	
0404	A	399,8	19,12	428,8		B2					132	
	K	382,4	18,29	417,0							145	
	SL	370,6	17,72	422,2							154	
0446	A	446,5	21,35	495,0		B3					108	
	K	430,6	20,59	471,8							121	
	SL	409,4	19,58	473,2							138	
0506	A	500,0	23,91	533,6		C1	LNEE 65-125/75/2	2	14	7,500	110	
	K	475,7	22,75	515,3							132	
	SL	444,0	21,23	513,6							158	
0526	A	525,8	25,14	576,4		D1	LNEE 80-160/75/2	2	14	7,500	152	
	K	516,4	24,70	563,0							156	
	SL	486,6	23,27	554,8							170	
0546	A	543,5	25,99	599,0		D2					143	
	K	533,6	25,52	582,8							148	
	SL	506,1	24,20	571,6							161	
0606	A	599,3	28,66	640,0		E1	LNES 100-250/75/4	4	14	7,500	108	
0708	A	696,6	33,31	752,7		F1	LNEE 100-160/110/2	2	20	11,00	156	
0738	A	724,8	34,66	794,7		F2					161	
0768	A	762,0	36,44	825,4		F3					149	
0808	A	799,2	38,22	853,3		F4					137	

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

CHILLED WATER HEAT EX. USER SIDE - EV - 1 PUMP 2P LH (VAR SPEED)

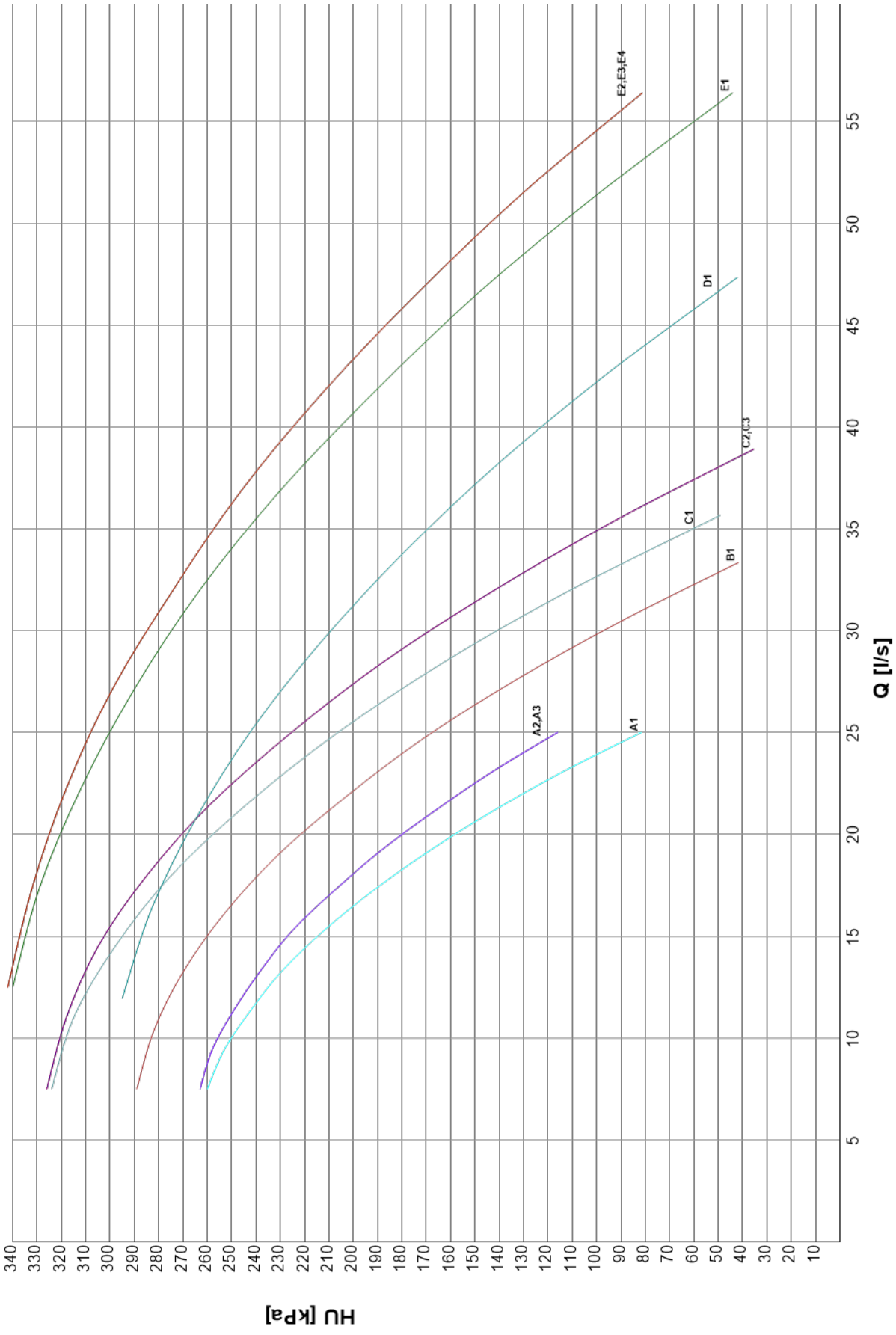


CHILLED WATER HEAT EX. USER SIDE - EV - 2 PUMPS 2P HH (VAR SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3	16,51	378,2		A1	LNTE 80-160/75/2	2	14	7,500	200	
	K	334,7	16,01	366,5							205	
	SL	316,4	15,13	363,8							213	
0364	A	361,5	17,29	399,2		A2					208	
	K	355,0	16,98	388,4							211	
	SL	336,8	16,11	381,0							218	
0404	A	399,8	19,12	428,8		A3					190	
	K	382,4	18,29	417,0							198	
	SL	370,6	17,72	422,2							204	
0446	A	446,5	21,35	495,0		B1	LNTE 80-160/92/2	2	17	9,200	208	
	K	430,6	20,59	471,8							216	
	SL	409,4	19,58	473,2							225	
0506	A	500,0	23,91	533,6		C1	LNTE 80-160/110/2	2	20	11,00	219	
	K	475,7	22,75	515,3							231	
	SL	444,0	21,23	513,6							246	
0526	A	525,8	25,14	576,4		C2					224	
	K	516,4	24,70	563,0							229	
	SL	486,6	23,27	554,8							243	
0546	A	543,5	25,99	599,0		C3					215	
	K	533,6	25,52	582,8							220	
	SL	506,1	24,20	571,6							234	
0606	A	599,3	28,66	640,0		D1	LNTE 100-160/150/2	2	27	15,00	219	
0708	A	696,6	33,31	752,7		E1	LNTE 100-160/185/2	2	33	18,50	254	
0738	A	724,8	34,66	794,7		E2					259	
0768	A	762,0	36,44	825,4		E3					248	
0808	A	799,2	38,22	853,3		E4					237	

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

CHILLED WATER HEAT EX. USER SIDE - EV - 2 PUMPS 2P HH (VAR SPEED)

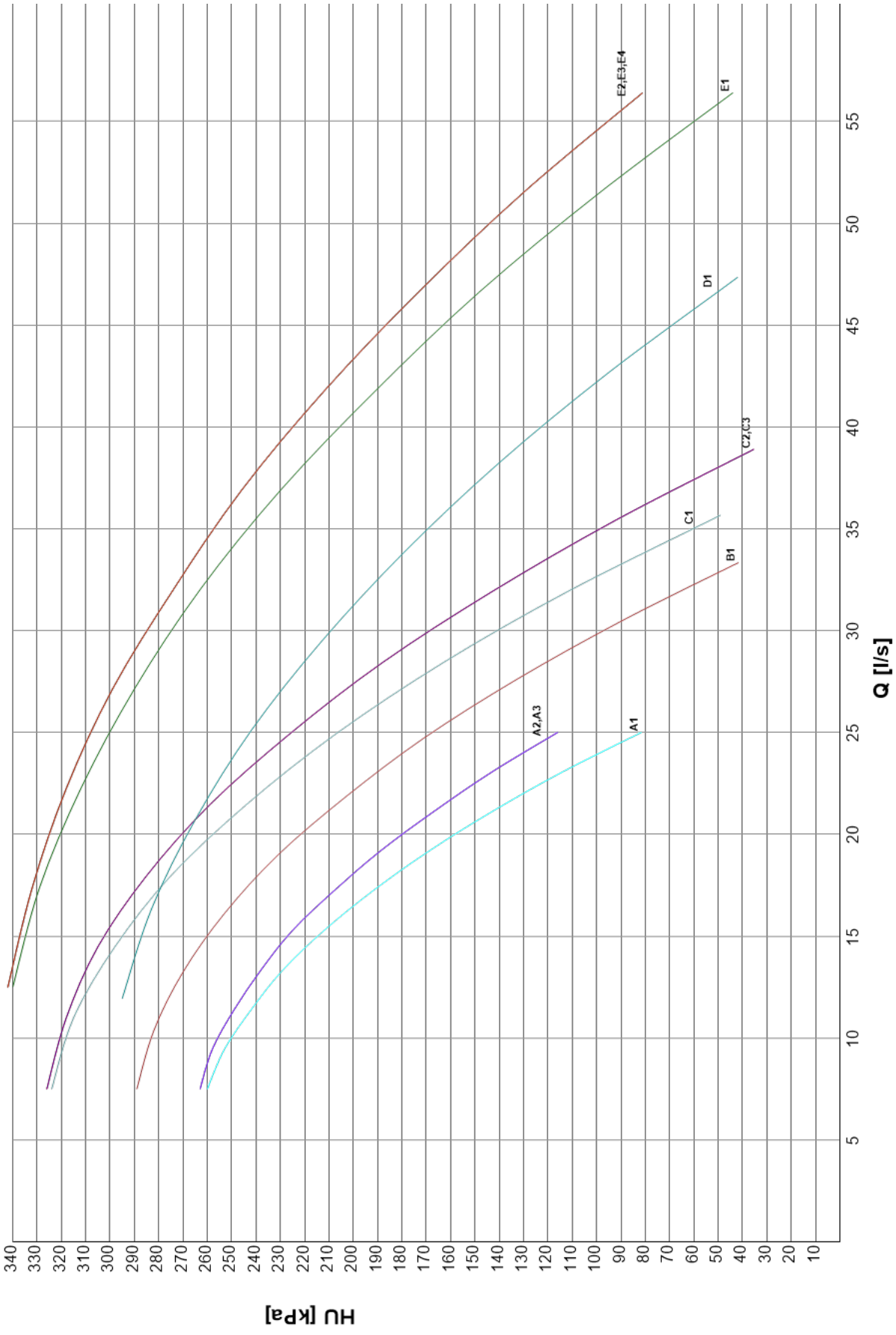


CHILLED WATER HEAT EX. USER SIDE - EV - 2 PUMPS 2P HP (FIX SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3	16,51	378,2		A1	LNTE 80-160/75/2	2	14	7,500	200	
	K	334,7	16,01	366,5							205	
	SL	316,4	15,13	363,8							213	
0364	A	361,5	17,29	399,2		A2					208	
	K	355,0	16,98	388,4							211	
	SL	336,8	16,11	381,0							218	
0404	A	399,8	19,12	428,8		A3					190	
	K	382,4	18,29	417,0							198	
	SL	370,6	17,72	422,2							204	
0446	A	446,5	21,35	495,0		B1	LNTE 80-160/92/2	2	17	9,200	208	
	K	430,6	20,59	471,8							216	
	SL	409,4	19,58	473,2							225	
0506	A	500,0	23,91	533,6		C1	LNTE 80-160/110/2	2	20	11,00	219	
	K	475,7	22,75	515,3							231	
	SL	444,0	21,23	513,6							246	
0526	A	525,8	25,14	576,4		C2					224	
	K	516,4	24,70	563,0							229	
	SL	486,6	23,27	554,8							243	
0546	A	543,5	25,99	599,0		C3					215	
	K	533,6	25,52	582,8							220	
	SL	506,1	24,20	571,6							234	
0606	A	599,3	28,66	640,0		D1	LNTE 100-160/150/2	2	27	15,00	219	
0708	A	696,6	33,31	752,7		E1	LNTE 100-160/185/2	2	33	18,50	254	
0738	A	724,8	34,66	794,7		E2					259	
0768	A	762,0	36,44	825,4		E3					248	
0808	A	799,2	38,22	853,3		E4					237	

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

CHILLED WATER HEAT EX. USER SIDE - EV - 2 PUMPS 2P HP (FIX SPEED)

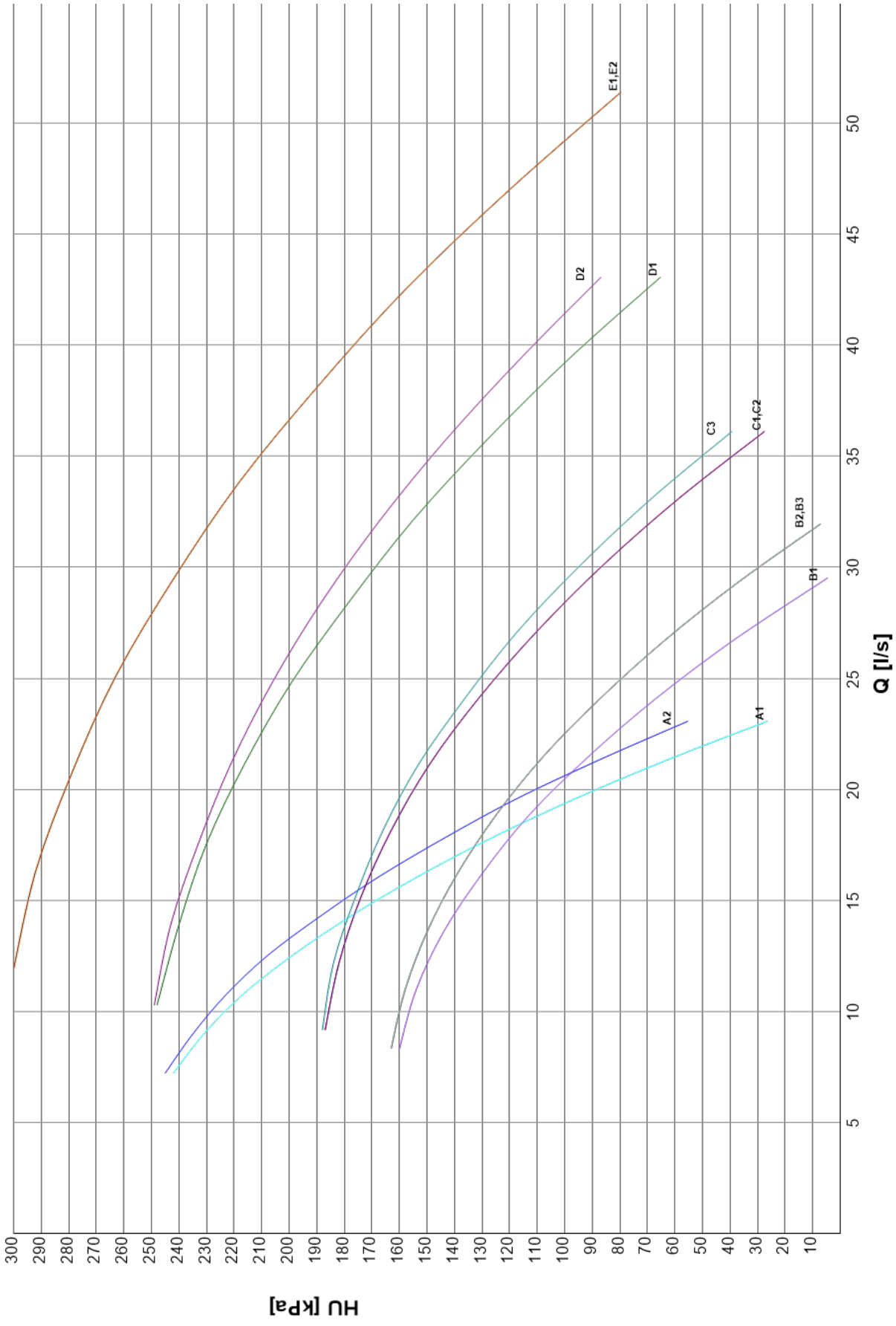


CHILLED WATER HEAT EX. USER SIDE - EV - 2 PUMPS 2P LH (FIX SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3	16,51	378,2		A1	LNTE 65-125/55/2	2	11	5,500	147	
	K	334,7	16,01	366,5							154	
	SL	316,4	15,13	363,8							167	
0364	A	361,5	17,29	399,2		A2					151	
	K	355,0	16,98	388,4							156	
	SL	336,8	16,11	381,0							167	
0404	A	399,8	19,12	428,8		B1	LNTS 100-250/55/4	4	15	5,500	110	
	K	382,4	18,29	417,0							116	
	SL	370,6	17,72	422,2							120	
0446	A	446,5	21,35	495,0		B2					108	
	K	430,6	20,59	471,8							114	
	SL	409,4	19,58	473,2							120	
0506	A	500,0	23,91	533,6		B3					88,7	
	K	475,7	22,75	515,3							98,0	
	SL	444,0	21,23	513,6							109	
0526	A	525,8	25,14	576,4		C1	LNTS 100-250/75/4	4	15	7,500	124	
	K	516,4	24,70	563,0							127	
	SL	486,6	23,27	554,8							137	
0546	A	543,5	25,99	599,0		C2					118	
	K	533,6	25,52	582,8							122	
	SL	506,1	24,20	571,6							131	
0606	A	599,3	28,66	640,0		C3					106	
0708	A	696,6	33,31	752,7		D1	LNTE 100-160/110/2	2	20	11,00	146	
0738	A	724,8	34,66	794,7		D2					151	
0768	A	762,0	36,44	825,4		E1	LNTE 100-160/150/2	2	27	15,00	201	
0808	A	799,2	38,22	853,3		E2					189	

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

CHILLED WATER HEAT EX. USER SIDE - EV - 2 PUMPS 2P LH (FIX SPEED)

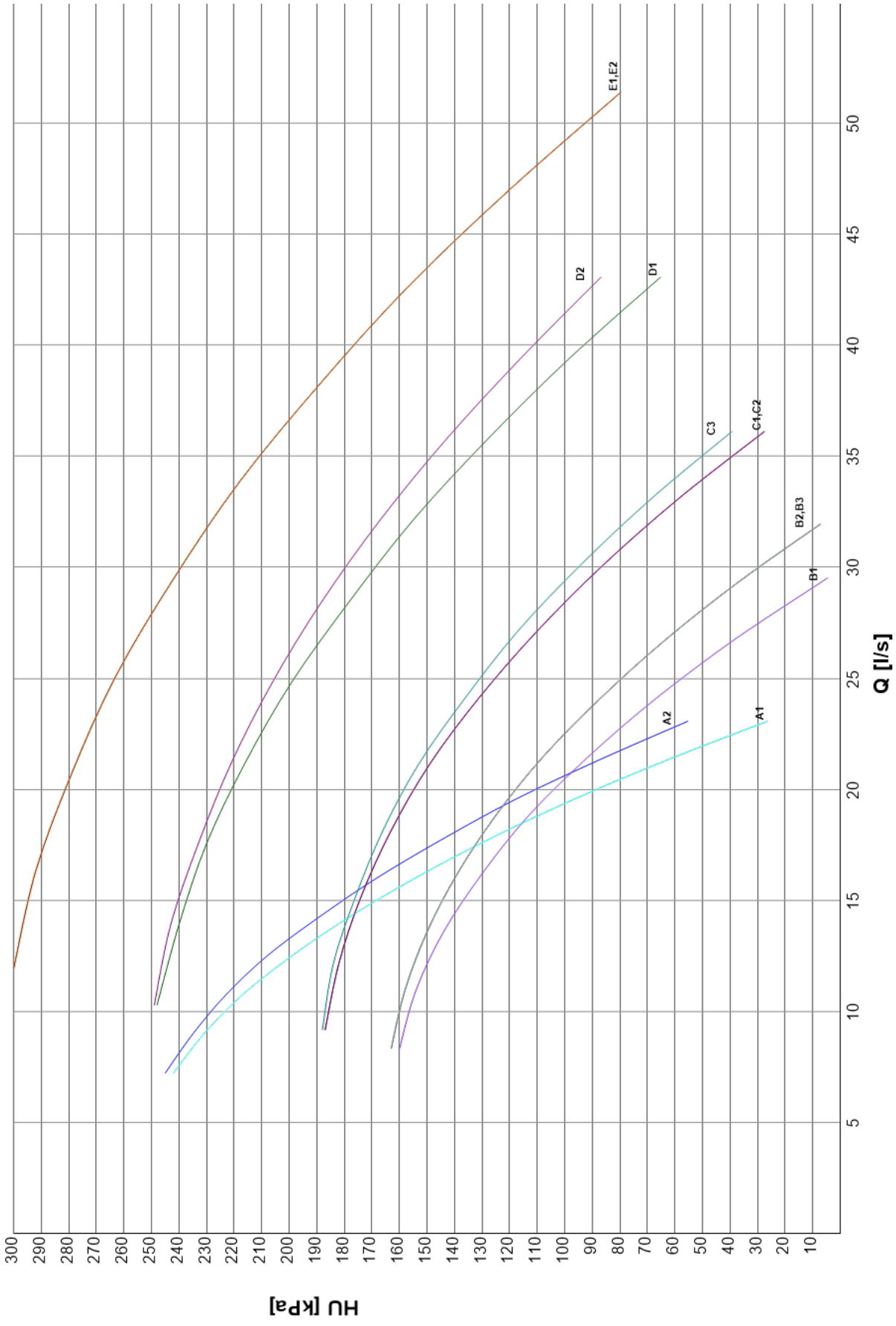


CHILLED WATER HEAT EX. USER SIDE - EV - 2 PUMPS 2P LH (VAR SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3	16,51	378,2		A1	LNTE 65-125/55/2	2	11	5,500	147	
	K	334,7	16,01	366,5							154	
	SL	316,4	15,13	363,8							167	
0364	A	361,5	17,29	399,2		A2					151	
	K	355,0	16,98	388,4							156	
	SL	336,8	16,11	381,0							167	
0404	A	399,8	19,12	428,8		B1	LNTS 100-250/55/4	4	15	5,500	110	
	K	382,4	18,29	417,0							116	
	SL	370,6	17,72	422,2							120	
0446	A	446,5	21,35	495,0		B2					108	
	K	430,6	20,59	471,8							114	
	SL	409,4	19,58	473,2							120	
0506	A	500,0	23,91	533,6		B3					88,7	
	K	475,7	22,75	515,3							98,0	
	SL	444,0	21,23	513,6							109	
0526	A	525,8	25,14	576,4		C1	LNTS 100-250/75/4	4	15	7,500	124	
	K	516,4	24,70	563,0							127	
	SL	486,6	23,27	554,8							137	
0546	A	543,5	25,99	599,0		C2					118	
	K	533,6	25,52	582,8							122	
	SL	506,1	24,20	571,6							131	
0606	A	599,3	28,66	640,0		C3					106	
0708	A	696,6	33,31	752,7		D1	LNTE 100-160/110/2	2	20	11,00	146	
0738	A	724,8	34,66	794,7		D2					151	
0768	A	762,0	36,44	825,4		E1	LNTE 100-160/150/2	2	27	15,00	201	
0808	A	799,2	38,22	853,3		E2					189	

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

CHILLED WATER HEAT EX. USER SIDE - EV - 2 PUMPS 2P LH (VAR SPEED)

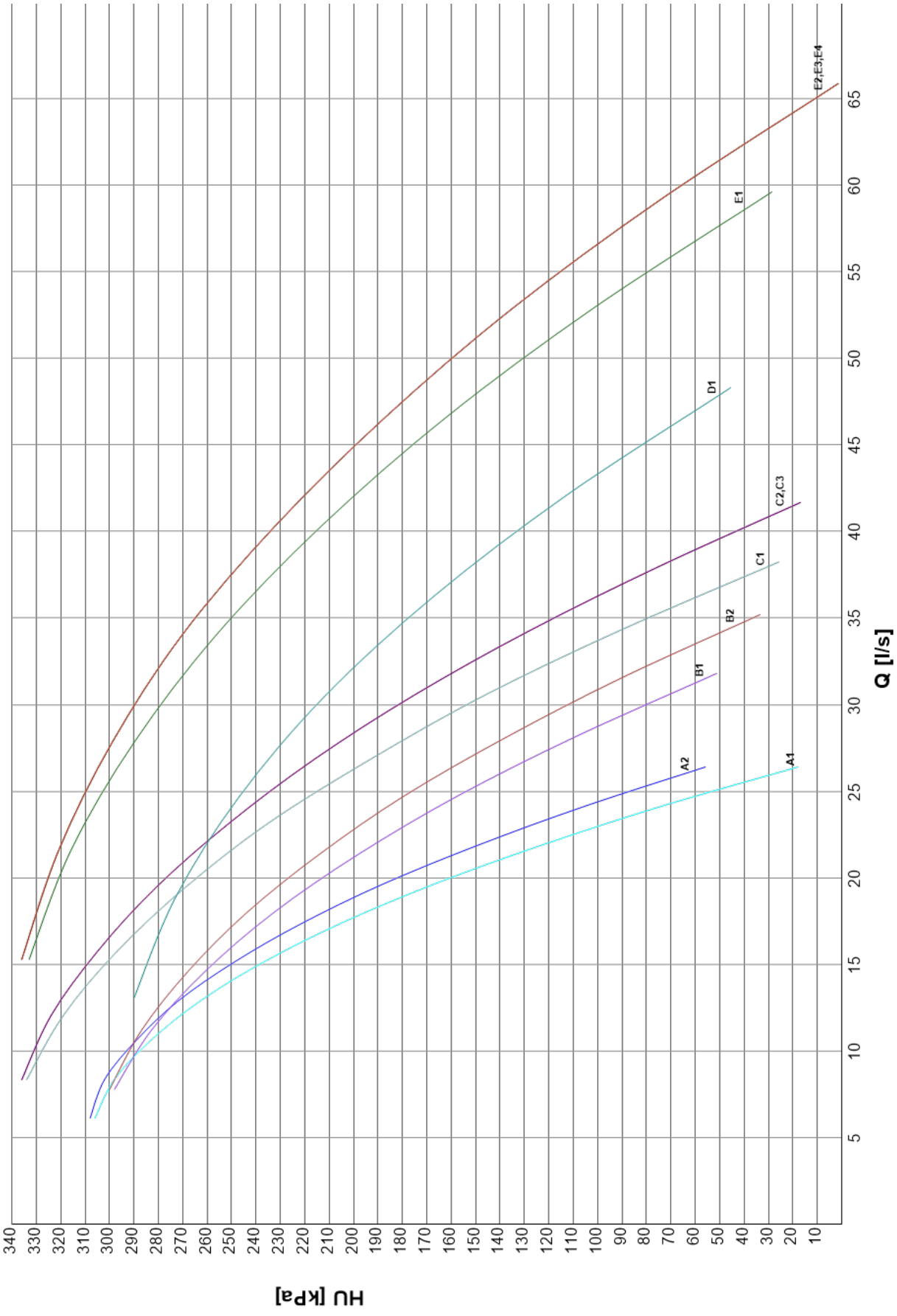


WARM WATER HEAT EX. USER SIDE - CD - 1 POMPA 2P AP (VAR SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3		378,2	18,26	A1	LNEE 65-160/75/2	2	14	7,500		191
	K	334,7		366,5	17,69							200
	SL	316,4		363,8	17,56							202
0364	A	361,5		399,2	19,27	A2						193
	K	355,0		388,4	18,75							201
	SL	336,8		381,0	18,39							207
0404	A	399,8		428,8	20,70	B1	LNEE 80-160/92/2	2	17	9,200		205
	K	382,4		417,0	20,13							212
	SL	370,6		422,2	20,38							209
0446	A	446,5		495,0	23,89	B2						188
	SL	409,4		473,2	22,84							199
0506	A	500,0		533,6	25,76	C1	LNEE 80-160/110/2	2	20	11,00		206
	K	475,7		515,3	24,87							216
	SL	444,0		513,6	24,79							217
0526	A	525,8		576,4	27,83	C2						206
	K	516,4		563,0	27,17							212
	SL	486,6		554,8	26,78							217
0546	A	543,5		599,0	28,91	C3						194
	K	533,6		582,8	28,13							202
	SL	506,1		571,6	27,59							208
0606	A	599,3		640,0	30,89	D1	LNEE 100-160/150/2	2	27	15,00		209
0708	A	696,6		752,7	36,34	E1	LNEE 100-160/185/2	2	33	18,50		242
0738	A	724,8		794,7	38,36	E2						245
0768	A	762,0		825,4	39,84	E3						236
0808	A	799,2		853,3	41,19	E4						227

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

WARM WATER HEAT EX. USER SIDE - CD - 1 POMPA 2P AP (VAR SPEED)

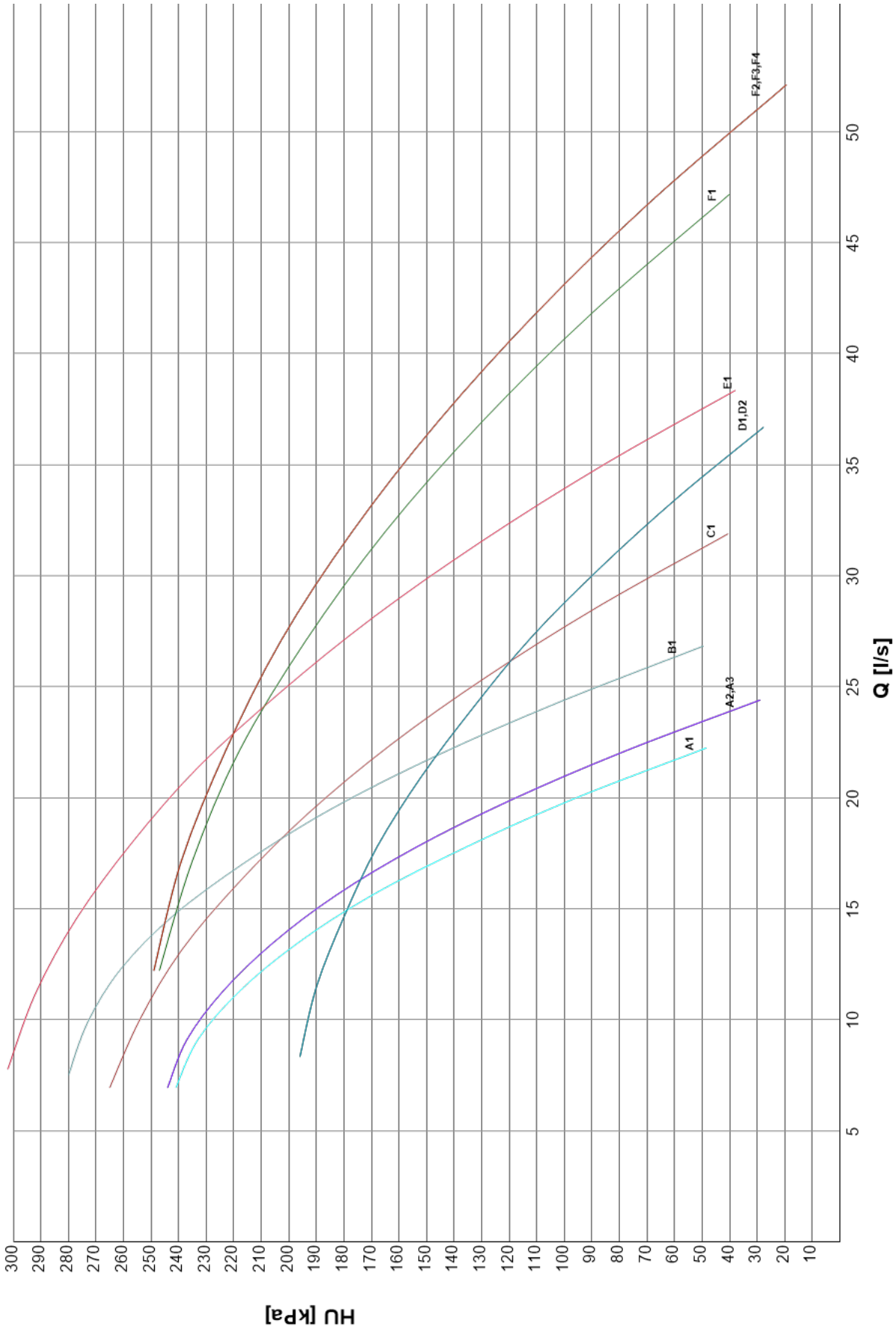


WARM WATER HEAT EX. USER SIDE - CD - 1 PUMP 2P BP (VAR SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3		378,2	18,26	A1	LNEE 65-125/55/2	2	11	5,500		128
	K	334,7		366,5	17,69							137
	SL	316,4		363,8	17,56							139
0364	A	361,5		399,2	19,27	A2						130
	K	355,0		388,4	18,75							138
	SL	336,8		381,0	18,39							144
0404	A	399,8		428,8	20,70	A3						105
	K	382,4		417,0	20,13							115
	SL	370,6		422,2	20,38							110
0446	A	446,5		495,0	23,89	B1	LNEE 65-125/75/2	2	14	7,500		110
	SL	409,4		473,2	22,84							130
0506	A	500,0		533,6	25,76	C1	LNEE 80-160/75/2	2	14	7,500		124
	K	475,7		515,3	24,87							135
	SL	444,0		513,6	24,79							136
0526	A	525,8		576,4	27,83	D1	LNES 100-250/75/4	4	14	7,500		107
	K	516,4		563,0	27,17							112
	SL	486,6		554,8	26,78							115
0546	A	543,5		599,0	28,91	D2						98,7
	K	533,6		582,8	28,13							105
	SL	506,1		571,6	27,59							109
0606	A	599,3		640,0	30,89	E1	LNEE 80-160/92/2	2	17	9,200		138
0708	A	696,6		752,7	36,34	F1	LNEE 100-160/110/2	2	20	11,00		135
0738	A	724,8		794,7	38,36	F2						136
0768	A	762,0		825,4	39,84	F3						125
0808	A	799,2		853,3	41,19	F4						115

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

WARM WATER HEAT EX. USER SIDE - CD - 1 PUMP 2P BP (VAR SPEED)

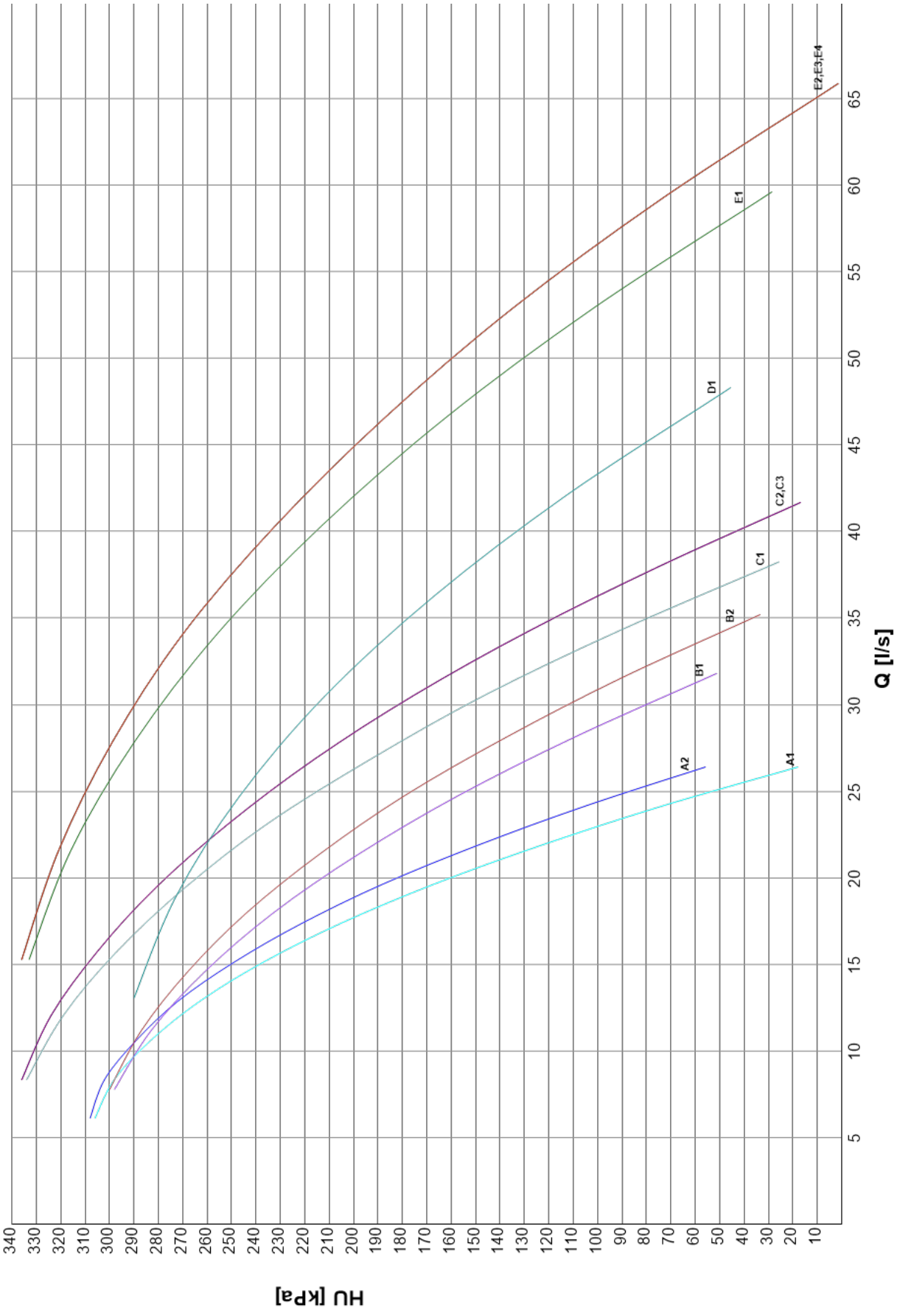


WARM WATER HEAT EX. USER SIDE - CD - 1 PUMP 2P HH (FIX SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3		378,2	18,26	A1	LNEE 65-160/75/2	2	14	7,500		191
	K	334,7		366,5	17,69							200
	SL	316,4		363,8	17,56							202
0364	A	361,5		399,2	19,27	A2						193
	K	355,0		388,4	18,75							201
	SL	336,8		381,0	18,39							207
0404	A	399,8		428,8	20,70	B1	LNEE 80-160/92/2	2	17	9,200		205
	K	382,4		417,0	20,13							212
	SL	370,6		422,2	20,38							209
0446	A	446,5		495,0	23,89	B2						188
	SL	409,4		473,2	22,84							199
0506	A	500,0		533,6	25,76	C1	LNEE 80-160/110/2	2	20	11,00		206
	K	475,7		515,3	24,87							216
	SL	444,0		513,6	24,79							217
0526	A	525,8		576,4	27,83	C2						206
	K	516,4		563,0	27,17							212
	SL	486,6		554,8	26,78							217
0546	A	543,5		599,0	28,91	C3						194
	K	533,6		582,8	28,13							202
	SL	506,1		571,6	27,59							208
0606	A	599,3		640,0	30,89	D1	LNEE 100-160/150/2	2	27	15,00		209
0708	A	696,6		752,7	36,34	E1	LNEE 100-160/185/2	2	33	18,50		242
0738	A	724,8		794,7	38,36	E2						245
0768	A	762,0		825,4	39,84	E3						236
0808	A	799,2		853,3	41,19	E4						227

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

WARM WATER HEAT EX. USER SIDE - CD - 1 PUMP 2P HH (FIX SPEED)

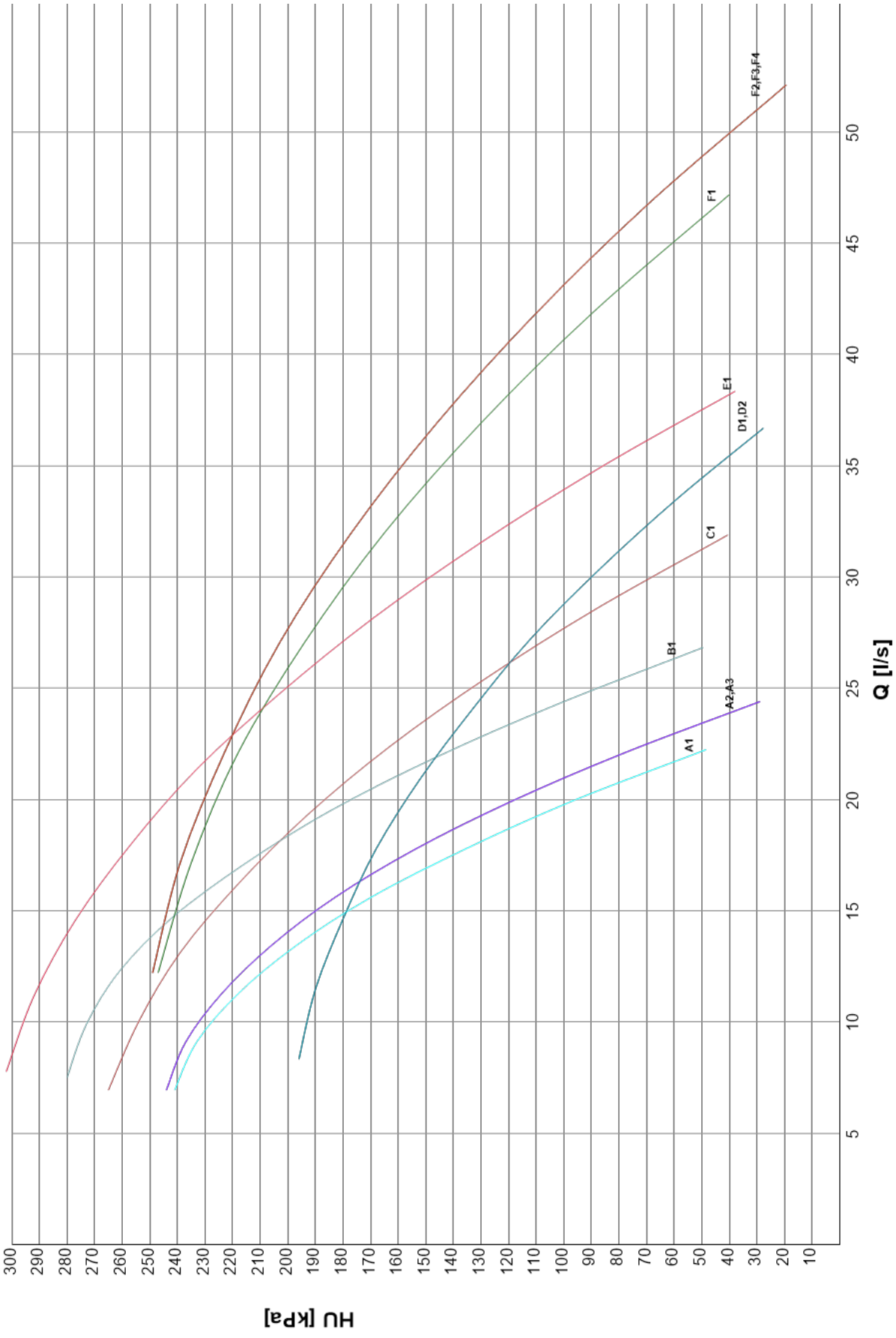


WARM WATER HEAT EX. USER SIDE - CD - 1 PUMP 2P LH (FIX SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3		378,2	18,26	A1	LNEE 65-125/55/2	2	11	5,500		128
	K	334,7		366,5	17,69							137
	SL	316,4		363,8	17,56							139
0364	A	361,5		399,2	19,27	A2						130
	K	355,0		388,4	18,75							138
	SL	336,8		381,0	18,39							144
0404	A	399,8		428,8	20,70	A3						105
	K	382,4		417,0	20,13							115
	SL	370,6		422,2	20,38							110
0446	A	446,5		495,0	23,89	B1	LNEE 65-125/75/2	2	14	7,500		110
	SL	409,4		473,2	22,84							130
0506	A	500,0		533,6	25,76	C1	LNEE 80-160/75/2	2	14	7,500		124
	K	475,7		515,3	24,87							135
	SL	444,0		513,6	24,79							136
0526	A	525,8		576,4	27,83	D1	LNES 100-250/75/4	4	14	7,500		107
	K	516,4		563,0	27,17							112
	SL	486,6		554,8	26,78							115
0546	A	543,5		599,0	28,91	D2						98,7
	K	533,6		582,8	28,13							105
	SL	506,1		571,6	27,59							109
0606	A	599,3		640,0	30,89	E1	LNEE 80-160/92/2	2	17	9,200		138
0708	A	696,6		752,7	36,34	F1	LNEE 100-160/110/2	2	20	11,00		135
0738	A	724,8		794,7	38,36	F2						136
0768	A	762,0		825,4	39,84	F3						125
0808	A	799,2		853,3	41,19	F4						115

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

WARM WATER HEAT EX. USER SIDE - CD - 1 PUMP 2P LH (FIX SPEED)

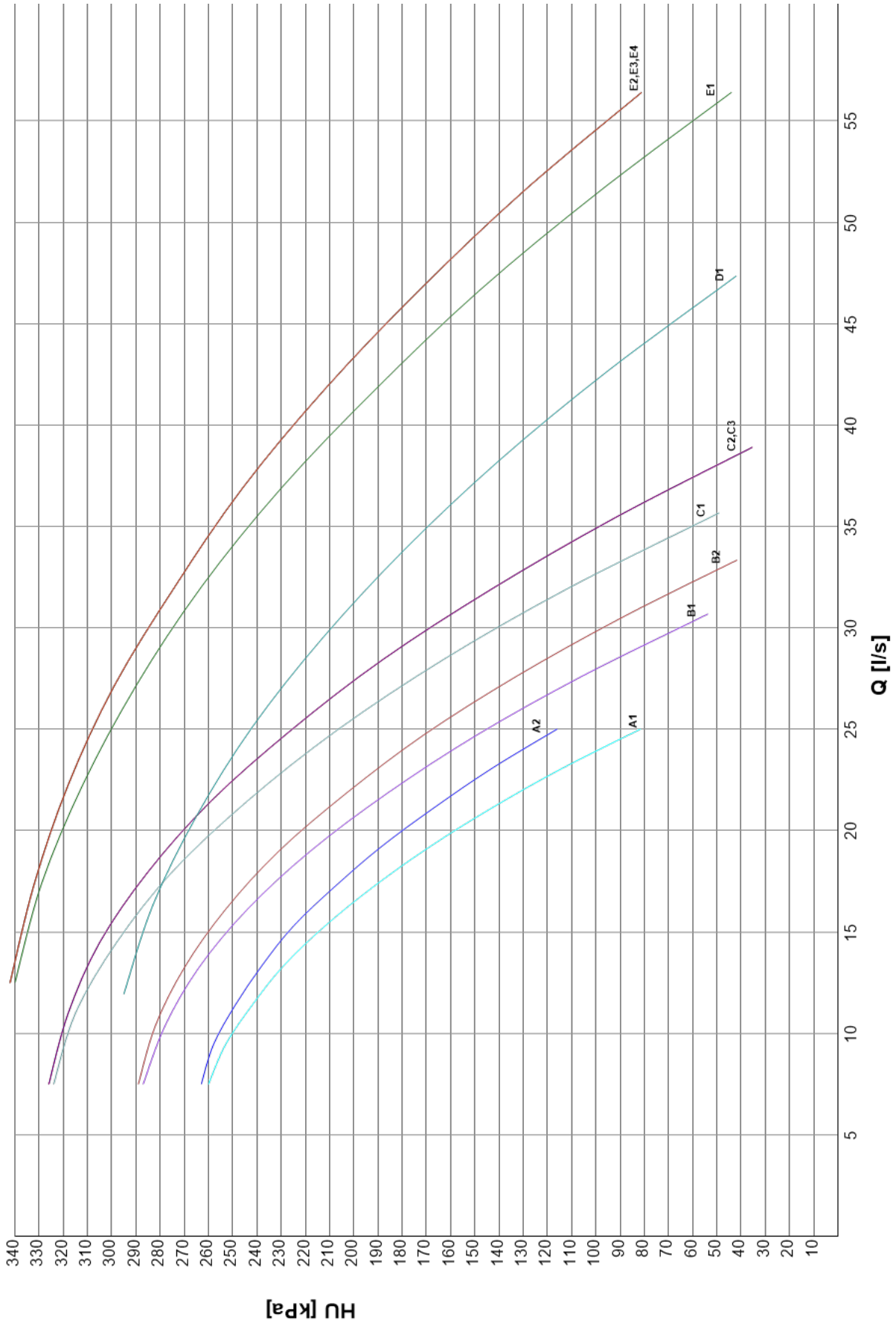


WARM WATER HEAT EX. USER SIDE - CD - 2 POMPE 2P AP (VAR SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3		378,2	18,26	A1	LNTE 80-160/75/2	2	14	7,500		180
	K	334,7		366,5	17,69							187
	SL	316,4		363,8	17,56							188
0364	A	361,5		399,2	19,27	A2						188
	K	355,0		388,4	18,75							194
	SL	336,8		381,0	18,39							197
0404	A	399,8		428,8	20,70	B1	LNTE 80-160/92/2	2	17	9,200		200
	K	382,4		417,0	20,13							206
	SL	370,6		422,2	20,38							203
0446	A	446,5		495,0	23,89	B2						180
	SL	409,4		473,2	22,84							192
0506	A	500,0		533,6	25,76	C1	LNTE 80-160/110/2	2	20	11,00		197
	K	475,7		515,3	24,87							208
	SL	444,0		513,6	24,79							209
0526	A	525,8		576,4	27,83	C2						195
	K	516,4		563,0	27,17							202
	SL	486,6		554,8	26,78							207
0546	A	543,5		599,0	28,91	C3						182
	K	533,6		582,8	28,13							191
	SL	506,1		571,6	27,59							198
0606	A	599,3		640,0	30,89	D1	LNTE 100-160/150/2	2	27	15,00		203
0708	A	696,6		752,7	36,34	E1	LNTE 100-160/185/2	2	33	18,50		234
0738	A	724,8		794,7	38,36	E2						236
0768	A	762,0		825,4	39,84	E3						226
0808	A	799,2		853,3	41,19	E4						216

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

WARM WATER HEAT EX. USER SIDE - CD - 2 POMPE 2P AP (VAR SPEED)

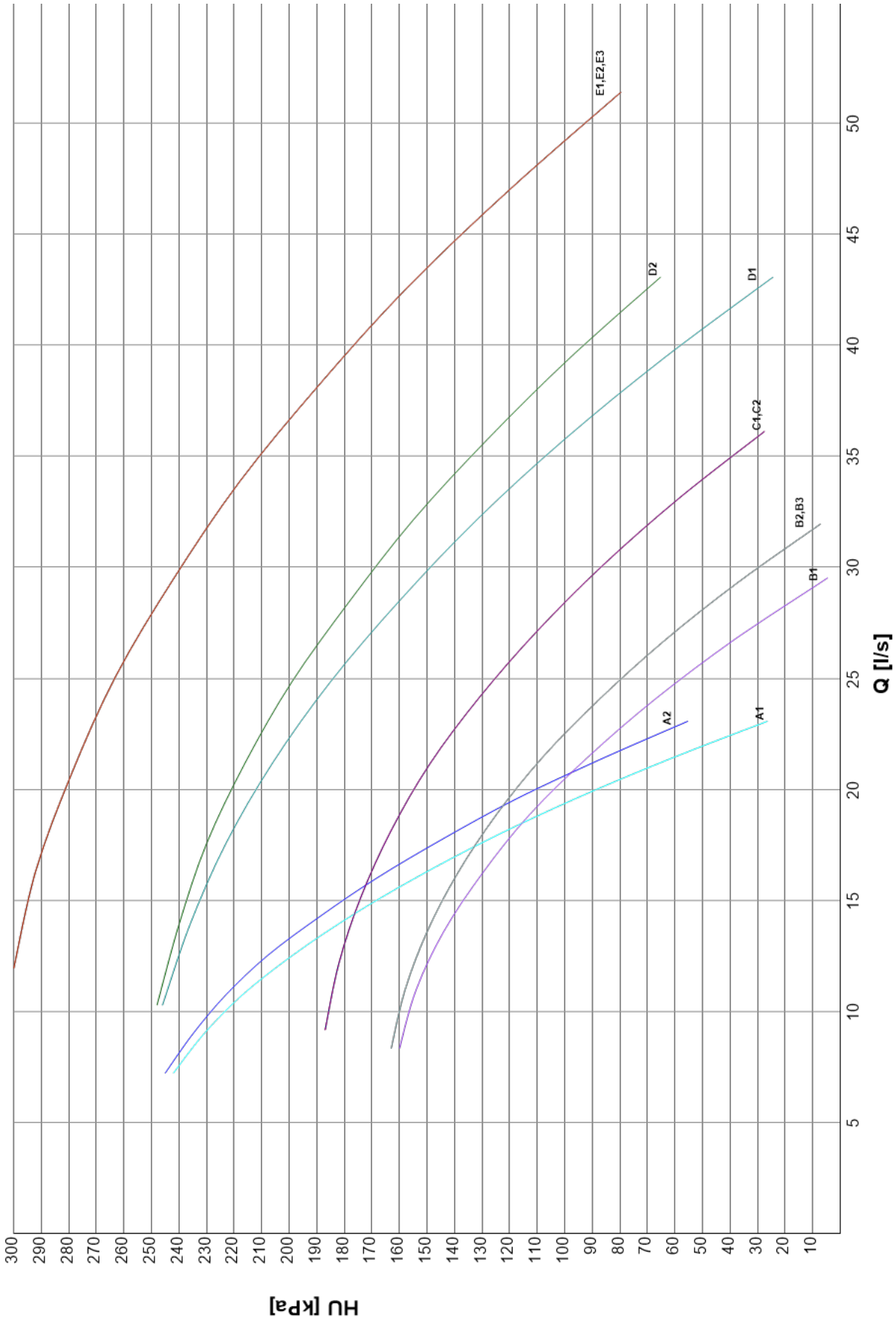


WARM WATER HEAT EX. USER SIDE - CD - 2 PUMPS 2P BP (VAR SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3		378,2	18,26	A1	LNTE 65-125/55/2	2	11	5,500		119
	K	334,7		366,5	17,69							129
	SL	316,4		363,8	17,56							131
0364	A	361,5		399,2	19,27	A2						122
	K	355,0		388,4	18,75							130
	SL	336,8		381,0	18,39							135
0404	A	399,8		428,8	20,70	B1	LNTS 100-250/55/4	4	15	5,500		98,0
	K	382,4		417,0	20,13							103
	SL	370,6		422,2	20,38							101
0446	A	446,5		495,0	23,89	B2						88,8
	SL	409,4		473,2	22,84							97,3
0506	A	500,0		533,6	25,76	B3						72,6
	K	475,7		515,3	24,87							80,5
	SL	444,0		513,6	24,79							81,2
0526	A	525,8		576,4	27,83	C1	LNTS 100-250/75/4	4	15	7,500		105
	K	516,4		563,0	27,17							110
	SL	486,6		554,8	26,78							113
0546	A	543,5		599,0	28,91	C2						96,0
	K	533,6		582,8	28,13							102
	SL	506,1		571,6	27,59							107
0606	A	599,3		640,0	30,89	D1	LNTE 100-160/110/2	2	20	11,00		142
0708	A	696,6		752,7	36,34	D2						124
0738	A	724,8		794,7	38,36	E1	LNTE 100-160/150/2	2	27	15,00		188
0768	A	762,0		825,4	39,84	E2						178
0808	A	799,2		853,3	41,19	E3						168

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

WARM WATER HEAT EX. USER SIDE - CD - 2 PUMPS 2P BP (VAR SPEED)

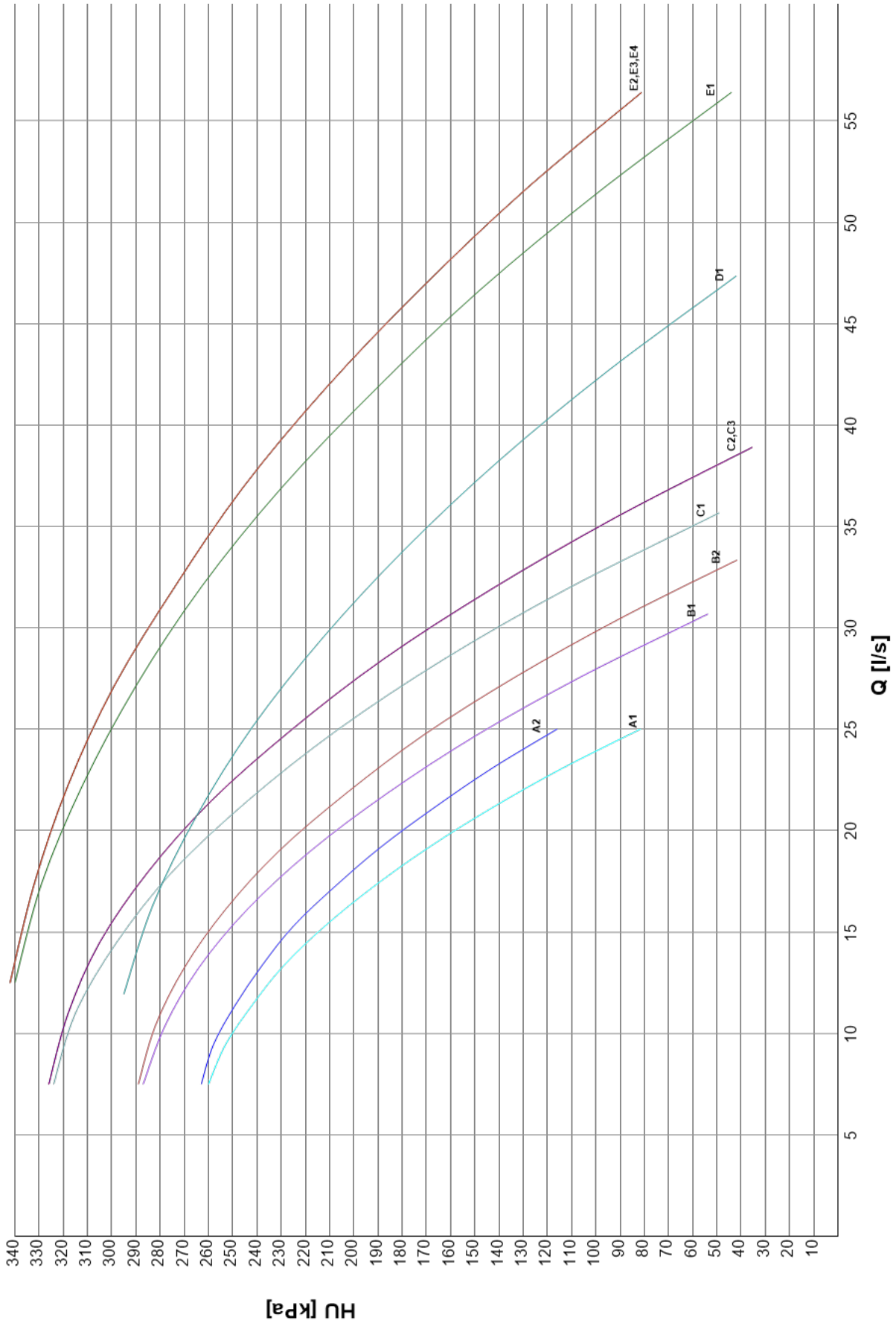


WARM WATER HEAT EX. USER SIDE - CD - 2 PUMPS 2P HH (FIX SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3		378,2	18,26	A1	LNTE 80-160/75/2	2	14	7,500		180
	K	334,7		366,5	17,69							187
	SL	316,4		363,8	17,56							188
0364	A	361,5		399,2	19,27	A2						188
	K	355,0		388,4	18,75							194
	SL	336,8		381,0	18,39							197
0404	A	399,8		428,8	20,70	B1	LNTE 80-160/92/2	2	17	9,200		200
	K	382,4		417,0	20,13							206
	SL	370,6		422,2	20,38							203
0446	A	446,5		495,0	23,89	B2						180
	SL	409,4		473,2	22,84							192
0506	A	500,0		533,6	25,76	C1	LNTE 80-160/110/2	2	20	11,00		197
	K	475,7		515,3	24,87							208
	SL	444,0		513,6	24,79							209
0526	A	525,8		576,4	27,83	C2						195
	K	516,4		563,0	27,17							202
	SL	486,6		554,8	26,78							207
0546	A	543,5		599,0	28,91	C3						182
	K	533,6		582,8	28,13							191
	SL	506,1		571,6	27,59							198
0606	A	599,3		640,0	30,89	D1	LNTE 100-160/150/2	2	27	15,00		203
0708	A	696,6		752,7	36,34	E1	LNTE 100-160/185/2	2	33	18,50		234
0738	A	724,8		794,7	38,36	E2						236
0768	A	762,0		825,4	39,84	E3						226
0808	A	799,2		853,3	41,19	E4						216

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

WARM WATER HEAT EX. USER SIDE - CD - 2 PUMPS 2P HH (FIX SPEED)

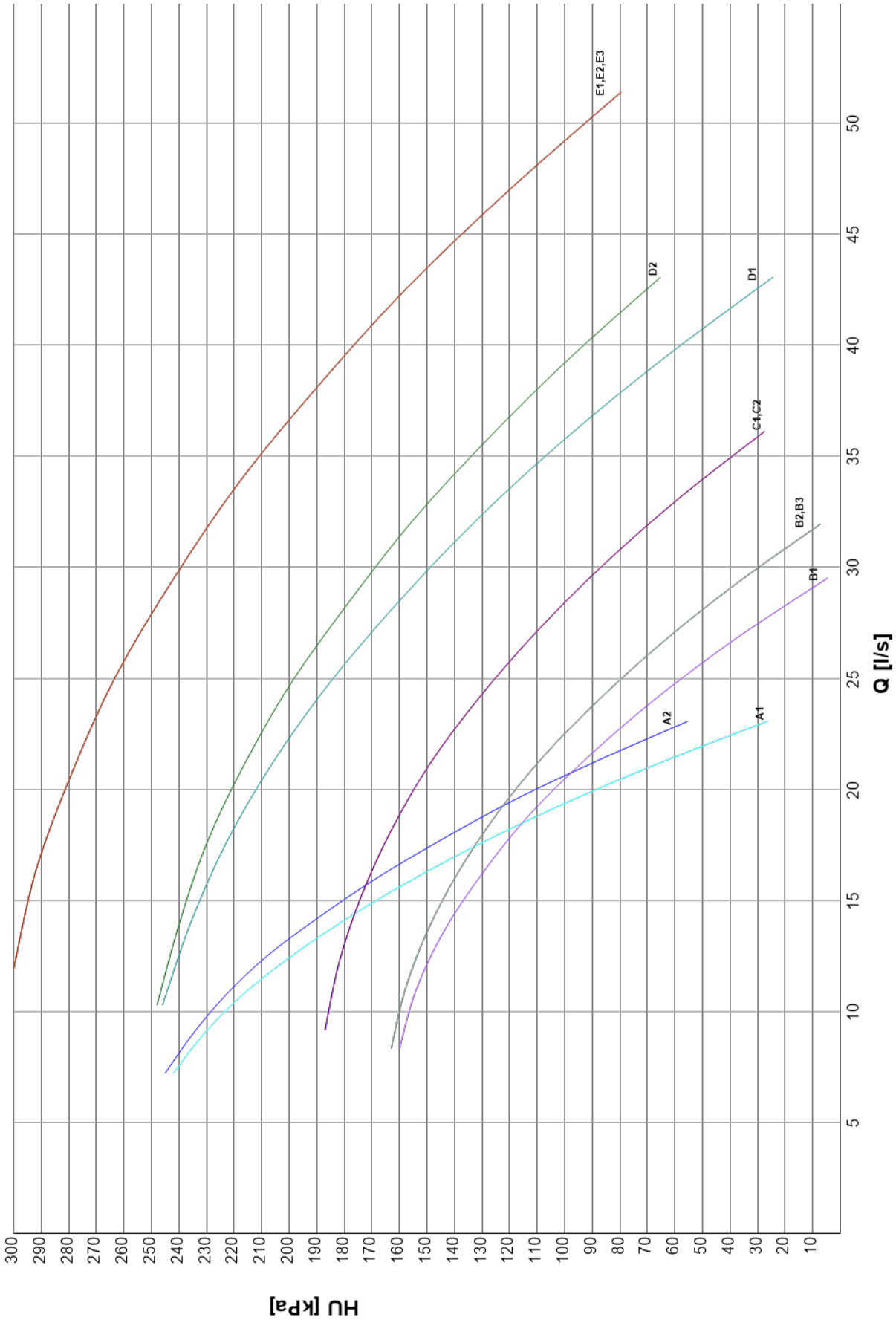


WARM WATER HEAT EX. USER SIDE - CD - 2 PUMPS 2P LH (FIX SPEED)

SIZE		CH		HP		PUMP					CH	HP
		Pfgross	Qfgross	Ptgross	Qcdgross	Curve	Model	N.	F.L.A.	F.L.I.	HU	HU
		[kW] (1)	[l/s] (1)	[kW] (1)	[l/s] (1)			Pole	[A]	[kW]	[kPa]	[kPa]
0344	A	345,3		378,2	18,26	A1	LNTE 65-125/55/2	2	11	5,500		119
	K	334,7		366,5	17,69							129
	SL	316,4		363,8	17,56							131
0364	A	361,5		399,2	19,27	A2						122
	K	355,0		388,4	18,75							130
	SL	336,8		381,0	18,39							135
0404	A	399,8		428,8	20,70	B1	LNTS 100-250/55/4	4	15	5,500		98,0
	K	382,4		417,0	20,13							103
	SL	370,6		422,2	20,38							101
0446	A	446,5		495,0	23,89	B2						88,8
	SL	409,4		473,2	22,84							97,3
0506	A	500,0		533,6	25,76	B3						72,6
	K	475,7		515,3	24,87							80,5
	SL	444,0		513,6	24,79							81,2
0526	A	525,8		576,4	27,83	C1	LNTS 100-250/75/4	4	15	7,500		105
	K	516,4		563,0	27,17							110
	SL	486,6		554,8	26,78							113
0546	A	543,5		599,0	28,91	C2						96,0
	K	533,6		582,8	28,13							102
	SL	506,1		571,6	27,59							107
0606	A	599,3		640,0	30,89	D1	LNTE 100-160/110/2	2	20	11,00		142
0708	A	696,6		752,7	36,34	D2						124
0738	A	724,8		794,7	38,36	E1	LNTE 100-160/150/2	2	27	15,00		188
0768	A	762,0		825,4	39,84	E2						178
0808	A	799,2		853,3	41,19	E3						168

(1) Values refer to nominal conditions
CH Cooling mode
HP HP mode
Pf Cooling capacity unit (Cooling mode)
Pt Heating capacity unit (Heating mode)
Q Plant (side) exchanger water flow
F.L.I. Pump power input
F.L.A. Pump running current
HU Pump residual pressure head (Units with hydronic group without mains filter)

WARM WATER HEAT EX. USER SIDE - CD - 2 PUMPS 2P LH (FIX SPEED)



16.1 Variable flow control

Pump energy consumption significantly impacts plant running costs, but it can be considerably reduced thanks to the use of variable speed pumps (inverter driven pumps), capable of adjusting the water flow rate according to the actual plant thermal load.
Mitsubishi Electric Hydronics & Cooling Systems has developed the VPF control series (Variable Primary Flow), that provides different water flow regulation logics specifically devoted to various hydraulic plant solutions: only a primary circuit, primary and secondary circuits, single unit or multi-unit systems controlled with external controller (Manager 3000, ClimaPRO).
The VPF systems adjust the pump speeds on the basis of the plant's thermal load and optimize the unit's thermoregulation algorithm for variable flow operation, in a dynamic and simultaneous way. This ensures the highest energy savings, stable operation, and complete reliability.

VPF SYSTEM (delta P control)
For plants with only a primary circuit

VPF - Plant and unit requirements

The VPF logic provides the variable flow control for the plant's primary circuit.

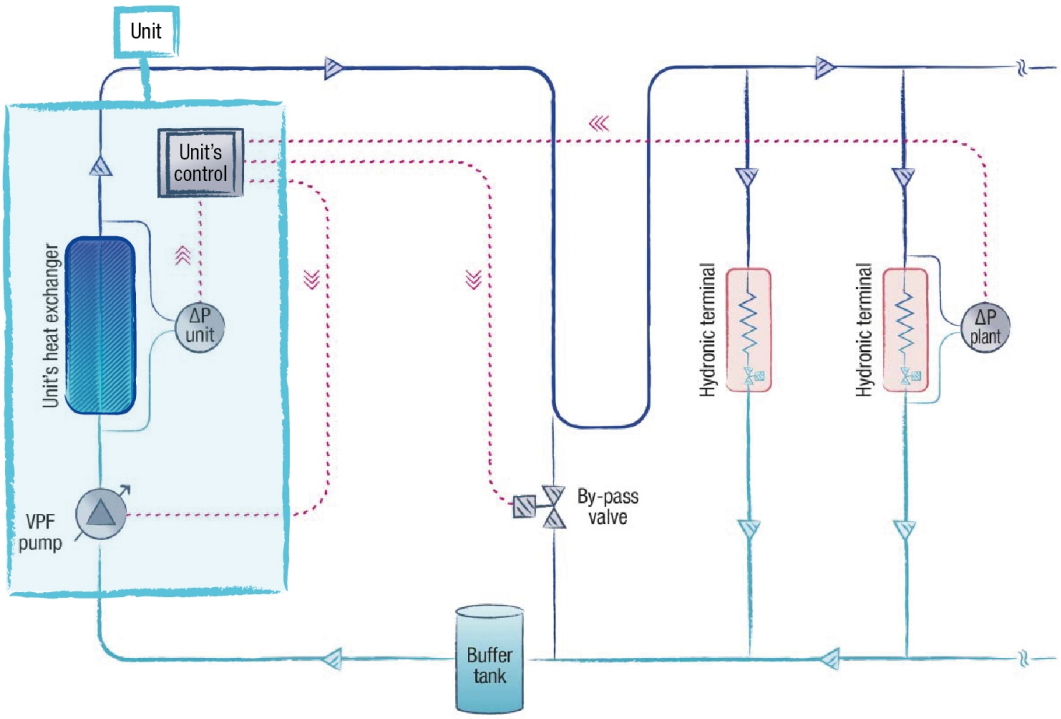
- Type of plant: primary circuit only, that feeds hydronic terminals fitted with a 2-way regulating valve

- Hydronic module: modulating regulation devices (0-10V signal) or variable speed pumps

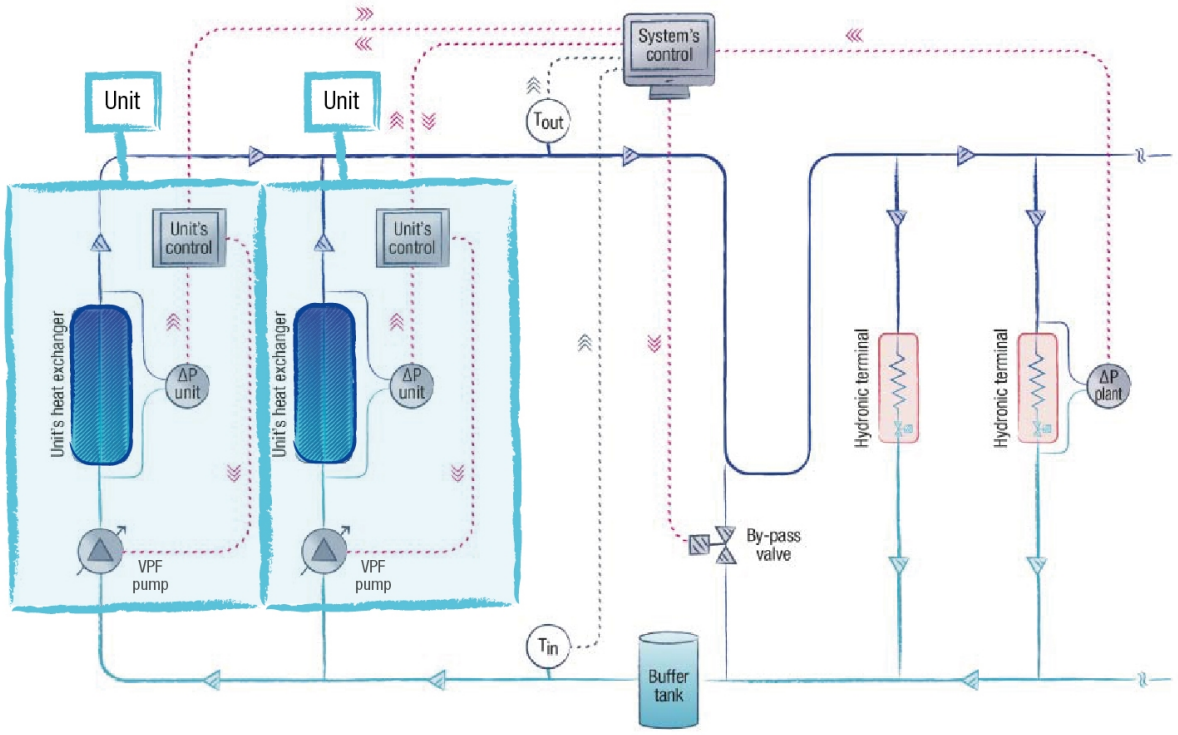
- Unit thermoregulation: control of the leaving water temperature

- Monitored parameter: delta P on relevant users' hydronic terminal

Plant diagram for single unit system



Plant diagram for multi-unit with external control system (Manager3000 or ClimaPRO)



VPF - Operating logic

Water flow regulation

The VPF system monitors the differential pressure on the plant side (ΔP) and adjusts the pump speed in order to keep it within a defined range (ΔPmin ΔPmax).

- If ΔPmin ≤ ΔP ≤ ΔPmax
The plant water flow is appropriate to the thermal load, the pump speed is kept constant.

- If ΔP > ΔPmax
The plant water flow exceeds what is necessary to properly cover the thermal load, the pump speed is reduced to save pump energy.

- If ΔP < ΔPmin
The plant water flow is too low to ensure the proper feed to the hydronic terminals, the pump speed is increased.

With the VPF system, the water flow can be reduced to 50% of the unit nominal water flow, with regards to the selection conditions, provided that the minimum water flow required by the unit's heat exchanger is respected (the control of the heat exchanger's minimum water flow is described below).
The pump speed regulation is performed with little progressive adjustments while continuously monitoring the values of both the delta P on the plant side and the water temperature on the heat exchanger. The absence of abrupt water flow changes prevents fluctuation due to possible conflicts with the unit's thermoregulation function (compressor regulation).

Control of the unit's minimum water flow

Under no circumstances can the primary circuit water flow be reduced below the minimum water flow required by the unit's heat exchanger.
The monitoring of the unit's water flow is performed through a factory installed differential pressure transducer on the unit's heat exchanger.
If the differential pressure on the plant side requests a users' water flow lower than the unit's minimum water flow, the VPF system commands the gradual opening of the hydraulic by-pass valve (safety function). This ensures that the minimum water flow required by the unit's heat exchanger is always provided. As soon as the hydronic terminals request an increase of the water flow (ΔP < ΔPmin), the VPF closes the by-pass valve.

Multi-unit systems

The VPF control logic is also the same for multi-unit systems.
The plant side differential pressure transducer reading and the by-pass valve opening are managed by the multi-unit control system (Manager3000, ClimaPRO).
Each unit autonomously adjusts its pump speed on the basis of the information provided by the multi-unit control system.
When the plant load requests the activation of a stand-by unit, the multi-unit control system calculates the starting speed of its pump in order to avoid excessive water flow variation of the running units.

VPF - Devices and installation

Device	Accessory name		
	VPF (w/o DP)(SU, MM_PR) (1)	VPF (w DP)(SU, MM_PR) (2)	VPF (M3000, CPRO, MM_N-PR) (3)
Differential pressure transducer on the unit's heat exchanger and related controller expansion board	Factory installed	Factory installed	Factory installed
Controller expansion board to read the plant side differential pressure transducer (4-20mA signal) and manage the hydraulic by-pass valve opening (0-10V signal)	Factory installed	Factory installed	Factory installed on the multi-unit external control system (Manager3000, ClimaPRO) (5)
Plant side differential pressure transducer	Not included (the supply is the customer's responsibility) (4)	Factory supplied, installation is the client's responsibility (4)(5)	Factory supplied with the multi-unit external control system (Manager3000, ClimaPRO); installation is the client's responsibility (4)(6)
Plant side hydraulic by-pass valve	Not included (the supply is the customer's responsibility) (7)	Not included (the supply is the customer's responsibility) (7)	Not included (the supply is the customer's responsibility) (7)

(1) VPF for unit without plant differential pressure transducer included (for single unit plant)
(2) VPF for unit with plant differential pressure transducer included (for single unit plant)
(3) VPF for multi-unit plant with external controller (Manager3000, ClimaPRO)
(4) It is recommended to install the differential pressure transducer on the most hydraulically critical hydronic terminal, to ensure it has a proper water flow in any load condition.
(5) Technical features of the differential pressure transducer supplied:
Model: Huba Control 692.9 120071C1
Pressure range: 0 ... + 1 bar
Output: 4-20mA
Electrical connection: DIN EN 175301-803-A (IP 65)
Pressure connection adapters: male threaded G 1/8"
(6) It is the customer's responsibility to configure the multi-unit control system (Manager3000, ClimaPRO) with option VPF.
(7) See attached table for information on the hydraulic by-pass design.

The following table provides the indications for a correct hydraulic by-pass design.

Heat exchanger minimum flow (m^3/h) (1)	Minimum by-pass diameter	Minimum by-pass valve diameter	Suggested valve model	Kvs	Suggested actuator model
From 19 to 30	DN50 (2”)	DN50 (2”)	VVG41.50	40	SKB60
Up to 37	DN65 (2" ½)	DN65 (2" ½)	VVF31.65	49	SKB60
Up to 60	DN80 (3“)	DN80 (3“)	VVF31.80	78	SKB60
Up to 95	DN100 (4“)	DN100 (4“)	VVF31.90	124	SKC60
Up to 150	DN125 (5“)	DN125 (5“)	VVF31.91	200	SKC60
Up to 230	DN150 (6”)	DN150 (6”)	VVF31.92	300	SKC60

((1) In case of a multi-unit system, the unit with the highest minimum water flow should be the reference.

VPF.D SYSTEM (delta T control)
For plants with primary and secondary circuits separated by a hydraulic decoupler.

VPF.D - Plant and unit requirements

The VPF.D logic provides the variable flow control for the plant’s primary circuit.

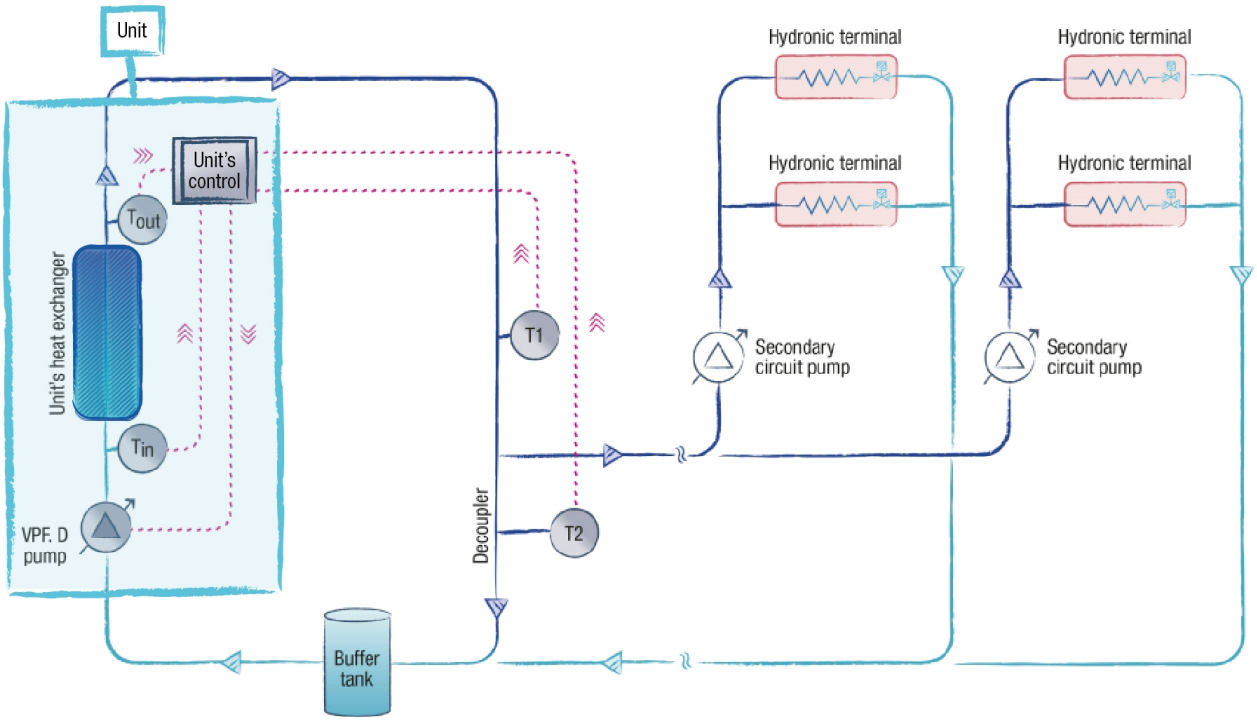
- Type of plant: primary and secondary circuits separated by a hydraulic decoupler

- Hydronic module: modulating regulation devices (0-10V signal) or variable speed pumps

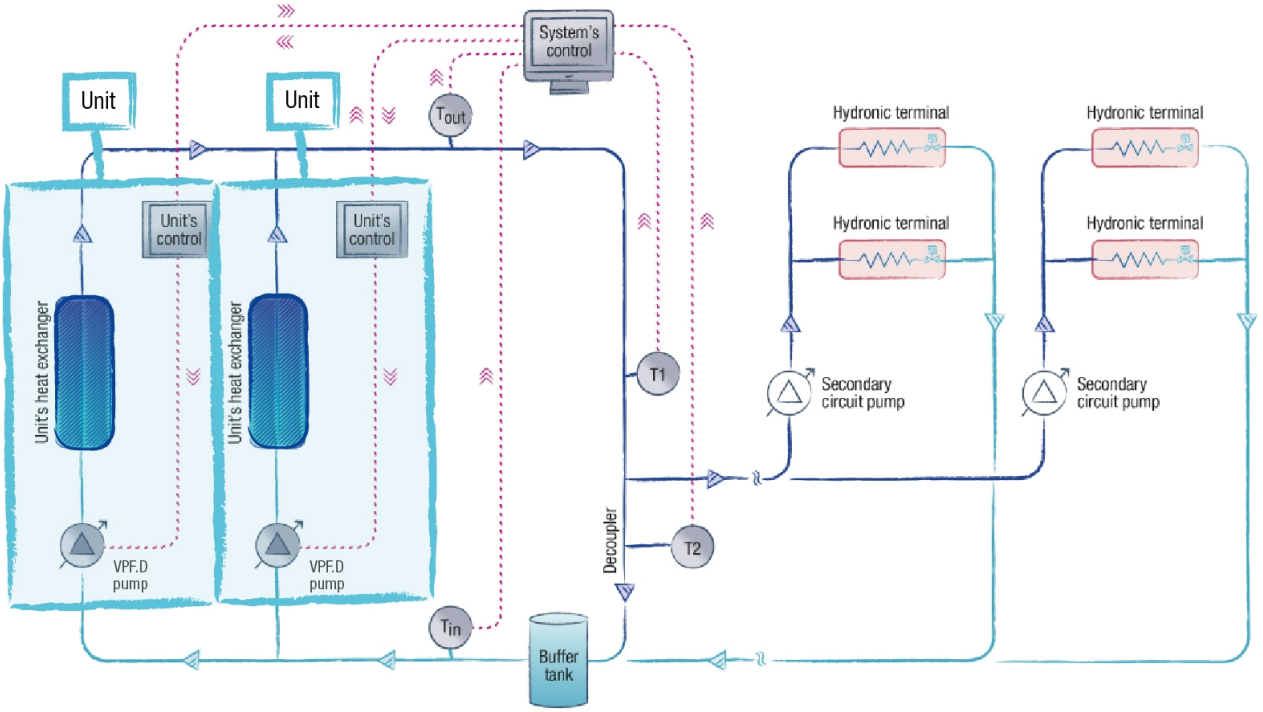
- Unit thermoregulation: control of the leaving water temperature

- Monitored parameter: delta T on primary circuit

Plant diagram for single unit system



Plant diagram for multi-unit with external control system (Manager3000 or ClimaPRO)



VPF.D - Operating logic

Water flow regulation

The VPF.D system monitors the temperature difference of the primary circuit (ΔT) (that corresponds to the temperature difference of the unit's heat exchanger in the case of a single unit system), and adjusts the primary circuit's pump speed in order to keep it within a defined range (ΔTmin ÷ ΔTmax). The secondary circuit water flow is completely independent and is to be managed by the client.

- If ΔTmin ≤ ΔT ≤ ΔTmax
The plant water flow is appropriate to the thermal load, the pump speed is kept constant.

- If ΔT < ΔTmax
The plant water flow exceeds what is necessary to properly cover the thermal load, the pump speed is reduced to save pump energy.

- If ΔT > ΔTmin
The plant water flow is too low to ensure the proper feed to the users, the pump speed is increased.

To prevent the returning water of the secondary circuit from recirculating through the decoupler and mixing with the delivery water, which would cause serious plant regulation problems, the VPF.D provides a safety function based on the temperatures, which are detected by two probes on the plant side: T1 on the unit delivery line and T2 on the hydraulic decoupler. If during the water flow regulation of the circuits, the flow direction in the decoupler reverses (detected temperatures T1 < T2), the system forces a quick increase of the primary water flow until the correct direction of the flow in the decoupler is restored (detected temperatures T1 = T2).

With the VPF.D system, the water flow can be reduced to 50% of the unit nominal water flow, with regards to the selection conditions, provided that the minimum water flow required by the unit's heat exchanger is respected (the control of the heat exchanger's minimum water flow is described below).
The pump speed regulation is performed with little progressive adjustments while continuously monitoring the values of both the temperature difference on the primary circuit and the temperatures of the probes T1 and T2. The absence of abrupt water flow changes prevents fluctuation due to possible conflicts with the unit's thermoregulation function (compressor regulation).

Control of the unit's minimum water flow

Under no circumstances can the primary circuit water flow be reduced below the minimum water flow required by the unit's heat exchanger.
The unit's minimum water flow is ensured by setting the minimum pump speed (service menu parameter).

Multi-unit systems

The VPF.D control logic is also the same for multi-unit systems.
The reading of the temperature difference on the primary circuit and the reading of the temperature probes T1 and T2 is managed by the multi-unit control system (Manager3000, ClimaPRO).
Each unit autonomously adjusts its pump speed on the basis of the information provided by the multi-unit control system.
When the plant load requests the activation of a stand-by unit, the multi-unit control system calculates the starting speed of its pump in order to avoid excessive water flow variation of the running units.

VPF.D - Devices and installation

Dispositivo	Accessory name	
	VPF.D (SU, MM_PR) (1)	VPF.D(M3000, CPRO, MM_N-PR) (2)
2 plant side NTC temperature sensors and related controller expansion board	Factory supplied (probes supplied without wells), installation is the client's responsibility (3)	Factory supplied with the multi-unit external control system, Manager3000 or ClimaPRO (probes supplied without wells); installation is the client's responsibility (3)(4)

(1) VPF.D for single unit plant
(2) VPF.D for multi-unit plant with external controller (Manager3000 or ClimaPRO)
(3) It is recommended to install the temperature probes as shown in the enclosed plant diagrams (T1 on the unit delivery line, T2 on the hydraulic decoupler)
(4) It is the customer's responsibility to configure the multi-unit control system (Manager3000, ClimaPRO) with option VPF.D.

The following table provides the indications for a correct hydraulic decoupler design.

Heat exchanger minimun flow (m^3/h) (1)	Minimum hydraulic decoupler diameter
From 25 to 40	DN65 (2" ½)
Up to 60	DN80 (3“)
Up to 100	DN100 (4“)
Up to 150	DN125 (5“)
Up to 225	DN150 (6”)
Up to 375	DN200 (8”)

(1) In case of a multi-unit system, the unit with the highest minimum water flow should be the reference.

MITSUBISHI ELECTRIC
HYDRONICS & IT COOLING SYSTEMS S.p.A.

Head Office:
Via Caduti di Cefalonia 1 - 36061 Bassano del Grappa (VI) - Italy
Tel (+39) 0424 509 500 - Fax (+39) 0424 509 509
www.melcohit.com