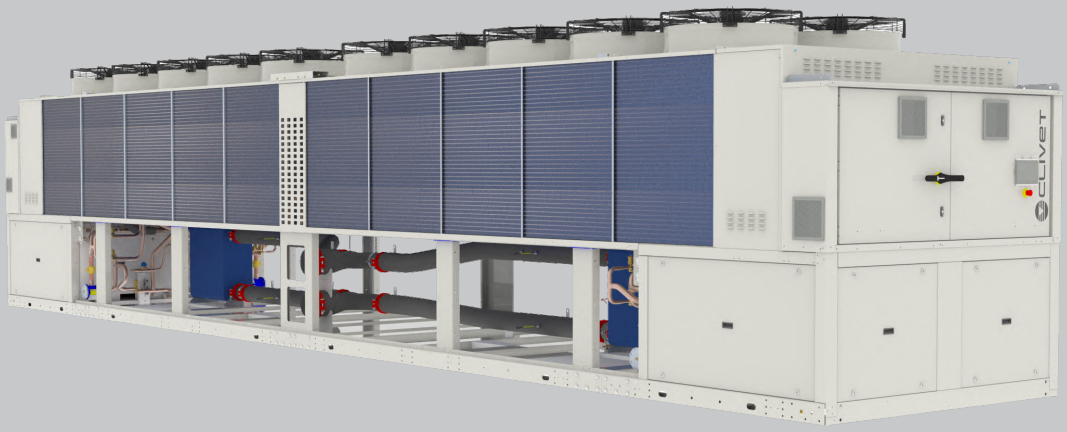
Air cooled reversible heat pump for outdoor installation

SPINchiller^4

WSAN-YSC4 260.8-480.12 RANGE

TECHNICAL BULLETIN



ErP 2021 COMPLIANT

R-32

SIZE - EXCELLENCE	260.8	290.8	320.8	345.9	370.10	420.12	450.12
Cooling capacity [kW]	710	780	860	930	1000	1111	1211
Heating capacity [kW]	750	830	910	985	1060	1169	1269

SIZE - PREMIUM	260.8	290.8	315.9	345.9	370.10	420.12	450.12	480.12
Cooling capacity [kW]	670	740	815	885	960	1060	1171	1260
Heating capacity [kW]	700	770	850	920	1000	1109	1219	1309

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Clivet is taking part in the EUROVENT certification programme up to 1.500 kW.
The products concerned appear in the certified products list of the EUROVENT www.eurovent-certification.com site.

Features and benefits

SPINchiller[4]: Modular scroll technology for every application

SPINchiller[4] is the new generation of Clivet liquid chillers and heat pump with modular scroll technology.
Thanks to its high seasonal efficiency and the adoption of the R-32 refrigerant with reduced environmental impact, it represents the ideal solution for different types of installation.

WSAN-YSC4 260.8 ÷ 480.12

Air cooled heat pump with multiscroll technology

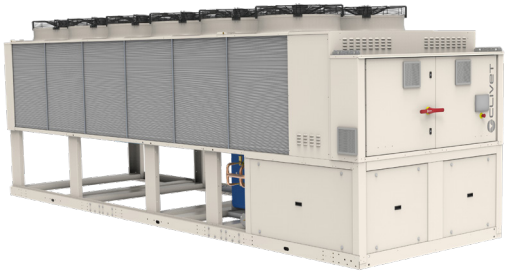
- Range 670 - 1260 kW
- EXCELLENCE / PREMIUM Version
- Seasonal efficiency (SEER) 4,8 / 4,6
- Operating with 48°C outdoor air temperature in cooling
- Operating with -15°C outdoor air temperature in heating
- Copper/aluminum condensing coil
- Partial recovery of the condensing heat
- Plate exchangers / shell and tube
- 4 refrigeration circuits

R-32

WSAN-YSC4 80.3 ÷ 240.6

Air cooled heat pump with multiscroll technology

- Range 215 - 655 kW
- EXCELLENCE / PREMIUM Version
- Seasonal efficiency (SEER) 4,8 / 4,5
- Operating with 48°C outdoor air temperature in cooling
- Operating with -15°C outdoor air temperature in heating
- Copper/aluminum condensing coil
- Partial recovery of the condensing heat
- Plate exchangers / shell and tube
- 2 refrigeration circuits



R-32

WSAT-YSC4 80.3 ÷ 240.6

Air cooled liquid chiller with multiscroll technology

- Range 222 ÷ 675 kW
- EXCELLENCE / PREMIUM Version
- Seasonal efficiency (SEER) 4,9 / 4,6
- Operating with 50°C outdoor air temperature
- Operating with -18°C outdoor air temperature
- Full aluminium microchannel coils
- Partial recovery of the condensing heat
- Total recovery of the condensing heat
- Plate exchangers / shell and tube
- 2 refrigeration circuits

R-32

Compressor
High efficiency hermetic orbiting scroll compressor complete with oil charge, motor over-temperature and over-current devices and protection against excessive gas discharge temperature with oil heater, which starts automatically, keeps the oil from being diluted by the refrigerant when the compressor stops.
Compressors, fitted on rubber antivibration mounts to prevent transmission of noise and vibration, are connected in TANDEM or TRIO on a single refrigerating circuit with biphasic oil equalisation, it allows to reach high efficiency at partial load.
Uniform compression process with reduced number of moving parts which ensure very low levels of noise and vibration.

Structure
Structure and base made entirely of sturdy sheet steel, thickness of 30/10 or 40/10, with the surface treatment in Zinc–Magnesium painted , for the parts in view, with polyester powder RAL 9001 that guarantees excellent mechanical characteristics and high corrosion strength over time.

Internal exchanger
Direct expansion heat exchanger, braze-welded AISI 316 stainless steel plates, in pack without seals using copper as the brazing material, with low refrigerant charge and large exchange surface, complete with:
- external thermal insulation no-condensation, thickness 9,5 mm, in extruded elastomer foam with closed cells;
- differential pressure switch, water side;
- antifreeze heater to protect the water side exchanger, preventing the formation of frost if the water temperature falls below a set value.

Maximum operating pressure exchanger: 10 bar on the water side.

Esternal exchanger
Finned exchanger, made from copper pipes arranged in staggered rows and mechanically expanded for better adherence to the collar of the fins. The exchangers are planned, designed and produced directly by CLIVET. The fins are made of aluminium and special corrugated surface, set a suitable distance apart to ensure maximum heat exchange efficiency. A proper liquid supply of the expansion valve is ensured by the subcooling circuit. Each finned heat exchanger is directly cooled by the air flow of its specific fans.

In Excellence version the fins are made of aluminium with hydrophilic treatment.

Fan
Axial fans with high performance and low-noise, balanced statically and dynamically, with blades in aluminum sheet coated in PP and sickle profile terminating with “Winglets”, Wall ring in sheet steel pre-galvanised, directly coupled to the three-phase electric motor with external rotor and IP54 protection and class F insulation. Fans are located in aerodynamically shaped structures, equipped with accident prevention steel guards.Supplied with variable speed control (ECOBREEZE).

Refrigeration circuit
Four independent refrigeration circuits made of copper, brazed and factory-assembled, complete with:
- anti-acid dehydrator filter with solid cartridge replaceable;
- liquid flow and humidity indicator;
- liquid receiver;
- electronic expansion valve;
- non return valve;
- 4-way reverse cycle valve;
- high-pressure safety pressure switch;
- safety valve for high and low pressure;
- cut-off valve on liquid line.
- inlet liquid separator.

Suction pipes thermally insulated with highly flexible EPDM rubber closed-cell elastomer insulation. Each cooling circuit is tested under pressure for leaks and is supplied complete with load of refrigerant gas.

Electrical panel
The unit is equipped with 2 electrical panels, 1 Master and 1 Slave.
The unit has a single power supply.
The Slave electrical panel is powered directly from the Master electrical panel.
Entirely manufactured and wired in conformity to the EN 60204 standard.
The power section includes:
- door locking main circuit breaker;
- main power supply terminals (400V / 3Ph / 50Hz)
- insulation transformer for powering the auxiliary circuit;
- magneto-thermal cut-out switches to protect compressors;
- magneto-thermal cut-out switches to protect fans;
- electrical panel ventilation;
- single power supply.

The control section includes:
- interface terminal with graphic display;
- proportional-integral-derivative adjustment of water temperature;
- anti-freeze protection;
- management of unit start-up from local or remote device (serial);
- compressor overload protection and timer;
- potential-free contacts for compressor status;
- self-diagnosis system with instant error code visualisation;
- pre-alarm function for water anti-frost and refrigerant gas high pressure functions;
- visualisation of no. of hours of compressor operation;
- multifunction phase monitor;
- remote ON/OFF control;
- second set-point enabling by potential-free contact;
- automatic rotation control of compressor start-up to balance wear (breakaway + hours of operation);
- relay for remote cumulative fault signal;
- set values, error codes and parameters can be displayed;
- set-point compensation with outdoor air temperature probe
- electrical socket (max 400W)

Standard unit technical specifications

Accessories

- Finned coil protection grilles
- Anti-hail protection grilles
- Copper / aluminium condenser coil with acrylic lining
- Copper / aluminium condensing coils with Aluminium Energy Guard DCC treatment
- Shell and tube evaporator PED test
- Soundproofing paneling of the pumping unit
- Energy meter
- Demand limit with signal 4-20mA;
- Demand limit with signal 0-10V
- Set point compensation with 4-20 mA signal
- Set-point compensation with 0-10 V signal
- Serial communication module for Modbus supervisor
- Serial communication module for LonWorks supervisor
- Serial communication module for BACnet-IP supervisor
- Inverter driven variable flow-rate user side control depending on the temperature differential
- Refrigerant leak detector assembled on the casing (available only with SC and EN configuration)
- Remote control via microprocessor control (separately supplied accessories)
- Electrical panel antifreeze protection for min. outdoor temperature down to -25°C
- Spring antivibration mounts (separately supplied accessories)
- Anti-seismic spring antivibration mounts (separately supplied accessories)
- Couple of manually operated shut-off valves (separately supplied accessories)
- Steel mesh strainer on the water side (separately supplied accessories)
- Mains power supply (separately supplied accessories)
- High and low pressure gauges
- Ecoshare function for the automatic management of a group of units
- Power factor correction capacitors
- Disposal for inrush current reduction
- Storage tank
- Cutoff valve on compressor supply and return

Test

Unit subjected to factory-tested in specific steps and test pressure of the piping of the refrigerant circuit (with nitrogen and hydrogen), before shipping them.

Unit equipment with outdoor air low temperatures

MINIMUM OUTDOOR AIR TEMPERATURE		OPERATING UNIT		UNIT IN STAND-BY [5] (fed unit)	UNIT IN STORAGE (unit not fed)
		COOLING*	HEATING**		
+11°C	1	✔ STANDARD UNIT (PREMIUM VERSION)		✔ STANDARD UNIT	✔ STANDARD UNIT [6]
+2°C	2				
-7°C	3				
-10°C	4				
Between –10°C and –15°C		✔ STANDARD UNIT (EXCELLENCE VERSION) NOT SUITABLE: BUILT-IN INVERTER PUMPS		✔ STANDARD UNIT X NOT SUITABLE: BUILT-IN INVERTER PUMPS	
Between –15°C and –25°C		NOT POSSIBLE		✔ WATER EMPTY UNIT OR WITH AN APPROPRIATE GLYCOL PERCETAGE ✔ ELECTRICAL PANEL ANTIFREEZE PROTECTION X NOT SUITABLE: BUILT-IN PUMPS PARTIAL RECOVERY, STORAGE AND SHELL AND TUBE EXCHANGER	NOT POSSIBLE

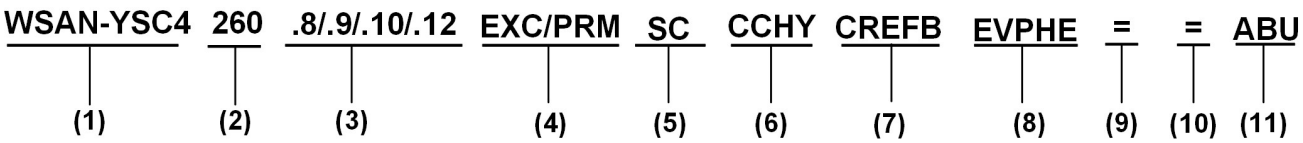
Data referred to the following conditions:
*chilled water production:
internal exchanger water = 12/7 °C
**hot water production:
internal exchanger water = 40/45 °C

Notes referring to cooling operation:
1. Part load unit and air speed equal to 1 m/s.
2. Part load unit and air speed equal to 0.5 m/s.
3. Part load unit and outdoor air temperature at rest.
4. Full load unit and outdoor air temperature at rest.

[5] The water pumping unit must be fed and connected to the unit according to the manual.
[6] Unit without water or containing water with an appropriate quantity of glycol.
At the unit start-up the water temperature or water with glycol must be inside the operating range indicated in the “Operating range” graph.
To know the water freezing temperature on varying the glycol percentage refer to the specific ‘Correction factors for glycol use’ table.

⚠ Air conditions which are at rest are defined as the absence of air flowing towards the unit. Weak winds can induce air to flow through the exchanger and air-levels which can cause a reduction in the operating range. In the presence of predominant winds it is necessary to use suitable windbreak barriers.
⚠ The unit, with an outdoor air temperature on average lower than -10°C, can remain stored for a maximum of 1 month.

Unit configuration



(1) Range
WSAN = Air cooled heat pump
YSC4 = SPINchiller range with multiscroll compressors and R-32 refrigerant

(2) Size
260 = Nominal compressor capacity (HP)

(3) Compressors
.8 / .9 / .10 / .12 = Compressor quantity

(4) Energy efficiency
EXC = EXCELLENCE Version (Standard)
PRM = PREMIUM Version

(5) Acoustic configuration
SC = Acoustic configuration with compressor soundproofing (standard)
EN = Super-silenced acoustic configuration

(6) Condensing coil
CCHY = Hydrophilic aluminium fins coil (Standard - Excellence Version)
CCS = Copper / aluminium condenser coil (Standard - Premium Version)
CCCA = Copper / aluminium condenser coil with acrylic lining
CCCA1 = Condenser coil with aluminium energy guard dcc treatment

(7) Fans
CREFB = Device for fan consumption reduction of the external section ECOBREEZE type (Standard)

(8) Evaporator
EVPHE = Plate exchangers (Standard)
EVFTP = Shell and tube evaporator PED test

(9) Condensation heat recovery
(-) not required (standard)
D - Partial energy recovery

(10) Pumping unit
(-) Not required (standard)
1P1SB = Hydropack with 1 pump + 1 in stand-by
1P1SBV = Hydropack user side with one inverter pump and one standby pump with dedicated inverter
2PM = Hydropack user side with 2 pumps
2PMV = Hydropack user side with no.2 of inverter pumps

(11) Water fittings
ABU = Flush hydraulic connections (Standard)
ACL = Internal water fittings provided by the customer

IVFDT

Inverter driven variable flow-rate user side control depending on the temperature differential

This option allows water flow-rate modulation to the unit during partial load conditions, maintaining stable the temperature difference between inlet and outlet to the heat exchanger. Flow-rate modulation is managed by embedded logic thanks to built-in temperature probes.

Designed for systems with primary circuit variable flow-rate systems decoupled from secondary circuit. With no building load the unit switches off the compressors while concerning pumps is possible to select:

- Active pumps with minimum flow-rate, monitoring secondary circuit temperature variations
- Pump switching off, periodically activating them (settable time) leading secondary circuit temperatures on primary circuit
- Pump switching off and waiting for the user signal for activation (free potential)

ACC

Storage tank

Steel storage tank complete with double layer covering with closed-cell insulation, stainless steel anti-freeze immersion resistance, bleed valve, draw off cock, quick connections with insulated casing.

EXCELLENCE	260.8	290.8	320.8	345.9	370.10	420.12	450.12	
storage capacity [Liters]	750+750	750+750	750+750	750+1050	1050+1050	1050+1050	1050+1050	
PREMIUM	260.8	290.8	315.9	345.9	370.10	420.12	450.12	480.12
storage capacity [Liters]	500+500	500+500	500+750	500+580	750+750	750+750	1050+1050	1050+1050

The device is installed and wired built-in the unit, and is placed on the return from the system.

CONTA2

Energy meter

Allows to display and record the unit's main electrical parameters. The data can be displayed with the user interface on the unit or via the supervisor through the specific protocol variables.

It is possible to control: voltage (V), absorbed current (A), frequency (Hz), cosfi, power input (kW), absorbed energy (kWh), harmonic components (%).

The device is installed and wired built-in the unit.

CMSC9

Serial communication module for Modbus supervisor

This enables the serial connection of the supervision system, using Modbus as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems.

The device is installed and wired built-in the unit.

⚠ The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

CMSC10

Serial communication module for LonWorks supervisor

This enables the serial connection of the supervision system which uses the LonWorks communication protocol. It enables access to a list of operating variables, commands and alarms which comply with the Echelon® standard.

The device is installed and wired built-in the unit.

⚠ The configuration and management activities for the LonWorks networks are the responsibility of the client.
⚠ LonWorks technology uses the LonTalk® protocol for communicating between the network nodes. Contact the service supplier for further information.
⚠ The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

CMSC11

Serial communication module for BACnet/IP supervisor

This enables the serial connection of the supervision system, using BACnet/IP as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems.

The device is installed and wired built-in the unit.

⚠ The configuration and management activities for the BACnet networks are the responsibility of the client.
⚠ The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

SCP4

Set-point compensation with 0-10 V signal

This device enables the set-point to be varied which is pre-set using an external 0÷10 V signal.

The device is installed and wired built-in the unit.

SPC1

Set-point compensation with 4-20 mA signal

This device enables the set-point to be varied which is pre-set using an external 4-20 mA signal.

The device is installed and wired built-in the unit.

Built-in options

ECS

ECOSHARE function for the automatic management of a group of units

The device allows automatic management of units that operate on the same hydraulic circuit, by creating a local communication network.
There are two control modes that can be set via a parameter during the activation stage. They both distribute the heat load on the available units by following the distribution logic to benefit from efficiency levels at part load.
Moreover:
Mode 1 - it keeps all the pumps active
Per unità in ECOSHARE il contenuto minimo di acqua dell'impianto è pari a quello dell'unità più grande aumentato di un +25% per ogni altra unità collegata.

- ⚠ The unit supplied with this device can also be equipped at the same time with the RCMRX option and one of the CMSC9 / CMSC10 / CMSC11 options.
- ⚠ It is necessary to provide a non-return valve for each unit installed in hydraulic parallel and equipped with an hydronic assembly installed on board (Installation by the Customer).
- ⚠ Not compatible with flow modulation

PFCP

Power-factor correction capacitors (cosfi > 0.9)

The component is necessary to lower the phase difference between current and voltage in the electromagnetic components of the unit (e.g. asynchronous motors). The component allows to put the cosfi power factor to values on average higher than 0.9, reducing the network reactive power. This often leads to an economic benefit which the energy provider grants to the final user.
The device is installed and wired built-in the unit.

PFCC

Power-factor correction capacitors (cosfi > 0,95)

The component is necessary to lower the phase difference between current and voltage in the electromagnetic components of the unit (e.g. asynchronous motors). The component allows to put the cosfi power factor to values on average higher than 0.95, reducing the network reactive power. This often leads to an economic benefit which the energy provider grants to the final user.
The device is installed and wirwd built-in the unit.

SFSTR

Disposal for inrush current reduction

Electronic device which automatically starts up the compressors gradually, reducing the starting current for the unit by around 40% in comparison with the nominal value. This results in the reduction of the starting torque of the ON/OFF compressor, it is more protected from mechanical stresses leading to an increased life of the component. The noise is also reduced.
Device installed and wired built-in the unit.

RE-25

Electrical panel antifreeze protection for min. outdoor temperature down to -25°C

This option is necessary for very cold climates, where the external temperature can be between -15°C and -25°C. It includes self-regulating temperature maintaining resistances which are able to protect the electrical panel against condensation and frost guaranteeing that it functions correctly. The choice of device should be carried out on the basis of the minimum temperatures reached at the unit installation site.
The device is built-in the unit.

- ⚠ This accessory does not lead to substantial variations in the electrical data for the unit which has been declared in the Electrical Data section.
- ⚠ This accessory operates even when the unit is switched off provided that the power supply is maintained active and the unit continues to be connected.
- ⚠ It is necessary to make precautions against build up of snow and ice in front of the exhaust and outdoor air inlet locations

MHP

High and low pressure gauges

It includes two liquid pressure gauges for the analog measurement of refrigerant pressures on suction and discharge lines of the compressors with pressure sockets installed in the unit in an easily accessible location.
The accessory is built-in the unit.

SDV

Cutoff valve on compressor supply and return

It includes the cut-off valve on compressor supply and return which facilitates maintenance or substitution of compressors.
Device installed built-in the unit.

RDVS

Switching valve with dual safety valves

Allows maintenance or replacement of the safety valve without draining the unit. Two pressure relief valves (each valve is sized according to 13136 clause 6.2) connected via a changeover valve are provided.

RPRI

Refrigerant leak detector assembled on the casing

Leak detector device built-in installed and placed inside the compressor box, it detects leaks of the internal refrigeration circuit.

- ⚠ Option available only for acoustic configuration with compressor soundproofing (SC) and super-silenced (EN).

PGFC — **Finned coil protection grilles**

Grilles made in drawn of electro-welded steel and coated to protect the external coil from accidental contact with people and things.
The protection grill has a height equal to the whole unit. Therefore, all areas under the coils are protected.
This accessory also protects the rear area of the unit opposite to the electric panel.
Ideal for installation in places where persons can pass from, such as car parks, terraces, etc.
The accessory is provided and installed built-in the unit. Grille slot 25mm.

⚠ This option is not suitable for application in sulphuric environments.

EVFTP — **Shell and tube evaporator PED test**

Direct expansion type exchanger with two independent circuits on the refrigerant side. The exchanger is composed of a cover made of carbon steel. The tubes, anchored to the tube plate by mechanical expansion, are made of copper, high efficiency, internally rifled to improve thermal exchange and specially designed for use with modern ecological refrigerants. It also includes a water side protection differential switch, an anti-freeze heating element to protect against icing, and covering in closed-cell thermo-insulating material that prevents the formation of condensation and heat exchange with the exterior. The water connections of the exchanger are quick-release with splined joint (Victaulic).

⚠ This option is not compatible with the storage tank option (ACC)

DLM0-10 — **Demand limit with signal 0-10V**

The device allows to limit the absorption unit through an external signal type 0-10V.

DLM4-20 — **Demand limit with signal 4-20mA**

The device allows to limit the absorption unit through an external signal type 4-20m

CCCA — **Copper / aluminium condenser coil with acrylic lining**

Condensing coils with copper pipes and aluminum fins with acrylic lacquering. Can be used in settings with moderately aggressive low saline concentrations and other chemical agents. The acrylic coating is used as the most economical and effective method particularly in protecting aluminum surfaces exposed to the corrosive influence of the humid and salty air in regions with marine climates.
Attention!
- Cooling capacity variation -2.7%
- Variation in compressor power input +4.2%
- Operating range reduction -2.1°C

CCCA1 — **Condenser coil with aluminium energy guard DCC treatment**

Condensing coils with copper pipes and aluminum fins with Aluminium Energy Guard DCC treatment. Complete treatment which offers an optimal thermal exchange and guarantees and protects the finned coil exchangers from corrosion over time and UV rays. Can be used in settings with very aggressive saline concentrations and other chemical agents in the air thus maintaining the performance of the coils over time and with negligible pressure drop.

PGCCH — **Anti-hail protection grilles**

Grilles made in drawn of electro-welded steel and coated suitable to protect the external coil from hail damage.
Accessories supplied and installed on the unit.

PFGP — **Soundproofing paneling of the pumping unit**

Configuration used to increase the hydronic assembly's silent operation.
It is made up of steel casings lined internally with high-density material with a soundproofing function. The casings are pre-painted with RAL 9001 color.
Option available for all pumping groups installed on the unit, in combination with the acoustic configuration with compressor soundproofing (SC).

Accessories separately supplied

RCMRX — **Remote control via microprocessor control**

This option allows to have full control over all the unit functions from a remote position. It can be easily installed on the wall and has the same aspect and functions of the user interface on the unit.

- All device functions can be repeated with a normal portable PC connected to the unit with an Ethernet cable and equipped with an internet navigation browser.
- The device must be installed on the wall with suitable plugs and connected to the unit (installation and wiring to be conducted by the Customer). Maximum remote control distance 350 m without auxiliary power supply.
- For distances greater than 350 m and in any case less than 700 m it is necessary to install the 'PSX - Mains power unit' accessory.
- Data and power supply serial connection cable n.1 twisted and shielded pair. Diameter of the individual conductor 0.8 mm.
- Installation is a responsibility of the Customer.

AMMX — **Spring antivibration mounts**

The spring antivibration mounts are attached in special housing on the support frame and serve to smooth the vibrations produced by the unit thus reducing the noise transmitted to the support structure.

- Installation is a responsibility of the Customer.

AMMSX — **Anti-seismic spring antivibration mounts**

The anti-sismic spring antivibration mounts must be fastened in special housings on the supporting metal struts.
The containment structure is designed to ensure high resistance multidirectional forces acting on the surface of the unit in the presence of wind and / or telluric movements.
The antivibration mounts have been tested according to ANSI/ASHRAE 171-2008 standard (Method of Testing Seismic Restraint devices for HVAC&R Equipment). The performance levels and the test methodology have been validated and certified by Lloyd's Register.

- Installation is a responsibility of the Customer.

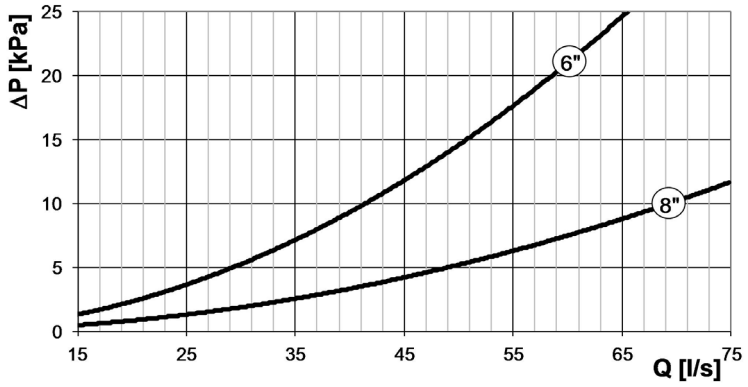
IFWX — **Steel mesh strainer on the water side**

The device stops the exchanger from being clogged by any impurities which are in the hydraulic circuit. The mechanical steel mesh strainer must be placed on the water input line. It can be easily dismantled for periodical maintenance and cleaning. It also includes:

- cast-iron shut-off butterfly valve with quick connections and activation lever with a mechanical calibration lock;
- quick connections with insulated casing.

- Option available only with option "Flush hydraulic connections" (ABU)
- Pressure drop referred to a clean filter.
- Installation is the responsibility of the Client, externally to the unit.
- Check for the presence of the required hydraulic shut-off valves in the system, in order to undertake periodical maintenance.

Steel mesh filter pressure drop



Q = Water flow rate (l/s)
DP = Water side pressure drop (kPa)

CSVX — **Couple of manually operated shut-off valves**

The kit allows to isolated the input and output water circuit. It includes:
- no. 2 of cast-iron shut-off butterfly valves with fast fittings and activation lever with a mechanical setting lock
- no. 2 of victaulic connections

- Installation is the responsibility of the Client, externally to the unit.

PSX — **Mains power supply**

The device allows the unit and the remote control to communicate with the user interface even when the serial line is longer than 350 m.
It must be connected to the serial line at a distance of 350 m from the unit and allows to extend the length to 700 m maximum in total. The device requires an external power supply at 230V AC.

- Power supply at 230V AC provided by Customer.
- Installation is a responsibility of the Customer.

IOTX

IoT industrial module for cloud based interoperability & services

This device allows the monitoring and the remote control the unit via Clivet Eye, the supervision cloud system for Clivet units.

With IoT module (i-LINK) it will be possible to monitor and manage the unit through the mobile app Clivet Eye and the dedicated web page.

Among the main functions, for all monitored units they allow to:

- display the main working parameters;
- display the alarms;
- switch on/off the unit;
- change the setpoint;
- change the operating mode;
- set the daily/weekly start-up or power-off programming of the unit;
- create charts of main system parameters trend (via web interface);
- display in a map the units monitored by Clivet Eye (via web interface).

Web interface at www.cliveteye.com.

Clivet Eye app available in Google Play and Apple Store

⚠ IoT module to be provided for each unit to be remotely monitored.
⚠ Internet ethernet connection in charge of customer.
⚠ Clivet Eye management is alternative to an external BMS supervision system.
⚠ Installation provided by the Customer.

General technical data

Correction factors for ethylene glycol use

% ETHYLENE GLYCOL BY WEIGHT		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2	-3,9	-6,5	-8,9	-11,8	-15,6	-19,0	-23,4	-27,8	-32,7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23,8	-29,4
Cooling Capacity Factor	Nr	0,997	0,994	0,990	0,986	0,981	0,976	0,970	0,964	0,957	0,950
Compressor power input Factor	Nr	0,999	0,999	0,998	0,997	0,996	0,996	0,995	0,994	0,993	0,993
Internal exchanger pressure drop factor	Nr	1,016	1,035	1,056	1,080	1,106	1,135	1,166	1,200	1,236	1,275

Correction factors for propylene glycol use

% PROPYLENE GLYCOL BY WEIGHT		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2	-3,9	-6,5	-8,9	-11,8	-15,6	-19,0	-23,4	-27,8	-32,7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23,8	-29,4
Cooling Capacity Factor	Nr	0,995	0,990	0,983	0,976	0,968	0,960	0,950	0,939	0,928	0,916
Compressor power input Factor	Nr	0,999	0,997	0,995	0,993	0,991	0,988	0,986	0,983	0,980	0,977
Internal exchanger pressure drop factor	Nr	1,027	1,058	1,093	1,133	1,176	1,224	1,276	1,332	1,393	1,457

Fouling Correction Factors

	INTERNAL EXCHANGER (EVAPORATOR)	
M2 °C/W	F1	FK1
0,44 x 10 (-4)	1,0	1,0
0,88 x 10 (-4)	0,97	0,99
1,76 x 10 (-4)	0,94	0,98

F1 = Cooling capacity correction factors
FK1 = Compressor power input correction factori

Exchanger operating range

		INTERNAL EXCHANGER	
		DPR	DPW
Plate exchanger	PED (CE)	4500	1000
Shell and tube exchanger	PED (CE)	4500	1000

DPr = Maximum operating pressure on refrigerant side in kPa
DPw = Maximum operating pressure on water side in kPa

Overload and control device calibrations

		OPEN	CLOSE	VALUE
High pressure switch	kPa	4050		-
Antifreeze protection	°C	4	5,5	-
High pressure safety valve	kPa	-	-	4500
Low pressure safety valve	kPa	-	-	3000
Max no. of compressor starts per hour	n°	-	-	10
Discharge safety thermostat	°C	-	-	150

Performance - Excellence

Standard acoustic configuration with Compressor soundproofing (SC)

SIZE			260.8	290.8	320.8	345.9	370.10	420.12	450.12
Cooling									
Cooling capacity	1	[kW]	710	780	860	930	1000	1112	1212
Compressor power input	1	[kW]	208	236	266	284	302	348	377
Total power input	2	[kW]	226	254	284	304	324	372	402
Partial recovery heating capacity	3	[kW]	239	264	293	316	339	380	413
EER	1	-	3,14	3,07	3,03	3,06	3,09	2,98	3,01
Water flow-rate (User Side) with ABU option	1	[l/s]	33,7	37,1	40,9	44,2	47,5	52,8	57,5
Internal exchanger pressure drops	1	[kPa]	31	32	32	34	36	44	41
Cooling capacity (EN14511:2018)	4	[kW]	710	780	860	930	1000	1111	1211
Total power input (EN14511:2018)	4	[kW]	228	256	286	306	326	376	405
EER (EN14511:2018)	4	-	3,12	3,05	3,01	3,03	3,06	2,96	2,99
SEER	6	-	4,82	4,75	4,70	4,81	4,86	4,83	4,84
SEPR	6	-	6,22	5,96	6,10	5,97	5,94	6,20	6,00
Cooling capacity (AHRI 550/590)	5	[kW]	704	772	852	921	990	1100	1263
Total power input (AHRI 550/590)	5	[kW]	226	252	282	302	322	370	401
COP_R	5	-	3,12	3,06	3,02	3,05	3,07	2,97	3,15
IPLV	5	-	4,88	4,78	4,62	4,77	4,91	4,77	4,79
Heating									
Heating capacity	7	[kW]	750	830	910	985	1060	1168	1268
Compressor power input	7	[kW]	206	230	252	272	292	328	358
Total power input	2	[kW]	226	248	272	294	316	352	385
COP	7	-	3,32	3,35	3,35	3,35	3,36	3,32	3,29
Water flow-rate (User Side) with ABU option	7	[l/s]	36,2	40,1	44,0	47,6	51,2	56,5	61,3
Internal exchanger pressure drops	7	[kPa]	35	37	37	39	41	49	46
Heating capacity (EN14511:2018)	8	[kW]	750	830	910	985	1060	1169	1269
Total power input (EN14511:2018)	8	[kW]	228	250	274	297	319	356	389
COP (EN14511:2018)	8	-	3,29	3,32	3,32	3,32	3,33	3,28	3,26

Super-silenced acoustic configuration (EN)

SIZE			260.8	290.8	320.8	345.9	370.10	420.12	450.12
Cooling									
Cooling capacity	1	[kW]	690	760	830	900	970	1080	1175
Compressor power input	1	[kW]	218	250	286	304	322	374	403
Total power input	2	[kW]	226	258	294	313	332	386	415
Partial recovery heating capacity	3	[kW]	236	263	290	313	336	378	410
EER	1	-	3,05	2,95	2,82	2,88	2,92	2,80	2,83
Water flow-rate (User Side) with ABU option	1	[l/s]	32,8	36,1	39,4	42,8	46,1	51,3	55,8
Internal exchanger pressure drops	1	[kPa]	29	31	31	33	35	42	39
Cooling capacity (EN14511:2018)	4	[kW]	690	760	830	900	970	1080	1175
Total power input (EN14511:2018)	4	[kW]	228	260	296	315	334	390	419
EER (EN14511:2018)	4	-	3,03	2,92	2,80	2,85	2,90	2,77	2,81
SEER	6	-	4,80	4,71	4,65	4,72	4,85	4,80	4,76
SEPR	6	-	6,11	5,82	5,91	5,85	5,77	6,00	5,89
Cooling capacity (AHRI 550/590)	5	[kW]	684	754	822	891	960	1070	1169
Total power input (AHRI 550/590)	5	[kW]	226	258	292	311	330	384	414
COP_R	5	-	3,03	2,92	2,82	2,86	2,91	2,79	2,82
IPLV	5	-	4,82	4,64	4,34	4,61	4,84	4,65	4,66
Heating									
Heating capacity	7	[kW]	750	830	910	985	1060	1168	1268
Compressor power input	7	[kW]	206	230	252	272	292	328	358
Total power input	2	[kW]	226	248	272	294	316	352	385
COP	7	-	3,32	3,35	3,35	3,35	3,36	3,32	3,29
Water flow-rate (User Side) with ABU option	7	[l/s]	36,2	40,1	44,0	47,6	51,2	56,5	61,3
Internal exchanger pressure drops	7	[kPa]	35	37	37	39	41	49	46
Heating capacity (EN14511:2018)	8	[kW]	750	830	910	985	1060	1169	1269
Total power input (EN14511:2018)	8	[kW]	228	250	274	297	319	356	389
COP (EN14511:2018)	8	-	3,29	3,32	3,32	3,32	3,33	3,28	3,26

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign LOT21. Contains fluorinated greenhouse gases (GWP 675)

1. Data referred to the following conditions: Internal exchanger water temperature = 12/7 °C. Entering external exchanger air temperature = 35°C. Evaporator fouling factor = 0.44 x 10^(-4) m^2 K/W.
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers.
3. Recovery exchanger water = 40/45°C
4. Data compliant to Standard EN 14511:2018 referred to the following conditions: Internal exchanger water temperature = 12/7 °C. Entering external exchanger air temperature = 35°C
5. Data compliant to Standard AHRI 550/590 referred to the following conditions: Internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature = 35°C. Evaporator fouling factor = 0.18 x 10^(-4) m^2 K/W
6. Data compliant according to EU regulation 2016/2281
7. Data referred to the following conditions: Internal exchanger water temperature = 40/45 °C. Entering external exchanger air temperature = 7°C D.B./6°C W.B. Evaporator fouling factor = 0.44 x 10^(-4) m^2 K/W
8. ata compliant to Standard EN 14511:2018 referred to the following conditions: Internal exchanger water temperature = 40/45 °C. Entering external exchanger air temperature = 7°C D.B./6°C W.B.

Performance - Premium

Standard acoustic configuration with Compressor soundproofing (SC)

SIZE			260.8	290.8	315.9	345.9	370.10	420.12	450.12	480.12
Cooling										
Cooling capacity	1	[kW]	670	740	815	885	960	1060	1172	1260
Compressor power input	1	[kW]	222	258	272	308	322	378	388	426
Total power input	2	[kW]	236	270	288	324	340	396	410	450
Partial recovery heating capacity	3	[kW]	232	259	283	310	333	374	406	438
EER	1	-	2,84	2,74	2,83	2,73	2,82	2,68	2,86	2,80
Water flow-rate (User Side) with ABU option	1	[l/s]	31,8	35,2	38,7	42,1	45,6	50,4	55,6	59,9
Internal exchanger pressure drops	1	[kPa]	37	33	38	39	39	46	48	48
Cooling capacity (EN14511:2018)	4	[kW]	670	740	815	885	960	1060	1171	1260
Total power input (EN14511:2018)	4	[kW]	238	272	291	327	344	400	414	454
EER (EN14511:2018)	4	-	2,82	2,72	2,81	2,71	2,80	2,65	2,83	2,77
SEER	6	-	4,56	4,56	4,59	4,56	4,62	4,60	4,64	4,63
SEPR	6	-	5,63	5,34	5,60	5,56	5,56	5,62	5,63	5,65
Cooling capacity (AHRI 550/590)	5	[kW]	664	734	808	877	952	1050	1160	1250
Total power input (AHRI 550/590)	5	[kW]	236	270	287	322	338	394	408	448
COP_R	5	-	2,81	2,72	2,82	2,72	2,82	2,66	2,84	2,79
IPLV	5	-	4,50	4,44	4,60	4,43	4,67	4,53	4,68	4,59
Heating										
Heating capacity	7	[kW]	700	770	850	920	1000	1108	1218	1308
Compressor power input	7	[kW]	208	232	250	272	292	326	354	380
Total power input	2	[kW]	222	246	266	288	310	346	378	406
COP	7	-	3,15	3,13	3,19	3,19	3,22	3,20	3,22	3,22
Water flow-rate (User Side) with ABU option	7	[l/s]	33,8	37,2	41,1	44,5	48,3	53,6	58,9	63,3
Internal exchanger pressure drops	7	[kPa]	42	37	42	41	43	52	53	53
Heating capacity (EN14511:2018)	8	[kW]	700	770	850	920	1000	1109	1219	1309
Total power input (EN14511:2018)	8	[kW]	224	248	269	291	314	350	382	411
COP (EN14511:2018)	8	-	3,12	3,10	3,16	3,16	3,19	3,17	3,19	3,18

Super-silenced acoustic configuration (EN)

SIZE			260.8	290.8	315.9	345.9	370.10	420.12	450.12	480.12
Cooling										
Cooling capacity	1	[kW]	650	720	795	865	940	1040	1142	1230
Compressor power input	1	[kW]	228	268	282	325	336	396	404	446
Total power input	2	[kW]	236	276	291	334	346	408	418	460
Partial recovery heating capacity	3	[kW]	228	257	280	309	332	373	402	436
EER	1	-	2,75	2,61	2,73	2,59	2,72	2,55	2,73	2,67
Water flow-rate (User Side) with ABU option	1	[l/s]	30,9	34,2	37,8	41,1	44,7	49,4	54,2	58,4
Internal exchanger pressure drops	1	[kPa]	34	31	36	35	38	45	46	46
Cooling capacity (EN14511:2018)	4	[kW]	650	720	794	865	940	1040	1141	1230
Total power input (EN14511:2018)	4	[kW]	238	278	293	336	348	412	422	464
EER (EN14511:2018)	4	-	2,73	2,59	2,71	2,57	2,70	2,53	2,71	2,65
SEER	6	-	4,55	4,55	4,56	4,55	4,59	4,56	4,58	4,57
SEPR	6	-	5,52	5,19	5,50	5,50	5,51	5,53	5,51	5,50
Cooling capacity (AHRI 550/590)	5	[kW]	644	714	788	857	932	1032	1132	1220
Total power input (AHRI 550/590)	5	[kW]	236	274	290	332	344	406	416	458
COP_R	5	-	2,73	2,61	2,72	2,58	2,71	2,54	2,72	2,66
IPLV	5	-	4,46	4,31	4,55	4,29	4,62	4,43	4,60	4,48
Heating										
Heating capacity	7	[kW]	700	770	850	920	1000	1108	1218	1308
Compressor power input	7	[kW]	208	232	250	272	292	326	354	380
Total power input	2	[kW]	222	246	266	288	310	346	378	406
COP	7	-	3,15	3,13	3,19	3,19	3,22	3,20	3,22	3,22
Water flow-rate (User Side) with ABU option	7	[l/s]	33,8	37,2	41,1	44,5	48,3	53,6	58,9	63,3
Internal exchanger pressure drops	7	[kPa]	42	37	42	41	43	52	53	53
Heating capacity (EN14511:2018)	8	[kW]	700	770	850	920	1000	1109	1219	1309
Total power input (EN14511:2018)	8	[kW]	224	248	269	291	314	350	382	411
COP (EN14511:2018)	8	-	3,12	3,10	3,16	3,16	3,19	3,17	3,19	3,18

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign LOT21. Contains fluorinated greenhouse gases (GWP 675)

1. Data referred to the following conditions: Internal exchanger water temperature = 12/7 °C. Entering external exchanger air temperature = 35°C. Evaporator fouling factor = 0.44 x 10^(-4) m^2 K/W.
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers.
3. Recovery exchanger water = 40/45°C
4. Data compliant to Standard EN 14511:2018 referred to the following conditions: Internal exchanger water temperature = 12/7 °C. Entering external exchanger air temperature = 35°C
5. Data compliant to Standard AHRI 550/590 referred to the following conditions: Internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature = 35°C. Evaporator fouling factor = 0.18 x 10^(-4) m^2 K/W
6. Data compliant according to EU regulation 2016/2281
7. Data referred to the following conditions: Internal exchanger water temperature = 40/45 °C. Entering external exchanger air temperature = 7°C D.B./6°C W.B. Evaporator fouling factor = 0.44 x 10^(-4) m^2 K/W
8. Data compliant to Standard EN 14511:2018 referred to the following conditions: Internal exchanger water temperature = 40/45 °C. Entering external exchanger air temperature = 7°C D.B./6°C W.B.

Construction

Excellence

SIZE			260.8	290.8	320.8	345.9	370.10	420.12	450.12
Compressor									
Type of compressors	1					SCROLL			
Refrigerant						R-32			
No. of compressors		[Nr]	8	8	8	9	10	12	12
Rated power (C1)		[HP]	65	65	80	80	80	105	105
Rated power (C2)		[HP]	65	80	80	80	105	105	105
Rated power (C3)		[HP]	65	65	80	80	80	105	120
Rated power (C4)		[HP]	65	80	80	105	105	105	120
Std Capacity control steps			12	12	8	12	12	16	14
Oil charge (C1)		[l]	17	17	18	18	18	27	27
Oil charge(C2)		[l]	17	18	18	18	27	27	27
Oil charge (C3)		[l]	17	17	18	18	18	27	38
Oil charge (C4)		[l]	17	18	18	27	27	27	38
Refrigerant charge (C1)		[Kg]	43	43	44	44	53	53	53
Refrigerant charge (C2)		[Kg]	40	43	44	44	53	53	53
Refrigerant charge (C3)		[Kg]	43	43	44	53	53	53	65
Refrigerant charge (C4)		[Kg]	40	43	44	53	53	53	65
Refrigeration circuits		[Nr]				4			
Internal exchanger									
Type of internal exchanger	2					PHE			
N. of internal exchanger		[Nr]	2	2	2	2	2	2	2
Water content		[l]	64	72	95	105	114	114	116
Minimum system water content		[l]	2688	2938	5438	5438	3938	4313	5625
External exchanger									
Type of external exchanger	3					CCHY			
Number of coils		[Nr]	8	8	8	8	8	8	8
External Section Fans									
Type of fans	4					AX			
Number of fans		[Nr]	16	16	16	18	20	20	22
Type of motor	5					EC			
Standard airflow in cooling (SC)		[l/s]	96000	96000	96000	108000	120000	120000	132000
Standard airflow in cooling (EN)		[l/s]	71733	71733	71733	80700	89667	89667	98633
Connections									
Water fittings with ABU option	7	["]	6	8	8	8	8	8	8
Water fittings with ACL option	8	["]	4	5	5	5	5	5	5
Power supply									
Standard power supply		[V]				400/3~/50			
Electrical data									
F.L.A. - Total		[A]	502	560	615	664	714	806	864
F.L.I. - Total		[kW]	310	349	385	415	445	500	539
M.I.C. - Total	6	[A]	837	895	950	999	1049	1141	1199
M.I.C. - with soft start accessory	6	[A]	659	717	772	821	871	963	1020

1. SCROLL = SCROLL Compressor
2. PHE = Plate exchanger
3. CCHY = Copper / aluminium condenser coil with hydrophilic treatment
4. AX = Axial fan
5. EC = Asynchronous motor with permanent magnet commuted electronically.
6. M.I.C.=Maximum unit starting current. The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible conditions (F.L.A.) of the remaining electric components.
7. ABU = Flush hydraulic connections (standard option)
8. ACL = Internal water fittings provided by the customer

Unbalance between phase max 2 %
Voltage variation: max +/- 10%
Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations.

Construction

Premium

SIZE			260.8	290.8	315.9	345.9	370.10	420.12	450.12	480.12
Compressor										
Type of compressors	1		SCROLL							
Refrigerant			R-32							
No. of compressors		[Nr]	8	8	9	9	10	12	12	12
Rated power (C1)		[HP]	65	65	65	80	80	105	105	120
Rated power (C2)		[HP]	65	80	65	80	105	105	120	120
Rated power (C3)		[HP]	65	65	80	80	80	105	105	120
Rated power (C4)		[HP]	65	80	105	105	105	105	120	120
Std Capacity control steps			12	12	12	10	12	16	16	12
Oil charge (C1)		[l]	17	17	17	18	18	27	27	38
Oil charge(C2)		[l]	17	18	17	18	27	27	38	38
Oil charge (C3)		[l]	17	17	18	18	18	27	27	38
Oil charge (C4)		[l]	17	18	27	27	27	27	38	38
Refrigerant charge (C1)		[Kg]	34	34	34	36	46	48	53	59
Refrigerant charge (C2)		[Kg]	34	34	34	36	48	47	55	60
Refrigerant charge (C3)		[Kg]	34	34	46	46	46	48	53	59
Refrigerant charge (C4)		[Kg]	34	34	48	48	48	47	55	60
Refrigeration circuits		[Nr]	4							
Internal exchanger										
Type of internal exchanger	2		PHE							
N. of internal exchanger		[Nr]	2	2	2	2	2	2	2	2
Water content		[l]	48	63	72	84	95	95	113	121
Minimum system water content		[l]	3188	2938	5063	5063	3688	4063	4438	6813
External exchanger										
Type of external exchanger	3		CCS							
Number of coils		[Nr]	8	8	8	8	8	8	8	8
External Section Fans										
Type of fans	4		AX							
Number of fans		[Nr]	12	12	14	14	14	16	16	20
Type of motor	5		EC							
Standard airflow in cooling (SC)		[l/s]	72000	72000	84000	84000	84000	96000	96000	120000
Standard airflow in cooling (EN)		[l/s]	61333	61333	71556	71556	71556	81778	81778	102222
Connections										
Water fittings with ABU option	7	["]	6	6	8	8	8	8	8	8
Water fittings with ACL option	8	["]	4	4	4/5	5	5	5	5	5
Power supply										
Standard power supply		[V]	400/3~/50							
Electrical data										
F.L.A. - Total		[A]	498	553	602	657	706	798	860	914
F.L.I. - Total		[kW]	308	344	374	410	440	495	536	572
M.I.C. - Total	6	[A]	833	888	937	992	1041	1133	1195	1249
M.I.C. - with soft start accessory	6	[A]	655	710	760	814	863	955	1017	1071

1. SCROLL = SCROLL Compressor
2. PHE = Plate exchanger
3. CCS = Copper / aluminium condenser coil
4. AX = Axial fan
5. EC = Asynchronous motor with permanent magnet commuted electronically.
6. M.I.C.=Maximum unit starting current. The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible conditions (F.L.A.) of the remaining electric components.
7. ABU = Flush hydraulic connections (standard option)
8. ACL = Internal water fittings provided by the customer

Unbalance between phase max 2 %
Voltage variation: max +/- 10%
Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations.

Sound levels cooling- Excellence

Acoustic configuration with compressor soundproofing (SC)

SIZE	Sound power level (dB) - Octave band (Hz)								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.8	82	85	86	89	90	86	79	69	71	94
290.8	82	84	86	89	91	86	79	68	71	94
320.8	82	84	86	89	91	87	80	68	72	94
345.9	83	85	86	90	91	87	80	69	72	95
370.10	83	86	87	91	92	88	81	70	72	95
420.12	83	86	87	91	92	88	81	70	72	95
450.12	84	86	88	91	93	89	82	70	73	96

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A).

Data referred to the following conditions:
- internal exchanger water temperature = 12/7 °C
- ambient temperature = 35 °C

Sound levels heating - Excellence

Acoustic configuration with compressor soundproofing (SC)

SIZE	Sound power level (dB) - Octave band (Hz)								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.8	82	85	86	89	90	86	79	69	71	94
290.8	82	84	86	89	91	86	79	68	71	94
320.8	82	84	86	89	91	87	80	68	72	94
345.9	83	85	86	90	91	87	80	69	72	95
370.10	83	86	87	91	92	88	81	70	72	95
420.12	83	86	87	91	92	88	81	70	72	95
450.12	84	86	88	91	93	89	82	70	73	96

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations.

Data referred to the following conditions:
- internal exchanger water temperature = 40/45 °C
- ambient temperature = 7/6 °C.

Sound levels cooling - Excellence

Super-silenced acoustic configuration (EN)

SIZE	Sound power level (dB) - Octave band (Hz)								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.8	67	72	81	83	86	83	75	66	67	89
290.8	67	72	81	84	87	84	75	66	68	90
320.8	67	72	81	84	87	84	76	66	68	90
345.9	68	73	82	84	88	85	76	67	68	91
370.10	68	73	83	85	88	85	77	67	69	91
420.12	68	73	83	85	89	86	77	68	69	92
450.12	69	74	84	86	89	86	78	68	69	92

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A).

Data referred to the following conditions:
- internal exchanger water temperature = 12/7 °C
- ambient temperature = 35 °C

Sound levels heating - Excellence

Super-silenced acoustic configuration (EN)

SIZE	Sound power level (dB) - Octave band (Hz)								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.8	82	85	86	89	90	86	79	69	71	94
290.8	82	84	86	89	91	86	79	68	71	94
320.8	82	84	86	89	91	87	80	68	72	94
345.9	83	85	86	90	91	87	80	69	72	95
370.10	83	86	87	91	92	88	81	70	72	95
420.12	83	86	87	91	92	88	81	70	72	95
450.12	84	86	88	91	93	89	82	70	73	96

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations.

Data referred to the following conditions:
- internal exchanger water temperature = 40/45 °C
- ambient temperature = 7/6 °C.

Sound levels cooling- Premium

Acoustic configuration with compressor soundproofing (SC)

SIZE	Sound power level (dB) - Octave band (Hz)								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.8	81	83	85	88	89	86	78	68	71	93
290.8	81	83	85	88	90	86	79	68	71	93
315.9	81	84	86	89	90	86	79	68	72	93
345.9	81	84	86	89	91	87	79	68	72	94
370.10	82	84	86	90	91	87	80	69	72	94
420.12	82	85	87	90	91	87	80	70	72	94
450.12	83	86	88	91	92	88	81	70	73	95
480.12	83	85	87	91	92	89	81	70	73	95

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A).

Data referred to the following conditions:
- internal exchanger water temperature = 12/7 °C
- ambient temperature = 35 °C.

Sound levels heating - Premium

Super-silenced acoustic configuration (EN)

SIZE	Sound power level (dB) - Octave band (Hz)								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.8	81	83	85	88	89	86	78	68	71	93
290.8	81	83	85	88	90	86	79	68	71	93
315.9	81	84	86	89	90	86	79	68	72	93
345.9	81	84	86	89	91	87	79	68	72	94
370.10	82	84	86	90	91	87	80	69	72	94
420.12	82	85	87	90	91	87	80	70	72	94
450.12	83	86	88	91	92	88	81	70	73	95
480.12	83	85	87	91	92	89	81	70	73	95

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations.

Data referred to the following conditions:
- internal exchanger water temperature = 40/45 °C
- ambient temperature = 7/6 °C.

Sound levels cooling- Premium

Super-silenced acoustic configuration (EN)

GRANDEZZE	Livello di Potenza Sonora - Bande d'ottava (Hz)								Livello di pressione sonora	Livello di potenza sonora
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.8	68	73	81	84	86	83	75	66	68	89
290.8	68	73	82	84	87	84	75	66	68	90
315.9	68	74	82	85	87	84	76	67	69	91
345.9	68	74	83	85	88	85	76	66	69	91
370.10	69	75	83	86	88	85	77	67	69	91
420.12	69	75	84	86	89	86	77	68	70	92
450.12	71	76	85	87	90	87	78	68	70	93
480.12	71	76	85	87	90	87	78	68	70	93

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A).

Data referred to the following conditions:
- internal exchanger water temperature = 12/7 °C
- ambient temperature = 35 °C.

Sound levels heating - Premium

Super-silenced acoustic configuration (EN)

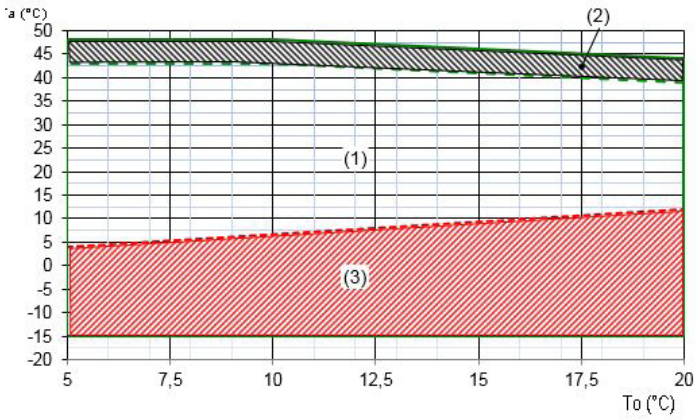
GRANDEZZE	Livello di Potenza Sonora - Bande d'ottava (Hz)								Livello di pressione sonora	Livello di potenza sonora
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.8	81	83	85	88	89	86	78	68	71	93
290.8	81	83	85	88	90	86	79	68	71	93
315.9	81	84	86	89	90	86	79	68	72	93
345.9	81	84	86	89	91	87	79	68	72	94
370.10	82	84	86	90	91	87	80	69	72	94
420.12	82	85	87	90	91	87	80	70	72	94
450.12	83	86	88	91	92	88	81	70	73	95
480.12	83	85	87	91	92	89	81	70	73	95

Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations.

Data referred to the following conditions:
- internal exchanger water temperature = 40/45 °C
- ambient temperature = 7/6 °C.

Operating range - Cooling

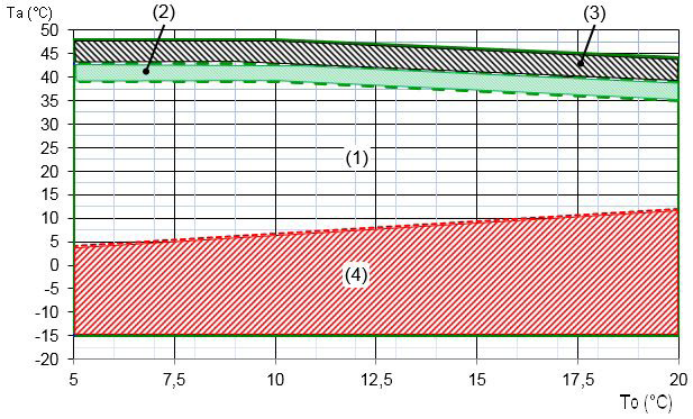
Excellence SC



Ta (°C) = external exchanger inlet air temperature (D.B.)
To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load
2. Unit operating range with automatic staging of the compressor capacity
3. Unit operating range with air flow automatic modulation

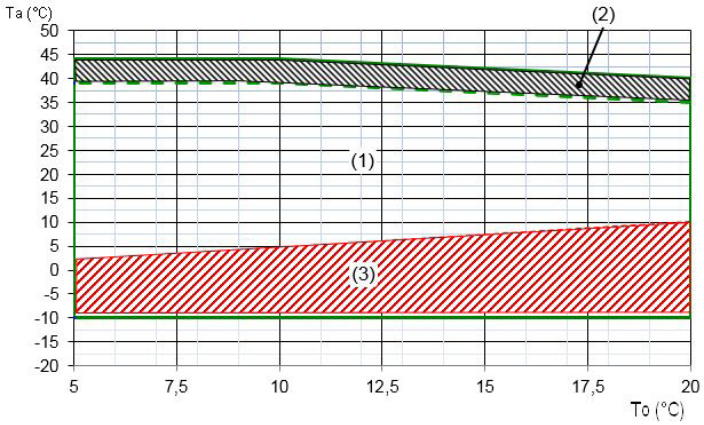
Excellence EN



Ta (°C) = external exchanger inlet air temperature (D.B.)
To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load
2. Extended operating range with air flow-rate automatic increasing. Inside this field the sound levels are the same of the 'compressor soundproofing (SC)' acoustic configuration
3. Unit operating range with automatic staging of th compressor capacity
4. Unit operating range with air flow-rate automatic modulation

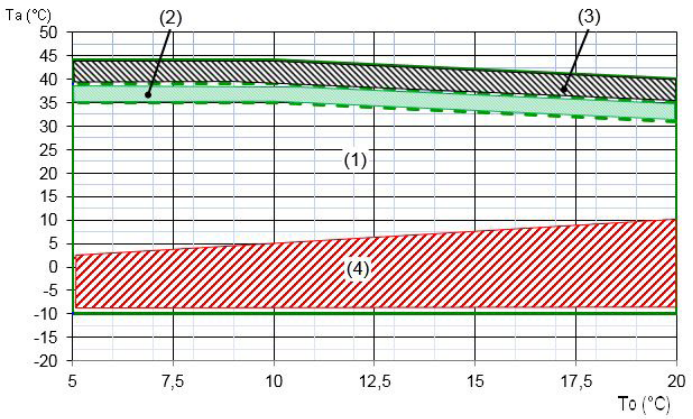
Premium SC



Ta (°C) = external exchanger inlet air temperature (D.B.)
To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load
2. Unit operating range with automatic staging of the compressor capacity
3. Unit operating range with air flow automatic modulation

Premium EN

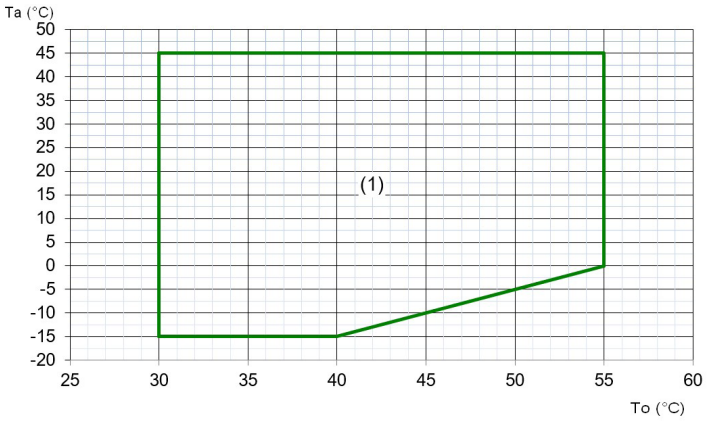


Ta (°C) = external exchanger inlet air temperature (D.B.)
To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load
2. Extended operating range with air flow-rate automatic increasing. Inside this field the sound levels are the same of the 'compressor soundproofing (SC)' acoustic configuration
3. Unit operating range with automatic staging of th compressor capacity
4. Unit operating range with air flow automatic modulation

Operating range - Heating

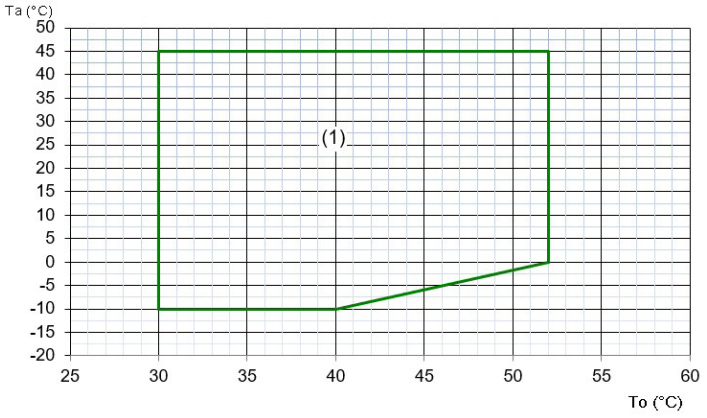
Excellence SC/EN



Ta (°C) = external exchanger inlet air temperature (D.B.)
To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load

Premium SC/EN



Ta (°C) = external exchanger inlet air temperature (D.B.)
To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load

Excellence

Cooling - SC

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		43		48*	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.8	5	720	168	692	185	660	204	626	224	606	238	378	154
	6	742	169	714	186	682	206	646	226	624	240	394	155
	7	772	171	742	188	710	208	672	230	650	244	406	156
	10	816	174	782	191	746	210	708	232	682	246	430	157
	15	928	181	892	199	854	220	812	242	784	256	500	162
	18	1010	185	970	204	928	226	882	248	854	264	548	165
	20	1066	189	1024	208	980	230	932	252	902	268	580	168
290.8	5	792	189	760	208	726	230	688	254	662	270	472	206
	6	816	191	784	210	748	232	708	256	684	272	488	206
	7	850	192	816	214	780	236	740	260	714	276	508	208
	10	906	197	868	218	826	240	780	264	752	280	538	210
	15	1034	206	992	228	948	250	900	276	868	292	626	218
	18	1122	212	1078	234	1030	258	978	284	944	300	682	224
	20	1184	218	1136	240	1086	264	1032	290	998	306	722	228
320.8	5	874	214	838	236	798	260	754	288	726	306	378	150
	6	902	216	864	238	824	262	778	290	750	310	394	152
	7	938	218	900	242	860	266	812	294	784	312	406	152
	10	994	224	952	246	906	272	858	300	826	318	436	154
	15	1142	236	1096	260	1046	286	990	314	956	334	508	159
	18	1240	244	1190	268	1136	294	1076	324	1038	344	556	162
	20	1306	248	1254	274	1198	302	1136	330	1096	350	590	164
345.9	5	944	228	906	252	864	278	817	307	788	326	544	237
	6	974	231	934	254	891	280	843	310	814	330	565	239
	7	1013	233	972	258	930	284	880	314	849	333	586	241
	10	1074	239	1029	262	981	290	929	319	896	339	624	244
	15	1234	251	1185	277	1132	304	1073	335	1037	355	726	254
	18	1340	259	1287	285	1229	313	1166	345	1127	366	793	259
	20	1412	264	1357	291	1297	321	1231	352	1189	372	839	263
370.10	5	1014	242	974	268	930	296	880	326	850	346	710	324
	6	1046	246	1004	270	958	298	908	330	878	350	736	326
	7	1088	248	1044	274	1000	302	948	334	914	354	766	330
	10	1154	254	1106	278	1056	308	1000	338	966	360	812	334
	15	1326	266	1274	294	1218	322	1156	356	1118	376	944	348
	18	1440	274	1384	302	1322	332	1256	366	1216	388	1030	356
	20	1518	280	1460	308	1396	340	1326	374	1282	394	1088	362
420.12	5	1128	280	1084	310	1032	340	978	376	942	400	710	322
	6	1166	282	1116	312	1064	344	1008	380	970	404	736	326
	7	1210	288	1162	316	1112	348	1050	386	1012	408	764	328
	10	1288	294	1232	324	1172	356	1108	392	1068	416	812	332
	15	1472	310	1412	340	1348	374	1276	412	1232	436	942	346
	18	1596	320	1532	352	1462	386	1386	424	1338	450	1028	354
	20	1682	328	1614	360	1540	396	1460	434	1410	458	1088	360
450.12	5	1253	305	1203	337	1147	370	1085	409	1045	435	739	321
	6	1288	307	1234	339	1176	374	1112	413	1071	438	759	324
	7	1323	310	1268	342	1212	377	1143	417	1101	442	779	325
	10	1409	317	1345	350	1278	385	1206	424	1162	450	828	329
	15	1610	334	1541	368	1469	404	1390	445	1340	471	961	343
	18	1746	345	1672	380	1594	417	1509	459	1456	486	1048	351
	20	1840	354	1762	389	1679	427	1590	469	1535	495	1109	357

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
To (°C) = Internal exchanger outlet water temperature
Performances in function of the inlet/outlet water temperature differential = 5°C
* Unit operating range with automatic staging of the compressor capacity

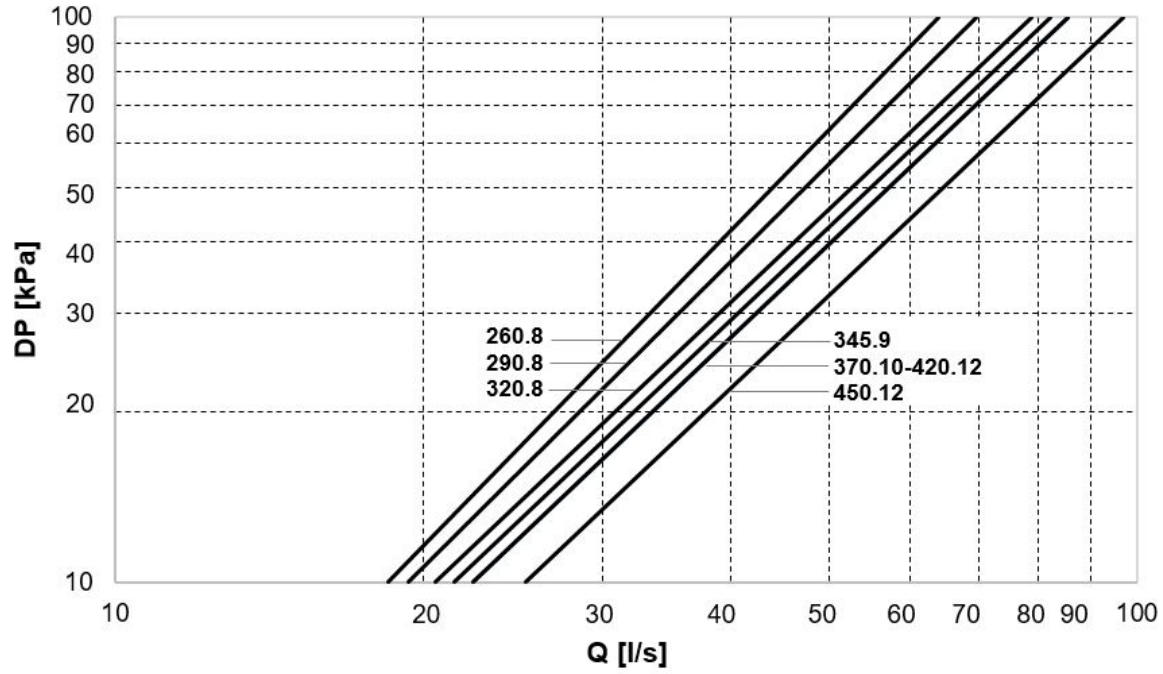
Excellence
Cooling - EN

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		39		43		48*	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.8	5	710	175	680	193	644	212	614	230	606	238	378	154
	6	732	177	700	195	664	216	634	234	624	240	394	155
	7	758	180	726	198	690	218	658	236	650	244	406	156
	10	800	184	764	202	724	224	690	240	682	246	430	157
	15	902	195	862	214	820	236	782	254	784	256	500	162
	18	980	202	936	222	889	240	850	262	854	264	548	165
	20	1030	206	984	228	934	250	894	268	902	268	580	168
290.8	5	776	202	744	222	708	244	676	264	662	270	472	206
	6	800	204	766	224	730	246	696	268	684	272	488	206
	7	830	206	796	228	760	250	726	272	714	276	508	208
	10	884	212	844	232	802	256	764	276	752	280	538	210
	15	1006	222	964	244	918	270	878	290	868	292	626	218
	18	1102	228	1054	250	1005	273	962	296	944	300	682	224
	20	1160	232	1110	256	1058	280	1014	302	998	306	722	228
320.8	5	850	228	812	252	772	278	736	302	726	306	378	150
	6	876	232	838	254	796	280	758	304	750	310	394	152
	7	912	234	872	258	830	286	790	308	784	312	406	152
	10	962	240	918	264	874	290	834	314	826	318	436	154
	15	1102	256	1054	280	1004	308	958	332	956	334	508	159
	18	1234	252	1178	276	1121	299	1070	326	1038	344	556	162
	20	1298	258	1240	282	1178	310	1128	334	1096	350	590	164
345.9	5	919	244	880	269	837	296	799	321	788	326	544	237
	6	947	247	907	271	863	299	824	324	814	330	565	239
	7	986	250	944	275	900	304	858	329	849	333	586	241
	10	1042	256	996	282	948	310	906	335	896	339	624	244
	15	1194	272	1143	298	1089	328	1041	354	1037	355	726	254
	18	1325	271	1267	297	1207	324	1154	351	1127	366	793	259
	20	1395	278	1333	304	1269	334	1216	360	1189	372	839	263
370.10	5	988	260	948	286	902	314	862	340	850	346	710	324
	6	1018	262	976	288	930	318	890	344	878	350	736	326
	7	1060	266	1016	292	970	322	926	350	914	354	766	330
	10	1122	272	1074	300	1022	330	978	356	966	360	812	334
	15	1286	288	1232	316	1174	348	1124	376	1118	376	944	348
	18	1416	290	1356	318	1293	348	1238	376	1216	388	1030	356
	20	1492	298	1426	326	1360	358	1304	386	1282	394	1088	362
420.12	5	1108	300	1060	332	1006	366	960	396	942	400	710	322
	6	1140	304	1090	334	1036	370	990	400	970	404	736	326
	7	1184	310	1134	340	1080	374	1030	406	1012	408	764	328
	10	1256	318	1198	348	1138	382	1084	414	1068	416	812	332
	15	1432	336	1370	370	1302	406	1244	438	1232	436	942	346
	18	1590	324	1518	356	1457	387	1380	434	1338	450	1028	354
	20	1672	332	1596	366	1532	400	1452	444	1410	458	1088	360
450.12	5	1227	326	1174	359	1115	396	1064	429	1045	435	739	321
	6	1258	329	1202	362	1142	400	1090	432	1071	438	759	324
	7	1291	333	1235	366	1176	403	1120	437	1101	442	779	325
	10	1362	342	1301	375	1236	412	1178	445	1162	450	828	329
	15	1553	362	1488	398	1415	437	1351	471	1340	471	961	343
	18	1731	353	1655	388	1581	422	1504	464	1456	486	1048	351
	20	1820	362	1740	398	1662	436	1582	475	1535	495	1109	357

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
To (°C) = Internal exchanger outlet water temperature
Performances in function of the inlet/outlet water temperature differential = 5°C
* Unit operating range with automatic staging of the compressor capacity

Excellence

Plate exchangers pressure drop (EVPHE)



The pressure drops are calculated considering a water temperature of 7°C

Q = Water flow-rate[l/s]
DP = Water side pressure drops [kPa]

The water flow-rate must be calculated with the following formula
Q [l/s] = kWf / (4,186 x DT)

kWf = Cooling capacity in kW
DT = Temperature difference between inlet / outlet water

Admissible water flow-rates - flush hydraulic connections (ABU)

Minimum (Qmin), nominal (Qnominal) and maximum (Qmax) admissible water flow for the unit to operate correctly.

		ST/SC						
SIZE		**260.8**	**290.8**	**320.8**	**345.9**	**370.10**	**420.12**	**450.12**
Qmin	[l/s]	18,5	19,4	20,6	21,5	22,4	22,4	25,2
Qnominal	[l/s]	33,9	37,3	41,1	44,4	47,8	53,0	57,8
Qmax	[l/s]	63,9	69,7	78,9	82,3	85,6	85,6	97,0
		EN						
Qmin	[l/s]	18,5	19,4	20,6	21,5	22,4	22,4	25,2
Qnominal	[l/s]	33,0	36,3	39,7	43,0	46,3	51,6	56,1
Qmax	[l/s]	63,9	69,7	78,9	82,3	85,6	85,6	97,0

Admissible water flow-rates - internal water fittings provided by the customer (ACL)

Minimum (Qmin), nominal (Qnominal) and maximum (Qmax) admissible water flow for the unit to operate correctly.

		ST/SC													
SIZE		**260.8**		**290.8**		**320.8**		**345.9**		**370.10**		**420.12**		**450.12**	
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	9,2	9,2	9,7	9,7	10,3	10,3	10,3	11,2	11,2	11,2	11,2	11,2	11,2	14,0
Qnominal	[l/s]	16,9	16,9	18,5	18,5	20,4	20,4	20,4	23,7	23,7	23,7	26,4	26,4	26,4	31,2
Qmax	[l/s]	32,0	32,0	34,8	34,8	39,5	39,5	39,5	42,8	42,8	42,8	42,8	42,8	42,8	54,2
		EN													
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	9,2	9,2	9,7	9,7	10,3	10,3	10,3	11,2	11,2	11,2	11,2	11,2	11,2	14,0
Qnominal	[l/s]	16,4	16,4	18,0	18,0	19,7	19,7	19,7	23,0	23,0	23,0	25,6	25,6	25,6	30,2
Qmax	[l/s]	32,0	32,0	34,8	34,8	39,5	39,5	39,5	42,8	42,8	42,8	42,8	42,8	42,8	54,2

Premium
Cooling - SC

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		37		39		44*	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.8	5	686	179	656	197	626	218	612	226	598	236	380	148
	6	706	181	676	199	644	220	630	228	616	238	394	149
	7	732	183	702	202	670	222	654	232	640	240	408	150
	10	776	187	742	206	706	226	690	236	672	244	428	152
	15	-	-	-	-	800	238	784	246	766	256	498	158
	18	-	-	-	-	834	242	824	252	814	262	544	161
	20	-	-	-	-	-	-	-	-	-	-	-	-
290.8	5	760	206	728	228	690	252	674	262	658	272	474	202
	6	784	208	748	230	712	254	696	264	678	274	492	204
	7	812	212	778	234	740	258	722	268	704	278	508	206
	10	858	216	820	238	778	262	758	272	740	284	534	208
	15	970	228	928	250	882	276	862	286	842	298	616	218
	18	1050	236	1004	260	956	286	934	296	914	308	670	224
	20	1104	242	1056	266	1006	292	984	304	962	314	708	228
315.9	5	833	218	798	241	760	266	743	276	726	288	549	231
	6	858	220	822	244	783	268	765	279	748	290	568	233
	7	890	224	854	247	815	272	796	283	778	294	591	235
	10	946	229	905	252	860	277	841	288	820	299	623	239
	15	-	-	-	-	982	292	961	303	939	315	722	250
	18	-	-	-	-	1047	300	1029	312	1010	324	787	257
	20	-	-	-	-	-	-	-	-	-	-	-	-
345.9	5	907	247	868	272	825	300	805	312	786	326	551	230
	6	934	249	894	275	850	303	829	316	810	328	571	232
	7	969	253	929	279	885	308	864	320	843	333	594	235
	10	1032	259	986	286	934	314	913	326	890	340	629	239
	15	1174	275	1123	302	1069	332	1045	345	1020	359	728	249
	18	1271	286	1216	313	1157	344	1132	357	1106	371	794	256
	20	1337	293	1280	321	1219	353	1192	367	1164	380	838	261
370.10	5	980	258	940	284	894	314	874	326	854	340	718	314
	6	1010	260	968	288	922	316	900	330	880	342	742	316
	7	1048	264	1006	292	960	322	938	334	916	348	774	320
	10	1116	270	1068	298	1014	328	992	340	968	354	818	326
	15	1274	286	1220	314	1164	346	1138	360	1112	374	946	342
	18	1380	298	1322	326	1260	358	1234	372	1206	386	1030	352
	20	1452	304	1392	334	1328	368	1300	382	1270	396	1086	358
420.12	5	1088	304	1040	334	990	368	966	384	942	398	718	316
	6	1122	306	1072	338	1018	372	996	388	970	404	742	320
	7	1160	312	1112	342	1060	378	1034	394	1010	410	774	324
	10	1240	320	1184	352	1122	386	1094	402	1068	418	818	328
	15	1406	340	1346	372	1280	410	1250	424	1220	442	946	344
	18	1522	352	1456	386	1384	424	1354	440	1322	456	1028	354
	20	1600	362	1530	398	1456	436	1424	452	1390	468	1086	362
450.12	5	1194	312	1144	344	1090	378	1066	394	1040	410	834	356
	6	1232	314	1180	346	1124	382	1098	398	1072	414	862	360
	7	1276	320	1226	352	1172	388	1144	404	1116	420	898	364
	10	1362	328	1302	360	1238	396	1210	412	1180	428	950	370
	15	1552	346	1488	380	1418	418	1388	434	1356	450	1098	386
	18	1682	358	1614	394	1538	432	1506	448	1472	466	1194	398
	20	1772	366	1698	402	1620	442	1586	458	1550	476	1260	406
480.12	5	1290	342	1234	378	1174	416	1148	434	1120	452	758	304
	6	1328	346	1272	382	1210	420	1182	438	1154	456	786	306
	7	1376	352	1320	386	1260	426	1230	444	1202	462	816	308
	10	1468	360	1404	396	1332	436	1302	454	1270	472	866	314
	15	1672	382	1602	420	1526	460	1492	478	1458	498	1004	326
	18	1812	396	1736	434	1654	478	1618	496	1580	514	1094	336
	20	1906	406	1828	446	1742	490	1704	508	1664	528	1156	342

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
To (°C) = Internal exchanger outlet water temperature
Performances in function of the inlet/outlet water temperature differential = 5°C
* Unit operating range with automatic staging of the compressor capacity

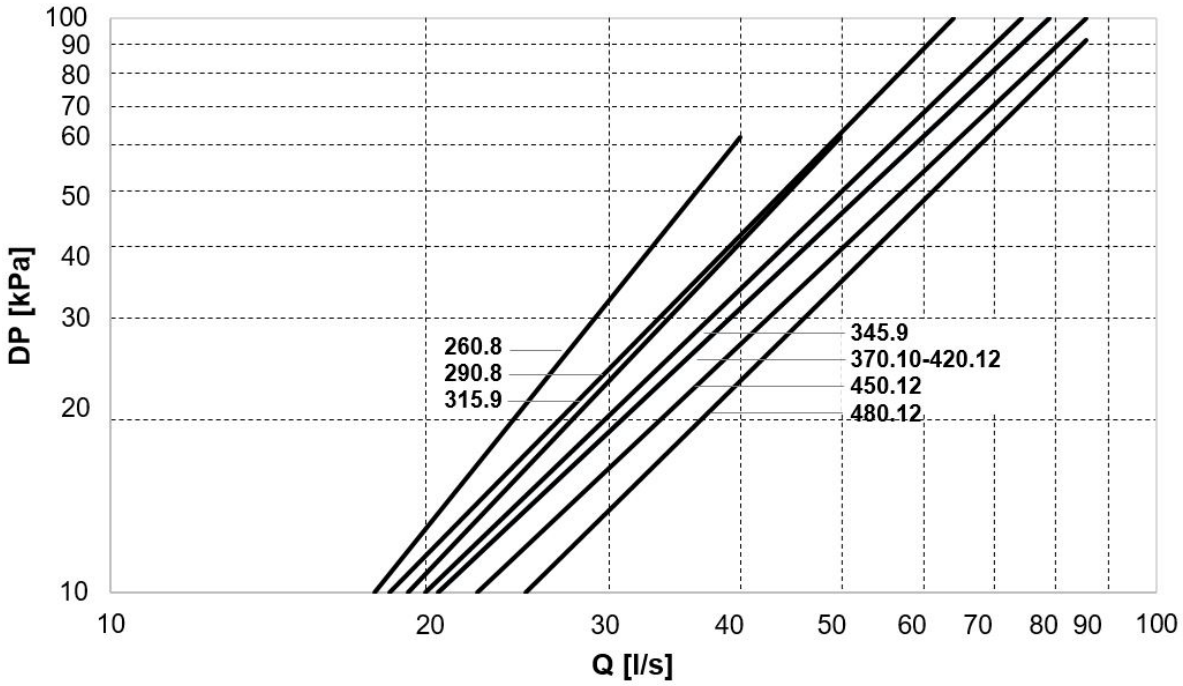
Premium
Cooling - EN

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		37		39		44*	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.8	5	668	184	638	202	606	224	612	226	598	236	380	148
	6	688	186	658	204	626	226	630	228	616	238	394	149
	7	712	188	682	208	650	228	654	232	640	240	408	150
	10	754	193	720	212	682	234	690	236	672	244	428	152
	15	-	-	-	-	774	246	784	246	766	256	498	158
	18	-	-	-	-	816	252	824	252	814	262	544	161
	20	-	-	-	-	-	-	-	-	-	-	-	-
290.8	5	744	216	710	238	674	262	674	262	658	272	474	202
	6	766	218	730	240	692	264	696	264	678	274	492	204
	7	794	222	758	244	720	268	722	268	704	278	508	206
	10	836	226	798	250	754	274	758	272	740	284	534	208
	15	944	240	902	264	856	290	862	286	842	298	616	218
	18	1020	250	974	274	926	300	934	296	914	308	670	224
	20	1072	256	1024	282	972	308	984	304	962	314	708	228
315.9	5	816	226	780	249	741	275	743	276	726	288	549	231
	6	840	229	804	252	764	278	765	279	748	290	568	233
	7	871	232	834	256	795	282	796	283	778	294	591	235
	10	924	238	882	262	837	289	841	288	820	299	623	239
	15	-	-	-	-	954	305	961	303	939	315	722	250
	18	-	-	-	-	1021	315	1029	312	1010	324	787	257
	20	-	-	-	-	-	-	-	-	-	-	-	-
345.9	5	891	259	851	286	807	316	805	312	786	326	551	230
	6	917	263	876	290	830	320	829	316	810	328	571	232
	7	951	267	909	294	865	325	864	320	843	333	594	235
	10	1010	275	962	302	912	333	913	326	890	340	629	239
	15	1147	293	1095	322	1040	353	1045	345	1020	359	728	249
	18	1239	305	1184	334	1124	367	1132	357	1106	371	794	256
	20	1303	314	1244	344	1182	377	1192	367	1164	380	838	261
370.10	5	964	268	922	296	876	326	874	326	854	340	718	314
	6	992	272	950	300	902	330	900	330	880	342	742	316
	7	1030	276	986	304	940	336	938	334	916	348	774	320
	10	1094	284	1044	312	992	344	992	340	968	354	818	326
	15	1246	302	1192	332	1134	364	1138	360	1112	374	946	342
	18	1348	314	1290	344	1226	378	1234	372	1206	386	1030	352
	20	1418	322	1356	354	1290	388	1300	382	1270	396	1086	358
420.12	5	1074	318	1024	350	972	386	966	384	942	398	718	316
	6	1104	322	1054	354	1000	390	996	388	970	404	742	320
	7	1144	326	1094	360	1040	396	1034	394	1010	410	774	324
	10	1218	336	1160	370	1098	406	1094	402	1068	418	818	328
	15	1380	360	1316	394	1248	432	1250	424	1220	442	946	344
	18	1490	374	1422	410	1348	450	1354	440	1322	456	1028	354
	20	1564	386	1492	422	1416	462	1424	452	1390	468	1086	362
450.12	5	1170	324	1118	356	1064	394	1066	394	1040	410	834	356
	6	1204	328	1152	360	1096	398	1098	398	1072	414	862	360
	7	1248	332	1196	366	1142	404	1144	404	1116	420	898	364
	10	1328	342	1268	376	1204	412	1210	412	1180	428	950	370
	15	1512	362	1446	398	1376	438	1388	434	1356	450	1098	386
	18	1636	376	1566	414	1490	454	1506	448	1472	466	1194	398
	20	1720	388	1646	424	1568	466	1586	458	1550	476	1260	406
480.12	5	1264	356	1208	392	1148	434	1148	434	1120	452	758	304
	6	1302	362	1244	398	1182	438	1182	438	1154	456	786	306
	7	1350	366	1292	404	1230	446	1230	444	1202	462	816	308
	10	1436	378	1370	414	1298	456	1302	454	1270	472	866	314
	15	1632	402	1560	440	1484	484	1492	478	1458	498	1004	326
	18	1766	418	1688	458	1604	504	1618	496	1580	514	1094	336
	20	1856	430	1774	472	1686	516	1704	508	1664	528	1156	342

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
To (°C) = Internal exchanger outlet water temperature
Performances in function of the inlet/outlet water temperature differential = 5°C
* Unit operating range with automatic staging of the compressor capacity

Premium

Plate exchangers pressure drop (EVPHE)



The pressure drops are calculated considering a water temperature of 7°C

Q = Water flow-rate[l/s]
DP = Water side pressure drops [kPa]

The water flow-rate must be calculated with the following formula
Q [l/s] = kWf / (4,186 x DT)

kWf = Cooling capacity in kW
DT = Temperature difference between inlet / outlet water

Admissible water flow-rates - flush hydraulic connections (ABU)

Minimum (Qmin), nominal (Qnominal) and maximum (Qmax) admissible water flow for the unit to operate correctly.

		ST/SC							
SIZE		**260.8**	**290.8**	**315.9**	**345.9**	**370.10**	**420.12**	**450.12**	**480.12**
Qmin	[l/s]	17,9	18,5	19,2	20,0	20,6	20,6	22,4	24,9
Qnominal	[l/s]	32,0	35,4	38,9	42,3	45,9	50,6	55,9	60,2
Qmax	[l/s]	40,0	63,9	50,1	74,3	78,9	78,9	85,6	85,6
		EN							
Qmin	[l/s]	17,9	18,5	19,2	20,0	20,6	20,6	22,4	24,9
Qnominal	[l/s]	31,1	34,4	38,0	41,3	44,9	49,7	54,5	58,8
Qmax	[l/s]	40,0	63,9	50,1	74,3	78,9	78,9	85,6	85,6

Admissible water flow-rates - internal water fittings provided by the customer (ACL)

Minimum (Qmin), nominal (Qnominal) and maximum (Qmax) admissible water flow for the unit to operate correctly.

		ST/SC															
SIZE		**260.8**		**290.8**		**315.9**		**345.9**		**370.10**		**420.12**		**450.12**		**480.12**	
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	8,9	8,9	9,2	9,2	8,9	10,3	9,7	10,3	10,3	10,3	10,3	10,3	11,2	11,2	12,5	12,5
Qnominal	[l/s]	15,9	15,9	17,6	17,6	15,9	22,8	19,2	22,8	22,8	22,8	25,2	25,2	27,8	27,8	29,9	29,9
Qmax	[l/s]	20,0	20,0	32,0	32,0	20,0	39,5	34,8	39,5	39,5	39,5	39,5	39,5	42,8	42,8	42,8	42,8
		EN															
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	8,9	8,9	9,2	9,2	8,9	10,3	9,7	10,3	10,3	10,3	10,3	10,3	11,2	11,2	12,5	12,5
Qnominal	[l/s]	15,4	15,4	17,1	17,1	15,4	22,3	18,8	22,3	22,3	22,3	24,7	24,7	27,1	27,1	29,2	29,2
Qmax	[l/s]	20,0	20,0	32,0	32,0	20,0	39,5	34,8	39,5	39,5	39,5	39,5	39,5	42,8	42,8	42,8	42,8

Excellence

Cooling at part load - SC

SIZE	Load	Entering external exchanger air temperature (°C)											
		20°C			25°C			30°C			35°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.8	100	800	173	4,62	772	189	4,08	742	206	3,60	710	226	3,14
	75	600	117	5,11	578	129	4,48	556	141	3,94	534	155	3,45
	50	400	71,8	5,57	386	79,0	4,89	372	86,6	4,30	356	95,0	3,75
	Minimum	162	28,0	5,78	156	30,8	5,08	150	33,8	4,45	144	37,0	3,90
290.8	100	878	193	4,54	850	210	4,05	816	232	3,52	780	254	3,07
	75	658	131	5,03	636	143	4,44	612	157	3,90	586	172	3,40
	50	438	78,8	5,56	424	87,0	4,87	408	94,8	4,30	390	104	3,74
	Minimum	162	27,4	5,93	157	30,2	5,19	151	33,2	4,54	145	36,4	3,97
320.8	100	974	216	4,51	938	236	3,97	900	260	3,46	860	284	3,03
	75	730	149	4,90	704	163	4,31	676	178	3,79	646	195	3,31
	50	486	89,2	5,45	470	98,2	4,79	450	107	4,21	430	117	3,66
	Minimum	262	48,2	5,44	254	53,0	4,79	244	58,0	4,21	234	63,6	3,68
345.9	100	1050	232	4,53	1013	253	4,00	972	278	3,50	930	304	3,06
	75	787	158	4,99	760	173	4,40	730	189	3,87	698	207	3,38
	50	525	94,7	5,54	507	104	4,86	486	114	4,26	465	125	3,72
	Minimum	213	37,6	5,66	206	41,3	5,00	198	45,3	4,38	190	49,7	3,83
370.10	100	1126	248	4,54	1088	270	4,03	1044	296	3,53	1000	324	3,09
	75	844	166	5,07	816	183	4,47	784	199	3,93	750	218	3,44
	50	564	100	5,63	544	111	4,92	522	121	4,30	500	133	3,77
	Minimum	164	27,0	6,07	159	29,6	5,36	153	32,6	4,69	147	35,8	4,10
420.12	100	1254	284	4,42	1210	310	3,90	1162	338	3,44	1112	372	2,98
	75	940	189	4,96	908	208	4,37	872	226	3,86	834	248	3,36
	50	626	113	5,55	604	124	4,86	580	136	4,25	556	149	3,73
	Minimum	165	27,0	6,10	159	29,6	5,37	153	32,6	4,70	147	35,6	4,13
450.12	100	1372	308	4,45	1323	335	3,95	1268	367	3,46	1212	402	3,01
	75	1029	206	5,00	993	226	4,39	951	245	3,88	909	269	3,38
	50	686	124	5,54	661	137	4,84	633	149	4,24	606	163	3,71
	Minimum	218	36,2	6,03	211	40,0	5,26	203	44,0	4,60	194	48,2	4,01

Load = % of cooling capacity compared to the value at full load
kWf = cooling capacity in kW
kWe_tot = unit total power input in kW
Internal exchanger water temeprature = leaving 7°C / entering 12°C / variable flow-rate with external exchanger air temperature

Excellence

Cooling at part load - EN

SIZE	Load	Entering external exchanger air temperature (°C)											
		20°C			25°C			30°C			35°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.8	100	790	171	4,61	758	188	4,03	726	206	3,52	690	226	3,05
	75	592	120	4,92	568	131	4,32	544	143	3,81	518	155	3,33
	50	394	72,2	5,46	380	78,8	4,82	362	85,8	4,22	346	93,4	3,70
	Minimum	161	28,0	5,76	156	30,8	5,06	150	33,8	4,44	144	37,0	3,89
290.8	100	862	195	4,41	830	214	3,88	796	236	3,37	760	258	2,95
	75	646	135	4,79	622	147	4,23	598	161	3,71	570	176	3,23
	50	430	79,8	5,39	418	87,8	4,76	398	95,6	4,16	380	105	3,63
	Minimum	163	27,6	5,91	157	30,2	5,21	151	33,2	4,56	145	36,6	3,96
320.8	100	946	222	4,26	912	242	3,77	872	266	3,28	830	294	2,82
	75	710	155	4,57	684	170	4,03	654	185	3,54	624	202	3,09
	50	474	92,8	5,11	456	102	4,47	436	111	3,94	416	121	3,44
	Minimum	254	49,8	5,10	244	54,8	4,45	236	59,8	3,95	226	65,6	3,45
345.9	100	1023	237	4,32	986	259	3,81	944	285	3,31	900	313	2,88
	75	768	163	4,70	740	179	4,15	708	194	3,64	676	212	3,19
	50	512	95,6	5,36	494	105	4,70	472	115	4,12	451	125	3,61
	Minimum	209	38,5	5,43	201	42,3	4,76	195	46,3	4,20	186	50,8	3,67
370.10	100	1100	252	4,37	1060	276	3,84	1016	304	3,34	970	332	2,92
	75	826	171	4,82	796	187	4,25	762	204	3,74	728	222	3,28
	50	550	98,4	5,59	532	108	4,91	508	119	4,28	486	129	3,77
	Minimum	164	27,2	6,04	159	29,8	5,33	153	32,8	4,66	147	36,0	4,08
420.12	100	1230	292	4,21	1184	320	3,70	1134	350	3,24	1080	386	2,80
	75	922	198	4,65	888	216	4,11	850	236	3,60	810	256	3,16
	50	616	112	5,50	594	123	4,82	568	135	4,22	540	146	3,69
	Minimum	166	27,2	6,10	160	29,8	5,38	154	32,8	4,71	148	35,8	4,14
450.12	100	1343	315	4,26	1291	345	3,74	1235	377	3,28	1176	415	2,83
	75	1007	214	4,70	968	233	4,15	926	255	3,63	882	277	3,18
	50	672	124	5,43	646	136	4,75	618	148	4,16	588	161	3,65
	Minimum	219	36,4	6,01	211	40,2	5,25	203	44,2	4,60	195	48,4	4,03

Load = % of cooling capacity compared to the value at full load
kWf = cooling capacity in kW
kWe_tot = unit total power input in kW
Internal exchanger water temeprature = leaving 7°C / entering 12°C / variable flow-rate with external exchanger air temperature

Premium

Cooling at part load - SC

SIZE	Load	Entering external exchanger air temperature (°C)											
		20°C			25°C			30°C			35°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.8	100	758	180	4,21	732	197	3,72	702	216	3,25	670	236	2,84
	75	574	125	4,59	548	137	4,01	526	149	3,52	504	164	3,08
	50	382	72,2	5,29	366	79,2	4,62	350	86,4	4,05	336	94,4	3,56
	Minimum	159	29,2	5,46	153	32,0	4,77	147	35,0	4,19	141	38,4	3,66
290.8	100	844	206	4,10	812	226	3,59	778	246	3,16	740	270	2,74
	75	638	137	4,66	608	149	4,07	582	163	3,57	556	178	3,13
	50	426	82,0	5,20	406	89,6	4,53	388	97,6	3,98	370	106	3,48
	Minimum	160	28,8	5,56	154	31,6	4,86	147	34,8	4,24	141	38,0	3,72
315.9	100	922	219	4,21	890	239	3,72	854	263	3,25	815	288	2,83
	75	697	147	4,73	667	161	4,14	640	176	3,64	612	193	3,17
	50	465	86,5	5,38	445	95,1	4,68	426	104	4,10	408	114	3,59
	Minimum	161	28,3	5,70	155	31,1	4,97	149	34,0	4,37	143	37,4	3,81
345.9	100	1006	245	4,11	969	269	3,60	929	295	3,15	885	324	2,73
	75	760	163	4,67	726	178	4,08	696	194	3,59	664	213	3,12
	50	507	98,7	5,14	484	108	4,46	464	118	3,92	443	129	3,42
	Minimum	212	39,1	5,41	202	42,9	4,72	194	46,9	4,14	186	51,5	3,62
370.10	100	1086	258	4,21	1048	282	3,72	1006	310	3,25	960	340	2,82
	75	820	170	4,83	786	186	4,23	754	202	3,73	720	222	3,24
	50	548	101	5,44	524	111	4,72	502	121	4,14	480	133	3,61
	Minimum	163	27,4	5,96	157	30,2	5,19	151	33,0	4,57	145	36,4	3,97
420.12	100	1204	302	3,99	1160	330	3,52	1112	360	3,09	1060	396	2,68
	75	910	195	4,66	870	212	4,10	834	232	3,59	796	254	3,13
	50	606	116	5,23	580	127	4,56	556	139	4,01	530	152	3,50
	Minimum	164	27,6	5,93	157	30,4	5,17	151	33,4	4,52	145	36,6	3,96
450.12	100	1324	312	4,24	1276	342	3,73	1226	374	3,28	1172	410	2,86
	75	1000	206	4,85	958	226	4,24	918	246	3,73	878	268	3,28
	50	666	126	5,29	638	138	4,62	612	151	4,06	586	164	3,57
	Minimum	165	27,2	6,07	158	30,0	5,28	152	33,0	4,62	146	36,0	4,07
480.12	100	1428	342	4,18	1376	374	3,68	1320	410	3,22	1260	450	2,80
	75	1078	226	4,77	1032	246	4,20	990	268	3,69	946	292	3,24
	50	720	135	5,32	688	149	4,62	660	163	4,05	630	177	3,55
	Minimum	272	47,4	5,74	260	52,4	4,96	250	57,6	4,34	240	63,0	3,81

Load = % of cooling capacity compared to the value at full load
kWf = cooling capacity in kW
kWe_tot = unit total power input in kW
Internal exchanger water temeprature = leaving 7°C / entering 12°C / variable flow-rate with external exchanger air temperature

Premium

Cooling at part load - EN

SIZE	Load	Entering external exchanger air temperature (°C)											
		20°C			25°C			30°C			35°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.8	100	740	179	4,12	712	196	3,63	682	216	3,16	650	236	2,75
	75	558	125	4,46	534	137	3,91	512	149	3,43	488	163	2,99
	50	372	70,8	5,25	356	77,6	4,59	340	84,6	4,02	326	92,0	3,54
	Minimum	158	28,8	5,48	151	31,6	4,78	145	34,8	4,17	139	38,0	3,66
290.8	100	826	210	3,93	794	230	3,45	758	252	3,01	720	276	2,61
	75	624	141	4,42	596	154	3,88	568	167	3,40	540	182	2,97
	50	416	83,0	5,01	396	90,6	4,37	380	98,2	3,87	360	106	3,38
	Minimum	160	28,8	5,55	153	31,6	4,85	147	34,8	4,23	141	38,0	3,71
315.9	100	905	221	4,10	871	241	3,61	834	266	3,14	795	291	2,73
	75	683	149	4,57	653	163	4,01	626	178	3,52	597	194	3,09
	50	456	84,8	5,38	436	93,2	4,68	417	102	4,11	398	111	3,60
	Minimum	161	28,1	5,72	154	30,9	4,99	148	33,9	4,37	142	37,2	3,82
345.9	100	989	252	3,92	951	276	3,45	909	304	2,99	865	334	2,59
	75	747	169	4,42	713	185	3,86	682	201	3,39	650	219	2,97
	50	499	100	4,97	476	110	4,32	455	120	3,79	433	131	3,31
	Minimum	209	40,3	5,18	200	44,3	4,50	192	48,4	3,96	184	53,1	3,46
370.10	100	1070	262	4,08	1030	286	3,60	986	316	3,12	940	346	2,72
	75	808	174	4,65	772	189	4,08	740	206	3,59	706	224	3,15
	50	540	98,8	5,47	516	109	4,74	494	118	4,17	470	129	3,64
	Minimum	164	27,4	5,98	157	30,2	5,20	151	33,0	4,58	145	36,4	3,98
420.12	100	1190	308	3,86	1144	338	3,38	1094	370	2,96	1040	408	2,55
	75	900	202	4,46	858	220	3,90	820	240	3,42	780	262	2,98
	50	600	115	5,20	572	126	4,53	546	137	3,98	520	149	3,49
	Minimum	165	27,6	5,98	158	30,4	5,20	152	33,4	4,56	146	36,8	3,96
450.12	100	1298	316	4,11	1248	346	3,61	1196	380	3,15	1142	418	2,73
	75	980	212	4,62	936	232	4,03	898	252	3,56	856	274	3,12
	50	654	126	5,18	624	138	4,52	598	150	3,98	570	163	3,50
	Minimum	164	27,2	6,04	158	30,0	5,26	152	32,8	4,63	146	36,0	4,05
480.12	100	1406	346	4,06	1350	380	3,55	1292	418	3,09	1230	460	2,67
	75	1062	232	4,58	1012	254	3,98	970	276	3,51	924	298	3,10
	50	708	136	5,21	674	149	4,54	646	162	3,99	616	176	3,50
	Minimum	272	47,4	5,74	260	52,4	4,96	250	57,6	4,34	240	63,0	3,81

Load = % of cooling capacity compared to the value at full load
kWf = cooling capacity in kW
kWe_tot = unit total power input in kW
Internal exchanger water temeprature = leaving 7°C / entering 12°C / variable flow-rate with external exchanger air temperature

Excellence

Heating - SC/EN

SIZE	Ta (°C) D.B./W.B.	Leaving internal exchanger water temperature (°C)									
		35		40		45		50		55	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
260.8	-7 / -8	526	155	526	176	528	196	-	-	-	-
	-5 / -6	556	158	556	178	558	198	556	220	-	-
	0 / -1	634	163	632	181	630	202	626	224	624	248
	2 / 1	668	165	664	183	662	202	656	226	652	250
	7 / 6	762	169	756	187	750	206	740	230	732	254
	12 / 11	850	175	840	193	830	212	816	234	804	258
290.8	-7 / -8	582	172	582	192	586	218	-	-	-	-
	-5 / -6	616	174	616	195	618	220	616	248	-	-
	0 / -1	702	180	698	200	698	224	692	250	690	280
	2 / 1	738	182	734	202	732	226	726	252	722	280
	7 / 6	842	186	834	206	830	230	818	254	810	284
	12 / 11	938	192	928	212	918	234	904	258	892	286
320.8	-7 / -8	638	186	640	208	644	236	-	-	-	-
	-5 / -6	676	189	676	210	678	238	678	272	-	-
	0 / -1	770	195	766	218	766	244	760	278	758	312
	2 / 1	810	198	806	220	804	248	796	278	792	312
	7 / 6	922	204	914	228	910	252	898	282	890	314
	12 / 11	1028	210	1016	234	1008	258	992	284	980	316
345.9	-7 / -8	690	201	691	224	695	254	-	-	-	-
	-5 / -6	730	203	730	227	732	256	732	292	-	-
	0 / -1	833	210	829	235	828	263	822	297	820	335
	2 / 1	877	213	872	237	869	266	861	299	857	335
	7 / 6	999	220	990	245	985	272	972	304	963	338
	12 / 11	1114	227	1101	252	1091	278	1074	307	1061	340
370.10	-7 / -8	742	216	742	240	746	272	-	-	-	-
	-5 / -6	784	218	784	244	786	274	786	312	-	-
	0 / -1	896	226	892	252	890	282	884	316	882	358
	2 / 1	944	228	938	254	934	284	926	320	922	358
	7 / 6	1076	236	1066	262	1060	292	1046	326	1036	362
	12 / 11	1200	244	1186	270	1174	298	1156	330	1142	364
420.12	-7 / -8	820	244	822	272	826	306	-	-	-	-
	-5 / -6	866	246	866	274	870	310	870	354	-	-
	0 / -1	988	256	984	284	984	320	978	358	976	400
	2 / 1	1040	260	1034	290	1032	322	1024	360	1020	400
	7 / 6	1184	266	1176	296	1168	328	1156	364	1146	406
	12 / 11	1320	274	1308	302	1296	334	1276	368	1260	408
450.12	-7 / -8	891	269	893	301	898	338	-	-	-	-
	-5 / -6	941	271	942	303	945	341	945	387	-	-
	0 / -1	1073	280	1069	311	1068	349	1062	391	1059	438
	2 / 1	1130	283	1124	316	1121	351	1112	393	1107	438
	7 / 6	1287	290	1277	323	1268	358	1254	398	1242	444
	12 / 11	1434	300	1420	330	1406	365	1384	403	1366	447

kWt = Internal exchanger heating capacity (kW)
The kWt heating capacity does not consider any defrosting cycles. For the real heating capacity calculation, including defrosting cycles, please refer to "Integrated heating capacities" table.
kWe = Compressor power input in kW

Ta = Entering external exchanger air temperature
D.B. = Dry bulb
W.B. = Wet bulb

Integrated heating capacities

Entering external exchanger air temperature °C (D.B. / W.B.)	-7/-8	-5/-6	0/-1	2/1	Altri
Heating capacity multiplication coefficient	0,90	0,89	0,88	0,90	1,00

The integrated heating capacity represents the real heating capacity considering the defrost cycles too.
To obtain the integrated heating capacity multiply the heating performance value in kWt (shown in the heating performance tables) by the coefficients indicated in the table.
In case of below zero outdoor air temperature with a long period of heat pump operating mode it is necessary to help the evacuation of the water produced during the defrost cycle; this to avoid the formation of ice in the unit basement. Pay attention that the evacuation will not create inconveniences to things or persons

Premium - Heating - SC/EN

SIZE	Ta (°C) D.B./W.B.	Leaving internal exchanger water temperature (°C)									
		35		40		45		50		52	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
260.8	-7 / -8	490	159	494	178	-	-	-	-	-	-
	-5 / -6	520	161	520	179	524	199	-	-	-	-
	0 / -1	590	164	590	182	590	202	588	226	588	236
	2 / 1	622	166	620	184	620	204	616	226	614	236
	7 / 6	707	169	702	188	700	208	692	230	690	240
	12 / 11	784	174	778	192	772	212	762	234	758	242
290.8	-7 / -8	542	177	544	199	-	-	-	-	-	-
	-5 / -6	572	178	574	200	578	224	-	-	-	-
	0 / -1	650	183	650	204	650	228	650	254	648	266
	2 / 1	682	185	682	206	682	228	678	254	678	266
	7 / 6	776	186	772	210	770	232	762	258	760	270
	12 / 11	862	192	854	212	850	234	838	260	834	270
315.9	-7 / -8	595	189	599	210	-	-	-	-	-	-
	-5 / -6	630	190	631	213	635	239	-	-	-	-
	0 / -1	716	195	716	218	716	243	714	272	713	284
	2 / 1	754	198	752	220	752	245	747	273	746	285
	7 / 6	858	203	853	225	850	250	841	277	838	289
	12 / 11	954	208	946	229	939	253	927	280	922	291
345.9	-7 / -8	645	204	649	228	-	-	-	-	-	-
	-5 / -6	682	206	684	231	689	261	-	-	-	-
	0 / -1	775	211	775	237	776	265	774	297	773	311
	2 / 1	815	215	814	239	814	267	810	299	809	312
	7 / 6	927	220	923	244	920	272	911	302	908	315
	12 / 11	1031	224	1023	247	1016	274	1004	303	999	316
370.10	-7 / -8	700	218	704	242	-	-	-	-	-	-
	-5 / -6	740	220	742	246	746	278	-	-	-	-
	0 / -1	842	226	842	254	842	284	840	318	838	332
	2 / 1	886	230	884	256	884	286	878	320	878	334
	7 / 6	1010	236	1004	262	1000	292	990	324	986	338
	12 / 11	1124	242	1114	266	1106	294	1092	326	1086	340
420.12	-7 / -8	778	246	782	276	-	-	-	-	-	-
	-5 / -6	822	250	826	280	832	316	-	-	-	-
	0 / -1	934	256	934	288	936	320	934	356	934	374
	2 / 1	982	260	982	290	982	322	978	358	976	374
	7 / 6	1118	266	1112	294	1108	326	1100	364	1096	380
	12 / 11	1244	270	1234	298	1226	330	1212	366	1206	380
450.12	-7 / -8	856	264	858	296	-	-	-	-	-	-
	-5 / -6	904	268	906	300	910	340	-	-	-	-
	0 / -1	1030	276	1028	310	1028	346	1022	388	1020	406
	2 / 1	1084	280	1080	312	1078	348	1070	388	1068	406
	7 / 6	1234	286	1226	318	1218	354	1206	394	1200	412
	12 / 11	1376	292	1362	324	1350	358	1330	396	1324	414
480.12	-7 / -8	920	284	924	318	-	-	-	-	-	-
	-5 / -6	972	288	974	322	980	366	-	-	-	-
	0 / -1	1104	298	1102	334	1104	374	1100	418	1098	438
	2 / 1	1162	300	1158	336	1158	376	1150	420	1148	440
	7 / 6	1324	308	1314	342	1308	380	1296	424	1290	442
	12 / 11	1472	314	1460	348	1448	384	1430	426	1422	444

kWt = Internal exchanger heating capacity (kW)
The kWt heating capacity does not consider any defrosting cycles. For the real heating capacity calculation, including defrosting cycles, please refer to “Integrated heating capacities” table.

kWe = Compressor power input in kW
Ta = Entering external exchanger air temperature
D.B. = Dry bulb
W.B. = Wet bulb

Integrated heating capacities

Entering external exchanger air temperature °C (D.B. / W.B.)	-7/-8	-5/-6	0/-1	2/1	Altri
Heating capacity multiplication coefficient	0,90	0,89	0,88	0,90	1,00

The integrated heating capacity represents the real heating capacity considering the defrost cycles too.
To obtain the integrated heating capacity multiply the heating performance value in kWt (shown in the heating performance tables) by the coefficients indicated in the table.
In case of below zero outdoor air temperature with a long period of heat pump operating mode it is necessary to help the evacuation of the water produced during the defrost cycle; this to avoid the formation of ice in the unit basement. Pay attention that the evacuation will not create inconveniences to things or persons

Excellence

Heating at part load - SC/EN

SIZE	Load	Entering external exchanger air temperature (°C)																	
		-7/-8			-5/-6			0/-1			2/1			7/6			12/11		
		kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP
260.8	100	528	216	2,45	558	218	2,57	630	220	2,86	662	222	2,98	750	226	3,32	830	232	3,58
	75	396	148	2,68	418	149	2,81	472	152	3,12	496	153	3,24	562	158	3,56	622	156	3,98
	50	264	90,8	2,91	278	91,6	3,04	316	93	3,39	330	94	3,53	374	96,0	3,90	416	95,2	4,36
	Minimum	110	36,2	3,03	116	36,6	3,16	133	37,8	3,52	140	38,2	3,67	160	39,4	4,07	182	40,4	4,50
290.8	100	586	236	2,47	618	238	2,59	698	244	2,87	732	244	2,99	830	248	3,35	918	254	3,62
	75	440	162	2,71	462	162	2,85	524	164	3,19	550	165	3,33	622	168	3,70	690	168	4,10
	50	292	101	2,90	308	101	3,05	348	102	3,41	366	103	3,56	414	105	3,96	460	105	4,39
	Minimum	110	36,0	3,04	116	36,4	3,18	133	37,4	3,55	140	37,8	3,71	160	38,8	4,14	183	39,6	4,61
320.8	100	644	256	2,52	678	258	2,63	766	264	2,90	804	268	3,00	910	272	3,35	1008	276	3,64
	75	482	176	2,74	508	177	2,87	574	180	3,19	602	181	3,32	682	184	3,71	756	182	4,14
	50	322	110	2,93	338	110	3,08	382	111	3,45	402	111	3,60	454	113	4,02	504	113	4,45
	Minimum	176	60,0	2,93	186	60,4	3,07	212	61,4	3,45	222	61,8	3,60	254	63,2	4,01	288	64,8	4,45
345.9	100	695	276	2,52	732	278	2,63	828	285	2,91	869	289	3,01	985	294	3,35	1091	300	3,64
	75	521	188	2,77	549	190	2,90	621	193	3,22	652	195	3,35	738	198	3,73	818	197	4,15
	50	348	118	2,95	366	118	3,09	414	119	3,47	435	120	3,64	492	121	4,06	546	121	4,52
	Minimum	144	48,3	2,98	152	48,7	3,12	174	49,7	3,50	183	50,0	3,65	209	51,1	4,09	238	52,2	4,55
370.10	100	746	296	2,53	786	298	2,63	890	306	2,90	934	310	3,02	1060	316	3,35	1174	324	3,63
	75	560	200	2,79	590	202	2,93	668	206	3,25	702	208	3,38	794	212	3,74	880	212	4,15
	50	374	126	2,95	394	126	3,11	446	127	3,50	468	128	3,66	530	129	4,09	588	128	4,58
	Minimum	112	36,6	3,06	118	37,0	3,20	136	38,0	3,58	143	38,2	3,75	164	39,0	4,21	187	39,6	4,73
420.12	100	826	330	2,50	870	334	2,60	984	344	2,85	1032	346	2,98	1168	352	3,32	1296	358	3,62
	75	620	222	2,78	652	224	2,92	738	228	3,23	774	236	3,29	876	238	3,70	972	238	4,09
	50	414	140	2,95	436	141	3,09	492	143	3,44	516	148	3,50	584	146	4,00	648	145	4,45
	Minimum	111	36,4	3,07	117	36,6	3,20	135	37,6	3,59	142	37,8	3,76	163	38,6	4,22	186	39,4	4,73
450.12	100	898	365	2,46	945	368	2,57	1068	376	2,84	1121	378	2,97	1268	385	3,29	1406	392	3,59
	75	674	248	2,72	709	250	2,84	801	255	3,14	841	259	3,25	951	262	3,63	1055	261	4,04
	50	450	154	2,92	473	155	3,06	534	157	3,41	560	159	3,51	634	160	3,96	703	159	4,42
	Minimum	148	48,9	3,02	156	49,2	3,16	178	50,3	3,55	188	50,7	3,71	214	51,8	4,14	244	53,1	4,59

Load = % of cooling capacity compared to the value at full load
kWt = Heating capacity (kW)
kWe_tot = Unit total power input in kW
Internal exchanger water temeprature = leaving 45°C / entering 40°C/ variable flow-rate with external exchanger air temperature

Premium

Heating at part load - SC/EN

Grandezze	Load	Entering external exchanger air temperature (°C)																	
		-7/-8			-5/-6			0/-1			2/1			7/6			12/11		
		kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP
260.8	100	498	212	2,34	524	214	2,45	590	218	2,72	620	218	2,83	700	222	3,15	772	226	3,42
	75	374	143	2,61	392	144	2,73	442	147	3,01	464	149	3,12	524	151	3,48	580	149	3,88
	50	248	87,6	2,84	262	88,0	2,98	296	89,6	3,30	310	90,2	3,43	350	91,8	3,81	386	91,4	4,23
	Minimum	106	36,0	2,94	113	36,4	3,09	129	37,6	3,41	135	38,2	3,55	154	39,2	3,92	175	40,6	4,32
290.8	100	550	238	2,31	578	238	2,42	650	242	2,69	682	242	2,81	770	246	3,13	850	250	3,41
	75	412	159	2,60	434	159	2,72	488	161	3,02	512	163	3,15	576	166	3,47	636	165	3,85
	50	276	98,6	2,79	290	98,8	2,93	326	100	3,25	340	101	3,38	384	103	3,73	424	102	4,14
	Minimum	105	35,4	2,96	112	36,0	3,11	128	37,0	3,45	135	37,4	3,59	154	38,6	3,98	175	39,6	4,40
315.9	100	604	253	2,39	635	256	2,48	716	260	2,75	752	262	2,87	850	266	3,20	939	270	3,48
	75	453	169	2,69	476	170	2,80	537	173	3,10	563	174	3,23	637	178	3,57	705	178	3,97
	50	301	105	2,88	318	105	3,03	359	106	3,39	376	107	3,53	425	108	3,94	469	107	4,37
	Minimum	108	35,9	3,00	114	36,3	3,14	131	37,4	3,49	138	37,8	3,64	157	38,7	4,06	179	39,8	4,49
345.9	100	656	276	2,38	689	278	2,48	776	281	2,76	814	284	2,87	920	288	3,19	1016	291	3,49
	75	491	183	2,68	517	184	2,81	582	187	3,12	610	187	3,26	690	191	3,61	762	191	3,99
	50	327	114	2,86	345	115	3,01	389	115	3,37	407	116	3,52	460	117	3,92	508	117	4,33
	Minimum	138	47,6	2,90	146	48,0	3,04	166	49,1	3,39	175	49,5	3,53	200	50,7	3,94	227	52,0	4,37
370.10	100	710	294	2,41	746	298	2,51	842	302	2,78	884	306	2,89	1000	310	3,23	1106	314	3,52
	75	532	194	2,74	560	195	2,87	632	199	3,17	662	200	3,30	750	206	3,65	830	206	4,04
	50	354	122	2,92	374	122	3,07	422	122	3,44	442	123	3,60	500	124	4,02	552	123	4,48
	Minimum	109	35,8	3,05	116	36,2	3,19	133	37,2	3,58	140	37,4	3,74	160	38,2	4,19	183	39,0	4,68
420.12	100	790	332	2,38	832	334	2,48	936	338	2,76	982	340	2,88	1108	346	3,20	1226	350	3,51
	75	594	218	2,73	624	218	2,85	702	224	3,14	736	226	3,26	832	232	3,59	920	232	3,97
	50	396	136	2,90	416	136	3,05	468	137	3,41	490	138	3,56	554	140	3,96	612	139	4,41
	Minimum	109	35,6	3,07	115	36,0	3,21	132	36,8	3,59	139	37,2	3,76	159	38,0	4,21	182	38,6	4,71
450.12	100	864	360	2,40	910	364	2,50	1028	370	2,77	1078	372	2,89	1218	378	3,22	1350	382	3,52
	75	648	236	2,75	682	238	2,87	770	242	3,19	808	244	3,31	914	252	3,63	1012	252	4,02
	50	432	148	2,92	454	148	3,07	514	149	3,44	538	150	3,59	610	152	4,01	674	151	4,47
	Minimum	111	36,2	3,07	117	36,6	3,20	135	37,4	3,59	142	37,8	3,76	163	38,6	4,22	186	39,2	4,73
480.12	100	930	386	2,41	980	392	2,50	1104	398	2,77	1158	400	2,90	1308	406	3,22	1448	410	3,54
	75	698	254	2,74	734	256	2,87	828	260	3,18	868	262	3,31	982	268	3,65	1086	272	4,01
	50	466	159	2,93	490	159	3,08	552	160	3,45	578	161	3,60	654	163	4,02	724	162	4,48
	Minimum	180	60,0	3,00	191	60,4	3,16	218	61,4	3,55	230	61,8	3,71	262	63,0	4,16	298	64,4	4,63

Load = % of cooling capacity compared to the value at full load
kWt = Heating capacity (kW)
kWe_tot = Unit total power input in kW
Internal exchanger water temeprature = leaving 45°C / entering 40°C/ variable flow-rate with external exchanger air temperature

SC - Acoustic configuration with compressor soundproofing (Standard)

Configuration used to increase the unit's silent operation by acting on the source of the noise. It consists of suitable steel casings lined with high-density material designed to provide sound insulation. The casings are secured to an aluminium frame and painted on the outside with polyester powder (RAL 9001).

⚠ With the acoustic configuration with compressor soundproofing if the hydronic units installed on the unit are selected, they are supplied without casing.

To assess the quality of the soundproofing benefit, refer to the 'Sound levels' tables.

EN - Super-silenced acoustic configuration

Configuration that further increases the unit's silent operation by acting on the source of the noise. It consists of suitable steel casings lined with high-density material designed to provide sound insulation. The casings are secured to an aluminium frame and painted on the outside with polyester powder (RAL 9001).
The unit also reduces the air flow.

⚠ With the super-silenced acoustic configuration, if the hydronic units installed on the unit are selected, they are supplied with casing.

To assess the benefit of the super silenced configuration, refer to the "Sound levels" tables.

PFGP - Soundproofing paneling of the pumping unit

Configuration used to increase the hydronic assembly's silent operation.
It is made up of steel casings lined internally with high-density material with a soundproofing function. The casings are pre-painted with RAL 9001 color.

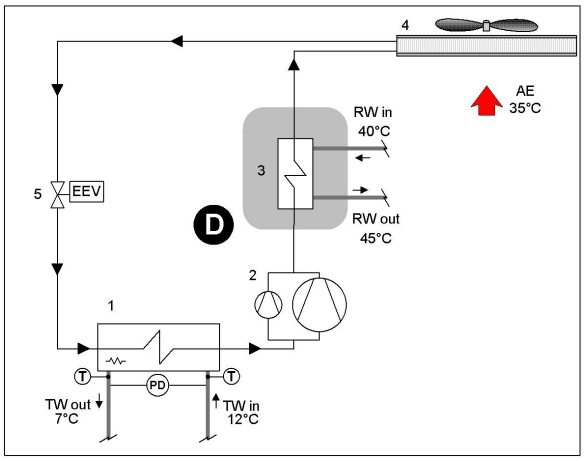
Option available for all pumping groups installed on the unit, in combination with the acoustic configuration with compressor soundproofing (SC)

Configurations

D - Partial energy recovery

A configuration which enables the production of hot water free-of-charge while operating in the cooling mode, thanks to the partial recovery of condensation heat that would otherwise be disposed of into the external heat source.
This option is also known as “desuperheater”. It is made up of a Inox 316 stainless steel brazed plate heat n°2 exchangers, suitable for recovering a part of the capacity dispersed by the unit (the dispersed heating capacity is equal to the sum of the cooling capacity and the electrical input capacity of the compressors).
The partial recovery device is considered to be operating when it is powered by the water flow which is to be heated. This condition improves the unit performance, since it reduces the condensation temperature: in nominal conditions the cooling capacity increases indicatively by 3.2% and the power input of the compressors is reduced by 3.6%.
When the temperature of the water to be heated is particularly low, it is opportune to insert a flow regulation valve in the hydraulic circuit, to maintain the recovery output temperature at higher than 35°C and thus avoid refrigerant condensation in the partial energy recovery device.

⚠ The hydraulic connection of the two exchangers is provided by the customer

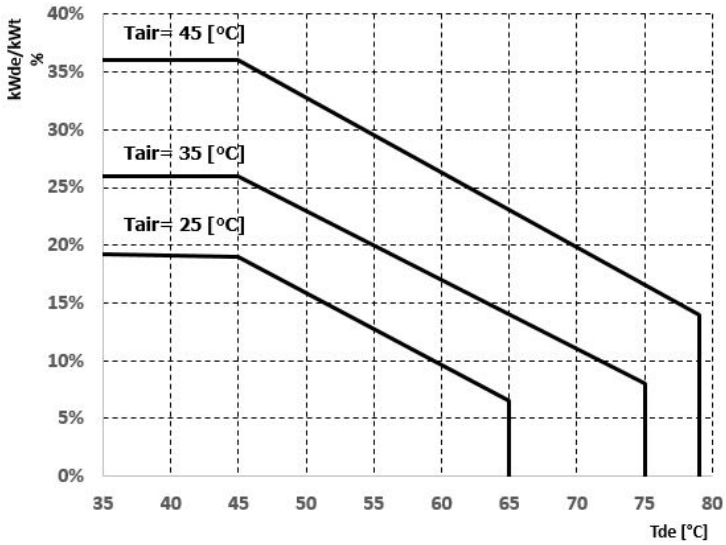


D - Partial recovery device
1 - Internal exchanger
2 - Compressors
3 - Recovery exchanger
4 - External exchanger
5 - Expansion electronic valve

TW in chilled water inlet
TW out chilled water outlet
RW in - Recovery water input
RW out - Recovery water output

T - Temperature probe
PD - Differential pressure switch
AE Outdoor air

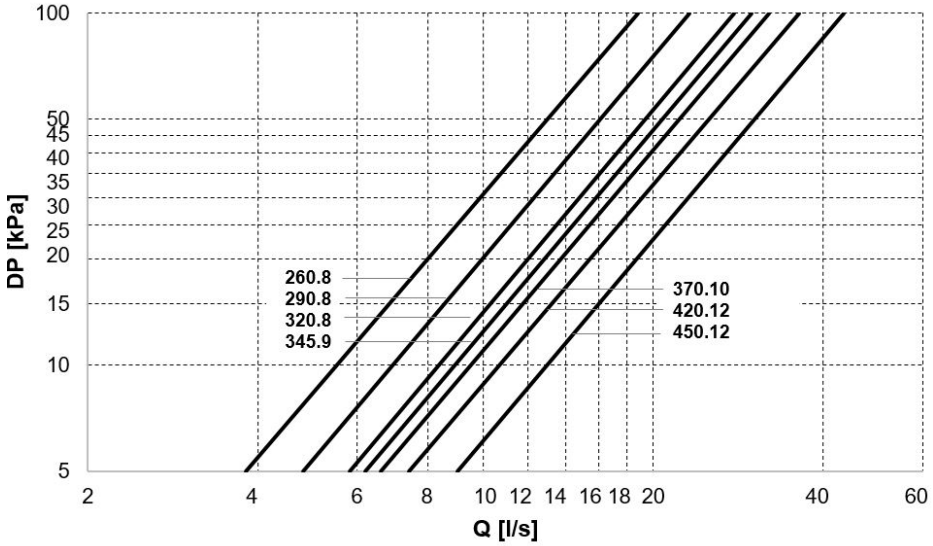
Partial recovery heating capacity



kWde/kWt = Potenza termica desurriscaldatore / Potenza termica al condensatore (potenza frigo+assorbita compressori) [%]
Tde = Temperatura uscita acqua desurriscaldatore [°C]
⚠ Valori con tolleranza ± 2%

Pressure drops of partial energy recovery exchanger

Excellence



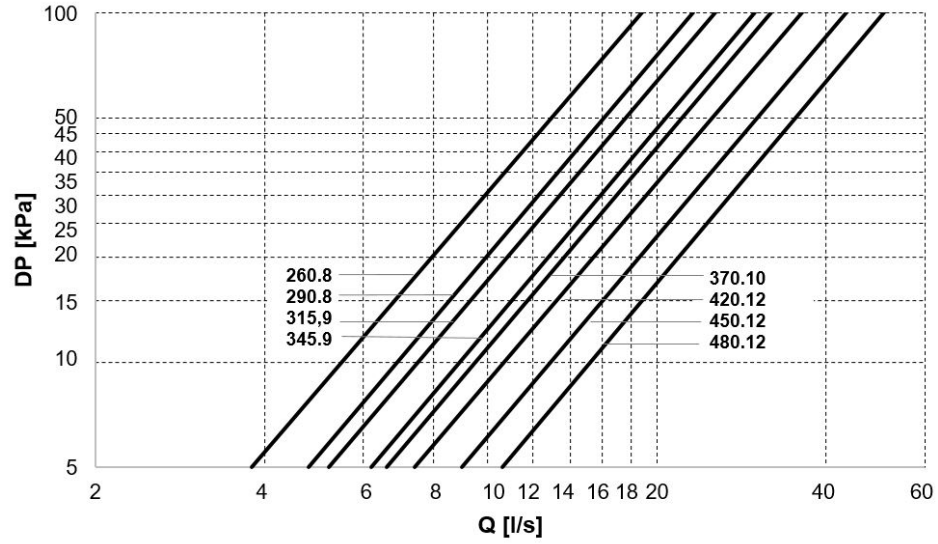
Q = Water flow-rate [l/s]
DP = Water side pressure drops (kPa)

Admissible water flow-rates

Minimum (Qmin) and maximum (Qmax) admissible water flow for the unit to operate correctly.

SIZE		260.8		290.8		320.8		345.9		370.10		420.12		450.12	
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	1,9	1,9	2,4	2,4	2,9	2,9	2,9	3,3	3,3	3,3	3,7	3,7	3,7	5,3
Qmax	[l/s]	9,4	9,4	11,6	11,6	13,9	13,9	13,9	16,0	16,0	16,0	18,1	18,1	18,1	25,4

Premium



Q = Water flow-rate[l/s]
DP = Water side pressure drops (kPa)

Admissible water flow-rates

Minimum (Qmin) and maximum (Qmax) admissible water flow for the unit to operate correctly

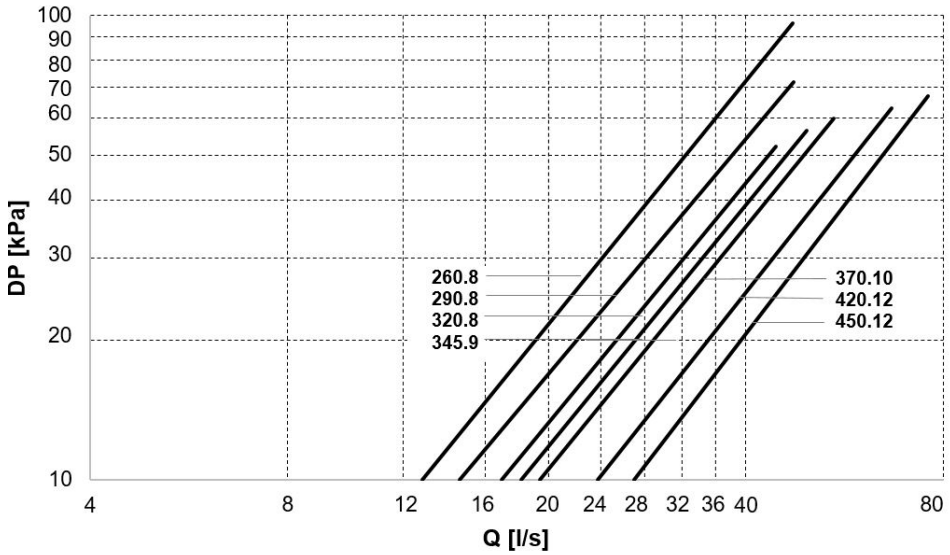
SIZE		260.8		290.8		315.9		345.9		370.10		420.12		450.12		480.12	
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	1,9	1,9	2,4	2,4	1,9	3,3	2,9	3,3	3,3	3,3	3,7	3,7	4,5	4,5	5,3	5,3
Qmax	[l/s]	9,4	9,4	11,6	11,6	9,4	16,0	13,9	16,0	16,0	16,0	18,1	18,1	21,8	21,8	25,4	25,4

Configurations

EVFTP - Shell and tube exchanger PED test

Direct expansion exchanger with two independent refrigerant circuits. The exchanger is composed of a cover made of carbon steel. The tubes, anchored to the tube plate by mechanical expansion, are made of copper, high efficiency, internally rifled to improve thermal exchange and specially designed for use with modern ecological refrigerants. It also includes a water side protection differential switch, an anti-freeze heating element to protect against icing, and covering in closed-cell thermo-insulating material that prevents the formation of condensation and heat exchange with the exterior. The water connections of the exchanger are quick-release with splined joint (Victaulic).

Shell and tube exchanger pressure drops (EVFTP) - Excellence



The pressure drops are calculated considering a water temperature of 7°C

Q = Water flow-rate[l/s]
DP = Water side pressure drops [kPa]

The water flow-rate must be calculated with the following formula

Q [l/s] = kWf / (4,186 x DT)

kWf = Cooling capacity in kW
DT = Temperature difference between inlet / outlet water

Admissible water flow-rates - flush hydraulic connections (ABU)

Minimum (Qmin), nominal (Qnominal) and maximum (Qmax) admissible water flow for the unit to operate correctly.

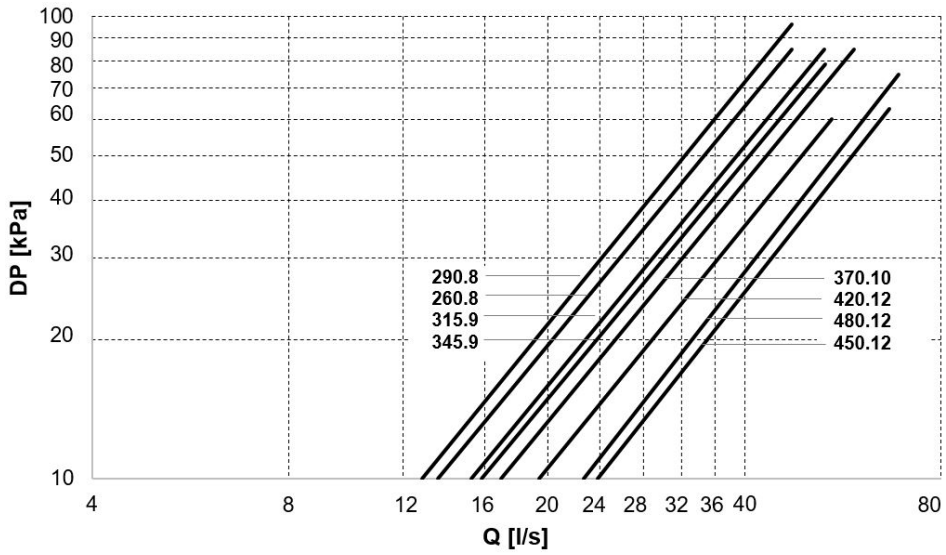
		ST/SC						
SIZE		**260.8**	**290.8**	**320.8**	**345.9**	**370.10**	**420.12**	**450.12**
Qmin	[l/s]	12,8	14,6	17,0	18,2	19,4	23,8	27,0
Qnominal	[l/s]	33,0	36,3	39,7	43,0	46,3	51,6	56,1
Qmax	[l/s]	47,2	47,3	44,4	49,4	54,4	66,7	75,8
		EN						
Qmin	[l/s]	12,8	14,6	17,0	18,2	19,4	23,8	27,0
Qnominal	[l/s]	33,0	36,3	39,7	43,0	46,3	51,6	56,1
Qmax	[l/s]	47,2	47,3	44,4	49,4	54,4	66,7	75,8

Admissible water flow-rates - internal water fittings provided by the customer (ACL)

Minimum (Qmin), nominal (Qnominal) and maximum (Qmax) admissible water flow for the unit to operate correctly.

		ST/SC													
SIZE		**260.8**		**290.8**		**320.8**		**345.9**		**370.10**		**420.12**		**450.12**	
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	6,4	6,4	7,3	7,3	8,5	8,5	8,5	9,7	9,7	9,7	11,9	11,9	11,9	15,1
Qnominal	[l/s]	16,4	16,4	18,0	18,0	19,7	19,7	19,7	23,0	23,0	23,0	25,6	25,6	25,6	30,2
Qmax	[l/s]	23,6	23,6	23,6	23,6	22,2	22,2	22,2	27,2	27,2	27,2	33,3	33,3	33,3	42,5
		EN													
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	6,4	6,4	7,3	7,3	8,5	8,5	8,5	9,7	9,7	9,7	11,9	11,9	11,9	15,1
Qnominal	[l/s]	16,4	16,4	18,0	18,0	19,7	19,7	19,7	23,0	23,0	23,0	25,6	25,6	25,6	30,2
Qmax	[l/s]	23,6	23,6	23,6	23,6	22,2	22,2	22,2	27,2	27,2	27,2	33,3	33,3	33,3	42,5

Shell and tube exchanger pressure drops (EVFTP) - Premium



The pressure drops are calculated considering a water temperature of 7°C

Q = Water flow-rate[l/s]
DP = Water side pressure drops [kPa]

The water flow-rate must be calculated with the following formula

Q [l/s] = kWf / (4,186 x DT)

kWf = Cooling capacity in kW
DT = Temperature difference between inlet / outlet water

Admissible water flow-rates - flush hydraulic connections (ABU)

Minimum (Qmin), nominal (Qnominal) and maximum (Qmax) admissible water flow for the unit to operate correctly.

		ST/SC							
SIZE		**260.8**	**290.8**	**315.9**	**345.9**	**370.10**	**420.12**	**450.12**	**480.12**
Qmin	[l/s]	13,5	12,8	15,3	15,8	17,0	19,4	23,8	22,7
Qnominal	[l/s]	32,0	35,4	38,9	42,3	45,9	50,6	55,9	60,2
Qmax	[l/s]	47,2	47,2	53,0	53,1	58,9	54,4	66,7	68,9
		EN							
Qmin	[l/s]	13,5	12,8	15,3	15,8	17,0	19,4	23,8	22,7
Qnominal	[l/s]	31,1	34,4	38,0	41,3	44,9	49,7	54,5	58,8
Qmax	[l/s]	47,2	47,2	53,0	53,1	58,9	54,4	66,7	68,9

Admissible water flow-rates - internal water fittings provided by the customer (ACL)

Minimum (Qmin), nominal (Qnominal) and maximum (Qmax) admissible water flow for the unit to operate correctly

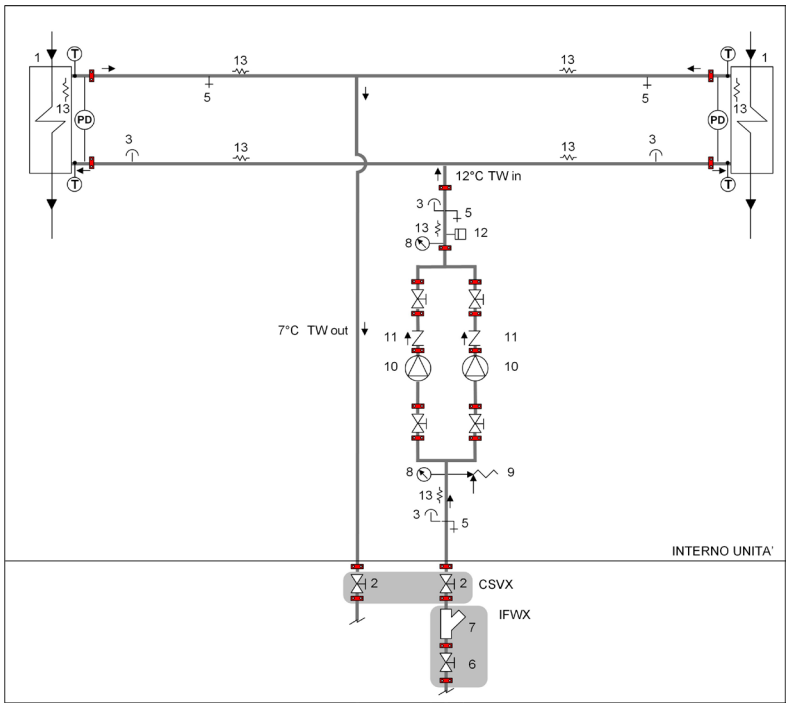
		ST/SC															
SIZE		**260.8**		**290.8**		**315.9**		**345.9**		**370.10**		**420.12**		**450.12**		**480.12**	
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	6,8	6,8	6,4	6,4	6,8	8,5	7,3	8,5	8,5	8,5	9,7	9,7	11,9	11,9	11,3	11,3
Qnominal	[l/s]	15,9	15,9	17,6	17,6	15,9	22,8	19,2	22,8	22,8	22,8	25,2	25,2	27,8	27,8	29,9	29,9
Qmax	[l/s]	23,6	23,6	23,6	23,6	23,6	29,4	23,6	29,4	29,4	29,4	27,2	27,2	33,3	33,3	34,4	34,4
		EN															
		Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave	Master	Slave
Qmin	[l/s]	6,8	6,8	6,4	6,4	6,8	8,5	7,3	8,5	8,5	8,5	9,7	9,7	11,9	11,9	11,3	11,3
Qnominal	[l/s]	15,4	15,4	17,1	17,1	15,4	22,3	18,8	22,3	22,3	22,3	24,7	24,7	27,1	27,1	29,2	29,2
Qmax	[l/s]	23,6	23,6	23,6	23,6	23,6	29,4	23,6	29,4	29,4	29,4	27,2	27,2	33,3	33,3	34,4	34,4

Accessories - Hydronic assembly

1P1SB - Hydropack with n°1 pump + n°1 in stand-by

Pumping unit made up of 1+1 electric pump (1 in stand-by), with the pump body made of cast iron and the impeller made of INOX or cast iron (depending on the models).
Mechanical seal using ceramic, carbon and EPDM elastomer components.
Three-phase electric motor with IP55 degree of protection. Complete with a thermoformed insulating casing, quick connections with insulated casing, safety valve, pressure gauges, system safety pressure switch, stainless steel antifreeze, intake, immersion-type heaters.
All water fittings are Victaulic.
Option supplied built-in the unit.

CONNECTION DIAGRAM - Hydropack with n°1 pump + n°1 in stand-by



1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
5 - Discharge stop valve
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
8 - Pressure gauge
9 - Safety valve (6 Bar)
10 - Packaged electric pump with high efficiency impeller
11 - Non return valve
12 - System load safety pressure switch (it avoids the pump operation if water is not present)
13 - Antifreeze heater

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

IFWX = Steel mesh strainer on the water side
CSVX - Couple of manually operated shut-off valves

The grey area indicates further optional components.

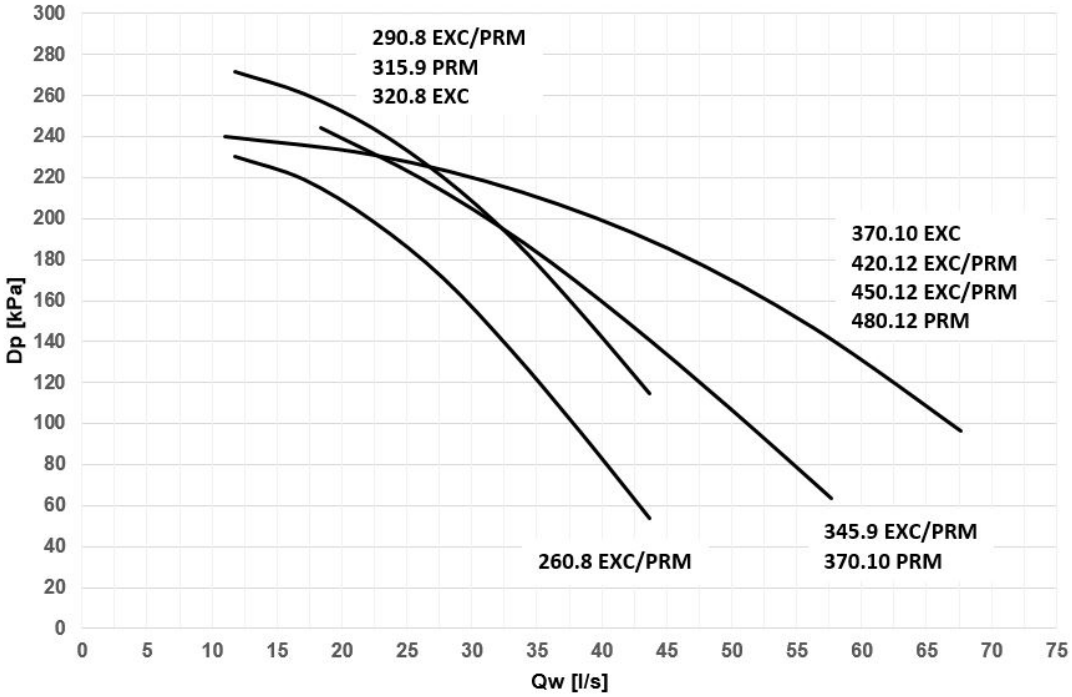
⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.

Electrical data Hydropack

PUMP	Rated power [kW]	Nominal Current [A]
260.8 PRM / 260.8 EXC	7,5	15,4
290.8-315.9 PRM / 290.8-320.8 EXC	9,2	18,8
345.9-370.10 PRM / 345.9 EXC	11,0	22,5
420.12 ÷ 480.12 PRM / 370.10 ÷ 450.12 EXC	15,0	29,0

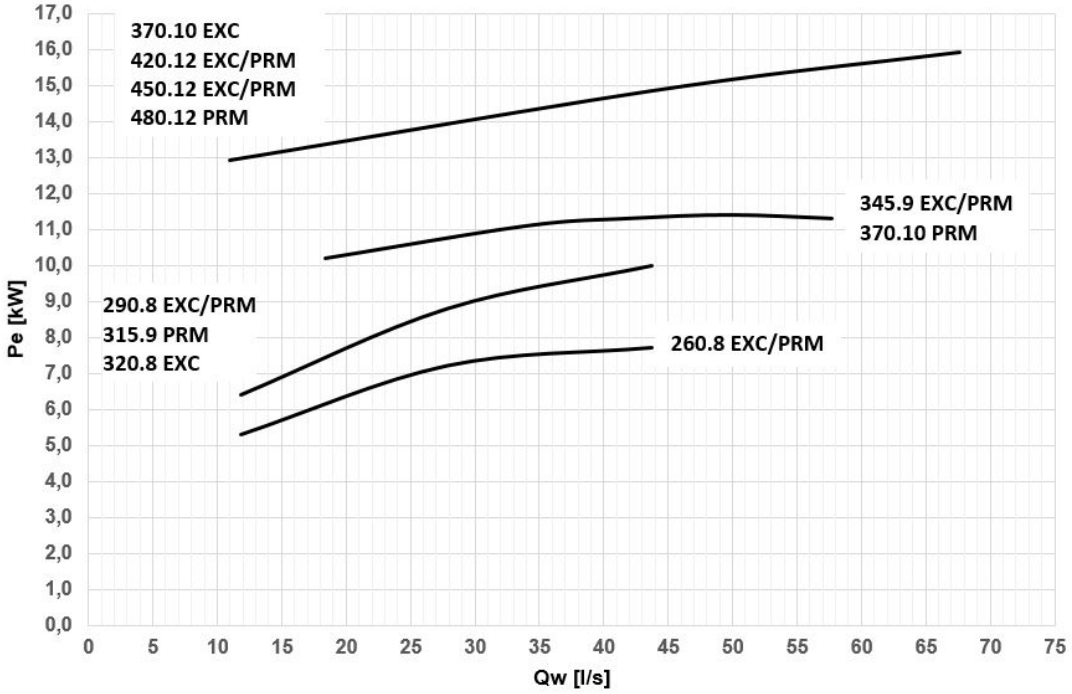
1P1SB - HydroPack with n°1 pump + n°1 in stand-by

Head



Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input



Pe = Power input [kW]
QW = Water flow-rate [l/s]

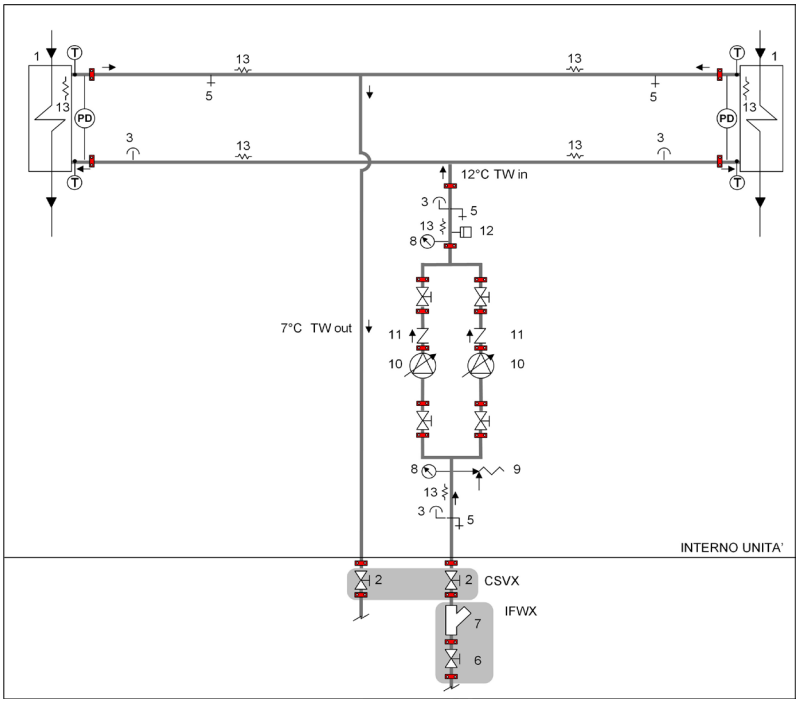
⚠ Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
Internal exchanger pressure drop
IFVX accessory –Steel mesh filter on the water side (where applicable)

Accessories - Hydronic assembly

1P1SBV - Hydropack user side with n°1 inverter pump and n°1 pump in stand-by with dedicated inverter

Pumping unit made up of 1+1 electropump (1 in stand-by) controlled by inverter to adapt to the different application conditions.
It enables the automatic reduction of the liquid flow rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel.
Through the inverter calibration, standard supplied, it is possible to adapt the pump flow-rate/head to the installation feature.
Centrifugal electric pump with the pump body made of cast iron and the impeller made stainless steel or cast iron (depending on the models).
Mechanical seal using ceramic, carbon and EPDM elastomer components
Three-phase electric motor with IP55-protection. Complete with thermoformed insulated casing, fast fittings with insulated casing, safety valve, pressure gauges, system load safety pressure switch, stainless steel anti-freeze immersion resistances located at the intake and at the supply point.
In combination with the "IVFDT" - Variable flow-rate control option, it allows the water flow rate variation to the installation in part load operation to obtain the maximum unit efficiency and lower pumping unit consumption.
All water fittings are Victaulic.
Option supplied on the unit.

CONNECTION DIAGRAM - Hydropack user side with n° 1 inverter pump and n° 1 pump in stand-by with dedicated inverter



1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
5 - Discharge stop valve
6 - Cutoff valve with quick joints
7 - Steel mesh strainer on the water side
8 - Pressure gauge
9 - Safety valve (6 Bar)
10 - Packaged electric pump with high efficiency impeller
11 - Non return valve
12 - System load safety pressure switch (it avoids the pump operation if water is not present)
13 - Antifreeze heater

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

IFWX = Steel mesh strainer on the water side
CSVX - Couple of manually operated shut-off valves)

The grey area indicates further optional components.

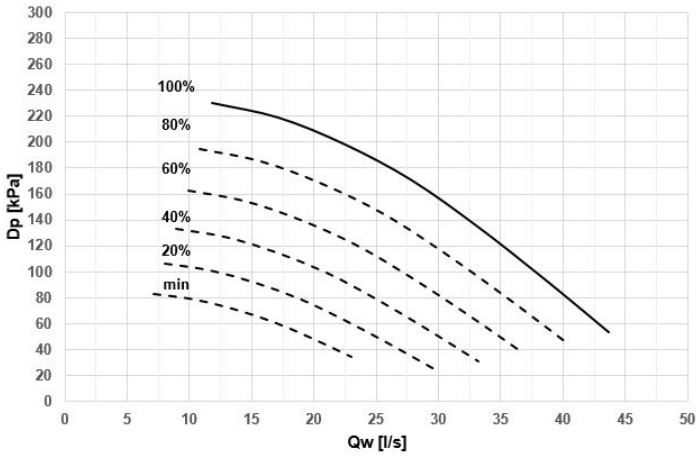
⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.

Electrical data Hydropack

PUMP	Rated power [kW]	Nominal Current [A]
260.8 PRM / 260.8 EXC	7,5	15,4
290.8-315.9 PRM / 290.8-320.8 EXC	9,2	18,8
345.9-370.10 PRM / 345.9 EXC	11,0	22,5
420.12 ÷ 480.12 PRM / 370.10 ÷ 450.12 EXC	15,0	29,0

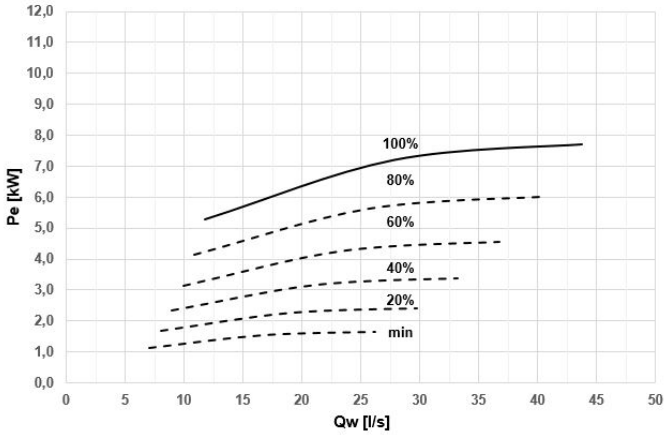
1P1SBV - Hydropack user side with n°1 inverter pump and n°1 pump in stand-by

Head - Size 260.8 EXC/PRM



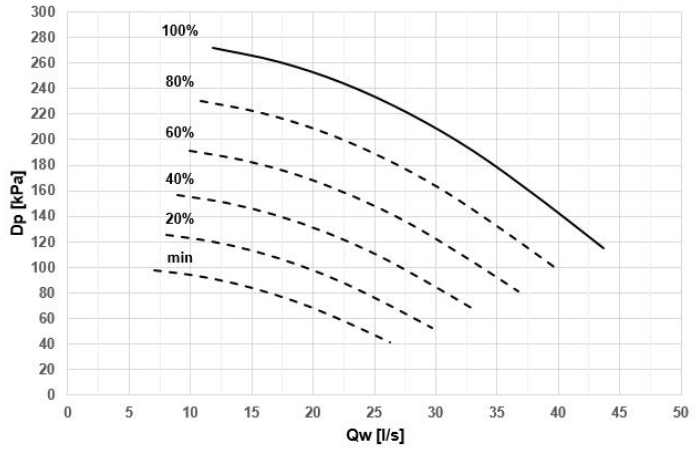
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 260.8 EXC/PRM



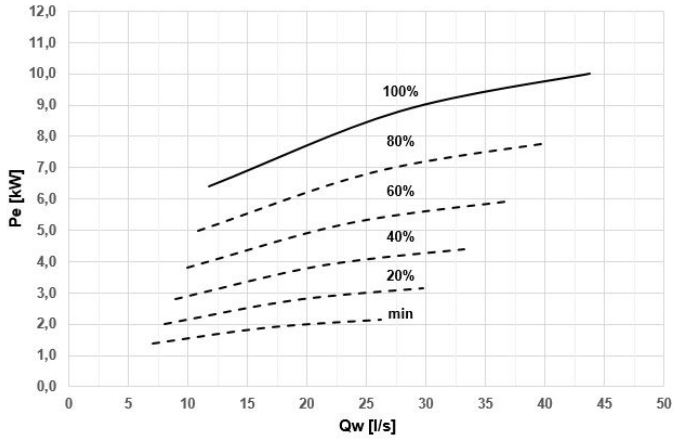
Pe = Power input [kW]
QW = Water flow-rate [l/s

Head - Size 290.8 EXC/PRM - 315.9 PRM - 320.8 EXC



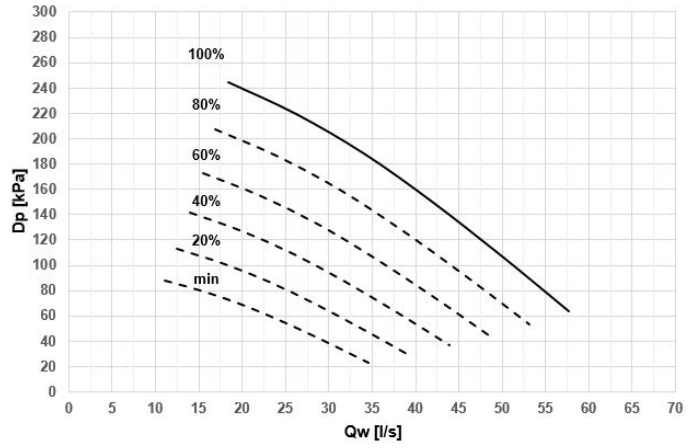
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 290.8 EXC/PRM - 315.9 PRM - 320.8 EXC



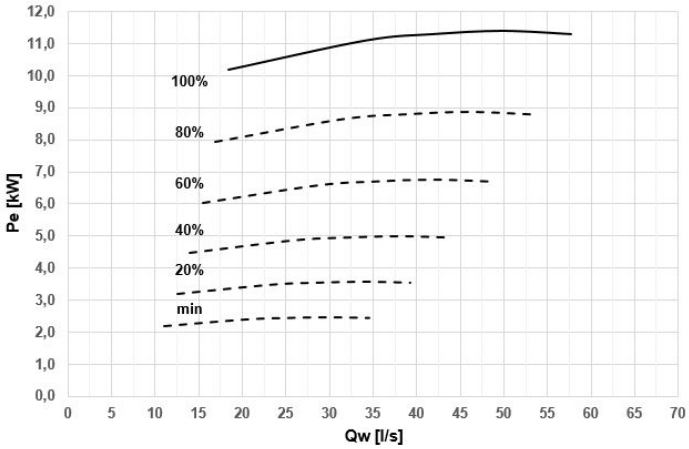
Pe = Power input [kW]
QW = Water flow-rate [l/s

Head - Size 345.9 EXC/PRM - 370.10 PRM



Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 345.9 EXC/PRM - 370.10 PRM

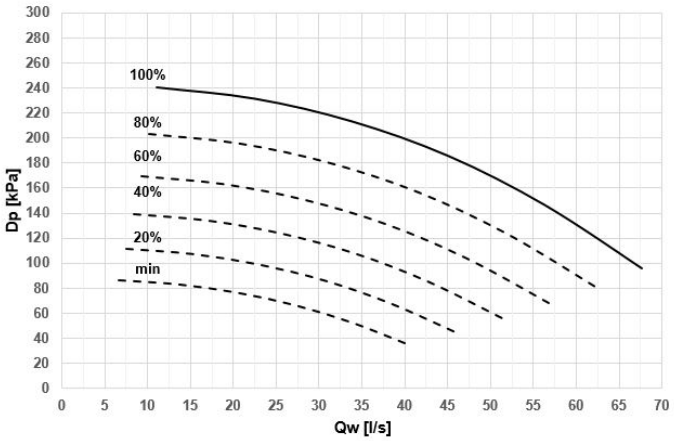


Pe = Power input [kW]
QW = Water flow-rate [l/s

Accessories - Hydronic assembly

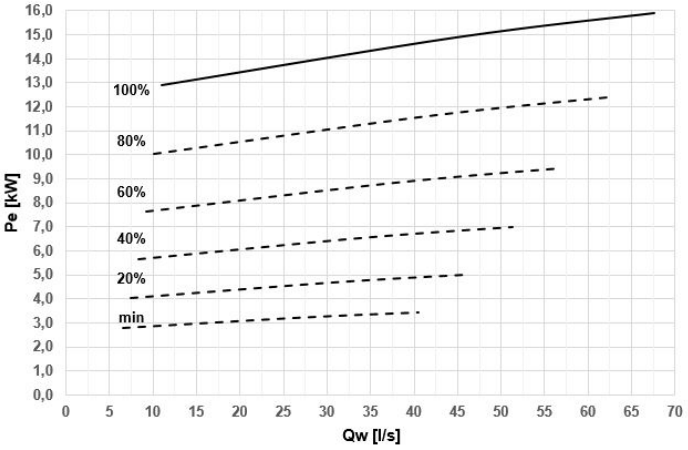
1P1SBV - Hydropack user side with n°1 inverter pump and n°1 pump in stand-by

Head - Size 370.10 EXC - 420.12 EXC/PRM
450.12 EXC/PRM - 480.12 PRM



Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 370.10 EXC - 420.12 EXC/PRM
450.12 EXC/PRM - 480.12 PRM



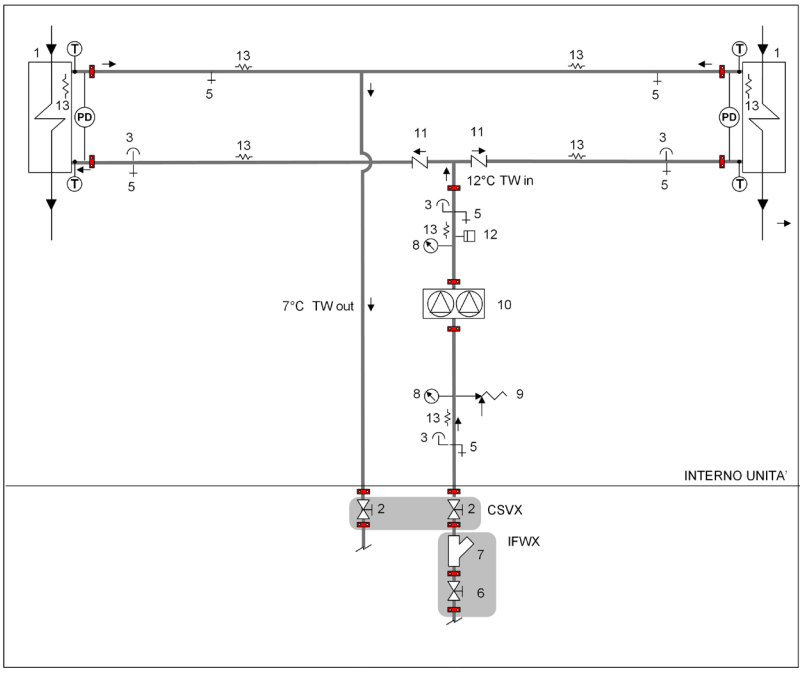
Pe = Power input [kW]
QW = Water flow-rate [l/s

⚠ Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
Internal exchanger pressure drop
IFVX accessory –Steel mesh filter on the water side (where applicable)

2PM - Hydropack with n°2 pumps

Pumping unit made up of two electric pumps laid out in parallel.
Centrifugal electric pump with the pump body made of cast iron and the impeller made stainless steel or cast iron (depending on the models).
Mechanical seal using ceramic, carbon and EPDM elastomer components
Three-phase electric motor with IP55 degree of protection. Complete with a thermoformed insulating casing, quick connections with insulated casing, safety valve, pressure gauges, system safety pressure switch, stainless steel antifreeze, intake, immersion-type heaters.
All water fittings are Victaulic.
Option supplied built-in the unit.

CONNECTION DIAGRAM - Hydropack with n° 2 pompe



1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
4 - Discharge stop valve
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
8 - Pressure gauge
9 - Safety valve (6 Bar)
10 - Packaged electric pump with high efficiency impeller
11 - Non return valve
12 - System load safety pressure switch (it avoids the pump operation if water is not present)
13 - Antifreeze heater

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

IFWX = Steel mesh strainer water side
CSVX - Couple of manually operated shut-off valves

The grey area indicates further optional components.

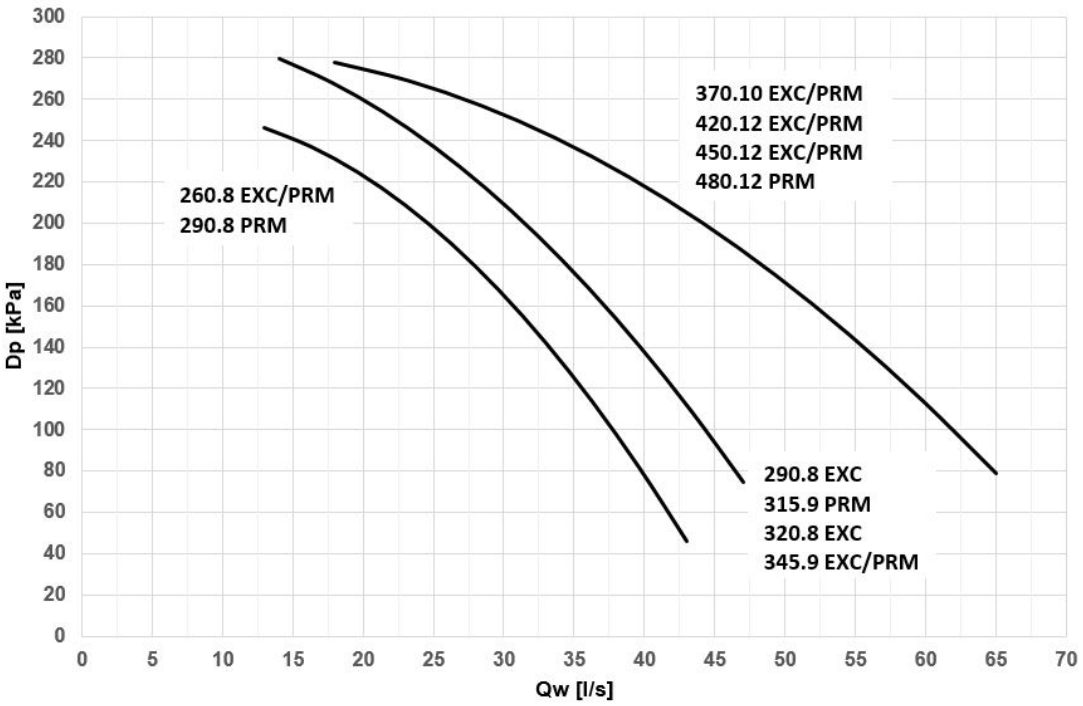
⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.

Electrical data Hydropack

PUMP	Rated power [kW]	Nominal Current [A]
260.8÷290.8 PRM / 260.8 EXC	2 x 5.5	2 x 11.5
320.8-345.9 PRM / 290.8÷345.9 EXC	2 x 7.5	2 x 15.4
370.10 ÷ 480.12 PRM / 370.10 ÷ 450.12 EXC	2 x 11.0	2 x 22.0

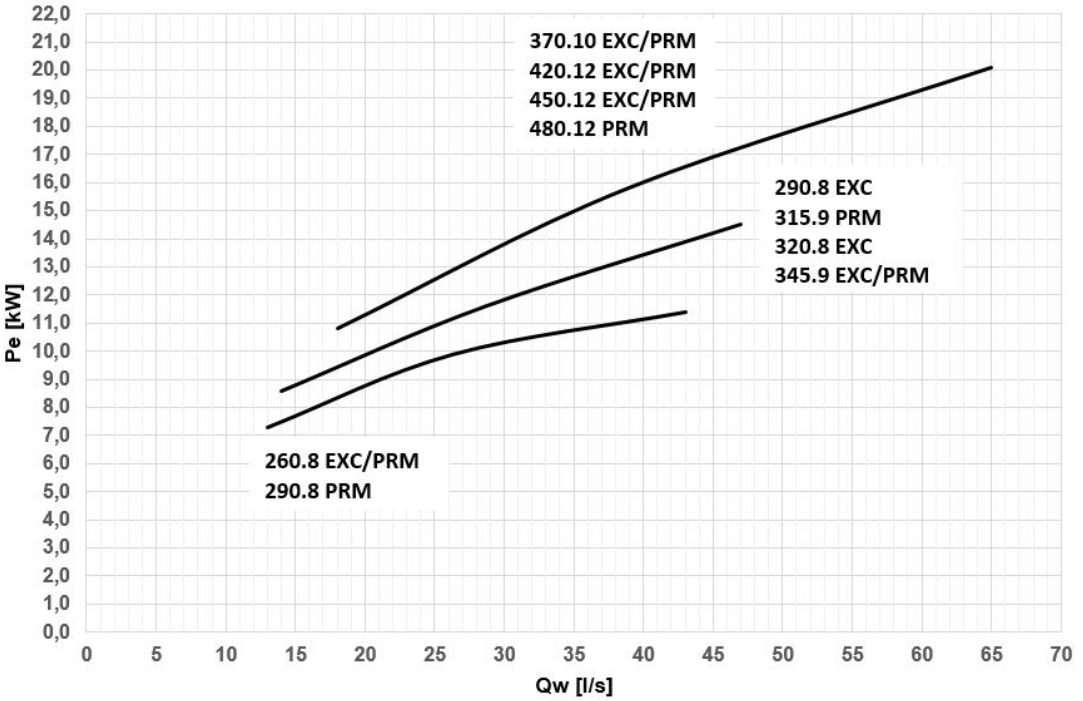
2PM - Hydropack with n°2 pumps

Head



Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input



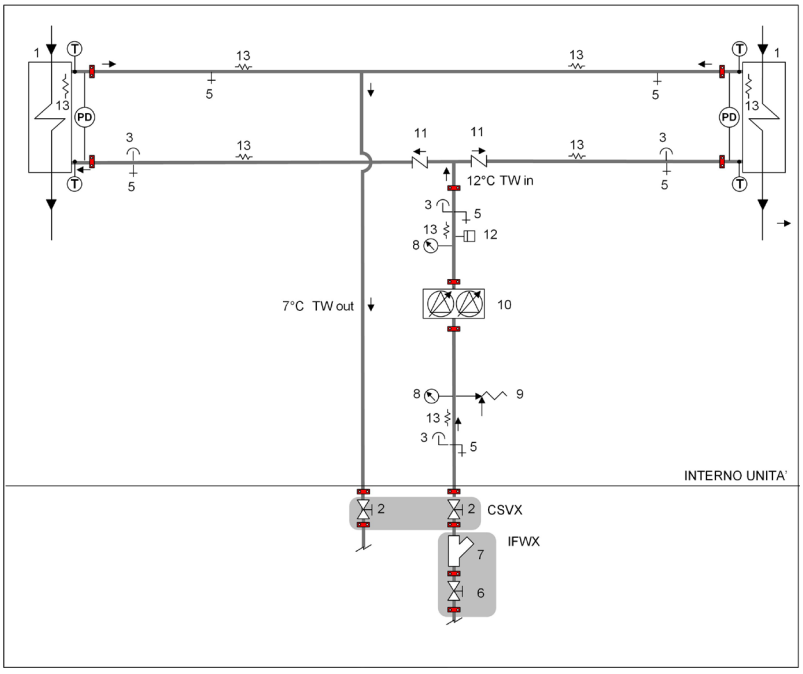
Pe = Power input [kW]
QW = Water flow-rate [l/s

⚠ Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
Internal exchanger pressure drop
IFVX accessory –Steel mesh filter on the water side (where applicable)

2PMV - Hydropack with n°2 inverter pumps

Pumping unit consisting of two parallel electric pumps and controlled by inverter to adapt to the different application conditions
It enables the automatic reduction of the liquid flow-rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel.
Through the inverter calibration, standard supplied, it is possible to adapt the pump flow-rate/head to the installation feature
Centrifugal electric pump with the pump body made of cast iron and the impeller made stainless steel or cast iron (depending on the models).
Mechanical seal using ceramic, carbon and EPDM elastomer components.
Three-phase electric motor with IP44-protection. Complete with thermoformed insulated casing, quick connections with insulated casing,safety valve, pressure gauges, system load safety pressure switch, stainless steel antifreeze immersion heaters located at the return and supply point.
In combination with the "IVFDT" - Variable flow-rate control option, it allows the water flow-rate variation to the installation in part load operation to obtain the maximum unit efficiency and lower pumping unit consumption
All water fittings are Victaulic.
Option supplied on the unit.

CONNECTION DIAGRAM - Hydropack with n° 2 inverter pumps



1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
5 - Discharge stop valve
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
8 - Pressure gauge
9 - Safety valve (6 Bar)
10 - Elettropompa monoblocco con girante ad alto rendimento
11 - Non return valve
12 - System load safety pressure switch (it avoids the pump operation if water is not present)
13 - Antifreeze heater

T - Temperature probe
PD - Differential pressure switch
TW in chilled water inlet
TW out chilled water outlet

IFWX = Steel mesh strainer water side
CSVX - Coppia di valvole di intercettazione ad azionamento manuale

The grey area indicates further optional components.

⚠ Provide hydraulic interceptions outside the unit ('CSVX - Couple of manually operated shut-off valves' option) to facilitate any possible extraordinary maintenance interventions.

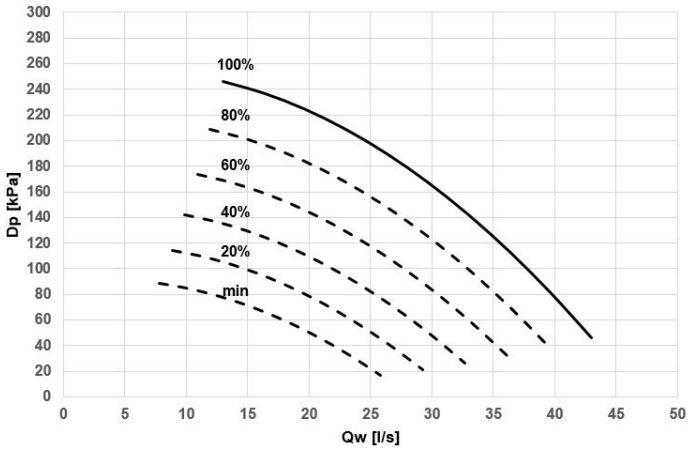
Electrical data Hydropack

PUMP	Rated power [kW]	Nominal Current [A]
260.8÷290.8 PRM / 260.8 EXC	2 x 5.5	2 x 11.5
320.8-345.9 PRM / 290.8÷345.9 EXC	2 x 7.5	2 x 15.4
370.10 ÷ 480.12 PRM / 370.10 ÷ 450.12 EXC	2 x 11.0	2 x 22.0

Accessories - Hydronic assembly

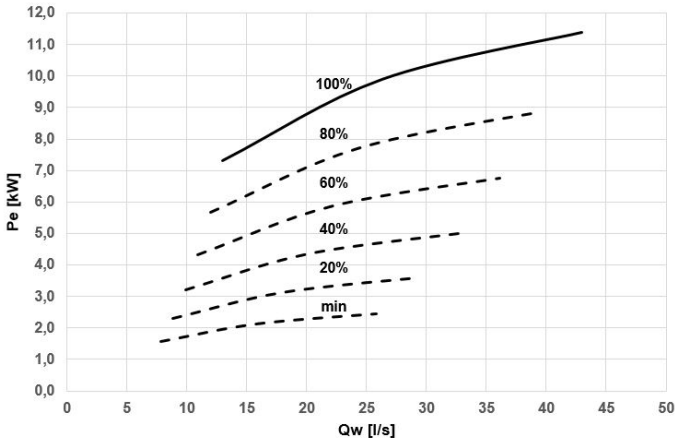
2PMV - Hydropack with n°2 inverter pumps

Head - Size 260.8 EXC/PRM - 290.8 PRM



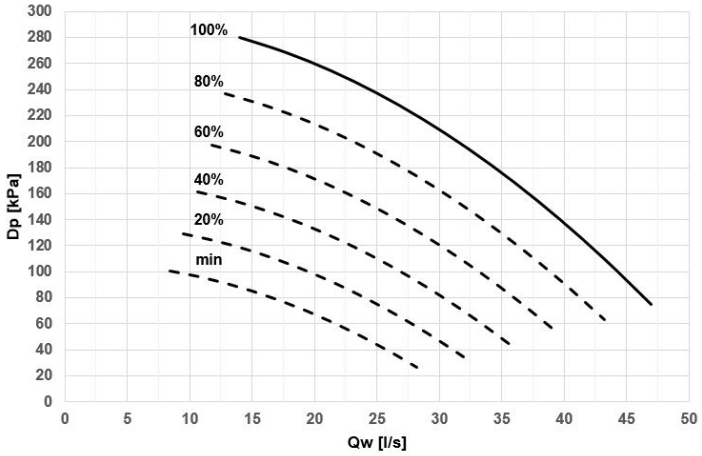
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 260.8 EXC/PRM - 290.8 PRM



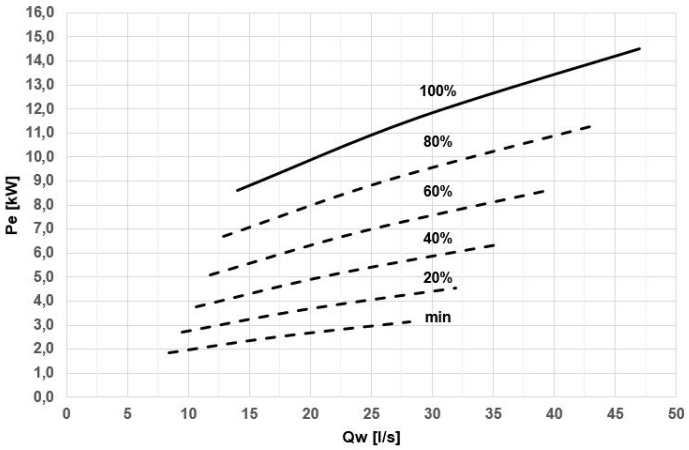
Pe = Power input [kW]
QW = Water flow-rate [l/s

Head - Size 290.8 EXC - 315.9 PRM - 320.8 EXC - 345.9 EXC/PRM



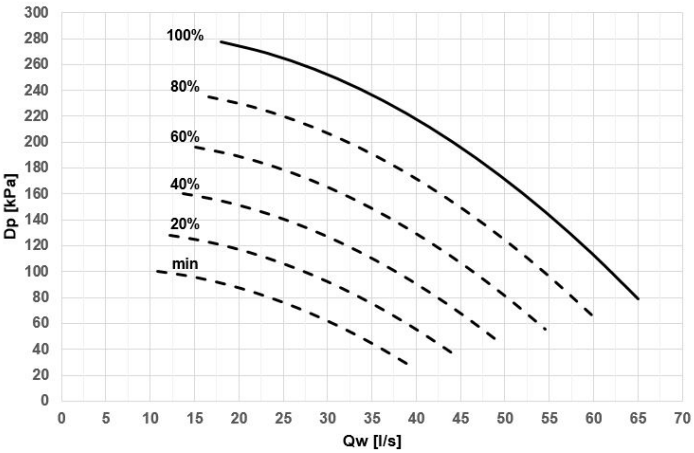
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 290.8 EXC - 315.9 PRM - 320.8 EXC - 345.9 EXC/PRM



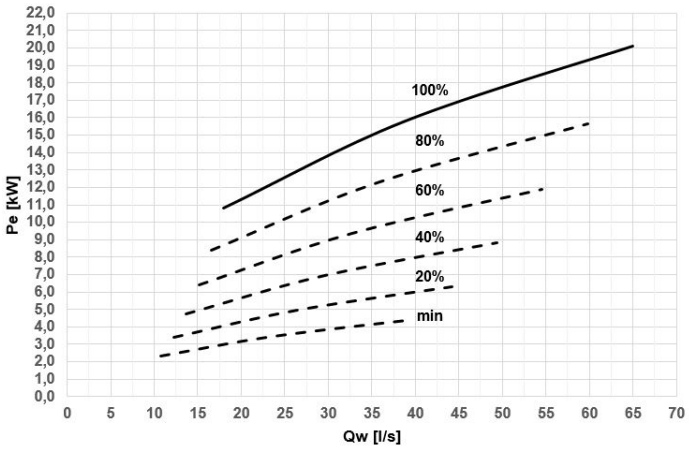
Pe = Power input [kW]
QW = Water flow-rate [l/s

Head - Size 370.10 EXC/PRM - 420.12 EXC/PRM 450.12 EXC/PRM - 480.12 PRM



Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 370.10 EXC/PRM - 420.12 EXC/PRM 450.12 EXC/PRM - 480.12 PRM



Pe = Power input [kW]
QW = Water flow-rate [l/s

⚠ Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
Internal exchanger pressure drop
IFVX accessory –Steel mesh filter on the water side (where applicable)

ACC - Storage tank

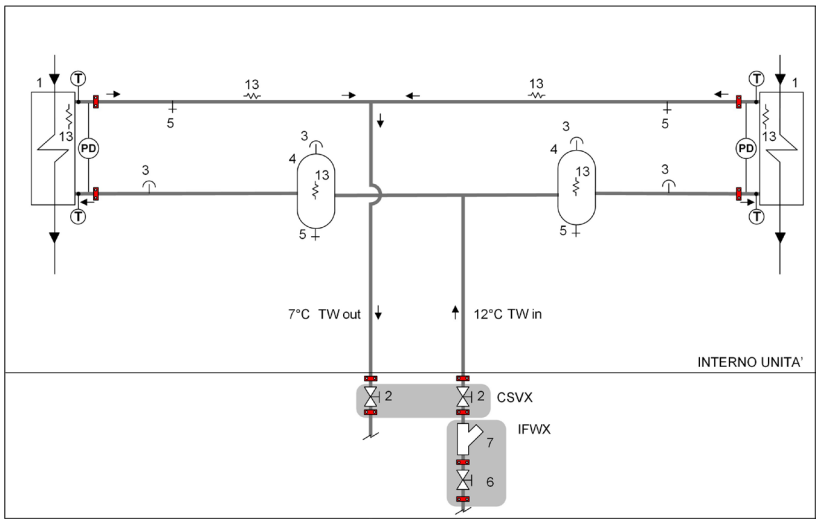
Steel storage tank complete with double layer covering with closed-cell insulation, stainless steel anti-freeze immersion resistance, bleed valve, draw off cock, cast-iron shut-off butterfly valve with quick connections and activation lever with a mechanical calibration lock at the evaporator output, quick connections with insulated casing.

EXCELLENCE	260.8	290.8	320.8	345.9	370.10	420.12	450.12
storage tank capacity [Litres]	750+750	750+750	750+750	750+1050	1050+1050	1050+1050	1050+1050

PREMIUM	260.8	290.8	315.9	345.9	370.10	420.12	450.12	480.12
storage tank capacity [Litres]	500+500	500+500	500+750	500+580	750+750	750+750	1050+1050	1050+1050

The device is installed and wired built-in the unit, and is placed on the return from the system.

CONNECTION DIAGRAM



1 - Internal exchanger
2 - Cutoff valve - (CSVX - Couple of manually operated shut-off valve)
3 - Purge valve
4 - Storage tank
5 - Discharge stop valve
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side - (IFWX)
8 - Pressure gauge
9 - Safety valve (6 Bar)
10 - Monobloc electric pump with high efficiency impeller
11 - Non return valve
12 - System load safety pressure switch (it avoids the pump operation if water is not present)
13 - Antifreeze heater

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

The grey area indicates further optional components.

Option compatibility

REF	DESCRIPTION	260.8	290.8	315.9	320.8	345.9	370.10	420.12	450.12	480.12
	Configurations and main accessories									
D	Partial energy recovery	o	o	o	o	o	o	o	o	o
ACC	Storage tank	o	o	o	o	o	o	o	o	o
EVFTP	Shell and tube evaporator PED test	o	o	o	o	o	o	o	o	o
1P1SB	Hydropack with 1 pump + 1 in stand-by	o	o	o	o	o	o	o	o	o
2PM	Hydropack with n° 2 pumps	o	o	o	o	o	o	o	o	o
1P1SBV	Hydropack with n° 1 + 1 inverter pump	o	o	o	o	o	o	o	o	o
2PMV	Hydropack with n° 2 inverter pumps	o	o	o	o	o	o	o	o	o
	EVFTP - Shell and tube evaporator PED test									
+ ACC	+ Storage tank	-	-	-	-	-	-	-	-	-
	D - Partial energy recovery									
+ ACC+ 1P1SB + 1P1SBV	+ Storage tank + Hydropack n° 1 + 1	-	-	-	-	-	-	-	-	-
	IVFDT - Inverter driven variable flow-rate user side control depending on the temperature differential									
1P1SB	Hydropack with 1 pump + 1 in stand-by	-	-	-	-	-	-	-	-	-
2PM	Hydropack with n° 2 pumps	-	-	-	-	-	-	-	-	-
1P1SBV	Hydropack with n° 1 + 1 inverter pump	o	o	o	o	o	o	o	o	o
2PMV	Hydropack with n° 2 inverter pumps	o	o	o	o	o	o	o	o	o
	Other accessories									
SFSTR	Disposal for inrush current reduction	o	o	o	o	o	o	o	o	o

o Option
- Not available

Dimensional drawings

SIZE 260.8 EXC

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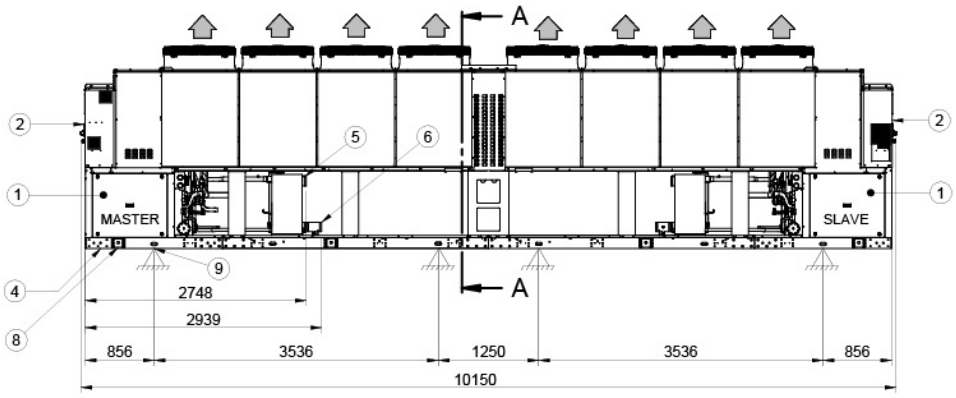
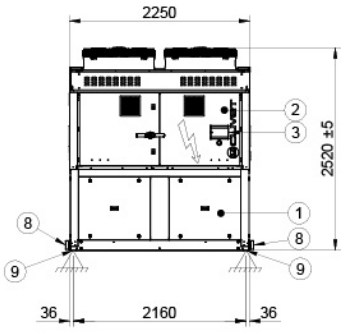
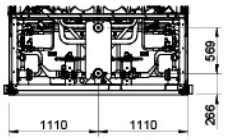
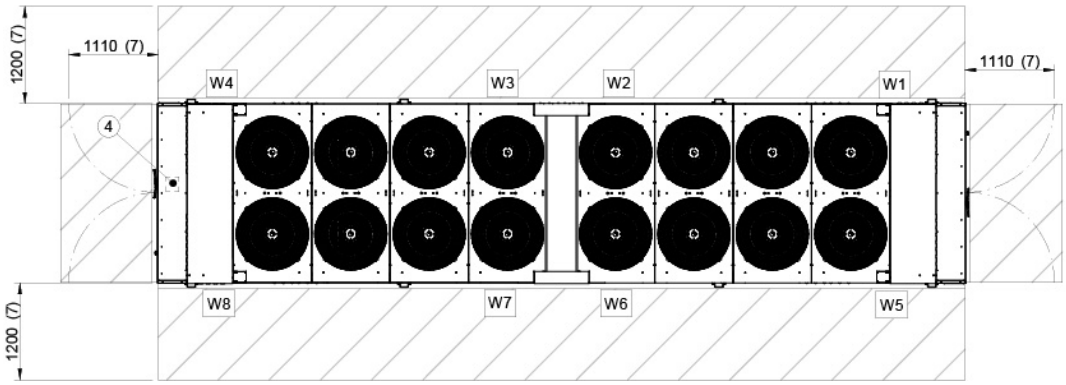




SEZIONE A-A





1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 4" Victaulic
6. Water outlet 4" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

SIZE		260.8
		SC/EN
Length	mm	10150
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	954
W2 Supporting point	kg	694
W3 Supporting point	kg	694
W4 Supporting point	kg	954
W5 Supporting point	kg	954
W6 Supporting point	kg	693
W7 Supporting point	kg	693
W8 Supporting point	kg	954
Operating weight	kg	6590
Shipping weight	kg	6558

La presenza di accessori opzionali può comportare una variazione significativa dei pesi riportati

SIZE 260.8 EXC - ABU (Standard option)

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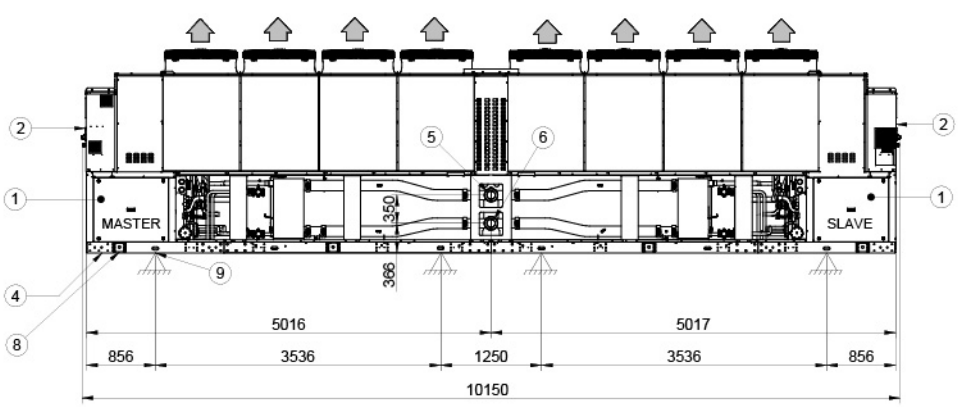
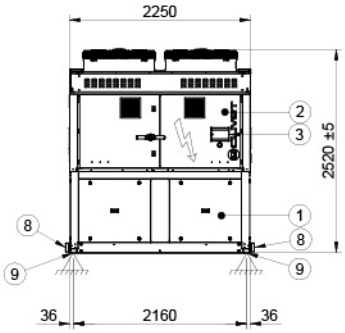
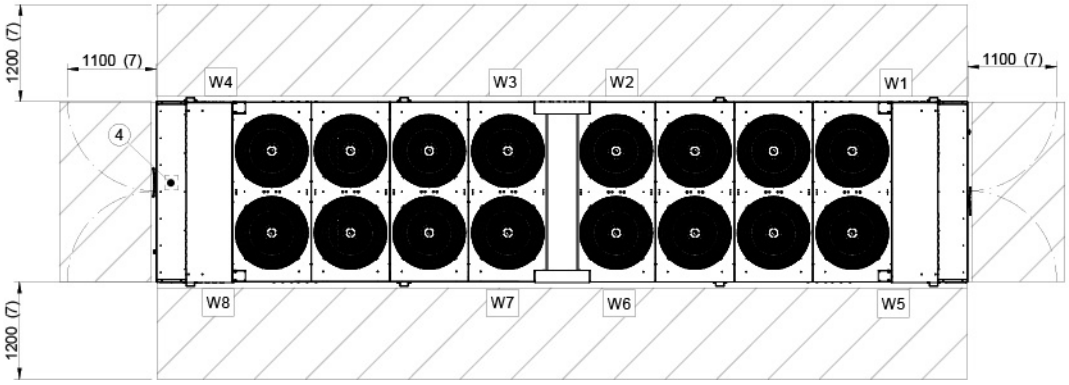
Data/Date 30/11/2021







1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 6" Victaulic
6. Water outlet 6" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

SIZE		260.8
		SC/EN
Length	mm	10150
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	969
W2 Supporting point	kg	725
W3 Supporting point	kg	725
W4 Supporting point	kg	969
W5 Supporting point	kg	971
W6 Supporting point	kg	728
W7 Supporting point	kg	728
W8 Supporting point	kg	971
Operating weight	kg	6786
Shipping weight	kg	6706

La presenza di accessori opzionali può comportare una variazione significativa dei pesi riportati

Dimensional drawings

SIZE 290.8 ÷ 320.8 EXC

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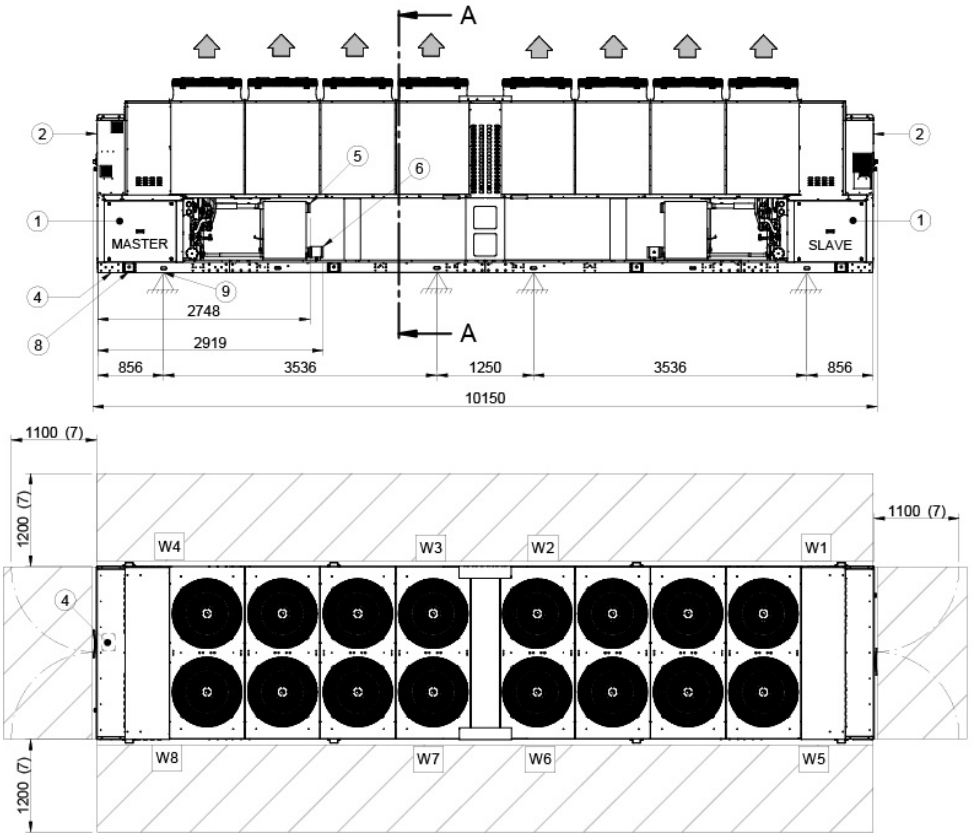
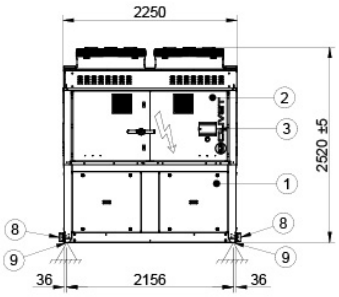
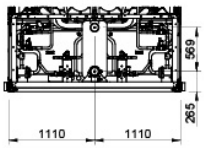
Data/Date 08/11/2021





SEZIONE A-A



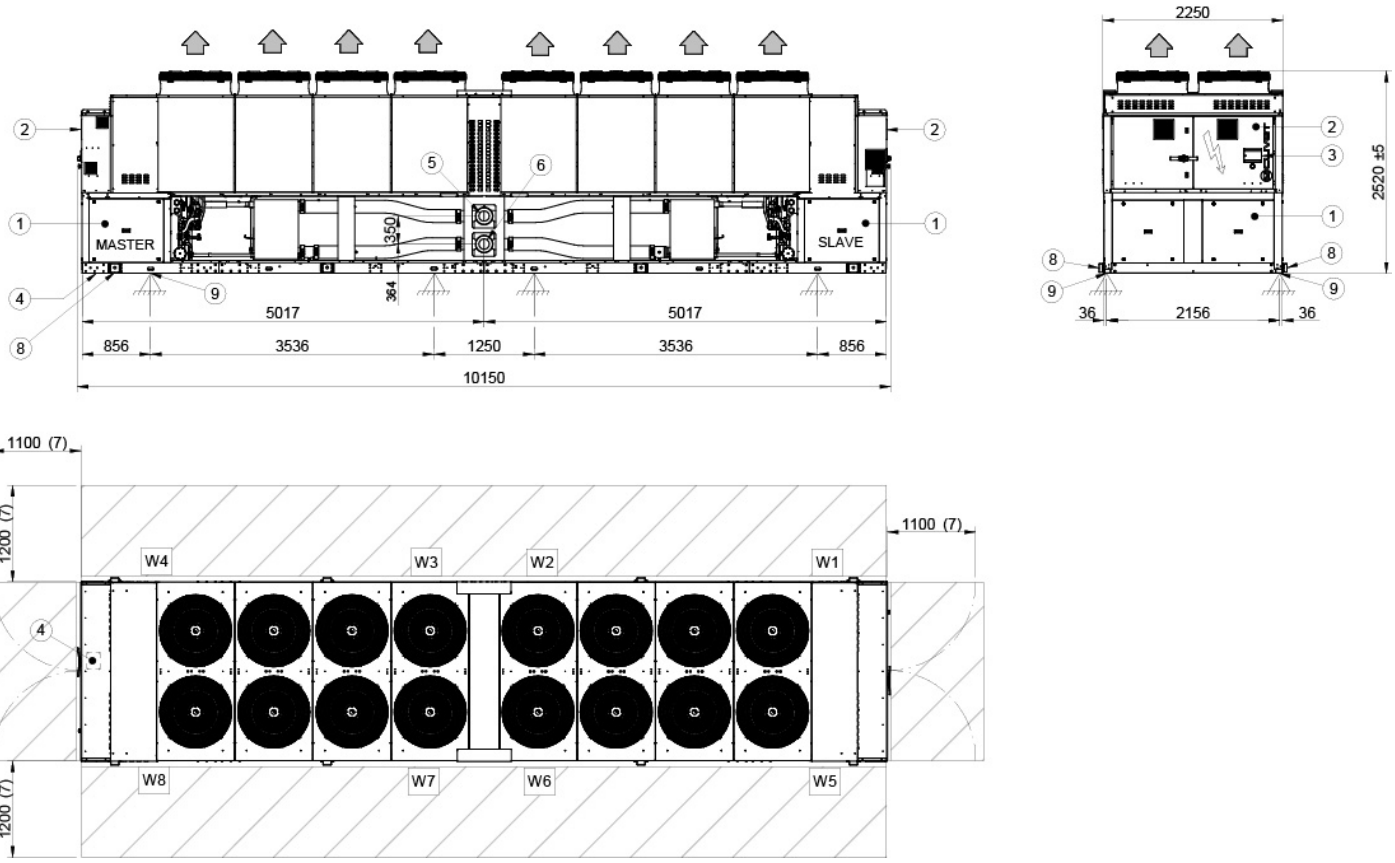
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 5" Victaulic
6. Water outlet 5" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

SIZE		290.8	320.8
		SC/EN	SC/EN
Length	mm	10150	10150
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	1014	1057
W2 Supporting point	kg	724	741
W3 Supporting point	kg	724	741
W4 Supporting point	kg	1014	1057
W5 Supporting point	kg	995	1056
W6 Supporting point	kg	705	740
W7 Supporting point	kg	705	740
W8 Supporting point	kg	995	1056
Operating weight	kg	6876	7188
Shipping weight	kg	6792	7076

La presenza di accessori opzionali può comportare una variazione significativa dei pesi riportati

SIZE 290.8 ÷ 320.8 EXC - ABU (Standard option)

DAAN40012_ABU_00
Data/Date 08/11/2021



1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 8" Victaulic
6. Water outlet 8" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

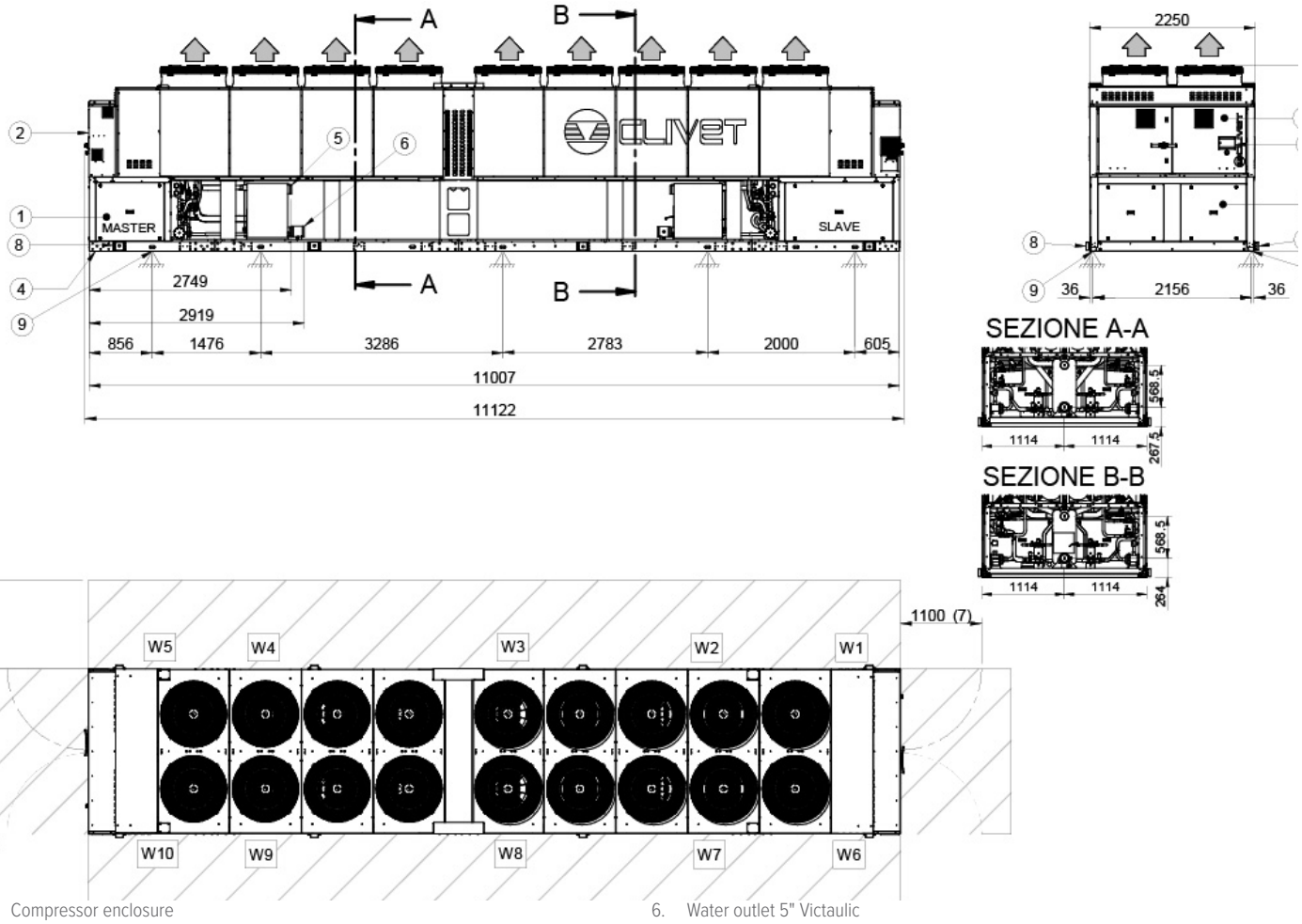
SIZE		290.8	320.8
		SC/EN	SC/EN
Length	mm	10150	10150
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	1028	1071
W2 Supporting point	kg	755	773
W3 Supporting point	kg	755	773
W4 Supporting point	kg	1028	1071
W5 Supporting point	kg	1013	1073
W6 Supporting point	kg	740	775
W7 Supporting point	kg	740	775
W8 Supporting point	kg	1013	1073
Operating weight	kg	7072	7384
Shipping weight	kg	6940	7224

La presenza di accessori opzionali può comportare una variazione significativa dei pesi riportati

Dimensional drawings

SIZE 345.9 EXC

DAAN40014_STD_00
Data/Date 17/11/2021



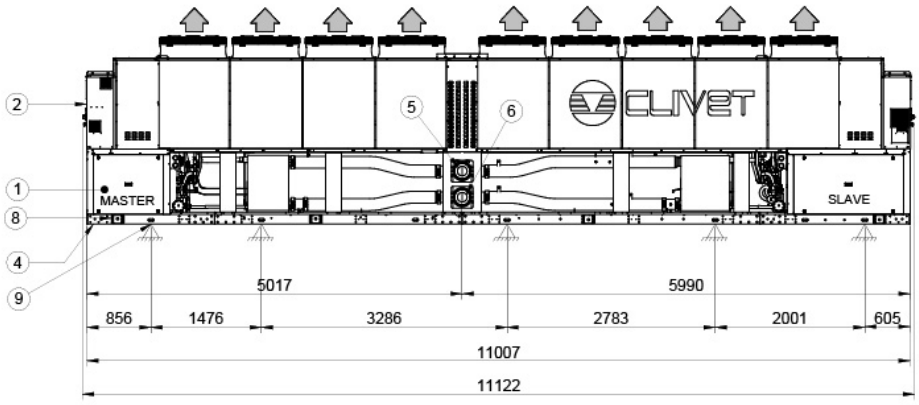
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 5" Victaulic
6. Water outlet 5" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

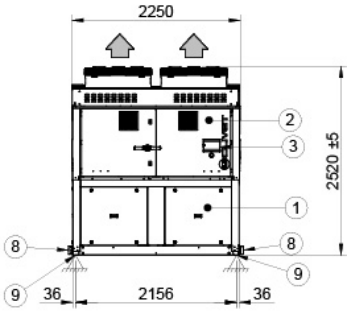
SIZE		345.9
		SC/EN
Length	mm	11122
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	718
W2 Supporting point	kg	1000
W3 Supporting point	kg	506
W4 Supporting point	kg	710
W5 Supporting point	kg	827
W6 Supporting point	kg	758
W7 Supporting point	kg	1034
W8 Supporting point	kg	500
W9 Supporting point	kg	707
W10 Supporting point	kg	829
Operating weight	kg	7589
Shipping weight	kg	7467

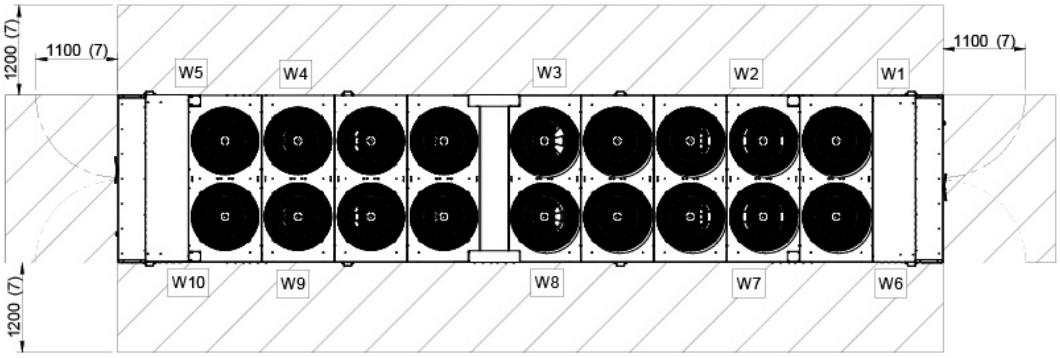
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SIZE 345.9 EXC - ABU (Standard option)

DAAN40014_ABU_00
Data/Date 17/11/2021







1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 8" Victaulic
6. Water outlet 8" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

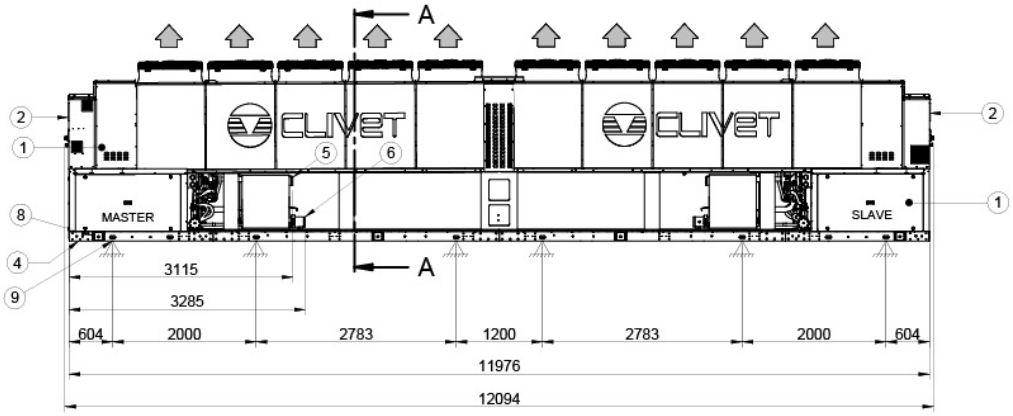
SIZE		345.9
		SC/EN
Length	mm	11122
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	733
W2 Supporting point	kg	1023
W3 Supporting point	kg	539
W4 Supporting point	kg	735
W5 Supporting point	kg	841
W6 Supporting point	kg	773
W7 Supporting point	kg	1057
W8 Supporting point	kg	533
W9 Supporting point	kg	732
W10 Supporting point	kg	843
Operating weight	kg	7809
Shipping weight	kg	7633

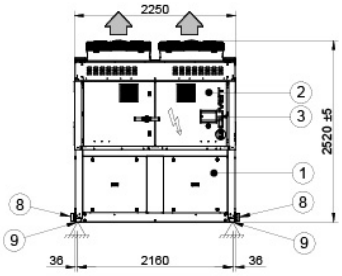
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

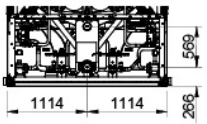
SIZE 370.10 ÷.420.12 EXC

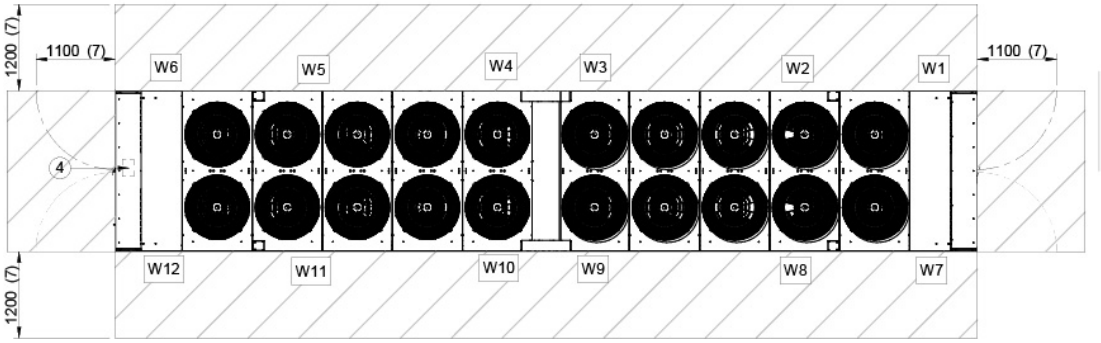
DAAN40016_STD_00
Data/Date 23/11/2021





SEZIONE A-A





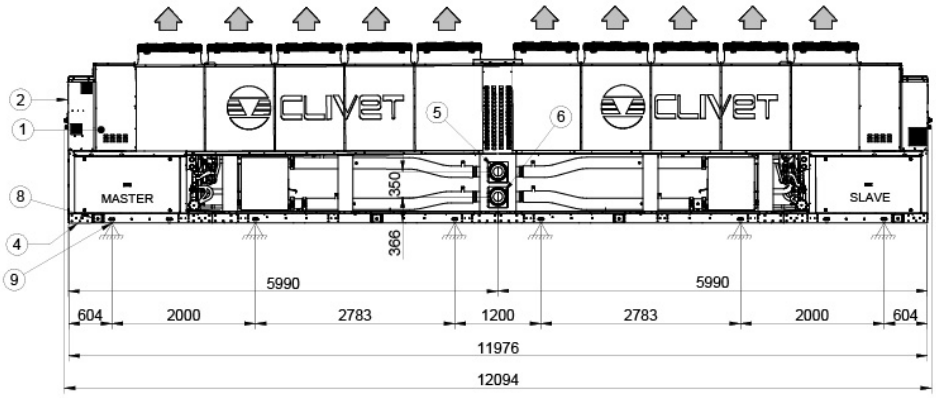
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 5" Victaulic
6. Water outlet 5" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

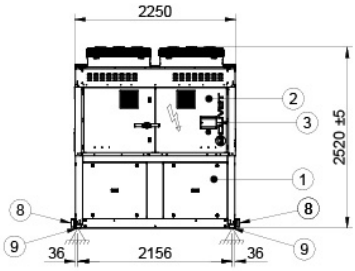
SIZE		370.10	420.12
		SC/EN	SC/EN
Length	mm	12094	12094
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	817	893
W2 Supporting point	kg	867	878
W3 Supporting point	kg	330	329
W4 Supporting point	kg	330	329
W5 Supporting point	kg	867	878
W6 Supporting point	kg	817	893
W7 Supporting point	kg	858	871
W8 Supporting point	kg	899	901
W9 Supporting point	kg	327	327
W10 Supporting point	kg	327	327
W11 Supporting point	kg	899	901
W12 Supporting point	kg	858	871
Operating weight	kg	8194	8398
Shipping weight	kg	8062	8266

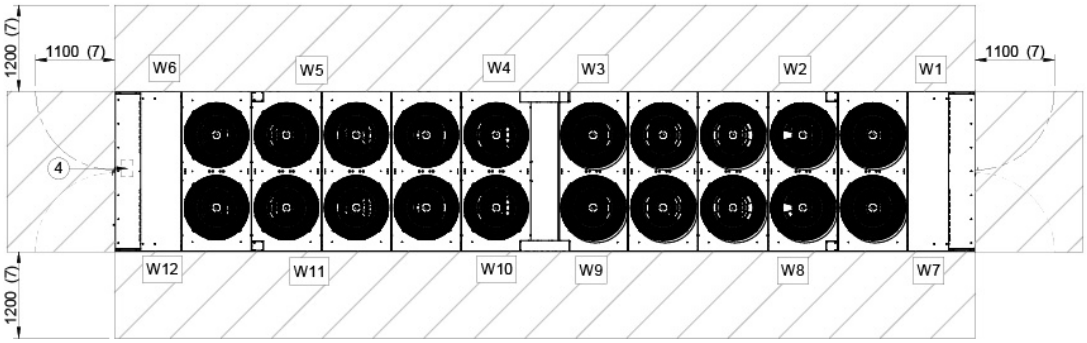
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SIZE 370.10 ÷.420.12 EXC - ABU (Standard option)

DAAN40016_ABU_00
Data/Date 23/11/2021







1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 8" Victaulic
6. Water outlet 8" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

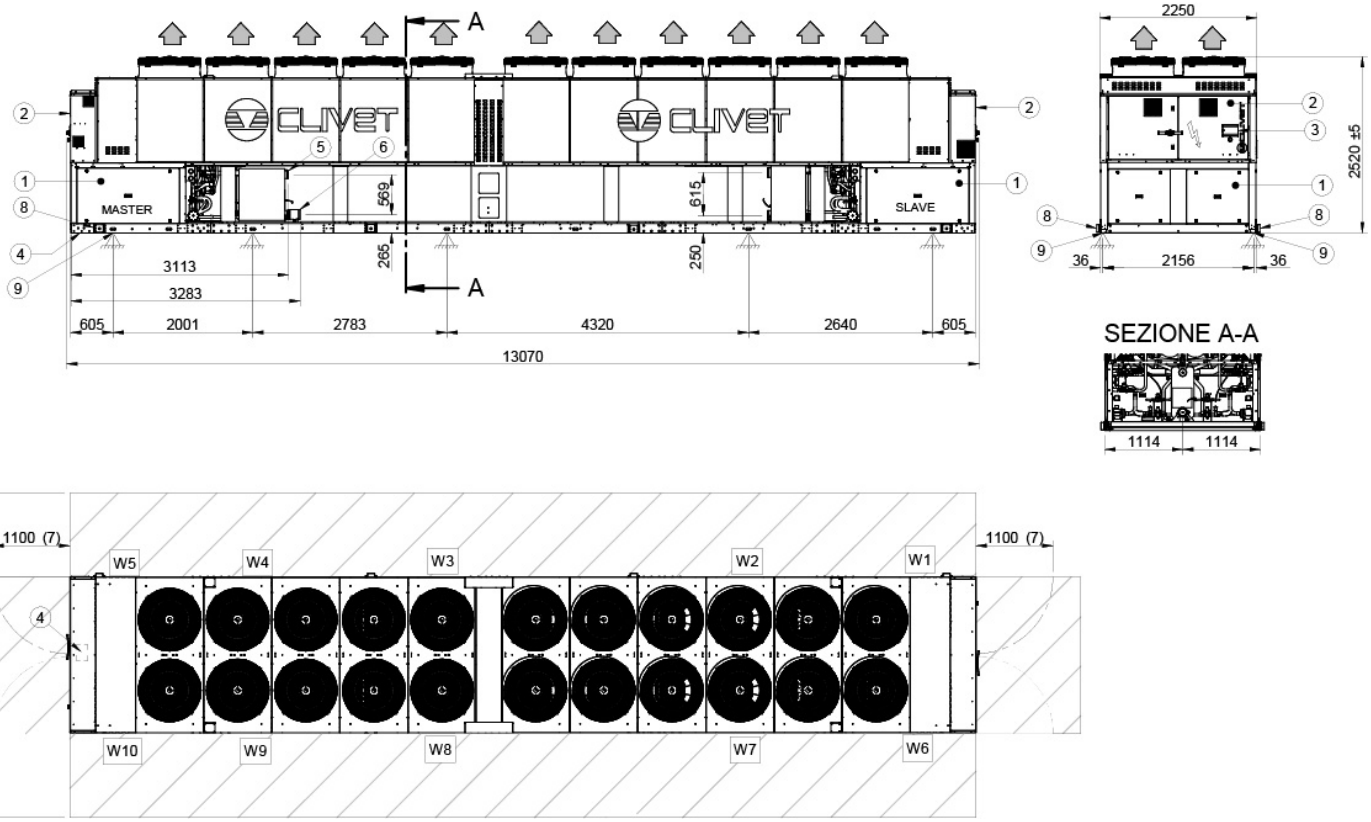
SIZE		370.10	420.12
		SC/EN	SC/EN
Length	mm	12094	12094
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	842	918
W2 Supporting point	kg	919	929
W3 Supporting point	kg	363	363
W4 Supporting point	kg	363	363
W5 Supporting point	kg	919	929
W6 Supporting point	kg	842	918
W7 Supporting point	kg	883	896
W8 Supporting point	kg	951	953
W9 Supporting point	kg	360	360
W10 Supporting point	kg	360	360
W11 Supporting point	kg	951	953
W12 Supporting point	kg	883	896
Operating weight	kg	8634	8838
Shipping weight	kg	8394	8598

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

SIZE 450.12 EXC

DAAN40019_STD_00
Data/Date 06/12/2021



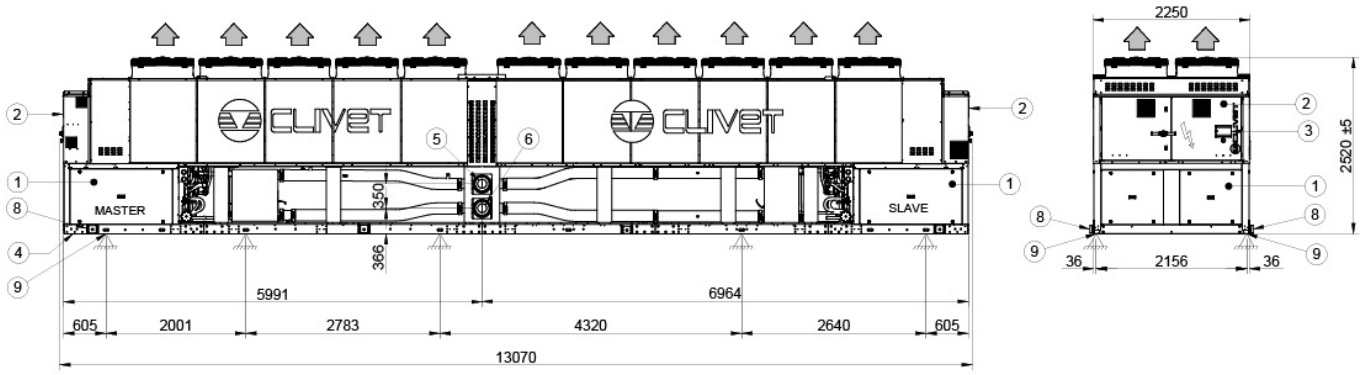
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 5" Victaulic
6. Water outlet 5" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

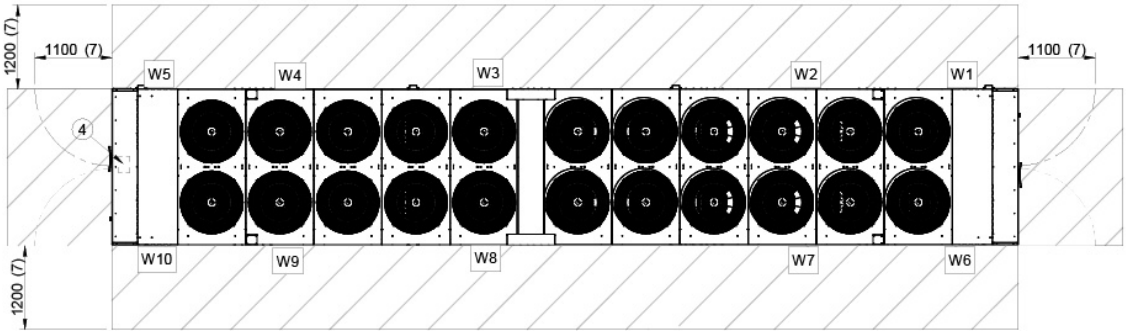
SIZE		450.12
		SC/EN
Length	mm	13070
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	930
W2 Supporting point	kg	1326
W3 Supporting point	kg	484
W4 Supporting point	kg	1056
W5 Supporting point	kg	735
W6 Supporting point	kg	949
W7 Supporting point	kg	1303
W8 Supporting point	kg	488
W9 Supporting point	kg	1054
W10 Supporting point	kg	735
Operating weight	kg	9061
Shipping weight	kg	8935

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SIZE 450.12 EXC - ABU (Standard option)

DAAN40019_ABU_00
Data/Date 06/12/2021





1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 8" Victaulic
6. Water outlet 8" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

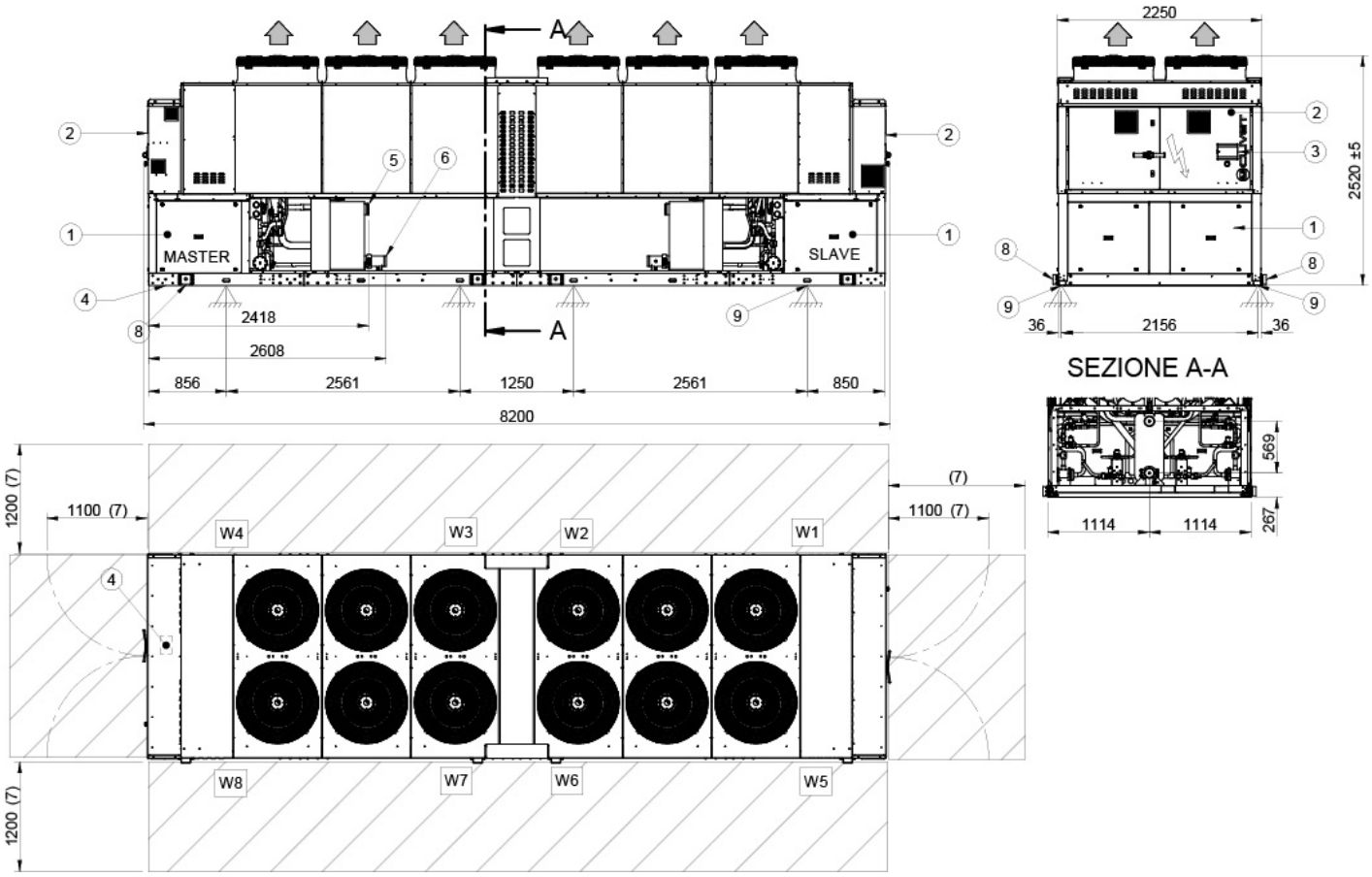
SIZE		450.12 SC/EN
Length	mm	13070
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	942
W2 Supporting point	kg	1359
W3 Supporting point	kg	517
W4 Supporting point	kg	1074
W5 Supporting point	kg	748
W6 Supporting point	kg	962
W7 Supporting point	kg	1337
W8 Supporting point	kg	521
W9 Supporting point	kg	1072
W10 Supporting point	kg	748
Operating weight	kg	9281
Shipping weight	kg	9101

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

SIZE 260.8 ÷ 290.8 PRM

DAAN40009_STD_01
Data/Date 30/11/2021



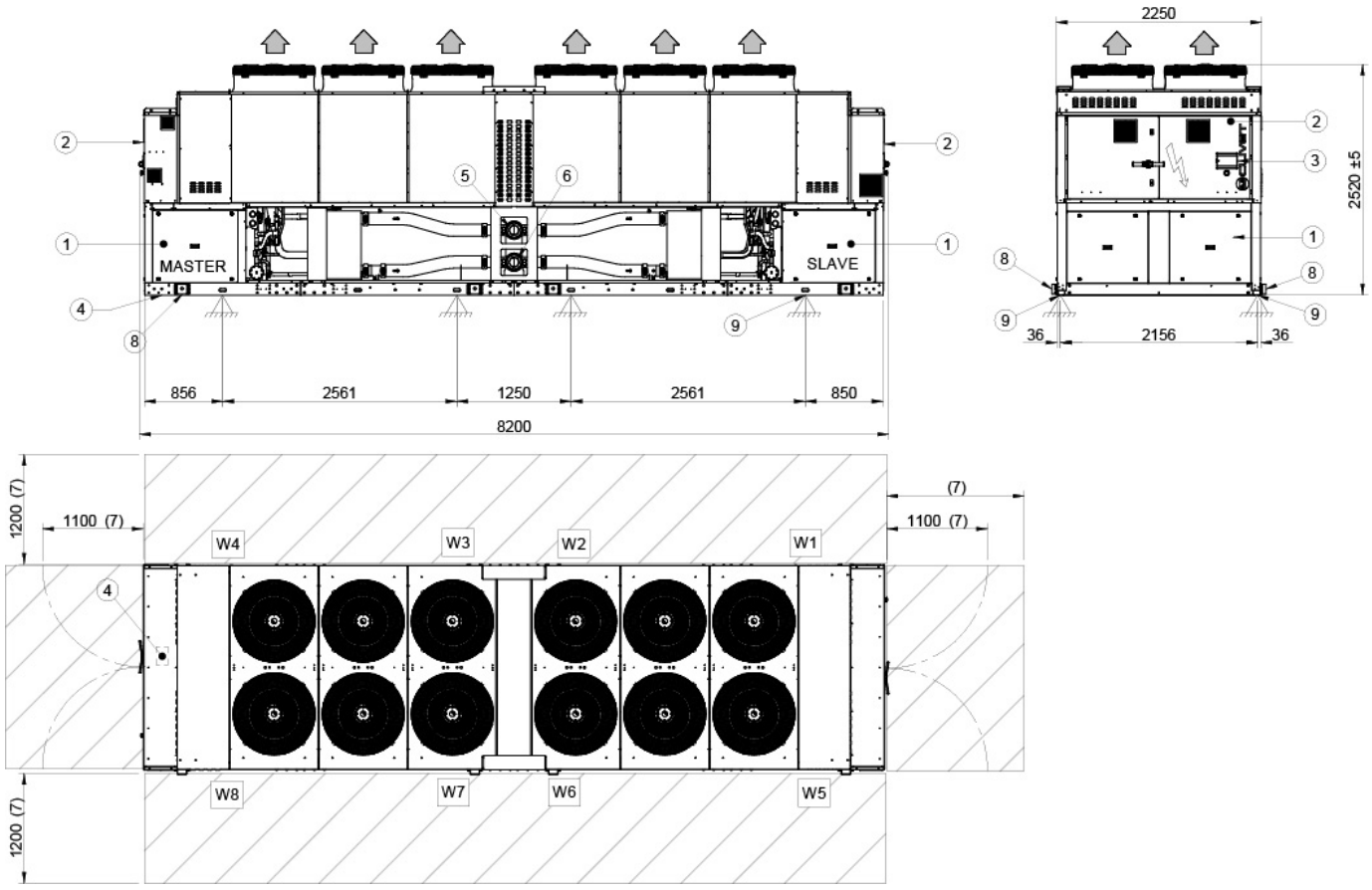
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 4" Victaulic
6. Water outlet 4" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

SIZE		260.8	290.8
		SC/EN	SC/EN
Length	mm	8200	8200
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	828	900
W2 Supporting point	kg	586	624
W3 Supporting point	kg	586	624
W4 Supporting point	kg	828	900
W5 Supporting point	kg	830	885
W6 Supporting point	kg	588	609
W7 Supporting point	kg	588	609
W8 Supporting point	kg	830	885
Operating weight	kg	5662	6036
Shipping weight	kg	5608	5970

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SIZE 260.8 ÷ 290.8 PRM - ABU (Standard option)

DAAN40009_ABU_01
Data/Date 30/11/2021



1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 6" Victaulic
6. Water outlet 6" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

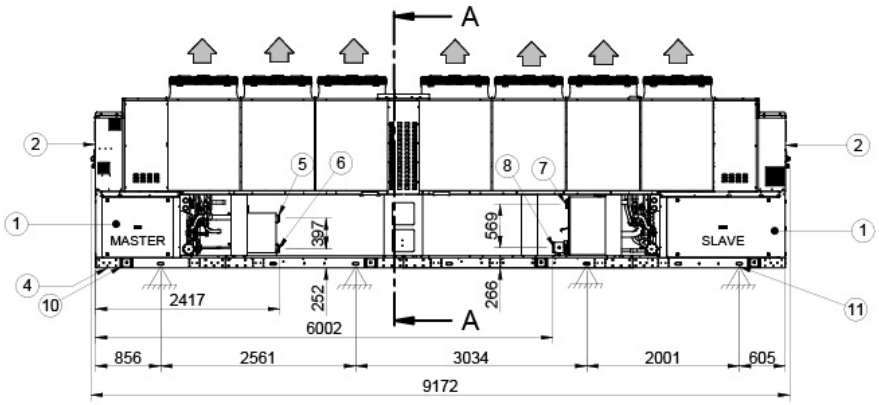
SIZE		260.8	290.8
		SC/EN	SC/EN
Length	mm	8200	8200
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	839	912
W2 Supporting point	kg	620	659
W3 Supporting point	kg	620	659
W4 Supporting point	kg	839	912
W5 Supporting point	kg	844	899
W6 Supporting point	kg	625	646
W7 Supporting point	kg	625	646
W8 Supporting point	kg	844	899
Operating weight	kg	5858	6232
Shipping weight	kg	5756	6118

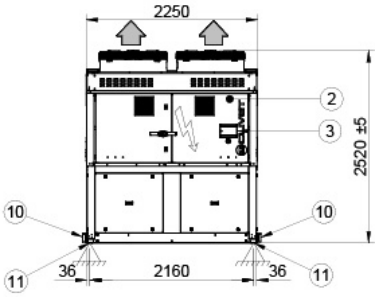
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

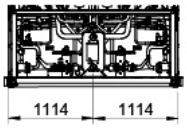
SIZE 315.9 PRM

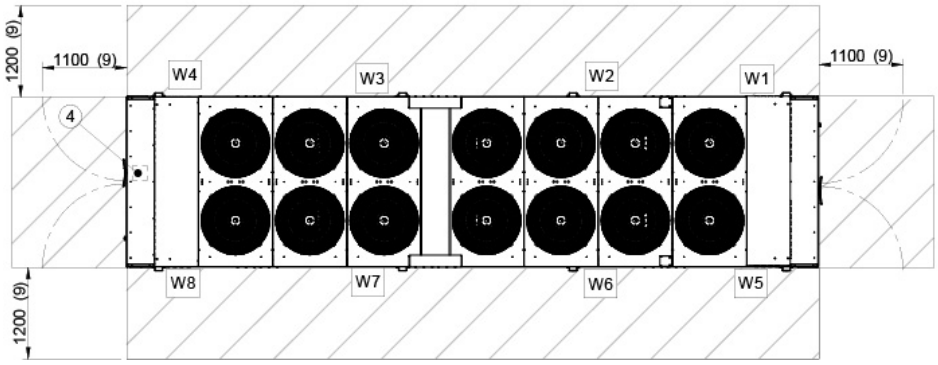
DAAN40020_STD_00
Data/Date 13/12/2021





SEZIONE A-A





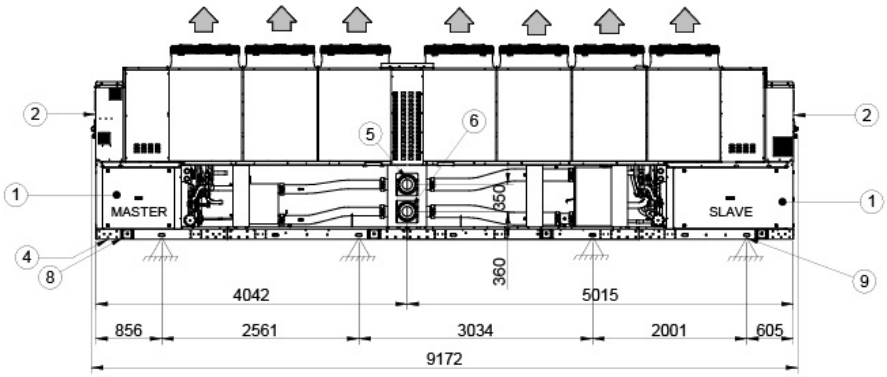
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 4" Victaulic
6. Water outlet 4" Victaulic
7. Water inlet 5" Victaulic
8. Water outlet 5" Victaulic
9. Functional spaces
10. Lifting bracket (removed)
11. Support points

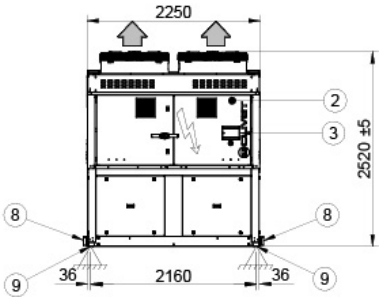
SIZE		315.9
		SC/EN
Length	mm	9172
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	754
W2 Supporting point	kg	1052
W3 Supporting point	kg	551
W4 Supporting point	kg	1191
W5 Supporting point	kg	745
W6 Supporting point	kg	977
W7 Supporting point	kg	618
W8 Supporting point	kg	1003
Operating weight	kg	6890
Shipping weight	kg	6795

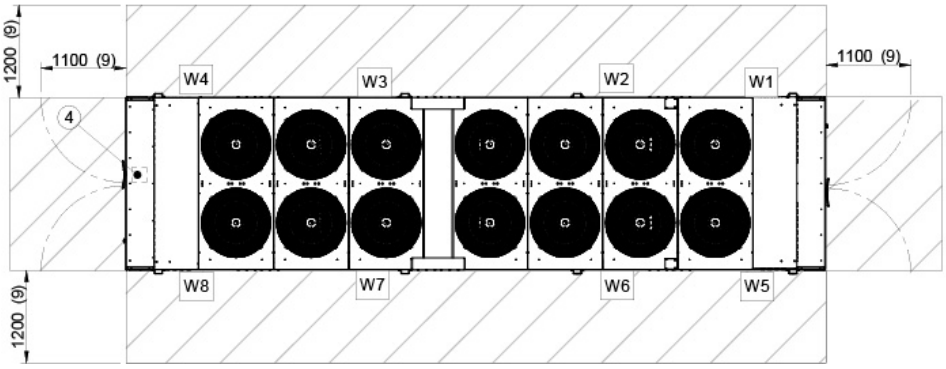
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SIZE 315.9 PRM - ABU (Standard option)

DAAN40020_ABU_00
Data/Date 13/12/2021







1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 8" Victaulic
6. Water outlet 8" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

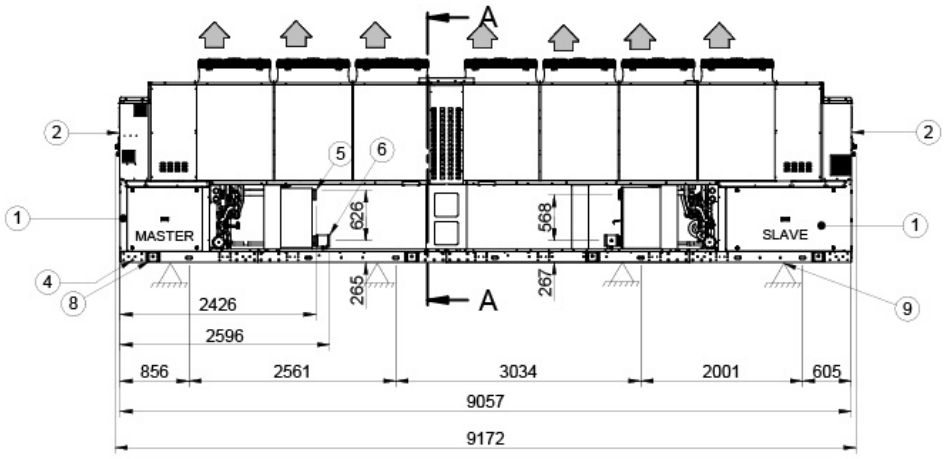
SIZE		315.9
		SC/EN
Length	mm	9172
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	771
W2 Supporting point	kg	1085
W3 Supporting point	kg	587
W4 Supporting point	kg	1215
W5 Supporting point	kg	762
W6 Supporting point	kg	1010
W7 Supporting point	kg	654
W8 Supporting point	kg	1027
Operating weight	kg	7110
Shipping weight	kg	6961

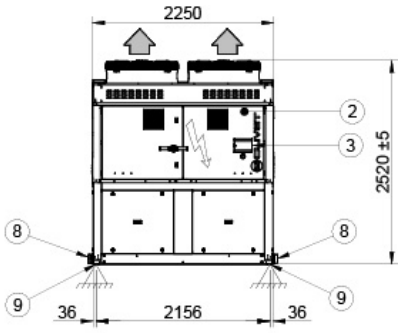
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

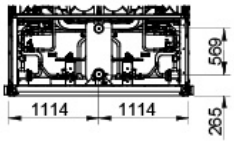
SIZE 345.9 PRM

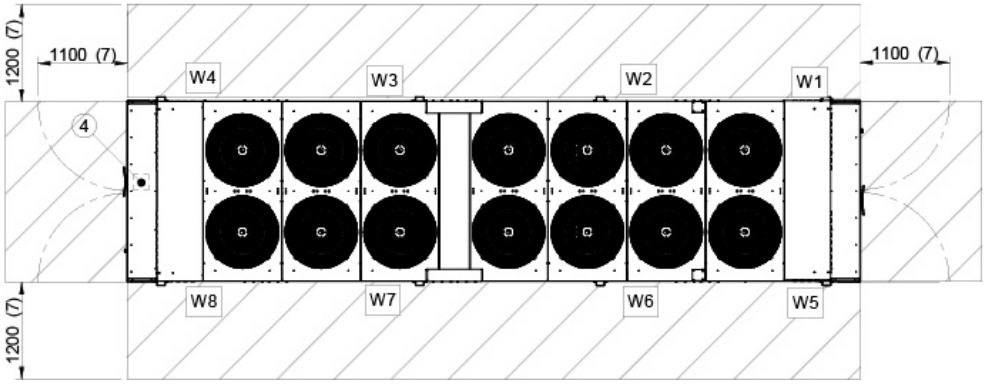
DAAN40015_STD_00
Data/Date 17/11/2021





SEZIONE A-A





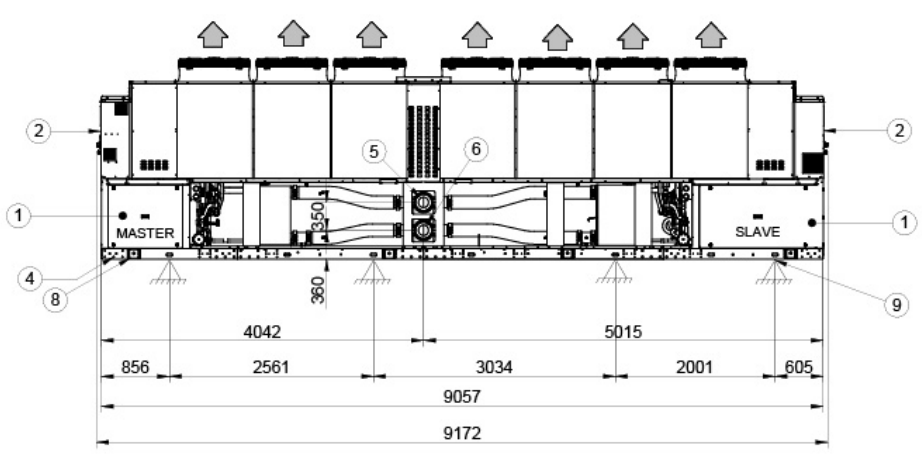
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 5" Victaulic
6. Water outlet 5" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

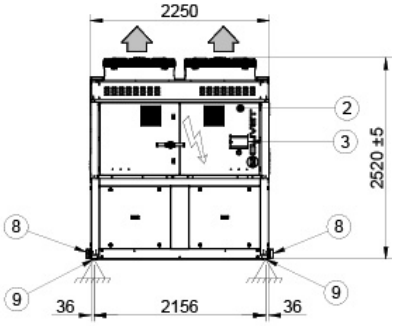
SIZE		345.9
		SC/EN
Length	mm	9172
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	770
W2 Supporting point	kg	1050
W3 Supporting point	kg	588
W4 Supporting point	kg	1102
W5 Supporting point	kg	747
W6 Supporting point	kg	986
W7 Supporting point	kg	598
W8 Supporting point	kg	10978
Operating weight	kg	6937
Shipping weight	kg	6816

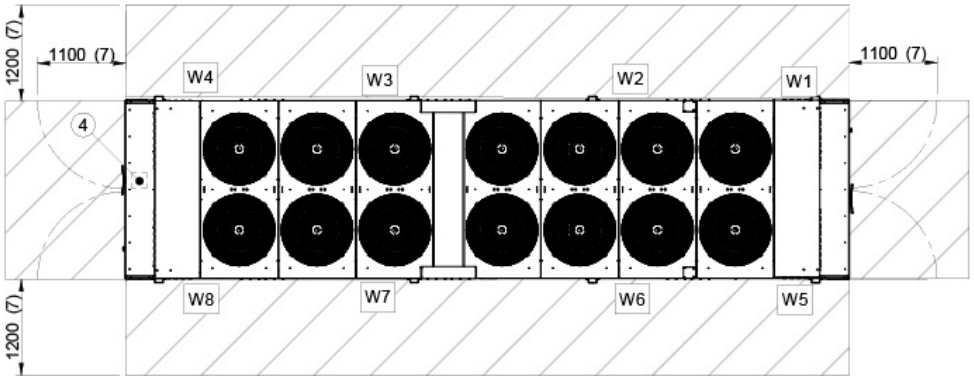
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SIZE 345.9 PRM - ABU (Standard option)

DAAN40015_ABU_00
Data/Date 17/11/2021







1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 8" Victaulic
6. Water outlet 8" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

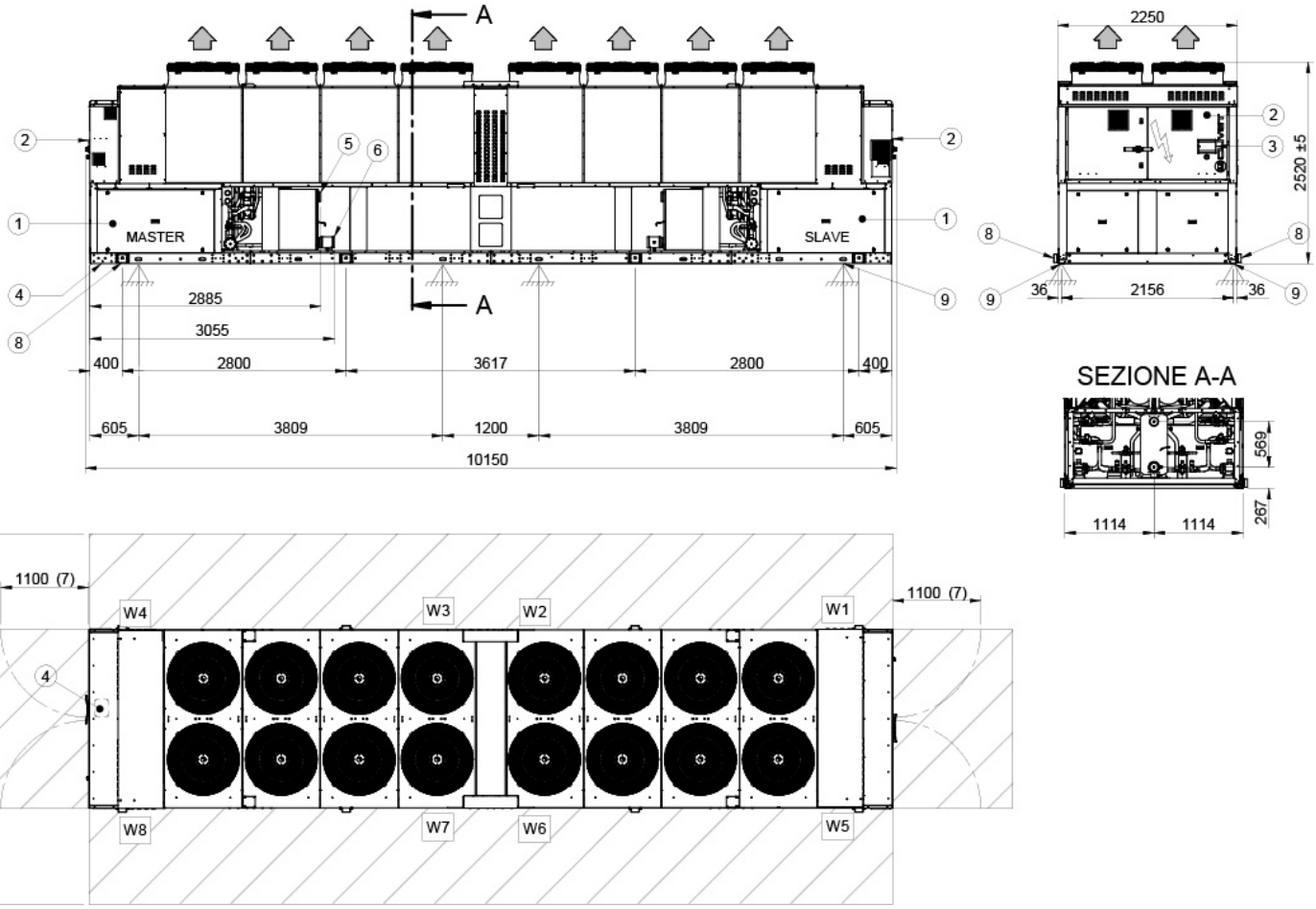
SIZE		345.9 SC/EN
Length	mm	9172
Depth	mm	2250
Height	mm	2520
W1 Supporting point	kg	787
W2 Supporting point	kg	1082
W3 Supporting point	kg	624
W4 Supporting point	kg	1126
W5 Supporting point	kg	764
W6 Supporting point	kg	1018
W7 Supporting point	kg	634
W8 Supporting point	kg	1121
Operating weight	kg	7157
Shipping weight	kg	6982

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

SIZE 370.10 ÷ 420.12 PRM

DAAN40011_STD_00
Data/Data 05/11/2021



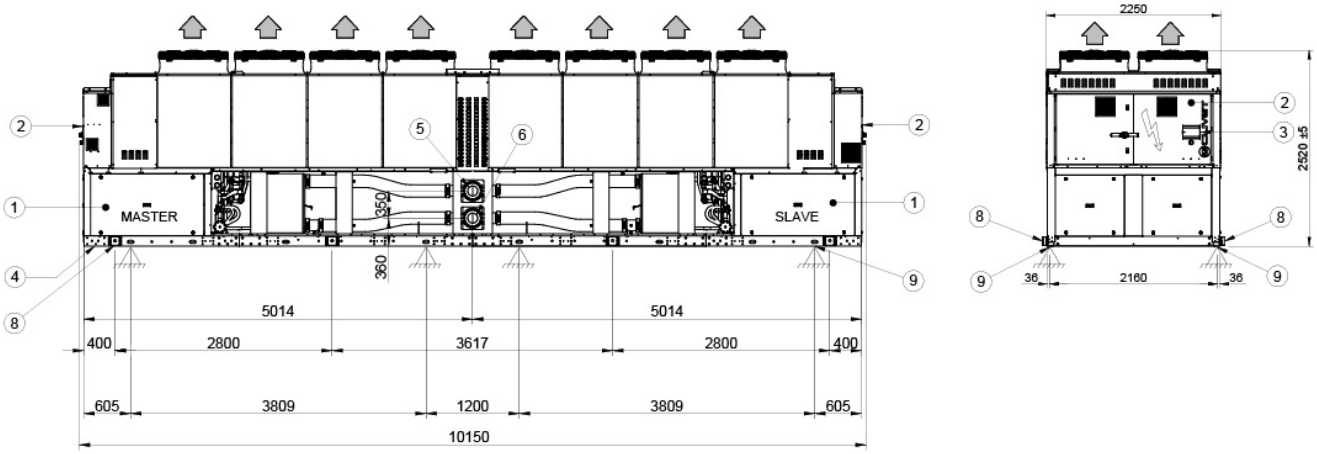
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 5" Victaulic
6. Water outlet 5" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

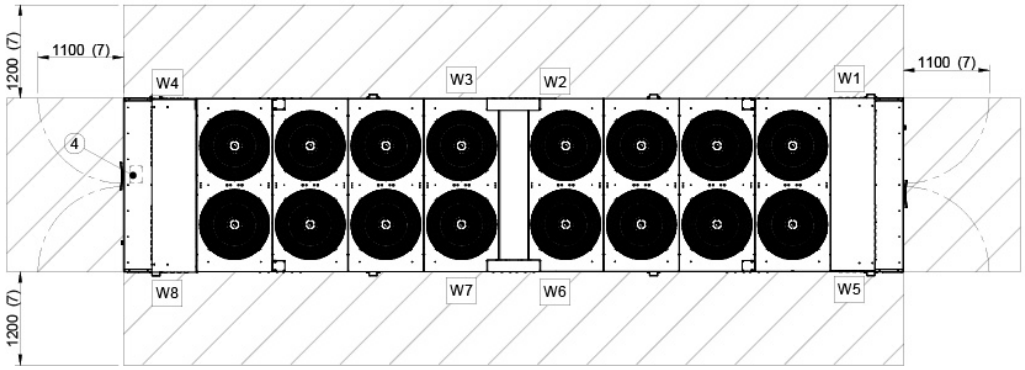
SIZE		370.10	420.12
		SC/EN	SC/EN
Length	mm	10150	10150
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	1098	1116
W2 Supporting point	kg	806	818
W3 Supporting point	kg	806	818
W4 Supporting point	kg	1098	1116
W5 Supporting point	kg	1084	1117
W6 Supporting point	kg	791	820
W7 Supporting point	kg	791	820
W8 Supporting point	kg	1084	1117
Operating weight	kg	7558	7742
Shipping weight	kg	7448	7632

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SIZE 370.10 ÷ 420.12 PRM - ABU (Standard option)

DAAN40011_ABU_00
Data/Date 05/11/2021





1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 8" Victaulic
6. Water outlet 8" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

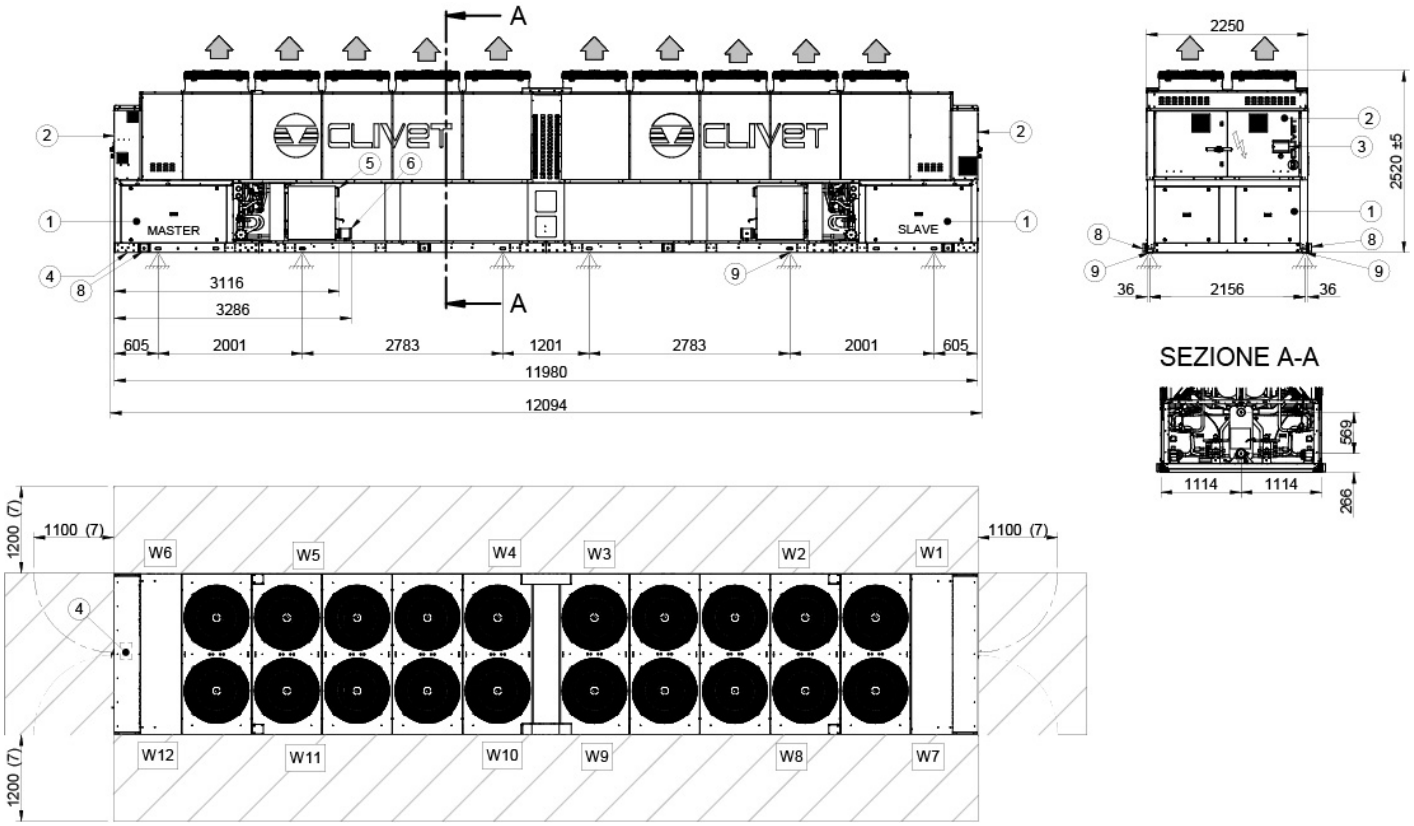
SIZE		370.10	420.12
		SC/EN	SC/EN
Length	mm	10150	10150
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	1113	1131
W2 Supporting point	kg	837	850
W3 Supporting point	kg	837	850
W4 Supporting point	kg	1113	1131
W5 Supporting point	kg	1101	1135
W6 Supporting point	kg	825	854
W7 Supporting point	kg	825	854
W8 Supporting point	kg	1101	1135
Operating weight	kg	7754	7938
Shipping weight	kg	7596	7780

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

SIZE 450.12 ÷ 480.12 PRM

DAAN40010_STD_00
Data/Data 23/04/2021



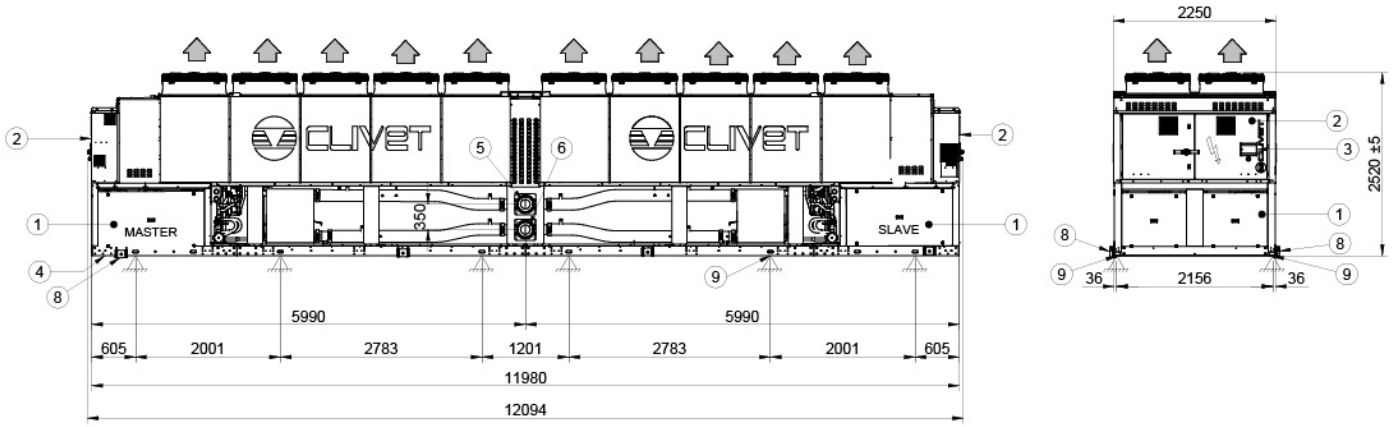
1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 5" Victaulic
6. Water outlet 5" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

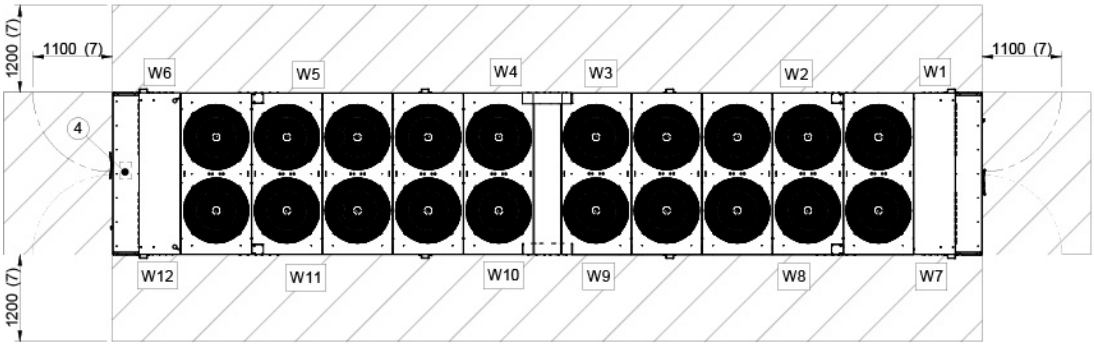
SIZE		450.12	480.12
		SC/EN	SC/EN
Length	mm	12094	12094
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	907	990
W2 Supporting point	kg	881	900
W3 Supporting point	kg	329	328
W4 Supporting point	kg	329	328
W5 Supporting point	kg	881	900
W6 Supporting point	kg	907	990
W7 Supporting point	kg	949	964
W8 Supporting point	kg	919	928
W9 Supporting point	kg	325	325
W10 Supporting point	kg	325	325
W11 Supporting point	kg	919	928
W12 Supporting point	kg	949	964
Operating weight	kg	8620	8870
Shipping weight	kg	8488	8730

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

SIZE 450.12 ÷ 480.12 PRM - ABU (Standard option)

DAAN40010_ABU_00
Data/Date 23/04/2021





1. Compressor enclosure
2. Electrical panel
3. Control keypad
4. Power input
5. Water inlet 8" Victaulic
6. Water outlet 8" Victaulic
7. Functional spaces
8. Lifting bracket (removed)
9. Support points

SIZE		450.12	480.12
		SC/EN	SC/EN
Length	mm	12094	12094
Depth	mm	2250	2250
Height	mm	2520	2520
W1 Supporting point	kg	919	1003
W2 Supporting point	kg	907	926
W3 Supporting point	kg	346	345
W4 Supporting point	kg	346	345
W5 Supporting point	kg	907	926
W6 Supporting point	kg	919	1003
W7 Supporting point	kg	962	976
W8 Supporting point	kg	945	954
W9 Supporting point	kg	342	342
W10 Supporting point	kg	342	342
W11 Supporting point	kg	945	954
W12 Supporting point	kg	962	976
Operating weight	kg	8840	9090
Shipping weight	kg	8600	8842

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

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