Air cooled liquid chiller with inverter technology for outdoor installation

SCREWLine^{4}-i

WDAT-iK4 120.1 - 580.2 RANGE

TECHNICAL BULLETIN

ErP 2021 COMPLIANT

R-513A

Screw INVERTER

SIZE	120.1	160.1	200.1	240.1	250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
COOLING CAPACITY [kW] - EXC	294	374	506	602	593	670	741	811	900	992	1089	1204	1325	1423
COOLING CAPACITY [kW] - PRM	281	340	473	577	550	615	681	754	837	911	1007	1120	1240	1338

Page

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

SCREWLine: Screw technology for an efficient and versatile product

SCREWLine is the new generation of Clivet liquid chillers with inverter Screw compression technology: high energy efficiency, great operating reliability and maximum choice versatility, with many versions and models for different types of installation.

WDAT-iK4

Air cooled water chiller with inverter technology

- EXCELLENCE / PREMIUM Version
- Continuous capacity control
- Seasonal efficiency 5,3 / 4,9
- Operating with 50°C of outdoor air temperature
- Full aluminium microchannel coils
- Partial recovery of the condensing heat

R-513A

WDAT-iZ4

Air cooled water chiller with inverter technology

- EXCELLENCE Version
- Continuous capacity control
- Seasonal efficiency 5,3
- Operating with 50°C of outdoor air temperature
- Full aluminium microchannel coils
- Partial recovery of the condensing heat

R-1234ze

WDAT-iL3

Air cooled water chiller with inverter technology

- PREMIUM compact version
- Continuous capacity control
- Seasonal efficiency 4,7
- Operating with 50°C of outdoor air temperature
- Copper aluminium condensing coils
- Partial recovery of the condensing heat

R-134a

Compressor

Compact, semi hermetic, helicoidal twin-screw compressors with high efficiency inegrated oil separator. The cooling capacity continuous modulation is made by a variable speed motor activated by the inverter integrated in the compressor. The start-up with limited current absorption is achieved by progressively accelerating the compressor with the inverter. The inverter is cooled with the liquid cooler taken from the liquid line. The liquid flow is activated by a solenoid valve and is sent to the inverter cooling plate by a thermostatic valve. Subsequently, the steam generated by the heat exchange is sucked by the screws inside a closed chamber at medium pressure without thereby reducing the compressor suction capacity.
The electronic boards are housed inside the inverter. They, in addition to managing the inverter and the electric motor rotation speed, perform all the functions of protection, monitoring and control of the compressor: oil level, oil temperature, motor temperature, Vi control, oil heater activation, if necessary, liquid injection for the inverter and compressor cooling, check of the operating range by specific HP and LP transducers, communication via MODBUS, operating timing, alarm management. The inverter and electric motor supply is three-phase, the auxiliaries are supplied with single phase line. At the compressor discharge is provided a non-return valve to avoid the counter-rotating during the stop. The emergency internal overpressure valve connects the compressor discharge with suction in case of an extreme pressure drop.

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 (evaporator)

Direct expansion exchanger with refrigerant side independent circuit for each compressor. 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).

Esternal exchanger (condenser)

Full aluminium microchannel coil with V structure open angle geometry. The entire exchanger (tubes, fins and manifolds) is made of aluminum and welded into a single body through a special brazing technology in a controlled-temperature chamber. The fins have a special corrugated surface to ensure maximum heat exchange efficiency. The special flat configuration of the pipes reduces the section that opposes to the air flow, limiting the pressure drops and maximizing the surface. The total refrigerant charge into the microchannel coil is reduced by 30% compared to an equivalent copper coil.

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

One or two independent refrigeration circuits made of copper, brazed and factory-assembled, complete with:
- anti-acid dehydrator filter with solid cartridge complete with quick-fit connector for refrigerant;
- high-pressure safety pressure switch;
- low pressure transducer;
- refrigerant temperature probe;
- electronic expansion valve;
- high pressure safety valve (safety valve with sealed tap open for inspection);
- double low pressure safety valves (safety valve with sealed tap open for inspection);
- liquid flow and humidity indicator;
- cut-off valve on compressor supply circuit;
- cut-off valve on liquid line.

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

Entirely manufactured and wired in conformity to the EN 60204 standard.
The power section includes:
- door locking main circuit breaker;
- insulation transformer for powering the auxiliary circuit;
- fuses and thermal relays for protecting the compressors;
- magneto-thermal cut-out switches to protect fans;
- electrical panel ventilation.

The control section includes:
- 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 and enabling;
- 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;
- interface terminal with graphic display;
- multifunction phase monitor;
- remote ON/OFF control;
- second set-point enabling by potential-free contact;
- control of compressor start-up automatic rotation;
- relay for remote cumulative fault signal;
- set values, error codes and parameters can be displayed;
- high refrigerant gas pressure pre-alarm function that in many cases prevents the unit from being shut-down;
- input for demand limit (absorbed power limit according to an external signal 0÷10V or 4÷20 mA);
- electrical socket (max 400 W)

Standard unit technical specifications

Accessories

- Protection grilles and compressor compartment
- Anti-hail protection grilles
- Energy meter
- Set-point compensation with outdoor air temperature probe
- 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
- Microchannel coils protection panels
- E-coated microchannel coil
- Ecoshare function for the automatic management of a group of units
- EMC filtering to reduce conducted compressor emissions
- Double safety valves with changeover valve
- Device for the condensing coil partialization

Test

All the units are factory-tested in specific steps, 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)
+11°C	1	✔ STANDARD UNIT	✔ STANDARD UNIT	✔ STANDARD UNIT
+2°C	2			
-7°C	3			
-10°C	4			
Tra -10°C e -15°C		✔ UNIT + REGBT OPTION	✔ UNIT + REGBT OPTION ✔ GLYCOL IN AN APPROPRIATE PERCENTAGE	✔ UNIT + REGBT OPTION [6]
Tra -15°C e -18°C		✔ UNIT + REGBT OPTION	✔ UNIT + REGBT OPTION ✔ WATER EMPTY UNIT ✔ ELECTRICAL PANEL ANTIFREEZE PROTECTION (RE-25) X NOT SUITABLE: BUILT-IN PUMPS	NOT POSSIBLE

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

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. Unit at full load 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.

Minimum system water content

For a proper functioning of the unit a minimum water content has to the provided to the system, using the formula:

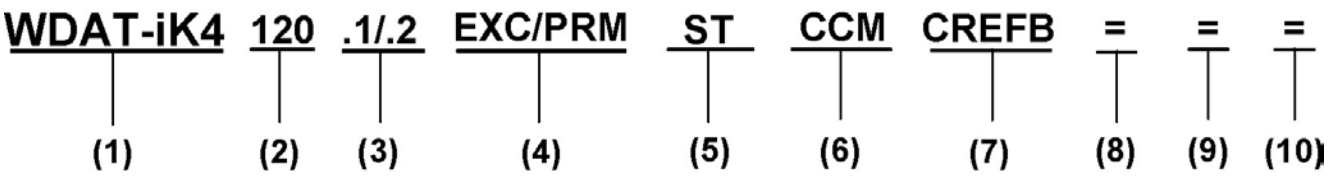
Minimum water content for comfort application [liters] = 13 x kWf (sizes 120.1 - 240.1)
= 5 x kWf (sizes 250.2 - 580.2)

Minimum water content for process application [liters] = 26 x kWf (sizes 120.1 - 240.1)
= 10 x kWf (sizes 250.2 - 580.2)

kWf = Nominal cooling capacity unit

⚠ Volume calculated does not consider internal heat exchanger (evaporator) water content.

Unit configuration



(1) Range
WDAT = Air cooled liquid chiller
iK4 = SCREWLine^4-i range with inverter screw compressor and R513A refrigerant

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

(3) Compressors
.1 / .2 = Compressor quantity

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

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

(6) Condensing coil
CCM = Aluminum microchannel condensing coils (Standard)
CCME = E-coated microchannel coil

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

(8) Low evaporator water temperature configuration
(-) Low water temperature: not required (standard)
B - Low water temperature, down to –8°C (Brine)

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

(10) Hydronic assemblies
(-) Not required (standard)
1PM = Hydropack with N° 1 pump
1PMH = Hydropack with N° 1 high static pressure pump
1PMV = Hydropack with N° 1 inverter pump
1PMVH = Hydropack with N° 1 high static pressure inverter pump
2PM = Hydropack with N° 2 pumps
2PMH = Hydropack with N° 2 high static pressure pumps
2PMV = Hydropack with N° 2 inverter pumps
2PMVH = Hydropack with N° 2 high static pressure inverter pumps

PGCC **Finned coil protection grilles and compressor compartment**

This accessory is used to protect the external coil from the accidental contact with external things or people.
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.

⚠ This option is not suitable for application in sulphuric environments.
⚠ Option available only in combination with microchannel coils protection panels (PPBM)

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)

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.

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..

SPC2 **Set-point compensation with outdoor air temperature probe**

This device enables the set-point to be varied automatically which is pre-set depending on the outdoor air temperature. This device enables the liquid flow temperature to be obtained, which varies depending on external conditions, enabling energy savings throughout the entire system.
The device is installed and wired built-in the unit.

⚠ The device includes a probe controlled remotely from outside to measure the outdoor air temperature (installation to be carried out by the customer). The connection cable length is 16 m.

CCME **E-coated microchannel coil**

The full aluminium microchannel coil is completely treated by electrolysis so as to create a protective layer of epoxy polymer on the surface, with the following characteristics:
- over 3000 hours of protection against salt spray (ASTM G85 A3 - SWAAT);
- over 2000 hours of protection against UV rays (ASTM G155-05a)
- provide a very high resistance against corrosion.

REGBT **Device for the condensing coil partialization**

Electronic device supplied on the unit allows to extend the unit operating range in cooling down to an outdoor air temperature of -18°C. For good operation of the unit at low outdoor temperatures, the fan motors speed is continuously adjusted as well as the finned exchange surface according to the ambient temperature.

Built-in options

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. 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)

Device installed and wired on board the machine available only with inverter pumps installed on board.

⚠ Option available only with inverter pumps installed on board (1PMV / 2PMV).

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 go down to –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.

⚠ It is necessary to make precautions against build up of snow and ice in front of the exhaust and outdoor air inlet locations
⚠ 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.
⚠ This accessory does not lead to substantial variations in the electrical data for the unit which has been declared in the Electrical Data section.

PPBM

Microchannel coils protection panels

Microchannel coils protection panels supplied on the manifold side.
They guarantee greater protection during transport and from accidental contact with things or people.

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.

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).

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
Mode 2 - it activates only the pumps of the unit required to operate

The device allows for rotation based on the criterion of minimum wear and management of units in stand-by. There are various unit sizes. Every unit must be fitted with the ECOSHARE feature. The set of units is controlled by a Master unit.
The local network can be extended up to 7 units (1 Master and 6 Slave).

⚠ 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.

FC2

EMC filtering to reduce conducted compressor emissions

The EMC filtering device, installed and wired on board the machine, reduces electromagnetic interference and makes the unit compliant with the immunity and industrial emission requirements in accordance with the EN 61000-6-2 and EN 61000-6-4 standards.

RDVS

Double safety valves with changeover valve

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.

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.

- ⚠ Pressure drop referred to a clean filter.
- ⚠ IInstallation 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.

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 a responsibility of the Customer, outside 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.

Performance - Excellence

Standard acoustic configuration (ST) / Compressor soundproofing (SC)

SIZE			120.1	160.1	200.1	240.1	250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Cooling capacity	1	[kW]	294	374	506	603	594	670	742	812	901	992	1090	1205	1326	1423
Compressor power input	1	[kW]	86,8	112	152	180	166	194	222	235	263	297	343	361	414	459
Total power input	2	[kW]	92,5	119	161	192	179	207	235	250	281	315	361	383	436	482
Partial recovery heating capacity	3	[kW]	38,1	48,6	65,8	78,3	76,0	86,4	96,3	105	116	129	143	157	174	188
EER	1	-	3,18	3,15	3,14	3,14	3,32	3,23	3,15	3,24	3,20	3,15	3,02	3,15	3,04	2,95
Water flow-rate (User Side)	1	[l/s]	14,1	17,9	24,2	28,8	28,4	32,0	35,4	38,8	43,0	47,4	52,1	57,6	63,4	68,0
Internal exchanger pressure drops	1	[kPa]	55	46	54	50	49	49	45	41	39	49	39	45	53	38
Cooling capacity (EN14511:2018)	4	[kW]	294	374	506	602	593	670	741	811	900	992	1089	1204	1325	1423
Total power input (EN14511:2018)	4	[kW]	93,9	120	163	194	181	210	238	253	284	318	364	387	441	485
EER (EN14511:2018)	4		3,13	3,11	3,10	3,10	3,27	3,19	3,12	3,21	3,17	3,11	2,99	3,11	3,01	2,93
SEER	6		5,13	5,12	5,11	5,12	5,36	5,38	5,37	5,39	5,34	5,31	5,35	5,34	5,30	5,31
SEPR	6		5,95	5,89	6,10	5,99	6,10	6,03	5,93	5,99	5,99	5,97	5,95	5,99	5,99	5,92
Cooling capacity (AHRI 550/590)	5	[kW]	294	374	506	603	594	670	742	812	901	992	1090	1205	1326	1423
Total power input (AHRI 550/590)	5	[kW]	92,5	119	161	192	179	207	235	250	281	315	361	383	436	482
COP_R	5		3,18	3,15	3,14	3,14	3,32	3,23	3,15	3,24	3,20	3,15	3,02	3,15	3,04	2,95
IPLV	5	-	6,04	6,03	5,84	5,91	6,01	5,73	5,54	6,05	6,00	5,74	5,86	5,83	5,82	5,87

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 631)

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

Super-silenced acoustic configuration (EN)

SIZE			120.1	160.1	200.1	240.1	250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Cooling capacity	1	[kW]	294	374	506	603	594	670	742	812	901	992	1090	1205	1326	1423
Compressor power input	1	[kW]	86,8	112	152	180	166	194	222	235	263	297	343	361	414	459
Total power input	2	[kW]	92,5	119	161	192	179	207	235	250	281	315	361	383	436	482
Partial recovery heating capacity	3	[kW]	38,1	48,6	65,8	78,3	76,0	86,4	96,3	105	116	129	143	157	174	188
EER	1	-	3,18	3,15	3,14	3,14	3,32	3,23	3,15	3,24	3,20	3,15	3,02	3,15	3,04	2,95
Water flow-rate (User Side)	1	[l/s]	14,1	17,9	24,2	28,8	28,4	32,0	35,4	38,8	43,0	47,4	52,1	57,6	63,4	68,0
Internal exchanger pressure drops	1	[kPa]	55	46	54	50	49	49	45	41	39	49	39	45	53	38
Cooling capacity (EN14511:2018)	4	[kW]	294	374	506	602	593	670	741	811	900	992	1089	1204	1325	1423
Total power input(EN14511:2018)	4	[kW]	93,9	120	163	194	181	210	238	253	284	318	364	387	441	485
EER (EN14511:2018)	4		3,13	3,11	3,10	3,10	3,27	3,19	3,12	3,21	3,17	3,11	2,99	3,11	3,01	2,93
SEER	6		5,13	5,12	5,11	5,12	5,36	5,38	5,37	5,39	5,34	5,31	5,35	5,34	5,30	5,31
SEPR	6		5,95	5,89	6,10	5,99	6,10	6,03	5,93	5,99	5,99	5,97	5,95	5,99	5,99	5,92
Cooling capacity (AHRI 550/590)	5	[kW]	294	374	506	603	594	670	742	812	901	992	1090	1205	1326	1423
Total power input (AHRI 550/590)	5	[kW]	92,5	119	161	192	179	207	235	250	281	315	361	383	436	482
COP_R	5		3,18	3,15	3,14	3,14	3,32	3,23	3,15	3,24	3,20	3,15	3,02	3,15	3,04	2,95
IPLV	5	-	6,04	6,03	5,84	5,91	6,01	5,73	5,54	6,05	6,00	5,74	5,86	5,83	5,82	5,87

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 631)

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

Performances - Premium

Standard acoustic configuration (ST) / Compressor soundproofing (SC)

SIZE			120.1	160.1	200.1	240.1	250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Cooling capacity	1	[kW]	281	341	473	577	551	615	682	754	837	911	1007	1121	1241	1339
Compressor power input	1	[kW]	91,5	125	165	190	183	214	249	257	281	311	361	379	425	474
Total power input	2	[kW]	96,1	129	172	199	192	223	258	268	295	325	374	397	443	492
Partial recovery heating capacity	3	[kW]	37,2	46,5	63,9	76,7	73,4	82,9	93,1	101	112	122	n.d.	150	167	181
EER	1	-	2,92	2,64	2,75	2,91	2,87	2,76	2,64	2,81	2,84	2,81	2,69	2,82	2,80	2,72
Water flow-rate (User Side)	1	[l/s]	13,4	16,3	22,6	27,6	26,3	29,4	32,6	36,0	40,0	43,5	48,1	53,6	59,3	64,0
Internal exchanger pressure drops	1	[kPa]	39	51	36	51	48	41	50	52	43	48	50	38	47	54
Cooling capacity (EN14511:2018)	4	[kW]	281	340	473	577	550	615	681	754	837	911	1007	1120	1240	1338
Total power input (EN14511:2018)	4	[kW]	97,1	131	173	201	194	225	261	271	297	328	378	400	447	496
EER (EN14511:2018)	4		2,89	2,61	2,73	2,87	2,83	2,74	2,61	2,78	2,82	2,78	2,66	2,80	2,78	2,70
SEER	6		4,96	4,84	4,80	4,89	4,95	4,92	4,87	4,99	4,88	4,91	4,90	4,97	4,97	4,97
SEPR	6		5,93	5,32	5,79	5,72	5,85	5,71	5,70	5,75	5,84	5,81	5,71	5,79	5,79	5,71
Cooling capacity (AHRI 550/590)	5	[kW]	281	341	473	577	551	615	682	754	837	911	1007	1121	1241	1339
Total power input (AHRI 550/590)	5	[kW]	96,1	129	172	199	192	223	258	268	295	325	374	397	443	492
COP_R	5		2,92	2,64	2,75	2,91	2,87	2,76	2,64	2,81	2,84	2,81	2,69	2,82	2,80	2,72
IPLV	5	-	5,80	5,51	5,62	5,71	5,71	5,39	5,08	5,53	5,62	5,40	5,30	5,73	5,71	5,73

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 631)

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

Super-silenced acoustic configuration (EN)

SIZE			120.1	160.1	200.1	240.1	250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Cooling capacity	1	[kW]	267	324	450	549	534	591	654	724	796	866	957	1065	1179	1272
Compressor power input	1	[kW]	86,1	117	155	178	176	203	237	244	264	292	339	356	399	445
Total power input	2	[kW]	90,7	122	162	187	185	212	246	255	278	306	353	374	417	463
Partial recovery heating capacity	3	[kW]	35,3	44,1	60,5	72,7	71,0	79,4	89,1	96,8	106	116	n.d.	142	158	172
EER	1	-	2,94	2,66	2,77	2,93	2,89	2,78	2,66	2,84	2,86	2,83	2,71	2,85	2,83	2,75
Water flow-rate (User Side)	1	[l/s]	12,8	15,5	21,5	26,2	25,5	28,2	31,3	34,6	38,0	41,4	45,7	50,9	56,3	60,8
Internal exchanger pressure drops	1	[kPa]	36	47	34	48	45	38	47	48	40	45	46	35	43	50
Cooling capacity (EN14511:2018)	4	[kW]	267	323	449	548	534	590	654	724	795	865	956	1064	1178	1271
Total power input (EN14511:2018)	4	[kW]	91,6	123	163	189	187	214	248	258	280	309	356	377	421	468
EER (EN14511:2018)	4		2,91	2,63	2,75	2,90	2,86	2,76	2,64	2,81	2,84	2,80	2,69	2,82	2,80	2,72
SEER	6		5,03	4,96	4,96	4,99	5,02	5,01	4,90	5,06	4,96	5,00	5,05	5,07	5,09	5,01
SEPR	6		5,93	5,32	5,79	5,72	5,85	5,71	5,70	5,75	5,84	5,81	5,71	5,79	5,79	5,71
Cooling capacity (AHRI 550/590)	5	[kW]	281	341	473	577	551	615	682	754	837	911	1007	1121	1241	1339
Total power input (AHRI 550/590)	5	[kW]	96,1	129	172	199	192	223	258	268	295	325	374	397	443	492
COP_R	5		2,92	2,64	2,75	2,91	2,87	2,76	2,64	2,81	2,84	2,81	2,69	2,82	2,80	2,72
IPLV	5	-	5,86	5,58	5,66	5,75	5,73	5,41	5,11	5,55	5,64	5,42	5,32	5,74	5,73	5,75

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 631)

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

General technical data

Construction

Excellence

SIZE			120.1	160.1	200.1	240.1	250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Compressor																
Type of compressors	1		ISW													
Refrigerant			R513A													
No. of compressors		Nr	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Rated power (C1)		HP	120	160	200	240	125	125	160	120	120	160	160	240	240	290
Rated power (C2)		HP					125	160	160	240	240	240	290	240	290	290
Std Capacity control steps			STEPLESS													
Oil charge (C1)		l	18	18	35	35	18	18	18	18	18	18	18	35	35	35
Oil charge(C2)		l					18	18	18	35	35	35	35	35	35	35
Refrigerant charge (C1)		kg	51	60	84	99	62	64	69	63	69	73	73	115	115	118
Refrigerant charge (C2)		kg					53	58	60	88	96	103	105	95	95	97
Refrigeration circuits		Nr	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Internal exchanger (evaporator)																
Type of internal exchanger	2		S&T													
N. of internal exchanger		Nr	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water content		l	150	219	301	319	319	565	541	518	973	953	930	917	902	872
External exchanger (condenser)																
Type of external exchanger	3		CCM													
Number of coils		Nr	5	6	8	10	12	12	12	14	16	16	16	20	20	20
External Section Fans																
Type of fans	4		AX													
Number of fans		Nr	5	6	8	10	12	12	12	14	16	16	16	20	20	20
Type of motor	5		EC													
Standard airflow		l/s	27083	32500	43333	54167	65000	65000	65000	75833	86667	86667	86667	108333	108333	108333
Connections																
Water fittings			6"	6"	6"	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Power supply																
Standard power supply			400/3~/50													
Electrical data																
F.L.A. - Total		A	193,6	236,9	341,7	422,6	390,7	434,0	473,5	536,9	617,8	659,2	723,2	844,9	908,9	972,9
F.L.I. - Total		kW	119,5	148,0	212,2	262,7	241,4	269,8	295,8	332,8	383,3	410,5	450,5	525,2	565,2	605,2
M.I.C. - Value	6	A	193,6	236,9	341,7	422,6	390,7	434,0	473,5	536,9	617,8	659,2	723,2	844,9	908,9	972,9

Premium

SIZE			120.1	160.1	200.1	240.1	250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Compressor																
Type of compressors	1		ISW													
Refrigerant			R513A													
No. of compressors		Nr	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Rated power (C1)		HP	120	160	200	240	125	125	160	120	120	160	160	240	240	290
Rated power (C2)		HP					125	160	160	240	240	240	290	240	290	290
Std Capacity control steps			STEPLESS													
Oil charge(C1)		l	18	18	35	35	18	18	18	18	18	18	18	35	35	35
Oil charge (C2)		l					18	18	18	35	35	35	35	35	35	35
Refrigerant charge (C1)		kg	44	48	71	85	48	49	51	49	53	53	56	100	103	105
Refrigerant charge (C2)		kg					46	47	49	74	86	86	92	84	86	89
Refrigeration circuits		Nr	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Internal exchanger (evaporator)																
Type of internal exchanger	2		S&T													
N. of internal exchanger		Nr	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water content		l	150	214	365	292	292	283	506	536	518	518	953	931	917	902
External exchanger (condenser)																
Type of external exchanger	3		CCM													
Number of coils		Nr	4	4	6	8	8	8	8	10	12	12	12	16	16	16
External Section Fans																
Type of fans	4		AX													
Number of fans		Nr	4	4	6	8	8	8	8	10	12	12	12	16	16	16
Type of motor	5		EC													
Standard airflow		l/s	21667	21667	32500	43333	43333	43333	43333	54167	65000	65000	65000	86667	86667	86667
Connections																
Water fittings			6"	6"	6"	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"	8"
Power supply																
Standard power supply			400/3~/50													
Electrical data																
F.L.A. - Total		A	193,6	236,9	341,7	422,6	390,7	434,0	473,5	536,9	617,8	659,2	723,2	844,9	908,9	972,9
F.L.I. - Total		kW	119,5	148,0	212,2	262,7	241,4	269,8	295,8	332,8	383,3	410,5	450,5	525,2	565,2	605,2
M.I.C. - Value	6	A	193,6	236,9	341,7	422,6	390,7	434,0	473,5	536,9	617,8	659,2	723,2	844,9	908,9	972,9

1. ISW = Double screw compressor
2. S&T = Shell and tube
3. CCM = Full aluminium microchannel coils
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.

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 - Excellence

Standard acoustic configuration (ST)

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)
120.1	74	72	72	84	95	91	81	66	77	97
160.1	81	80	76	88	93	93	82	67	77	97
200.1	82	74	84	91	94	91	86	75	77	97
240.1	87	90	80	88	95	90	90	73	77	98
250.1	71	63	75	89	100	90	75	62	79	101
280.2	77	69	78	92	100	92	76	62	80	101
320.2	79	71	80	94	99	93	77	63	80	101
340.2	78	65	85	94	101	91	79	69	80	102
360.2	82	78	81	92	101	90	82	67	80	102
400.2	83	79	82	94	101	92	82	67	80	102
440.2	78	71	83	99	101	96	82	70	81	103
480.2	85	82	84	94	102	90	85	70	80	103
540.2	83	80	85	99	102	95	85	72	81	104
580.2	69	68	84	101	101	97	85	73	81	104

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

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)
120.1	66	68	71	79	91	87	78	65	73	93
160.1	74	76	76	83	90	90	80	66	74	94
200.1	75	71	83	85	90	89	83	74	73	94
240.1	80	86	79	84	92	88	87	72	74	95
250.1	63	59	74	84	96	87	72	60	76	97
280.2	70	66	78	88	97	89	74	62	77	98
320.2	73	68	80	89	97	90	75	62	77	98
340.2	71	61	84	89	97	88	76	67	76	98
360.2	76	76	82	89	99	89	80	67	78	100
400.2	77	76	83	91	99	91	80	67	78	100
440.2	71	68	83	94	98	93	80	69	78	100
480.2	80	80	85	91	100	90	83	70	78	101
540.2	77	77	84	94	99	93	83	71	78	101
580.2	62	65	84	96	98	94	82	72	78	101

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

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)
120.1	65	67	71	81	86	83	76	62	69	89
160.1	73	74	77	86	86	84	77	63	70	90
200.1	73	67	82	87	86	84	78	69	69	90
240.1	78	83	79	85	87	85	81	68	70	91
250.1	62	57	74	86	92	82	71	58	72	93
280.2	69	63	79	90	93	84	72	59	73	94
320.2	71	65	80	91	92	84	72	59	73	94
340.2	69	58	84	90	92	83	72	63	72	94
360.2	74	73	82	90	95	85	75	64	74	96
400.2	75	73	83	92	94	86	75	64	74	96
440.2	69	64	82	95	93	85	74	65	74	96
480.2	77	76	84	92	96	87	77	66	74	97
540.2	74	73	83	95	94	86	76	66	74	97
580.2	59	61	82	96	93	86	75	67	74	97

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 - Premium

Standard acoustic configuration (ST)

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)
120.1	74	72	71	84	95	91	80	66	78	97
160.1	81	80	76	88	93	93	81	66	78	97
200.1	83	74	84	91	93	91	86	75	77	97
240.1	87	90	80	88	95	90	90	74	77	98
250.1	70	62	73	87	99	89	72	60	79	100
280.2	77	69	78	92	100	91	75	62	81	101
320.2	80	71	80	94	99	93	76	62	80	101
340.2	78	64	84	94	101	91	78	68	81	102
360.2	81	78	81	92	101	90	81	67	81	102
400.2	83	79	83	94	101	92	82	67	81	102
440.2	78	71	83	99	100	96	82	71	81	103
480.2	86	82	84	94	102	90	85	70	81	103
540.2	82	79	84	100	102	96	85	72	82	104
580.2	69	68	84	101	100	97	85	73	82	104

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

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)
120.1	67	69	70	79	91	87	77	65	74	93
160.1	75	77	77	84	90	90	79	66	75	94
200.1	76	71	84	86	90	88	83	74	74	94
240.1	80	87	80	84	92	88	87	73	74	95
250.1	64	59	73	83	96	86	70	60	76	97
280.2	70	65	77	86	96	88	72	60	76	97
320.2	73	69	80	89	96	90	74	62	77	98
340.2	71	61	84	88	97	87	75	67	77	98
360.2	74	74	79	86	97	87	77	65	76	98
400.2	77	76	83	90	98	90	80	67	78	99
440.2	71	68	83	94	98	93	80	70	78	100
480.2	79	79	84	90	99	88	82	69	78	100
540.2	75	75	84	94	98	92	82	71	78	100
580.2	63	66	85	97	98	95	82	73	79	101

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.

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)
120.1	67	68	72	82	87	82	75	63	70	89
160.1	75	76	78	87	86	84	76	64	71	90
200.1	74	68	84	88	85	83	78	70	70	90
240.1	79	84	80	85	87	84	81	69	70	91
250.1	64	58	75	86	92	81	68	58	72	93
280.2	69	63	78	89	91	81	69	58	72	93
320.2	72	66	81	92	92	83	70	59	73	94
340.2	70	59	84	91	92	82	71	64	73	94
360.2	73	72	80	89	93	82	72	62	72	94
400.2	75	73	83	92	93	84	73	63	74	95
440.2	69	65	83	96	92	84	73	66	74	96
480.2	77	76	84	92	94	85	76	65	74	96
540.2	73	72	83	96	93	84	74	66	74	96
580.2	60	62	83	98	92	85	74	68	75	97

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

Correction factors for ethylene glycol use

% ETHYLENE GLYCOL BY WEIGHT		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2,0	-3,9	-6,5	-8,9	-11,8	-15,6	-19,0	-23,4	-27,8	-32,7
Safety temperature	°C	3,0	1,0	-1,0	-4,0	,6,0	-10,0	-14,0	-19,0	-23,8	-29,4
Cooling Capacity Factor	kW	0,995	0,989	0,983	0,977	0,971	0,964	0,956	0,949	0,941	0,933
Compressor power input Factor	kW	0,998	0,997	0,995	0,994	0,992	0,990	0,989	0,987	0,986	0,984
Internal exchanger pressure drop factor	kW	1,041	1,085	1,131	1,180	1,231	1,285	1,341	1,400	1,461	1,525

Correction factors for propylene glycol use

% PROPYLENE GLYCOL BY WEIGHT		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2,0	-3,9	-6,5	-8,9	-11,8	-15,6	-19,0	-23,4	-27,8	-32,7
Safety temperature	°C	3,0	1,0	-1,0	-4,0	,6,0	-10,0	-14,0	-19,0	-23,8	-29,4
Cooling Capacity Factor	kW	0,993	0,985	0,977	0,968	0,958	0,947	0,936	0,925	0,912	0,899
Compressor power input Factor	kW	0,998	0,995	0,993	0,990	0,987	0,983	0,980	0,976	0,972	0,968
Internal exchanger pressure drop factor	kW	1,052	1,108	1,170	1,237	1,309	1,386	1,467	1,554	1,646	1,743

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 factor

Exchanger operating range

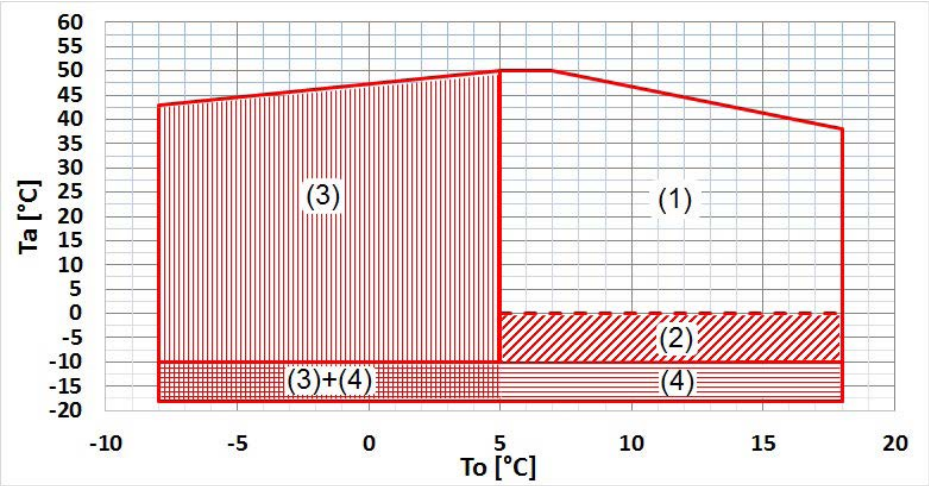
	INTERNAL EXCHANGER (EVAPORATOR)	
	DPR	DPW
PED (CE)	2400	1000

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	2100	1500	-
Antifreeze protection	°C	3	5,5	-
High pressure safety valve	kPa	-	-	2400
Low pressure safety valve	kPa	-	-	1500
Max no. of compressor starts per hour	n°	-	-	6
Discharge safety thermostat	°C	-	-	120

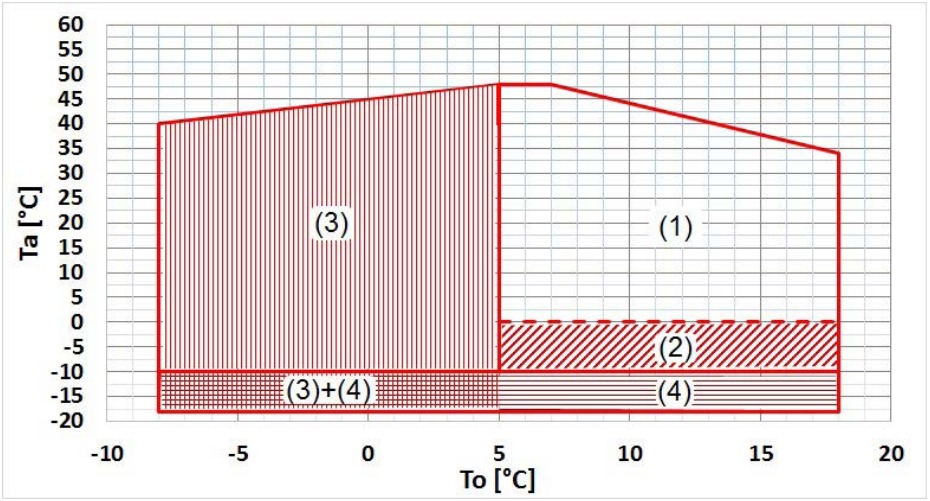
Operating range - Excellence



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. Standard unit operating range with air flow automatic modulation
3. Unit operating range in 'B - Low water temperature' configuration
4. Unit operating range with 'REGBT - Device for the condensing coil partialization'

Operating range - Premium



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. Standard unit operating range with air flow automatic modulation
3. Unit operating range in 'B - Low water temperature' configuration
4. Unit operating range with 'REGBT - Device for the condensing coil partialization'

Excellence

Cooling - ST/SC/EN

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		50	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
120.1	5	308	70,2	292	77,3	275	84,8	254	92,1	233	99,5	212	107
	6	318	71,0	301	78,2	284	85,8	263	93,1	242	101	220	108
	7	328	71,8	311	79,1	294	86,8	272	94,1	251	102	228	109
	10	356	73,9	341	81,4	322	89,3	299	96,7	275	104	-	-
	15	407	78,0	388	85,9	367	93,7	343	102	-	-	-	-
	18	434	80,1	415	88,1	396	96,1	368	104	-	-	-	-
160.1	5	390	91,9	371	100	350	109	325	117	301	127	272	136
	6	403	93,3	383	102	362	111	337	119	312	128	281	138
	7	416	94,7	396	103	374	112	349	120	323	130	291	139
	10	454	98,9	432	107	410	116	383	125	353	134	-	-
	15	517	106	494	115	469	124	440	133	-	-	-	-
	18	553	110	529	119	504	128	472	138	-	-	-	-
200.1	5	523	125	499	136	473	148	444	160	411	173	378	186
	6	540	127	516	138	489	150	459	162	426	175	392	188
	7	558	129	533	140	506	152	474	164	440	177	405	190
	10	607	134	582	146	554	158	517	170	482	183	-	-
	15	695	143	667	155	634	168	592	180	-	-	-	-
	18	743	148	714	161	680	174	634	186	-	-	-	-
240.1	5	622	151	593	163	562	175	526	191	490	207	451	222
	6	643	153	614	166	582	178	545	194	507	210	468	225
	7	664	156	635	168	603	180	564	196	525	212	484	228
	10	724	162	693	175	660	188	619	204	574	220	-	-
	15	830	174	796	187	756	200	715	217	-	-	-	-
	18	889	180	853	195	812	209	769	225	-	-	-	-
250.2	5	625	133	590	147	553	162	515	176	478	191	437	207
	6	646	135	611	149	573	164	535	178	495	193	454	209
	7	668	136	631	150	594	166	554	180	513	194	471	211
	10	732	140	693	154	653	170	612	184	566	200	-	-
	15	838	147	797	162	753	177	708	193	-	-	-	-
	18	902	151	859	166	813	182	766	198	-	-	-	-
280.2	5	703	159	667	173	629	189	581	205	537	222	489	239
	6	724	160	688	175	649	192	602	207	556	224	507	241
	7	745	162	708	177	670	194	623	209	575	226	525	244
	10	803	167	767	183	727	199	681	216	629	233	-	-
	15	907	176	866	193	825	210	781	228	-	-	-	-
	18	964	182	923	199	881	216	838	235	-	-	-	-
320.2	5	775	185	736	201	696	216	644	235	595	253	542	271
	6	799	187	759	203	719	219	667	238	616	256	563	275
	7	822	190	782	206	742	222	690	241	637	259	583	278
	10	893	197	847	214	806	232	755	250	697	268	-	-
	15	1010	209	961	227	915	245	864	265	-	-	-	-
	18	1081	217	1030	235	977	254	932	274	-	-	-	-
340.2	5	838	190	799	209	757	229	705	247	655	267	603	288
	6	867	193	827	211	785	232	731	250	678	270	626	291
	7	896	195	855	214	812	235	757	253	701	273	648	295
	10	983	202	935	221	889	242	832	261	772	282	-	-
	15	1128	215	1075	234	1020	256	963	275	-	-	-	-
	18	1215	222	1159	242	1102	263	1041	284	-	-	-	-
360.2	5	937	217	892	237	842	257	785	279	728	302	668	325
	6	966	220	921	239	871	260	813	282	754	305	693	329
	7	995	222	949	242	901	263	841	285	780	308	717	332
	10	1081	230	1029	251	982	273	920	295	853	319	-	-
	15	1224	243	1170	265	1120	288	1060	312	-	-	-	-
	18	1310	250	1248	273	1200	297	1137	322	-	-	-	-

Excellence
Cooling - ST/SC/EN

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		50	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
400.2	5	1028	241	983	266	930	290	868	311	799	331	733	355
	6	1061	245	1016	270	961	293	897	316	827	335	759	359
	7	1099	248	1048	274	992	297	927	320	859	339	789	363
	10	1194	258	1139	283	1081	308	1010	330	938	351	-	-
	15	1353	275	1293	300	1230	325	1152	348	-	-	-	-
	18	1444	286	1382	309	1315	335	1234	358	-	-	-	-
440.2	5	1132	291	1076	313	1020	333	950	360	878	385	805	410
	6	1169	295	1112	317	1055	338	982	365	909	390	834	415
	7	1206	300	1148	322	1090	343	1014	370	940	395	863	420
	10	1316	313	1256	336	1186	360	1110	384	1032	410	-	-
	15	1492	336	1428	360	1353	384	1264	408	-	-	-	-
	18	1593	349	1527	374	1450	399	1353	423	-	-	-	-
480.2	5	1241	301	1184	325	1126	351	1048	380	976	412	899	445
	6	1283	305	1225	330	1166	356	1086	385	1011	417	932	450
	7	1325	310	1265	334	1205	361	1124	390	1046	423	965	456
	10	1443	325	1381	350	1321	376	1233	408	1145	441	-	-
	15	1651	347	1584	375	1513	403	1423	436	-	-	-	-
	18	1767	360	1698	390	1623	420	1530	451	-	-	-	-
540.2	5	1372	347	1309	374	1244	402	1160	432	1076	462	991	494
	6	1416	353	1351	380	1285	408	1199	438	1113	469	1026	501
	7	1460	358	1394	385	1326	414	1238	443	1150	475	1061	507
	10	1583	373	1513	401	1438	430	1348	461	1255	493	-	-
	15	1792	399	1715	428	1633	459	1534	490	-	-	-	-
	18	1913	415	1832	445	1745	475	1642	508	-	-	-	-
580.2	5	1469	394	1405	419	1332	446	1245	478	1154	512	1062	545
	6	1524	401	1452	426	1378	453	1287	485	1194	519	1099	552
	7	1573	407	1499	432	1423	459	1329	492	1234	526	1136	559
	10	1710	426	1633	454	1552	482	1448	514	1348	547	-	-
	15	1941	457	1858	487	1772	518	1650	548	-	-	-	-
	18	2074	476	1988	506	1898	538	1766	568	-	-	-	-

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
To (°C) = Internal exchanger outlet water temperature (evaporator)
Performances in function of the inlet/outlet water temperature differential = 5°C

Premium
Cooling - ST/SC

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
120.1	5	297	74,4	281	81,7	263	89,3	243	96,4	223	104	210	109
	6	306	75,4	290	82,8	272	90,5	252	97,6	231	105	218	110
	7	316	76,5	299	83,9	281	91,5	260	98,9	239	106	225	111
	10	342	79,5	324	86,7	306	94,7	284	102	-	-	-	-
	15	386	84,6	367	92,1	347	99,9	323	108	-	-	-	-
	18	412	87,7	392	95,4	372	103	346	112	-	-	-	-
160.1	5	357	104	339	112	321	121	294	130	268	139	253	144
	6	368	106	349	114	331	123	304	131	277	140	262	146
	7	378	107	360	116	341	125	313	133	288	142	273	148
	10	411	113	391	121	370	130	342	139	-	-	-	-
	15	460	122	437	131	413	139	384	148	-	-	-	-
	18	489	127	468	136	442	144	412	154	-	-	-	-
200.1	5	492	135	468	147	444	160	414	172	383	184	363	192
	6	508	137	484	150	459	163	427	175	395	187	375	195
	7	524	140	499	152	473	165	441	177	408	189	387	197
	10	569	147	543	158	514	172	480	184	-	-	-	-
	15	646	158	617	170	584	183	545	196	-	-	-	-
	18	690	165	660	177	624	190	582	203	-	-	-	-
240.1	5	600	159	571	171	540	184	505	199	467	215	444	226
	6	620	162	590	174	559	187	522	202	483	218	459	229
	7	640	164	609	177	577	190	539	205	500	221	474	231
	10	695	172	664	185	630	198	587	213	-	-	-	-
	15	789	186	755	199	716	213	669	229	-	-	-	-
	18	843	194	808	209	763	223	716	238	-	-	-	-
250.2	5	574	149	550	164	516	179	477	193	435	208	406	217
	6	592	151	568	166	534	181	493	195	450	210	420	220
	7	610	153	586	168	551	183	509	198	466	213	434	222
	10	665	160	637	174	600	189	554	204	-	-	-	-
	15	756	170	716	185	680	200	633	216	-	-	-	-
	18	811	176	769	192	732	207	677	223	-	-	-	-
280.2	5	652	179	615	193	578	207	533	225	487	242	459	253
	6	673	182	635	196	597	210	551	228	504	245	474	256
	7	693	185	655	199	615	214	568	231	520	249	489	259
	10	752	193	712	209	668	224	618	241	-	-	-	-
	15	854	208	807	224	758	240	702	257	-	-	-	-
	18	911	217	862	233	809	249	750	266	-	-	-	-
320.2	5	724	208	683	225	641	242	591	259	540	277	509	288
	6	747	212	705	229	661	246	610	263	558	280	524	291
	7	770	216	727	232	682	249	629	267	576	284	539	294
	10	836	227	791	244	738	260	682	278	-	-	-	-
	15	951	247	902	264	833	278	776	296	-	-	-	-
	18	1015	258	964	276	893	289	828	308	-	-	-	-
340.2	5	791	210	750	230	708	250	656	269	604	288	572	301
	6	816	213	774	233	731	253	678	273	625	292	591	305
	7	840	217	798	236	754	257	700	276	645	296	610	309
	10	910	226	865	245	818	266	761	286	-	-	-	-
	15	1034	242	979	262	932	283	865	304	-	-	-	-
	18	1108	252	1050	272	995	293	929	315	-	-	-	-
360.2	5	875	235	831	254	784	273	730	297	673	321	640	335
	6	904	238	859	257	811	277	754	301	695	325	662	339
	7	933	242	887	261	837	281	778	305	718	329	684	343
	10	1019	253	966	274	916	295	846	318	-	-	-	-
	15	1163	272	1106	294	1046	317	967	339	-	-	-	-
	18	1250	283	1189	305	1126	329	1039	351	-	-	-	-

Premium
Cooling - ST/SC

SIZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
400.2	5	951	264	909	282	856	302	796	326	722	350	688	368
	6	983	269	937	286	884	307	822	331	746	355	707	370
	7	1019	273	966	295	911	311	848	336	771	359	726	376
	10	1107	287	1046	308	990	328	922	350	-	-	-	-
	15	1256	310	1183	330	1121	351	1047	373	-	-	-	-
	18	1343	324	1262	344	1197	364	1119	387	-	-	-	-
440.2	5	1059	309	1005	330	947	351	879	376	809	403	767	420
	6	1091	314	1036	335	977	356	907	382	836	408	788	425
	7	1123	319	1066	340	1007	361	935	387	862	414	809	429
	10	1212	336	1153	358	1090	381	1014	406	-	-	-	-
	15	1369	361	1305	384	1231	410	1154	433	-	-	-	-
	18	1456	378	1390	401	1312	429	1231	452	-	-	-	-
480.2	5	1176	319	1114	343	1053	369	983	399	912	430	869	451
	6	1214	324	1149	348	1087	374	1014	405	943	436	900	457
	7	1251	329	1185	354	1121	379	1045	410	974	442	930	463
	10	1362	346	1292	371	1220	398	1139	428	-	-	-	-
	15	1548	371	1471	398	1392	426	1296	455	-	-	-	-
	18	1660	386	1578	414	1495	442	1390	471	-	-	-	-
540.2	5	1289	362	1226	387	1163	413	1081	444	1001	477	950	498
	6	1330	368	1266	393	1200	419	1117	451	1034	483	982	505
	7	1371	374	1305	399	1241	425	1154	457	1068	490	1014	511
	10	1487	393	1418	420	1341	446	1256	479	-	-	-	-
	15	1690	423	1617	451	1518	477	1435	512	-	-	-	-
	18	1804	444	1728	472	1620	497	1535	534	-	-	-	-
580.2	5	1403	409	1332	434	1258	460	1170	493	1080	526	1024	548
	6	1445	416	1373	441	1298	468	1208	500	1116	533	1059	555
	7	1488	423	1414	448	1339	474	1245	507	1152	541	1093	563
	10	1616	445	1538	472	1449	499	1359	532	-	-	-	-
	15	1820	482	1735	509	1638	537	1540	572	-	-	-	-
	18	1938	505	1849	533	1747	562	1644	597	-	-	-	-

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
To (°C) = Internal exchanger outlet water temperature (evaporator)
Performances in function of the inlet/outlet water temperature differential = 5°C

Premium
Cooling - EN

GRANDEZZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
120.1	5	282	69,9	267	76,8	250	84,0	231	90,7	212	98,0	200	102
	6	291	70,9	275	77,8	259	85,1	239	91,8	219	99,0	207	103
	7	300	71,9	284	78,8	267	86,1	247	92,9	227	100	214	104
	10	325	74,7	308	81,5	291	89,0	269	95,8	-	-	-	-
	15	367	79,5	349	86,6	330	93,9	307	101	-	-	-	-
	18	391	82,4	373	89,7	353	97,2	329	105	-	-	-	-
160.1	5	339	97,6	322	105	305	114	279	122	255	130	240	135
	6	349	99,3	332	107	314	115	288	124	263	132	249	137
	7	360	101	342	109	324	117	298	125	274	134	260	139
	10	390	106	372	114	351	122	325	131	-	-	-	-
	15	437	114	415	123	392	131	364	139	-	-	-	-
	18	465	119	445	128	420	136	391	145	-	-	-	-
200.1	5	467	127	445	138	422	151	393	162	364	173	345	181
	6	482	129	459	141	436	153	406	164	376	176	357	183
	7	498	131	474	143	450	155	419	166	387	178	368	186
	10	541	138	516	149	488	161	456	173	-	-	-	-
	15	613	149	586	160	554	172	517	184	-	-	-	-
	18	655	155	627	167	593	179	553	191	-	-	-	-
240.1	5	570	149	543	161	513	173	480	187	444	202	422	212
	6	589	152	561	164	531	175	496	190	459	205	436	215
	7	608	154	579	166	549	178	512	193	475	208	451	218
	10	661	162	630	174	599	186	558	201	-	-	-	-
	15	750	175	717	187	680	200	635	215	-	-	-	-
	18	801	182	768	196	725	209	680	224	-	-	-	-
250.2	5	557	143	533	157	501	172	462	185	422	199	393	208
	6	574	145	551	159	518	174	478	188	437	202	407	211
	7	592	147	568	161	534	176	493	190	452	204	421	213
	10	645	153	618	167	582	181	537	196	-	-	-	-
	15	734	163	694	178	660	192	614	207	-	-	-	-
	18	787	169	746	184	710	199	657	214	-	-	-	-
280.2	5	626	170	591	183	555	197	512	213	468	230	441	240
	6	646	173	610	186	573	200	529	216	484	233	455	243
	7	666	175	629	189	591	203	545	219	499	236	469	246
	10	722	184	683	198	642	212	593	229	-	-	-	-
	15	820	197	775	213	727	228	673	244	-	-	-	-
	18	875	206	827	221	777	237	720	253	-	-	-	-
320.2	5	695	198	655	213	616	230	567	246	519	263	489	273
	6	717	201	677	217	635	233	586	250	536	266	503	276
	7	739	205	698	221	654	237	604	253	552	270	518	280
	10	802	216	759	232	708	247	655	264	-	-	-	-
	15	913	234	866	251	800	264	745	282	-	-	-	-
	18	975	245	925	262	857	275	795	292	-	-	-	-
340.2	5	759	200	720	218	679	237	630	255	580	274	549	286
	6	783	203	743	221	701	241	651	259	600	278	567	290
	7	807	206	766	224	724	244	672	262	619	281	586	293
	10	874	215	831	233	785	253	731	271	-	-	-	-
	15	992	230	940	249	895	269	830	289	-	-	-	-
	18	1063	239	1008	259	956	279	892	299	-	-	-	-
360.2	5	832	221	789	238	744	257	693	279	639	302	608	315
	6	859	224	816	242	770	261	716	283	661	306	629	319
	7	886	228	843	246	796	264	739	286	682	310	650	323
	10	968	238	918	258	870	277	804	299	-	-	-	-
	15	1105	255	1050	276	993	298	918	318	-	-	-	-
	18	1187	266	1130	287	1070	309	987	330	-	-	-	-

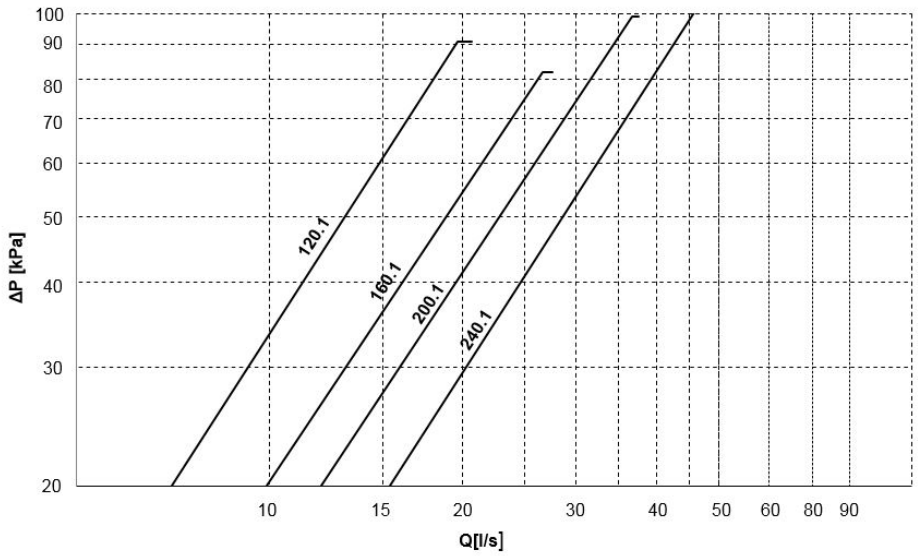
Premium
Cooling - EN

GRANDEZZE	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		48	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
400.2	5	904	248	863	265	813	284	756	307	686	329	654	346
	6	933	253	890	269	840	288	781	311	709	333	672	348
	7	968	257	918	277	866	292	805	316	732	338	690	353
	10	1052	270	994	290	940	308	876	329	-	-	-	-
	15	1194	291	1124	310	1065	330	994	351	-	-	-	-
	18	1275	304	1199	323	1137	343	1063	364	-	-	-	-
440.2	5	1006	291	955	310	900	330	835	354	769	379	729	395
	6	1036	296	984	315	928	335	861	359	794	384	748	399
	7	1067	300	1013	320	957	339	888	364	819	389	768	404
	10	1151	316	1095	336	1035	359	963	381	-	-	-	-
	15	1301	340	1240	361	1169	386	1096	407	-	-	-	-
	18	1384	356	1320	377	1246	403	1170	425	-	-	-	-
480.2	5	1118	300	1058	323	1000	346	933	375	866	405	826	424
	6	1153	304	1092	327	1033	352	963	380	896	410	855	430
	7	1188	309	1126	332	1065	356	993	385	926	416	883	435
	10	1294	325	1228	349	1159	374	1082	402	-	-	-	-
	15	1471	349	1398	374	1323	400	1231	427	-	-	-	-
	18	1577	363	1500	389	1421	416	1320	442	-	-	-	-
540.2	5	1225	340	1164	363	1105	388	1027	417	951	448	902	468
	6	1264	346	1202	369	1140	394	1062	424	982	454	933	474
	7	1302	351	1240	375	1179	399	1096	430	1014	461	964	481
	10	1412	370	1347	394	1274	419	1193	450	-	-	-	-
	15	1606	398	1536	424	1442	448	1363	481	-	-	-	-
	18	1713	417	1641	443	1539	468	1459	502	-	-	-	-
580.2	5	1332	385	1265	408	1195	433	1111	463	1026	494	973	515
	6	1373	391	1305	415	1233	440	1147	470	1060	501	1006	522
	7	1413	397	1344	421	1272	445	1183	477	1094	508	1038	529
	10	1535	419	1461	443	1377	469	1291	500	-	-	-	-
	15	1729	453	1648	479	1556	505	1463	538	-	-	-	-
	18	1841	474	1757	501	1660	528	1562	561	-	-	-	-

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
To (°C) = Internal exchanger outlet water temperature (evaporator)
Performances in function of the inlet/outlet water temperature differential = 5°C

Excellence

Internal exchanger (evaporator) pressure drop - Size 120.1 ÷ 240.1



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)

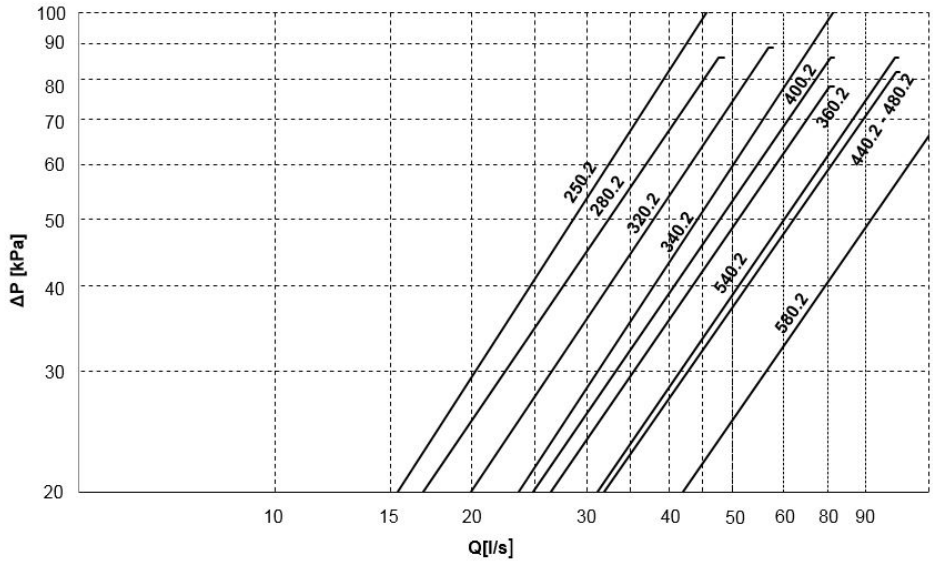
kWf = Cooling capacity in kW
DT = Temperature difference between inlet / outlet water

Admissible water flow-rates

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

SIZE		120.1	160.1	200.1	240.1
Qmin	[l/s]	7,0	9,9	12,0	15,4
Qmax	[l/s]	19,6	26,6	36,6	48,0

Internal exchanger (evaporator) pressure drop - Size 250.2 ÷ 580.2



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

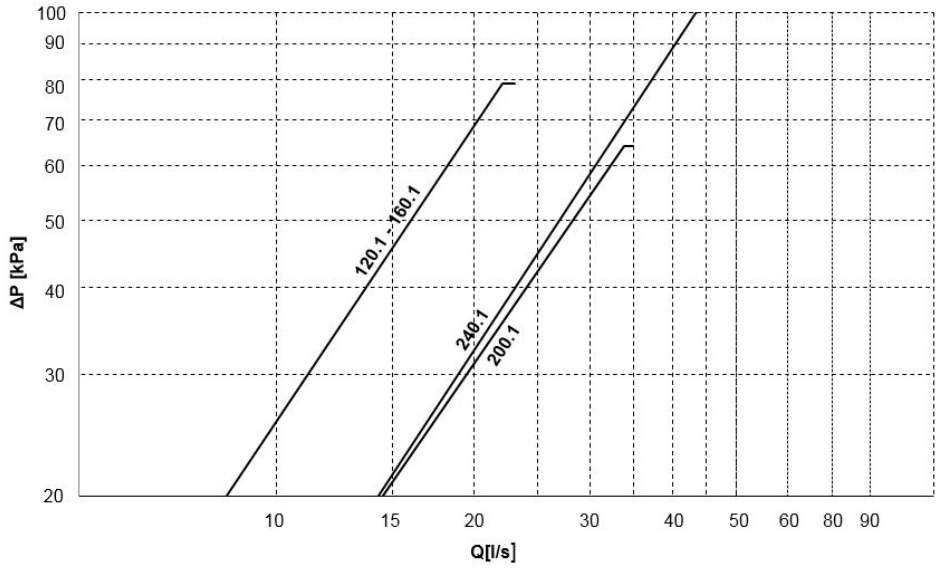
Admissible water flow-rates

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

SIZE		250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Qmin	[l/s]	15,4	16,9	19,9	23,6	26,4	24,8	31,9	31,9	31,2	42,2
Qmax	[l/s]	48,0	47,6	56,9	73,2	70,7	70,8	88,4	88,4	88,8	118,4

Premium

Internal exchanger (evaporator) pressure drop - Size 120.1 ÷ 240.1



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)

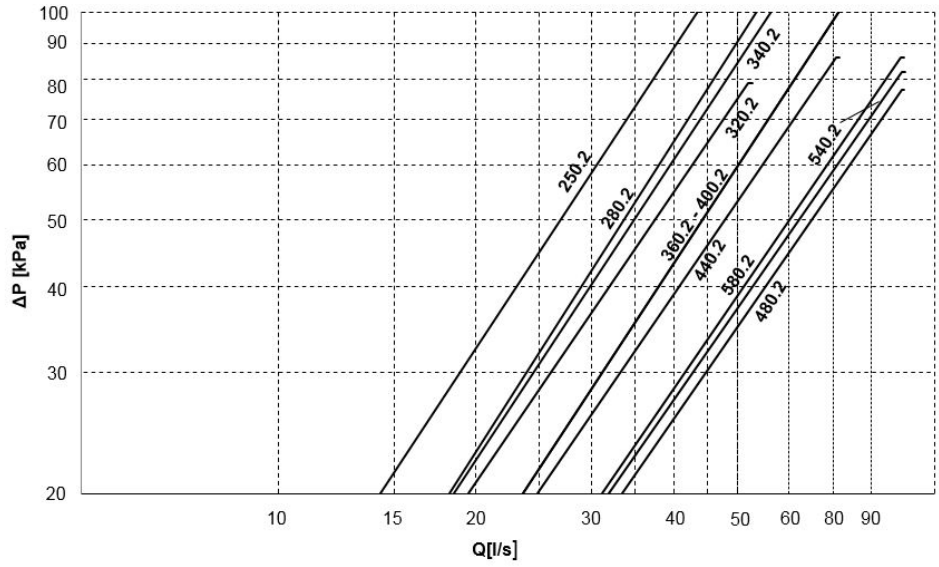
kWf = Cooling capacity in kW
DT = Temperature difference between inlet / outlet water

Admissible water flow-rates

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

SIZE		120.1	160.1	200.1	240.1
Qmin	[l/s]	8,4	8,4	14,5	14,3
Qmax	[l/s]	22,0	22,0	33,9	43,8

Internal exchanger (evaporator) pressure drop - Size 250.2 ÷ 580.2



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

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

SIZE		250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Qmin	[l/s]	14,3	18,2	16,9	18,5	23,6	23,6	24,8	33,5	31,9	31,2
Qmax	[l/s]	43,8	55,0	47,6	57,1	73,2	73,2	70,8	89,1	89,1	88,8

Excellence

Cooling at part load - ST/SC/EN

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
120.1	100	294	92,5	3,18	311	84,8	3,67	328	77,5	4,23	344	70,7	4,87
	75	221	65,6	3,36	233	59,6	3,91	246	54,7	4,50	258	49,9	5,17
	50	147	41,1	3,58	155	36,6	4,25	164	32,8	4,99	172	29,3	5,86
	25	75,0	22,2	3,38	84,0	19,2	4,38	91,0	16,6	5,48	98,0	14,3	6,85
	Min	-	-	-	-	-	-	-	-	-	-	-	-
160.1	100	374	119	3,15	396	110	3,61	416	102	4,10	429	93,5	4,59
	75	280	86,5	3,24	297	79,5	3,74	312	72,8	4,29	322	65,4	4,92
	50	187	54,4	3,44	198	48,8	4,06	208	44,0	4,73	214	38,7	5,54
	25	97,0	30,0	3,23	108	26,2	4,12	118	22,7	5,20	127	19,6	6,48
	Min	-	-	-	-	-	-	-	-	-	-	-	-
200.1	100	506	161	3,14	533	149	3,58	558	138	4,06	581	127	4,57
	75	380	121	3,14	400	110	3,64	419	99,7	4,20	436	90,4	4,82
	50	253	75,0	3,37	266	66,5	4,01	279	59,0	4,73	291	52,3	5,55
	25	145	45,6	3,18	161	40,0	4,02	175	35,0	5,00	188	30,8	6,10
	Min	-	-	-	-	-	-	-	-	-	-	-	-
240.1	100	603	192	3,15	635	179	3,55	664	167	3,98	693	154	4,49
	75	452	135	3,36	476	124	3,85	498	113	4,41	520	104	5,00
	50	301	81,0	3,72	318	72,8	4,36	332	65,3	5,09	346	59,0	5,87
	25	153	43,9	3,49	168	38,4	4,38	182	33,6	5,42	195	29,6	6,59
	Min	-	-	-	-	-	-	-	-	-	-	-	-
290.1	100	594	179	3,32	631	164	3,85	668	150	4,47	702	137	5,13
	75	445	124	3,60	473	113	4,17	501	104	4,80	527	95,5	5,51
	50	297	78,7	3,77	316	70,4	4,48	334	63,5	5,26	351	57,3	6,12
	25	148	41,8	3,55	158	34,7	4,55	167	29,2	5,72	175	25,0	7,03
	Min	77,0	23,3	3,30	86,0	20,3	4,24	93,0	17,8	5,22	100	15,6	6,41
250.2	100	670	207	3,23	708	191	3,71	745	176	4,24	780	161	4,84
	75	503	149	3,38	531	136	3,90	559	124	4,49	585	114	5,14
	50	335	94,3	3,55	354	84,3	4,20	373	75,5	4,93	390	67,8	5,75
	25	167	50,2	3,33	177	41,7	4,25	186	35,0	5,32	195	29,5	6,61
	Min	86,0	27,4	3,14	95,0	24,1	3,94	104	21,0	4,95	112	18,4	6,09
280.2	100	742	235	3,15	782	220	3,56	822	203	4,05	860	187	4,60
	75	556	172	3,24	587	157	3,73	617	144	4,28	645	132	4,90
	50	371	109	3,40	391	97,6	4,01	411	87,4	4,70	430	78,2	5,50
	25	186	58,5	3,17	195	48,4	4,04	205	40,4	5,08	215	34,0	6,31
	Min	95,0	31,6	3,01	106	27,8	3,81	116	24,3	4,77	125	21,2	5,90
320.2	100	812	250	3,24	855	230	3,72	896	211	4,25	940	194	4,85
	75	609	181	3,37	641	164	3,90	672	149	4,50	705	137	5,14
	50	406	113	3,59	427	100	4,26	448	89,0	5,03	470	80,0	5,88
	25	203	60,4	3,36	214	50,4	4,24	224	42,4	5,28	235	36,4	6,45
	Min	114	35,5	3,21	126	31,2	4,04	137	27,4	5,00	147	24,2	6,07
360.2	100	901	281	3,21	949	260	3,65	995	240	4,15	1038	221	4,70
	75	676	195	3,47	712	178	4,00	746	163	4,58	778	149	5,23
	50	451	120	3,76	475	107	4,43	497	96,1	5,18	519	86,4	6,00
	25	225	63,9	3,53	237	53,3	4,45	249	45,1	5,51	260	38,6	6,72
	Min	115	34,9	3,30	127	30,7	4,14	138	27,0	5,11	148	23,9	6,19
400.2	100	992	315	3,15	1048	291	3,60	1099	266	4,13	1131	246	4,60
	75	744	224	3,32	786	206	3,81	824	189	4,36	848	170	4,99
	50	496	137	3,62	524	124	4,24	549	111	4,95	565	98,5	5,74
	25	248	73,8	3,36	262	61,6	4,25	275	52,1	5,28	283	43,8	6,46
	Min	123	38,7	3,18	136	34,1	3,99	148	30,0	4,93	158	26,5	5,96

Excellence

Cooling at part load - ST/SC/EN

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
440.2	100	1090	361	3,02	1148	340	3,38	1206	318	3,79	1260	297	4,25
	75	817	256	3,20	861	235	3,66	905	217	4,16	945	200	4,73
	50	545	153	3,56	574	137	4,18	603	124	4,88	630	111	5,65
	25	272	81,1	3,36	287	67,6	4,25	301	56,8	5,31	315	48,0	6,56
	0	139	43,7	3,18	154	38,3	4,02	167	33,5	4,99	179	29,3	6,11
480.2	100	1205	383	3,15	1265	357	3,55	1325	332	3,99	1368	309	4,43
	75	904	269	3,36	949	246	3,86	994	224	4,44	1026	204	5,04
	50	603	162	3,73	632	145	4,37	662	130	5,09	684	116	5,89
	25	301	86,6	3,48	316	72,5	4,36	331	61,4	5,39	342	52,4	6,52
	Min	152	46,6	3,26	168	41,1	4,09	182	36,3	5,01	195	32,3	6,04
540.2	100	1326	436	3,04	1394	407	3,42	1460	380	3,84	1522	354	4,29
	75	994	308	3,23	1046	283	3,69	1095	261	4,20	1142	240	4,75
	50	663	181	3,67	697	162	4,29	730	146	4,99	761	132	5,76
	25	332	96,1	3,45	349	80,2	4,35	365	67,6	5,40	381	57,8	6,59
	Min	167	51,0	3,27	183	44,8	4,08	199	39,4	5,05	213	34,7	6,14
580.2	100	1423	482	2,95	1499	455	3,30	1573	429	3,67	1634	403	4,06
	75	1067	335	3,18	1124	310	3,63	1180	287	4,11	1225	264	4,64
	50	711	195	3,65	749	175	4,28	786	158	4,97	817	142	5,75
	25	356	103	3,47	375	85,8	4,37	393	72,2	5,45	408	61,1	6,69
	Min	183	55,4	3,30	201	48,5	4,14	218	42,5	5,13	233	37,2	6,26

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 - ST/SC

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
120.1	100	281	96,1	2,92	299	88,5	3,38	316	81,1	3,90	332	74,4	4,46
	75	211	64,3	3,28	224	59,0	3,80	237	54,3	4,37	249	49,7	5,01
	50	140	41,1	3,42	150	36,7	4,07	158	32,9	4,80	166	29,7	5,60
	25	74,0	22,7	3,26	83,0	19,7	4,21	90,0	17,0	5,29	97,0	14,7	6,60
	Min	-	-	-	-	-	-	-	-	-	-	-	-
160.1	100	341	129	2,64	360	120	2,99	378	112	3,38	396	104	3,81
	75	256	87,5	2,92	270	80,3	3,36	284	73,3	3,87	297	67,1	4,43
	50	170	56,6	3,01	180	50,6	3,56	189	45,1	4,19	198	40,1	4,93
	25	90,0	31,8	2,83	90,0	31,8	2,83	111	24,4	4,55	120	21,2	5,66
	Min	-	-	-	-	-	-	-	-	-	-	-	-
200.1	100	473	172	2,75	499	159	3,14	524	146	3,58	547	136	4,04
	75	355	117	3,03	374	106	3,51	393	96,9	4,05	410	88,2	4,65
	50	237	74,9	3,16	249	66,2	3,77	262	58,7	4,46	274	52,0	5,26
	25	142	47,4	3,00	158	41,7	3,79	172	36,6	4,70	186	32,1	5,79
	Min	-	-	-	-	-	-	-	-	-	-	-	-
240.1	100	577	198	2,91	609	186	3,28	640	173	3,70	668	161	4,14
	75	433	130	3,32	457	120	3,80	480	110	4,35	501	102	4,93
	50	289	80,6	3,58	304	72,3	4,21	320	65,1	4,91	334	58,8	5,68
	25	150	44,5	3,37	166	39,0	4,26	180	34,2	5,26	193	30,0	6,43
	Min	-	-	-	-	-	-	-	-	-	-	-	-
250.2	100	551	192	2,87	586	177	3,31	610	162	3,76	645	149	4,32
	75	413	126	3,28	439	115	3,81	457	104	4,41	484	95,6	5,06
	50	276	81,1	3,40	293	72,3	4,05	305	63,7	4,79	322	57,4	5,62
	25	138	42,9	3,21	146	35,5	4,13	152	29,4	5,19	161	25,0	6,46
	Min	73,0	24,1	3,03	82,0	21,0	3,90	89,0	18,3	4,86	96,0	16,0	6,00
280.2	100	615	223	2,76	655	208	3,15	693	194	3,58	730	179	4,08
	75	461	150	3,08	491	138	3,56	520	127	4,10	548	117	4,69
	50	308	96,8	3,18	327	86,8	3,77	347	78,1	4,44	365	70,2	5,20
	25	154	51,8	2,97	164	43,0	3,81	173	36,2	4,79	182	30,7	5,94
	Min	81,0	28,6	2,83	91,0	25,2	3,61	100	22,0	4,55	108	19,3	5,60
320.2	100	682	258	2,64	727	242	3,01	770	225	3,42	810	209	3,88
	75	511	176	2,91	545	162	3,36	578	150	3,85	607	138	4,41
	50	341	114	2,99	364	103	3,53	385	92,6	4,16	405	83,3	4,86
	25	170	61,4	2,78	182	51,3	3,55	192	43,2	4,46	202	36,4	5,56
	Min	88,0	33,1	2,66	99,0	29,2	3,39	109	25,7	4,24	118	22,4	5,27
340.2	100	754	268	2,81	798	248	3,22	840	228	3,69	880	210	4,19
	75	566	181	3,12	599	166	3,61	630	151	4,17	660	138	4,78
	50	377	116	3,25	399	103	3,87	420	91,7	4,58	440	81,5	5,39
	25	189	61,8	3,05	199	51,6	3,87	210	43,6	4,82	226	38,0	5,94
	Min	107	36,7	2,92	120	32,3	3,72	131	28,4	4,61	141	25,0	5,64
360.2	100	837	295	2,84	887	275	3,23	933	256	3,65	981	236	4,16
	75	628	187	3,35	665	172	3,87	700	158	4,43	736	146	5,06
	50	418	118	3,54	444	106	4,19	467	94,8	4,92	490	85,7	5,72
	25	209	62,9	3,33	222	52,7	4,21	233	44,5	5,24	245	38,3	6,40
	Min	113	35,7	3,17	125	31,4	3,98	136	27,6	4,93	146	24,4	5,98
400.2	100	911	325	2,81	966	308	3,13	1019	287	3,55	1056	266	3,97
	75	683	212	3,22	725	196	3,70	764	180	4,24	792	163	4,85
	50	455	134	3,39	483	121	4,00	510	109	4,68	528	96,7	5,46
	25	228	71,9	3,17	242	60,5	3,99	255	51,2	4,97	264	43,3	6,10
	Min	121	40,1	3,02	134	35,4	3,79	146	31,2	4,68	158	27,5	5,75

Premium

Cooling at part load - ST/SC

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
440.2	100	1007	374	2,69	1066	354	3,01	1123	333	3,37	1176	313	3,76
	75	755	242	3,12	800	224	3,58	842	207	4,08	882	191	4,63
	50	504	151	3,34	533	135	3,93	561	122	4,61	588	109	5,37
	25	252	80,1	3,14	267	67,1	3,97	281	56,4	4,98	294	47,8	6,15
	0	134	44,7	3,00	149	39,3	3,79	163	34,4	4,74	175	30,1	5,81
480.2	100	1121	397	2,82	1185	372	3,19	1251	347	3,61	1314	323	4,07
	75	841	250	3,37	889	229	3,87	938	212	4,42	986	197	5,01
	50	561	156	3,59	593	140	4,24	626	126	4,95	657	114	5,74
	25	280	83,5	3,36	296	70,1	4,22	313	59,9	5,22	329	51,8	6,34
	Min	150	47,1	3,18	165	41,5	3,98	180	36,7	4,90	192	32,6	5,89
540.2	100	1241	443	2,80	1305	417	3,13	1371	392	3,50	1433	367	3,90
	75	931	282	3,29	979	259	3,77	1028	240	4,29	1075	221	4,86
	50	621	173	3,58	653	155	4,21	685	139	4,91	717	126	5,70
	25	310	91,9	3,38	326	76,8	4,25	343	65,0	5,27	358	55,6	6,44
	Min	166	51,5	3,22	182	45,3	4,02	198	39,8	4,97	212	35,1	6,04
580.2	100	1339	492	2,72	1414	466	3,03	1488	441	3,38	1558	416	3,74
	75	1004	314	3,20	1060	291	3,65	1116	270	4,14	1168	250	4,67
	50	669	191	3,51	707	171	4,12	744	154	4,82	779	139	5,59
	25	335	101	3,32	353	84,2	4,20	372	71,2	5,23	389	60,7	6,42
	Min	179	56,4	3,17	197	49,4	3,99	214	43,2	4,95	229	37,9	6,04

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)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
120.1	100	267	90,7	2,94	284	83,4	3,41	300	76,5	3,92	315	70,2	4,49
	75	200	60,7	3,30	213	55,5	3,84	225	50,9	4,42	236	46,5	5,08
	50	133	39,2	3,41	142	34,8	4,08	150	31,1	4,83	157	27,8	5,66
	25	74,0	22,7	3,26	83,0	19,7	4,21	90,0	17,0	5,29	97,0	14,7	6,60
	Min	-	-	-	-	-	-	-	-	-	-	-	-
160.1	100	324	122	2,66	342	114	3,01	360	106	3,41	376	97,9	3,84
	75	243	82,8	2,94	257	75,7	3,39	270	69,1	3,91	282	62,8	4,49
	50	162	54,0	3,00	171	48,0	3,56	180	42,7	4,21	188	37,7	4,98
	25	90,0	31,8	2,83	101	28,0	3,61	111	24,4	4,55	120	21,2	5,66
	Min	-	-	-	-	-	-	-	-	-	-	-	-
200.1	100	450	162	2,78	474	150	3,16	498	138	3,61	519	128	4,06
	75	338	110	3,07	355	99,4	3,58	373	90,3	4,14	389	81,8	4,76
	50	225	71,5	3,15	237	62,9	3,77	249	55,5	4,48	260	48,8	5,31
	25	142	47,4	3,00	158	41,7	3,79	172	36,6	4,70	186	32,1	5,79
	Min	-	-	-	-	-	-	-	-	-	-	-	-
240.1	100	549	187	2,93	579	175	3,31	608	163	3,72	635	152	4,18
	75	412	123	3,35	434	113	3,85	456	103	4,41	476	94,9	5,02
	50	274	76,9	3,57	290	68,7	4,21	304	61,6	4,94	317	55,4	5,73
	25	150	44,5	3,37	166	39,0	4,26	180	34,2	5,26	193	30,0	6,43
	Min	-	-	-	-	-	-	-	-	-	-	-	-
250.2	100	534	185	2,89	568	170	3,33	592	156	3,79	626	144	4,36
	75	400	122	3,29	426	111	3,83	444	100	4,44	470	92,1	5,10
	50	267	78,7	3,39	284	70,1	4,05	296	61,5	4,81	313	55,4	5,65
	25	134	41,7	3,20	142	34,5	4,12	148	28,6	5,18	156	24,3	6,44
	Min	77,0	23,3	3,30	86,0	20,3	4,24	89,0	18,3	4,86	96,0	16,0	6,00
280.2	100	591	212	2,79	629	198	3,18	666	184	3,61	701	170	4,11
	75	443	143	3,09	472	132	3,58	499	121	4,13	526	111	4,73
	50	296	93,2	3,17	314	83,3	3,77	333	74,7	4,46	351	66,9	5,24
	25	148	49,9	2,96	157	41,4	3,80	167	34,9	4,77	175	29,6	5,92
	Min	86,0	27,4	3,14	95,0	24,1	3,94	100	22,0	4,55	108	19,3	5,60
320.2	100	654	246	2,66	698	230	3,03	739	214	3,45	778	199	3,91
	75	490	168	2,92	524	155	3,38	554	143	3,88	583	131	4,45
	50	327	110	2,98	349	98,7	3,53	370	88,5	4,18	389	79,4	4,90
	25	163	59,0	2,77	174	49,3	3,54	185	41,5	4,45	195	35,1	5,54
	Min	95,0	31,6	3,01	106	27,8	3,81	109	25,7	4,24	118	22,4	5,27
240.2	100	724	255	2,84	766	236	3,25	807	217	3,72	845	200	4,22
	75	543	173	3,14	575	157	3,65	605	143	4,22	634	131	4,85
	50	362	112	3,24	383	98,9	3,87	404	87,7	4,60	422	77,7	5,44
	25	181	59,5	3,04	191	49,7	3,86	209	43,4	4,82	226	38,0	5,94
	Min	114	35,5	3,21	126	31,2	4,04	131	28,4	4,61	141	25,0	5,64
360.2	100	796	278	2,87	843	259	3,25	886	241	3,67	932	223	4,18
	75	597	176	3,38	632	162	3,91	665	148	4,50	699	136	5,14
	50	398	113	3,53	421	101	4,19	443	89,6	4,95	466	80,7	5,78
	25	199	60,0	3,32	211	50,3	4,19	221	42,5	5,21	233	36,6	6,37
	Min	115	34,9	3,30	127	30,7	4,14	136	27,6	4,93	146	24,4	5,98
400.2	100	866	306	2,83	918	291	3,16	968	270	3,58	1004	251	4,00
	75	650	200	3,25	688	184	3,74	726	169	4,29	753	153	4,92
	50	433	128	3,38	459	115	4,00	484	103	4,71	502	91,1	5,51
	25	217	68,5	3,16	230	57,7	3,98	242	48,9	4,95	252	41,5	6,07
	Min	123	38,7	3,18	136	34,1	3,99	146	31,2	4,68	158	27,5	5,75

Premium

Cooling at part load - EN

SIZE	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
440.2	100	957	353	2,71	1013	333	3,04	1067	314	3,40	1117	295	3,79
	75	718	227	3,16	760	210	3,63	800	193	4,15	838	178	4,72
	50	479	144	3,33	506	129	3,94	533	115	4,64	558	103	5,43
	25	239	76,4	3,13	253	63,9	3,96	267	53,8	4,96	280	45,7	6,13
	0	139	43,7	3,18	154	38,3	4,02	163	34,4	4,74	175	30,1	5,81
480.2	100	1065	374	2,85	1126	350	3,21	1188	327	3,63	1248	304	4,10
	75	799	235	3,40	844	215	3,92	891	199	4,49	936	183	5,10
	50	532	149	3,58	563	133	4,24	594	119	4,98	624	108	5,79
	25	266	79,6	3,35	282	66,9	4,21	297	57,2	5,20	312	49,5	6,30
	Min	152	46,6	3,26	168	41,1	4,09	180	36,7	4,90	192	32,6	5,89
540.2	100	1179	417	2,83	1240	393	3,16	1302	369	3,53	1361	346	3,93
	75	884	265	3,34	930	243	3,83	976	223	4,37	1021	206	4,96
	50	589	165	3,57	620	147	4,22	651	132	4,94	680	118	5,75
	25	295	87,6	3,37	310	73,2	4,23	326	62,0	5,25	340	53,1	6,41
	Min	167	51,0	3,27	183	44,8	4,08	198	39,8	4,97	212	35,1	6,04
580.2	100	1272	463	2,75	1344	439	3,06	1413	415	3,40	1480	392	3,77
	75	954	294	3,24	1008	272	3,71	1060	251	4,22	1110	232	4,78
	50	636	182	3,50	672	163	4,13	706	146	4,85	740	131	5,65
	25	318	95,9	3,32	336	80,3	4,18	353	67,9	5,21	370	57,9	6,39
	Min	183	55,4	3,30	201	48,5	4,14	214	43,2	4,95	229	37,9	6,04

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

ST - Standard acoustic configuration
The standard units is supplied with inverter screw compressors without soundproofing casing.

⚠ With the standard acoustic configuration, if the hydronic assemblies are installed on board, they are supplied without casing

To find out the standard unit sound level, refer to the 'Sound levels' tables.

SC - Acoustic configuration with compressor soundproofing
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 assemblies are installed on board, 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 is also equipped with anti-vibration joints to attenuate vibrations.

⚠ With the super-silenced acoustic configuration, if the hydronic assemblies are installed on board, they are supplied with casing.

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

PPBM - Microchannel coils protection panels
Microchannel coils protection panels supplied on the manifold side.
They guarantee greater protection during transport and from accidental contact with things or people.

Standard unit

Unit with PPBM option

Configurations

CCME - E-coated microchannel coil
The full aluminium microchannel coil is completely treated by electrolysis so as to create a protective layer of epoxy polymer on the surface, with the following characteristics:
- over 3000 hours of protection against salt spray (ASTM G85 A3 - SWAAT);
- over 2000 hours of protection against UV rays (ASTM G155-05a)
- provide a very high resistance against corrosion

Categories of atmospheric corrosion
Atmospheric corrosion is divided into six categories of corrosivity level, as shown in table.

Corrosivity	ISO 9223 Category	Corrosion rate for aluminium g/m²
Very low	C1	negligible
Low	C2	$r_{corr} \leq 0.6$
Medium	C3	$0.6 \ r_{cor} \leq 2$
High	C4	$2 < r_{cor} \leq 5$
Very high	C5	$5 < r_{cor} \leq 10$
Extreme	CX	$r_{cor} > 10$

Atmospheric Corrosivity category (ISO 9223)	C1, C2	C3 (inland)	C3 (coastal)	C4	C5	CX
Corrosivity	Very low, low	Medium	Medium	High	Very high	Extreme
Typical environments -examples	Indoor, Rural areas	Urban areas	Urban areas	Polluted Urban, industrial, coastal areas	Very high pollution & salt deposition areas	Extreme industrial, coastal areas
CCM - coils (standard)	OK	OK	NR	NR	NR	NR
CCME - E-coated microchannel coil	**OK**	**OK**	**OK**	**OK**	**AP**	**AP**

OK: Reccomended;
AP: Acceptable, life may be shorter;
NR: Not recommended

B - Water low temperature (Brine)
Configuration also known as “Brine”. Enables an “unfreezable” solution to be cooled (for example, water and ethylene glycol in suitable quantities) up to a temperature of between +4°C and –8°C. It includes:
- suitable exchangers with extra-thick closed-cell insulation
- electronic expansion valve, functional calibration and safety devices suitable for particular uses.

⚠ During the selection phase it is necessary to indicate the required operating type, the unit will be optimised on the basis of this: - Unit with single operating set-point (only at low temperature) - Unit with double operating set-point

⚠ The unit in this configuration has a different operating field, which was reported in the previous pages

⚠ In low temperature operation, some staging steps could not be available

⚠ The glycol concentration must be chosen based on the minimum temperature the water can reach. The presence of glycol influences pressure drops on the water side and the unit’s output as indicated in the table reporting the ”correction factors for use with glycol”.

Correction factor for water low temperature

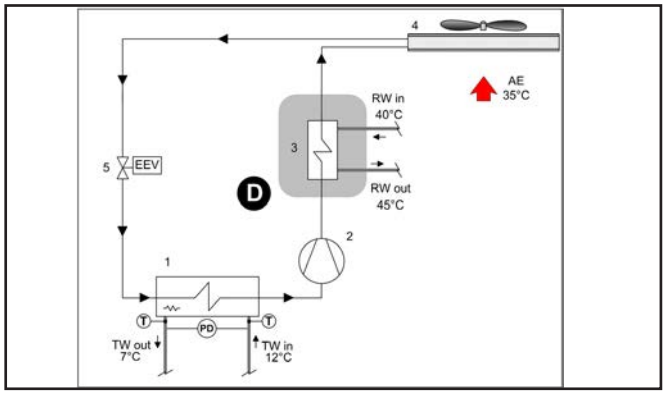
Evaporator outlet water temperature factor	2	0	-2	-4
Cooling capacity factor	0.860	0.804	0.748	0.692
Compressor power input factor	0.945	0.923	0.901	0.879

⚠ The correction coefficients must be applied to condition: internal exchanger water (evaporator) = 12 / 7 °C.

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 rejected to the external heat source. This option is also called 'desuperheater'. It consists of shell and tube heat exchangers, suitable to recover part of the unit heating capacity (equal to the sum of the cooling capacity and the capacity absorbed by 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 wise to insert a flow control valve into the system water circuit, in order to maintain the temperature at the recovery output at above 35°C and thus avoid the condensation of the refrigerant into the partial energy recovery device.

⚠ Partial recovery option not availabel for size 440.2.



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

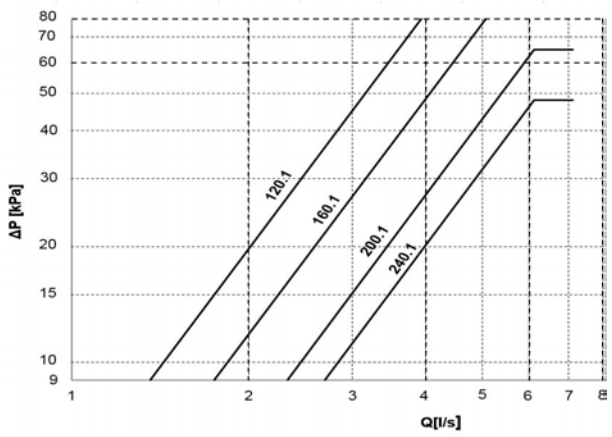
RW in - Recovery water inlet
RW out - Recovery water outlet

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

The maximum capacity available from the partial recovery is equal to the 10% of the rejected heating capacity (cooling capacity + compressor power input).

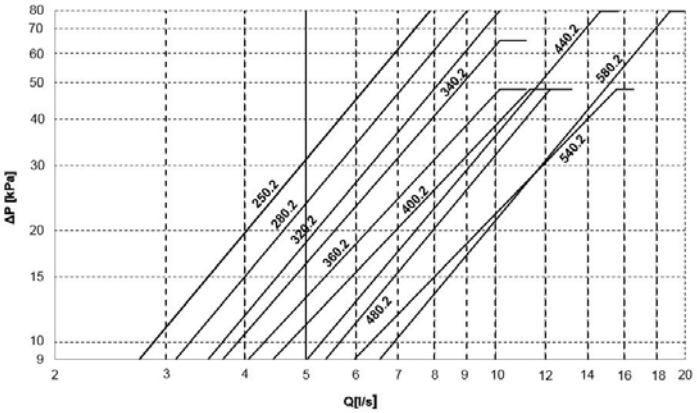
Pressure drops of partial energy recovery exchanger

Size 12.1 ÷ 240.1



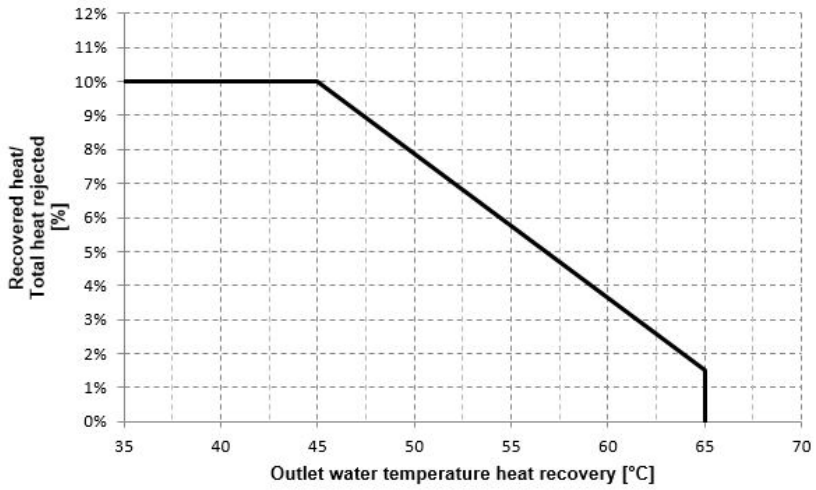
Q = Water flow-rate [l/s]
DP = Water side pressure drops (kPa)

Size 250.2 ÷ 580.2



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

Partial recovery heating capacity

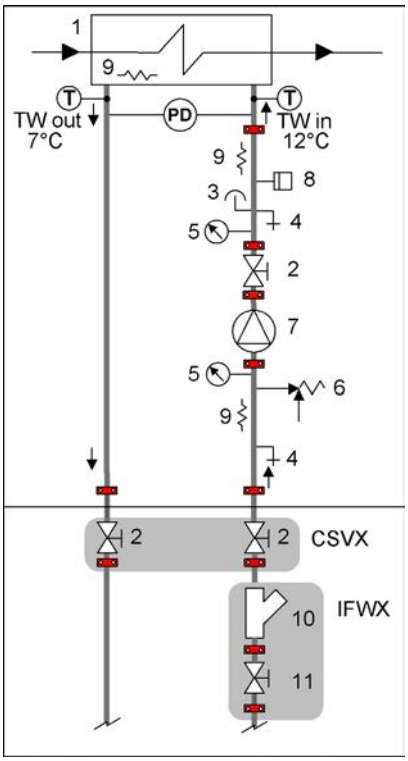


Accessories - Hydronic assembly

1PM/1PMH - User side HydroPack with N° 1 pump

Option supplied built-in the unit. Pumping unit made up of N°1 centrifugal electric pump, 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, non-return valve, safety valve, pressure gauges, system safety pressure switch, stainless steel antifreeze, intake, immersion-type heaters.
All water fittings are Victaulic.
1PM = Hydropack with N° 1 pump
1PMH = Hydropack with N° 1 high static pressure pump

CONNECTION DIAGRAM - GROUP WITH N° 1 PUMP



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

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

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..

⚠ The head and absorption graphs of the hydronic assembly refer to operation with pure water. In the presence of a mixture of water and glycol, please contact Clivet office to check the correct operating point of the hydronic assembly.

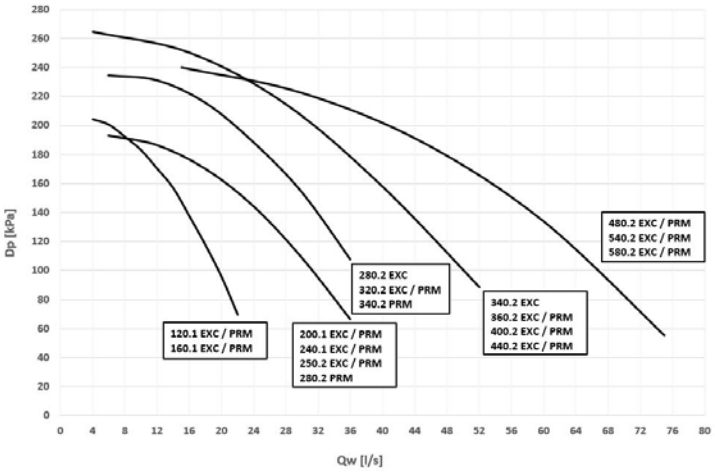
Electrical data Hydropack

PUMP	Rated power [kW]	Nominal Current [A]
1PM 120.1-160.1 EXC/PRM	4	7,62
1PM 200.1-240.1-250.2 EXC/PRM - 280.2 PRM	5,5	10,5
1PM 280.2 EXC - 320.2 EXC/PRM - 340.2 PRM	7,5	14,1
1PM 340.2 EXC - 360.2-400.2-440.2 EXC/PRM	11	20,2
1PM 480.2-540.2-580.2 EXC/PRM	15	26,6

PUMP	Rated power [kW]	Nominal Current [A]
1PMH 120.1-160.1 EXC/PRM	7,5	14,1
1PMH 200.1-240.1-250.2-280.2-320.2 EXC/PRM	11	20,2
1PMH 340.2-360.2-400.2-440.2 EXC/PRM	15	26,6
1PMH 480.2-540.2-580.2 EXC/PRM	22	40,4

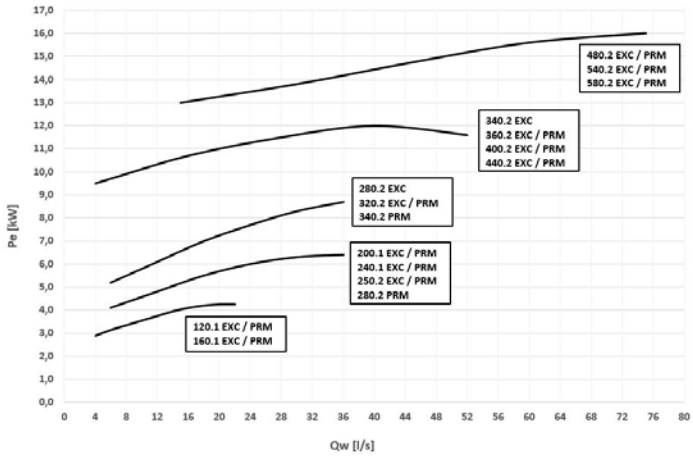
1PM - HYDROPACK WITH N° 1 PUMP

Head



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

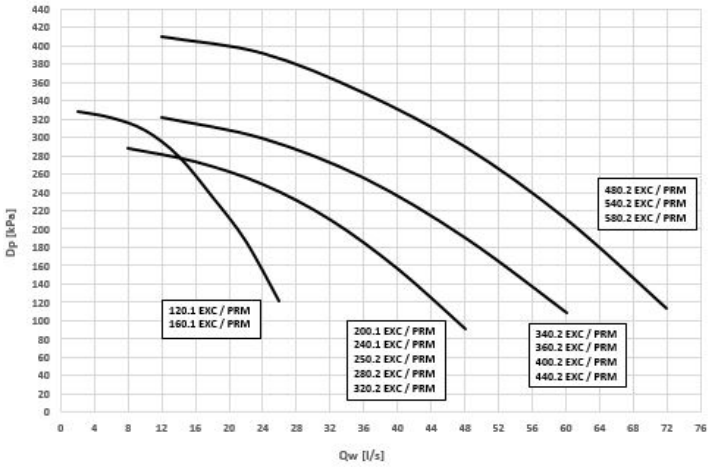
Power input



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

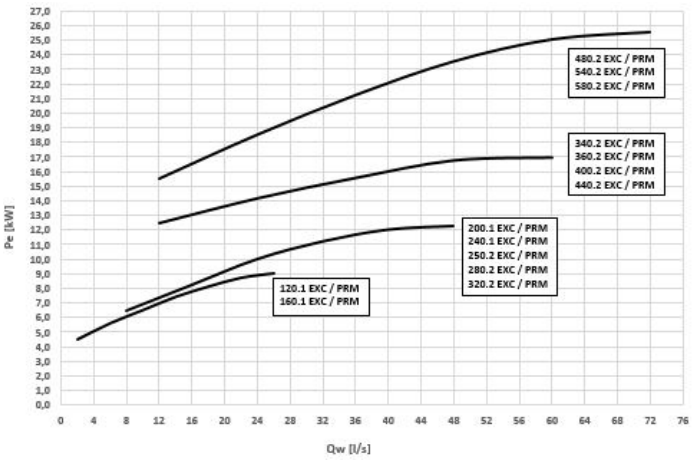
1PMH - HYDROPACK WITH NR.1 HIGH STATIC PRESSURE PUMP

Head



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

Power input



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

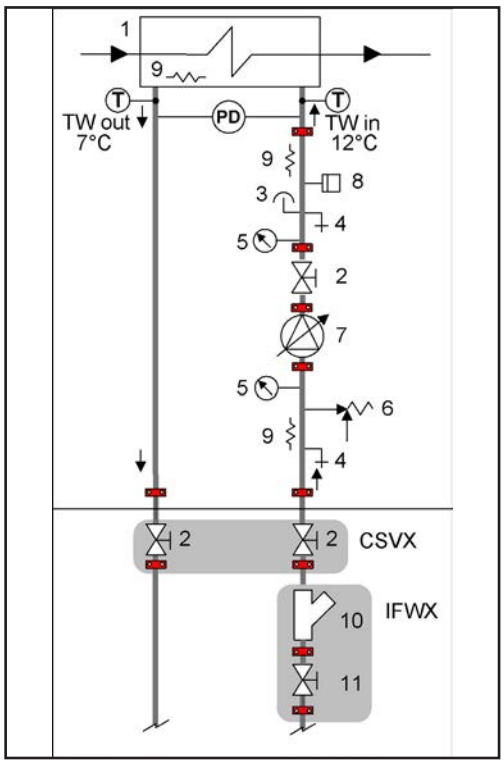
⚠ Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
Internal exchanger pressure drop
IFVX accessory –Steel mesh filter on the water side (where applicable)

Accessories - Hydronic assembly

1PMV/1PMVH - Hydropack user side with N° 1 inverter pump

Option supplied on the unit. Pumping unit made up of one electropump 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 of AISI 316 stainless steel (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, no-return valve, 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.
1PMV = Hydropack with N° 1 inverter pump
1PMVH = Hydropack with N° 1 high static pressure inverter pump

CONNECTION DIAGRAM - GROUP WITH N° 1 INVERTER PUMP



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

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

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.

⚠ The head and absorption graphs of the hydronic assembly refer to operation with pure water. In the presence of a mixture of water and glycol, please contact Clivet office to check the correct operating point of the hydronic assembly.

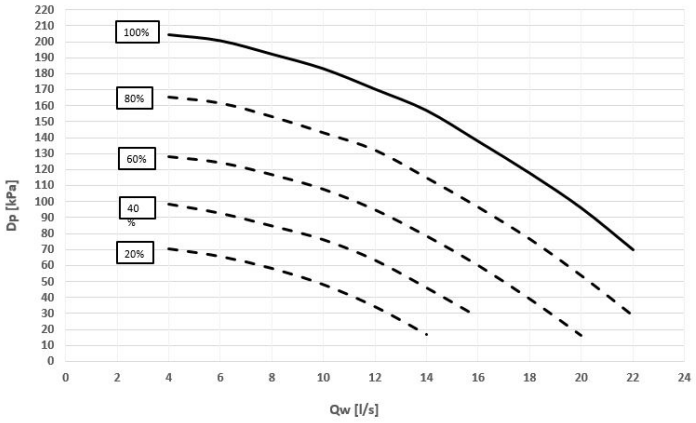
Electrical data Hydropack

PUMP	Rated power [kW]	Nominal Current [A]
1PMV 120.1-160.1 EXC/PRM	4	7,62
1PMV 200.1-240.1-250.2 EXC/PRM - 280.2 PRM	5,5	10,5
1PMV 280.2 EXC - 320.2 EXC/PRM - 340.2 PRM	7,5	14,1
1PMV 340.2 EXC - 360.2-400.2-440.2 EXC/PRM	11	20,2
1PMV 480.2-540.2-580.2 EXC/PRM	15	26,6

PUMP	Rated power [kW]	Nominal Current [A]
1PMVH 120.1-160.1 EXC/PRM	7,5	14,1
1PMVH 200.1-240.1-250.2-280.2-320.2 EXC/PRM	11	20,2
1PMVH 340.2-360.2-400.2-440.2 EXC/PRM	15	26,6
1PMVH 480.2-540.2-580.2 EXC/PRM	22	40,4

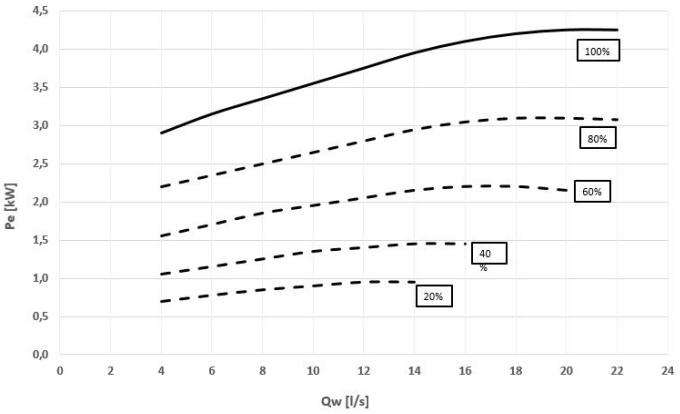
1PMV - HYDROPACK WITH N° 1 INVERTER PUMP

Head - Size 120.1 - 160.1 EXC/PRM



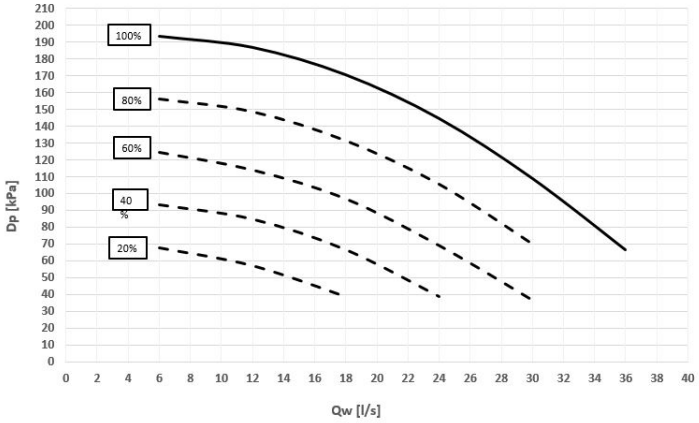
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 120.1 - 160.1 EXC/PRM



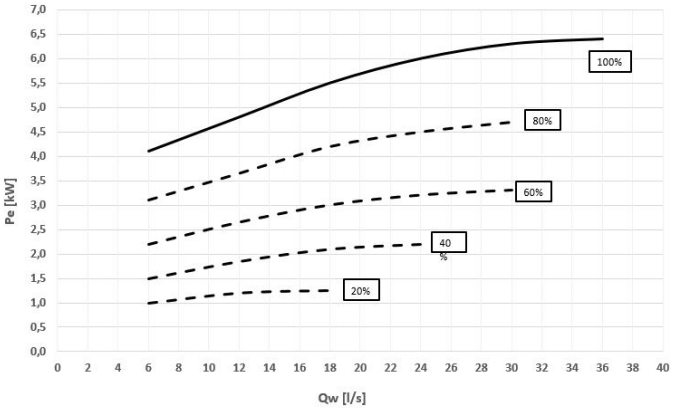
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head - Size 200.1 - 240.1 - 250.2 - EXC/PRM - 280.2 PRM



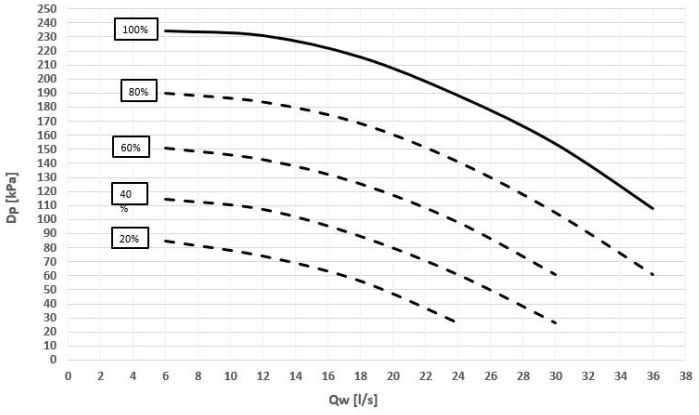
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 200.1 - 240.1 - 250.2 - EXC/PRM - 280.2 PRM



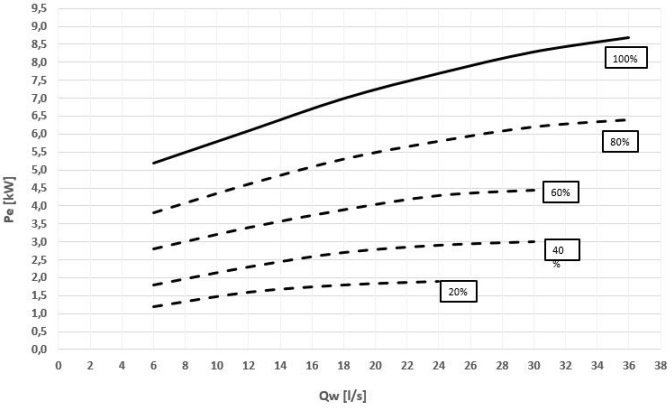
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head - Size 280.2 EXC - 320.2 EXC/PRM - 340.2 PRM



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

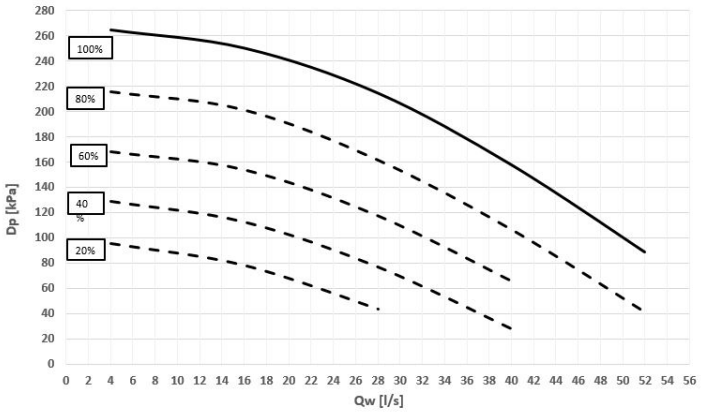
Power input - Size 280.2 EXC - 320.2 EXC/PRM - 340.2 PRM



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

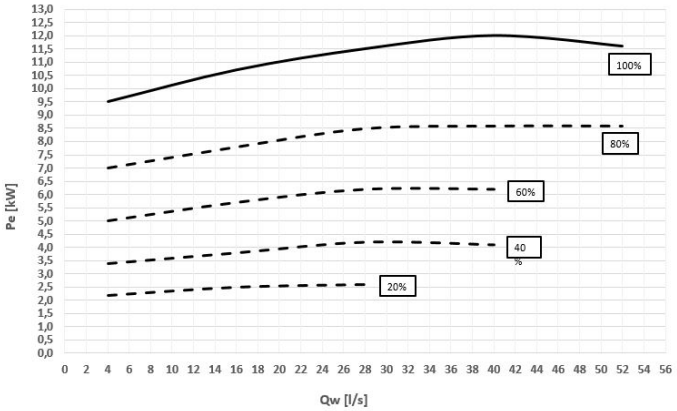
1PMV - HYDROPACK WITH N° 1 INVERTER PUMP

Head - Size 340.2 EXC - 360.2 - 400.2 - 440.2 EXC/PRM



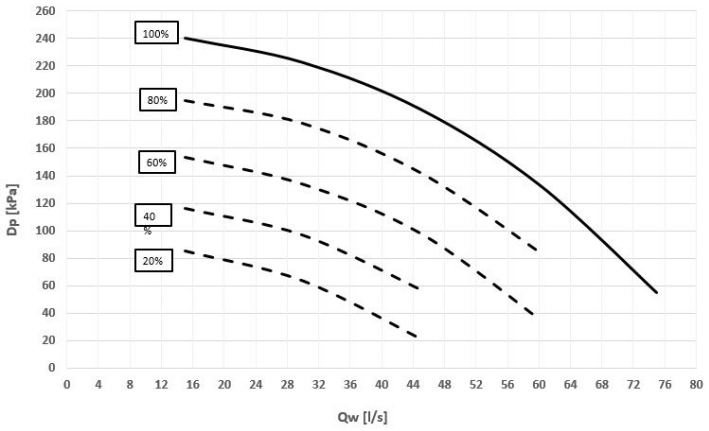
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 340.2 EXC - 360.2 - 400.2 - 440.2 EXC/PRM



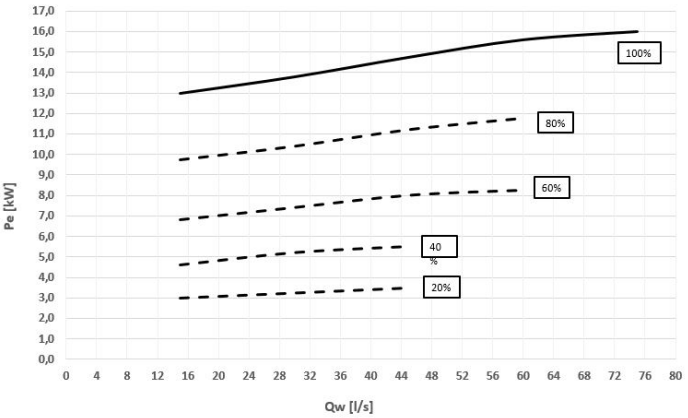
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head - Size 480.2 - 540.2 - 580.2 EXC/PRM



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

Power input - Size 480.2 - 540.2 - 580.2 EXC/PRM

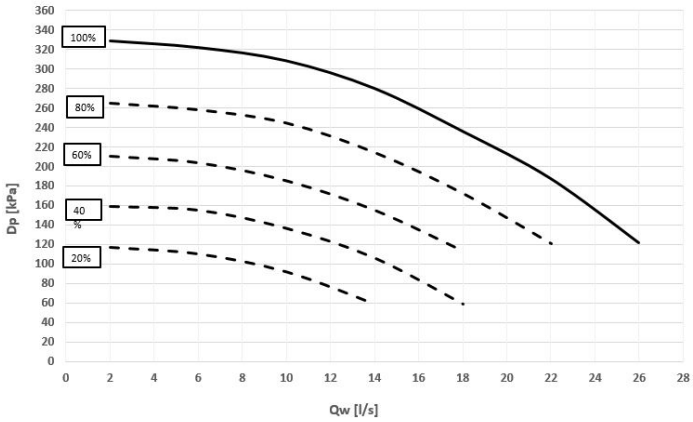


Pe = Power input [kW]
QW = Water flow-rate [l/s]

⚠ 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)

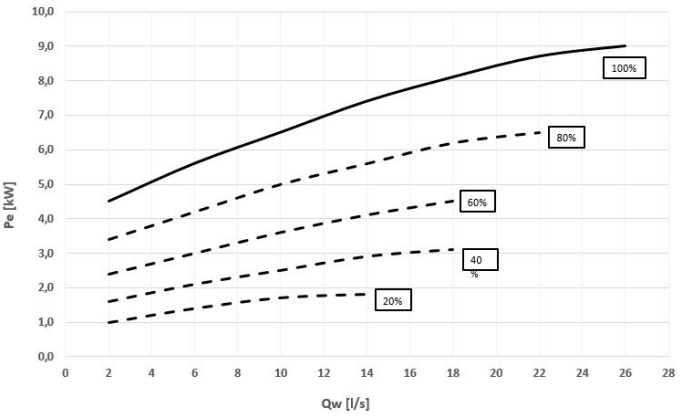
1PMVH - HYDROPACK WITH N° 1 HIGH STATIC PRESSURE INVERTER PUMP

Head Size 120.1 - 160.1 EXC/PRM



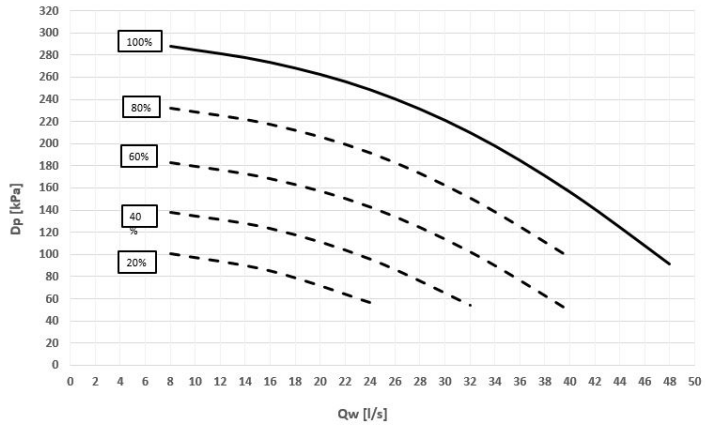
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 120.1 - 160.1 EXC/PRM



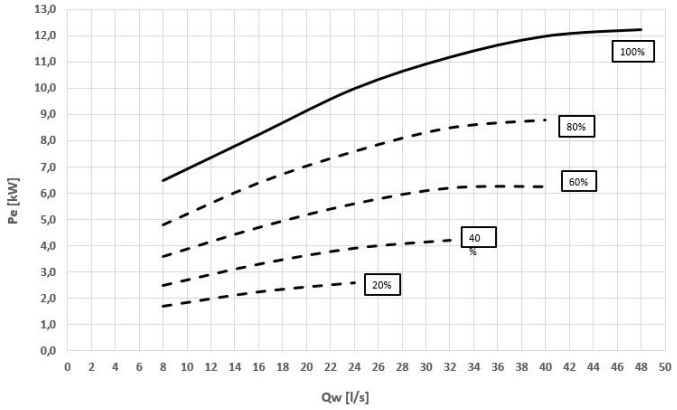
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head Size 200.1 - 240.1 - 250.2 - 280.2 -320.2 EXC/PRM



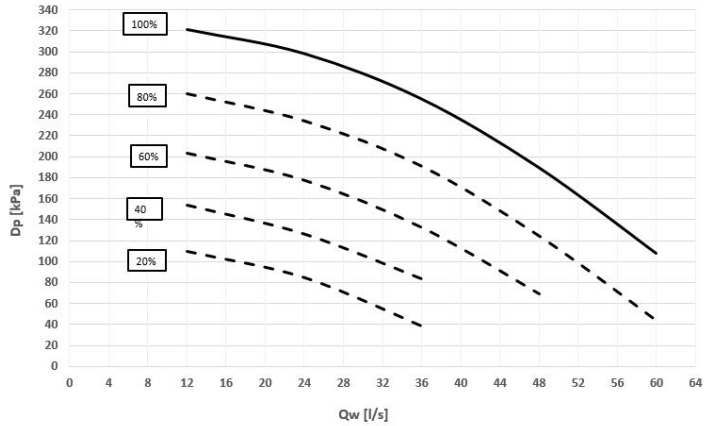
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 200.1 - 240.1 - 250.2 - 280.2 -320.2 EXC/PRM



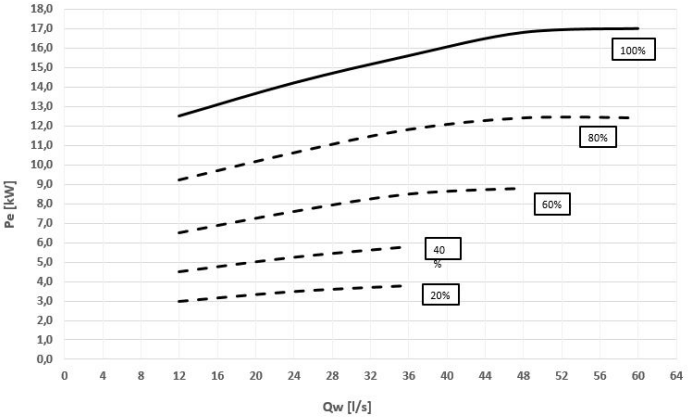
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head Size 340.2 - 360.2 - 400.2 - 440.2 EXC/PRM



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

Power input - Size 340.2 - 360.2 - 400.2 - 440.2 EXC/PRM

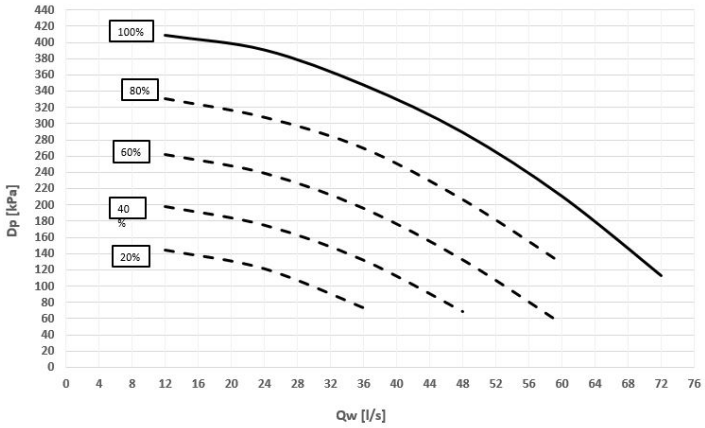


Pe = Power input [kW]
QW = Water flow-rate [l/s]

Accessories - Hydronic assembly

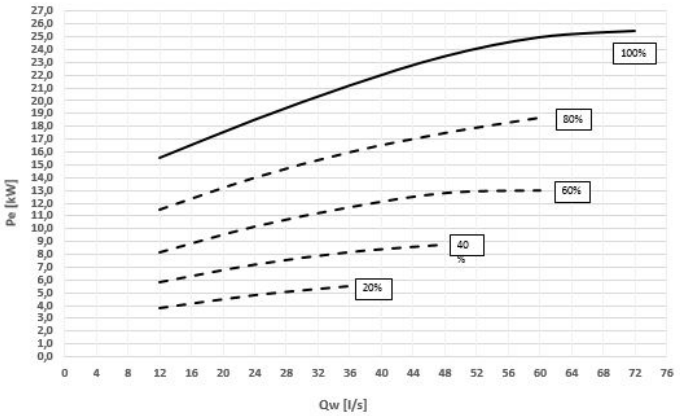
1PMVH - HYDROPACK WITH N° 1 HIGH STATIC PRESSURE INVERTER PUMP

Prevalenza - Gr. 480.2 - 540.2 - 580.2 EXC/PRM



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

Power input - Size 480.2 - 540.2 - 580.2 EXC/PRM



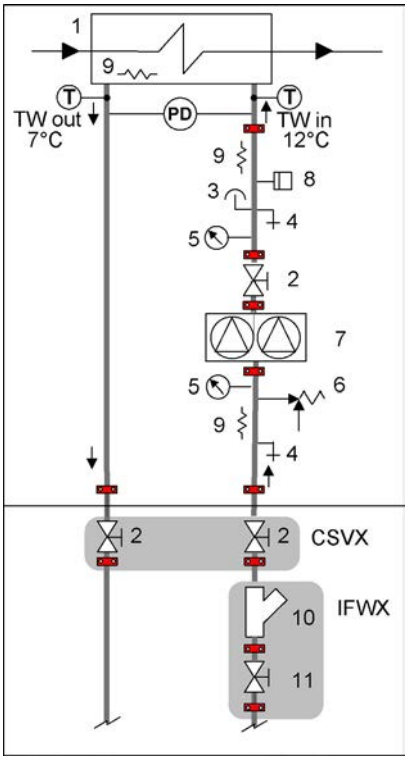
Pe = Power input [kW]
QW = Water flow-rate [l/s]

⚠ 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/2PMH - HydroPack with N° 2 pumps

Option supplied built-in the unit. Pumping unit made up of two electric pumps laid out in parallel, with auto-adaptive modular logic activation. 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.
Centrifugal electric pump, with the pump body made of cast iron and the impeller made of AISI 316 stainless steel.
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, non-return valve, safety valve, pressure gauges, system safety pressure switch, stainless steel antifreeze, intake, immersion-type heaters.
All water fittings are Victaulic.
2PM = Hydropack with N° 2 pump
2PMH = Hydropack with N° 2 high static pressure pump

CONNECTION DIAGRAM - GROUP WITH N° 2 PUMPS



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

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

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.

⚠ The head and absorption graphs of the hydronic assembly refer to operation with pure water. In the presence of a mixture of water and glycol, please contact Clivet office to check the correct operating point of the hydronic assembly.

Electrical data Hydropack

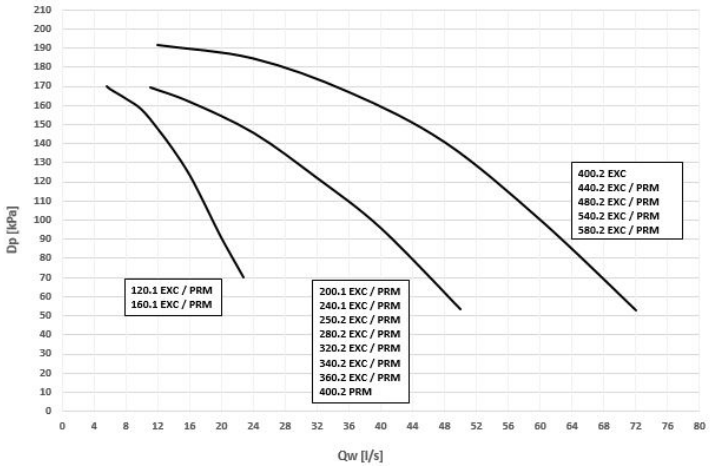
PUMP	Rated power [kW]	Nominal Current [A]
2PM 120.1-160.1 EXC/PRM	2x2,2	2x4,56
2PM 200.1-240.1-250.2-280.2-320.2-340.2-360.2 EXC/PRM - 4002 PRM	2x4	2x7,62
2PM 400.2 EXC - 440.2-48/0.2-540.2-580.2 EXC/PRM	2x7,5	2x15,2

PUMP	Rated power [kW]	Nominal Current [A]
2PMH 120.1-160.1 EXC/PRM	2x4	2x7,62
2PMH 200.1-240.1-250.2-280.2-320.2-340.2-360.2 EXC/PRM - 4002 PRM	2x7,5	2x10,2
2PMH 400.2 EXC - 440.2-48/0.2-540.2-580.2 EXC/PRM	2x11	2x20,2

Accessories - Hydronic assembly

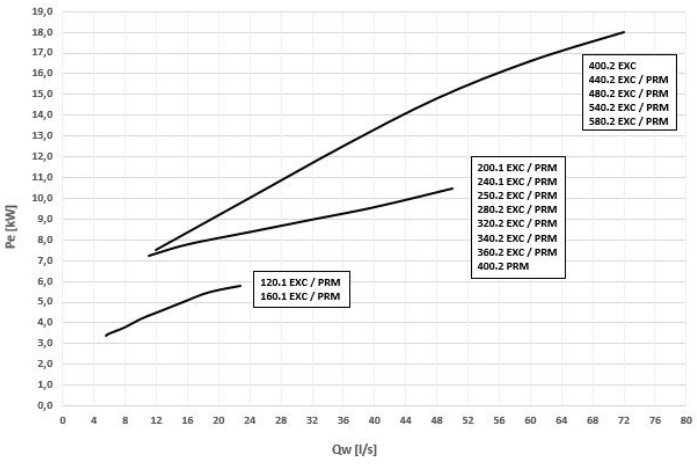
2PM- HYDROPACK WITH N° 2 PUMPS

Head



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

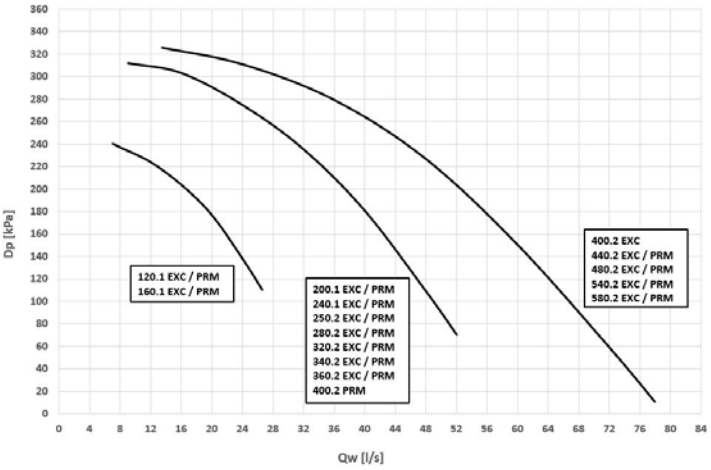
Power input



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

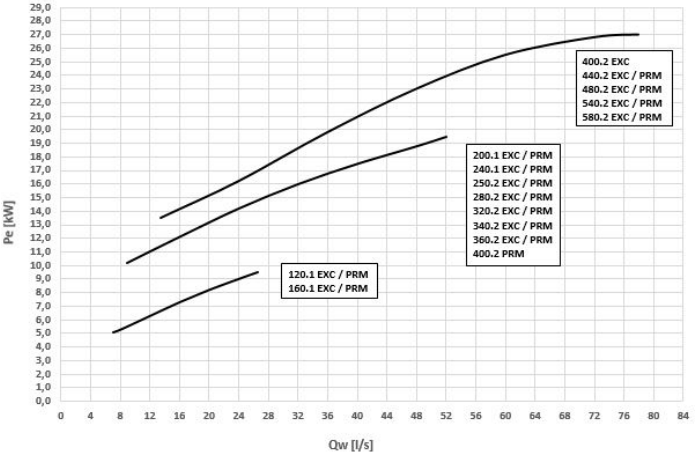
2PMH - HYDROPACK WITH N° 2 HIGH STATIC PRESSURE PUMPS

Head



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

Power input



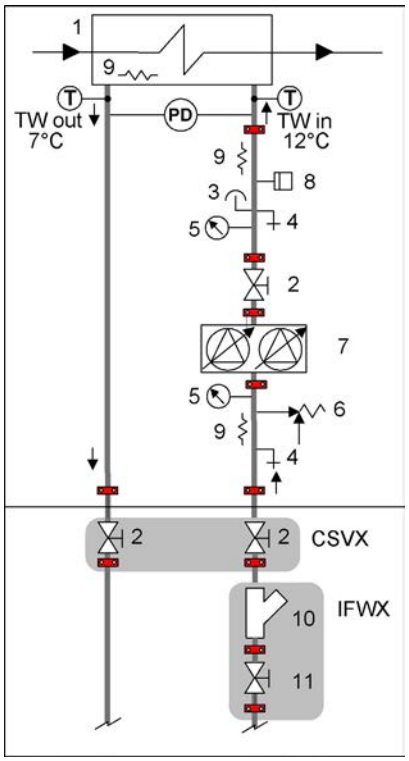
Pe = Power input [kW]
QW = Water flow-rate [l/s]

⚠ 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/2PMVH - Hydropack user side with no. 2 of inverter pumps

Option supplied on the unit. Pumping unit consisting of 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 impeller made with AISI 304 steel and AISI 304 stainless steel body or grey cast iron (depending on 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,non return valve, 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.
2PMV = Hydropack with N° 2 inverter pump
2PMVH = Hydropack with N° 2 high static pressure inverter pump

CONNECTION DIAGRAM - GROUP WITH 2 INVERTER PUMPS



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

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

The grey area indicates further optional components.

⚠ Provided with hydraulic interceptions to the outside of the unit (option 'CSVX - A pair of manually operated shut-off valves') to facilitate any major maintenance operations

.

⚠ The head and absorption graphs of the hydronic assembly refer to operation with pure water. In the presence of a mixture of water and glycol, please contact Clivet office to check the correct operating point of the hydronic assembly.

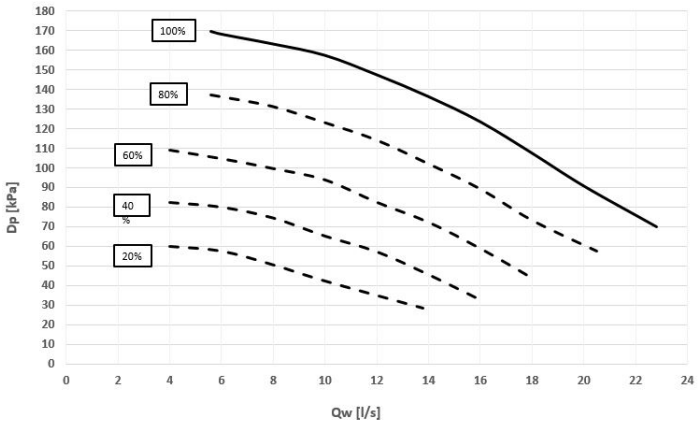
Electrical data Hydropack

PUMP	Rated power [kW]	Nominal Current [A]
2PMV 120.1-160.1 EXC/PRM	2x2,2	2x4,56
2PMV 200.1-240.1-250.2-280.2-320.2-340.2-360.2 EXC/PRM - 4002 PRM	2x4	2x7,62
2PMV 400.2 EXC - 440.2-48/0.2-540.2-580.2 EXC/PRM	2x7,5	2x15,2

PUMP	Rated power [kW]	Nominal Current [A]
2PMVH 120.1-160.1 EXC/PRM	2x4	2x7,62
2PMVH 200.1-240.1-250.2-280.2-320.2-340.2-360.2 EXC/PRM - 4002 PRM	2x7,5	2x10,2
2PMVH 400.2 EXC - 440.2-48/0.2-540.2-580.2 EXC/PRM	2x11	2x20,2

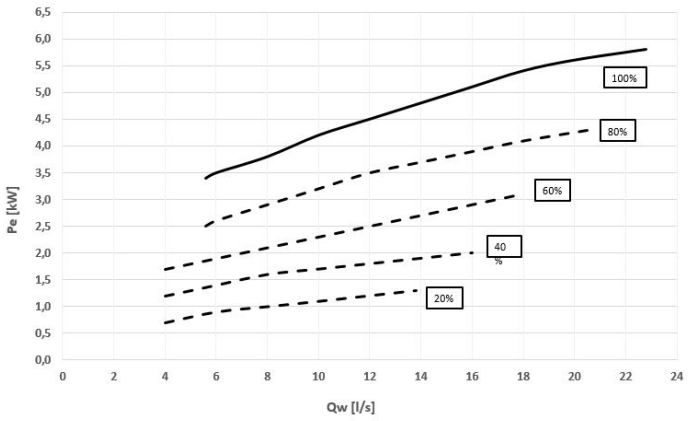
2PMV - HYDROPACK WITH N° 2 INVERTER PUMPS

Head - Size 120.1 - 160.1 EXC/PRM



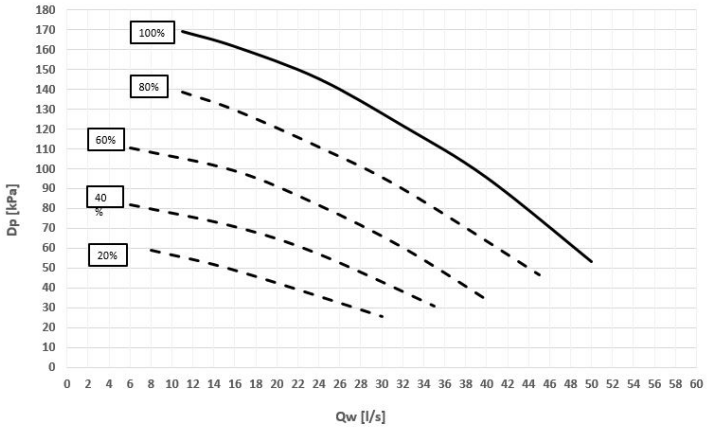
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 120.1 - 160.1 EXC/PRM



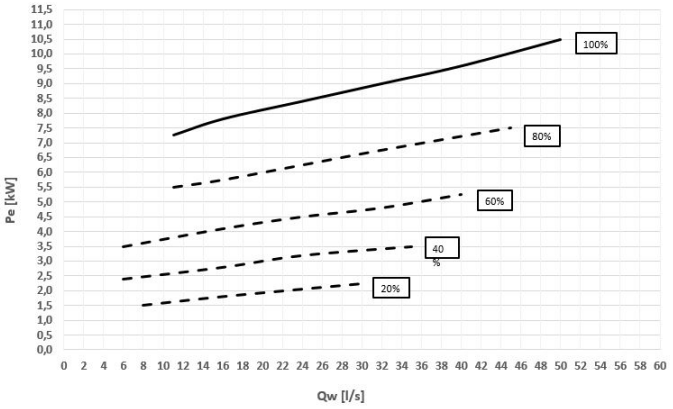
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head - Size 200.1-240.1-250.2-280.2-320.2-340.2-360.2 EXC/PRM Size 400.2 PRM



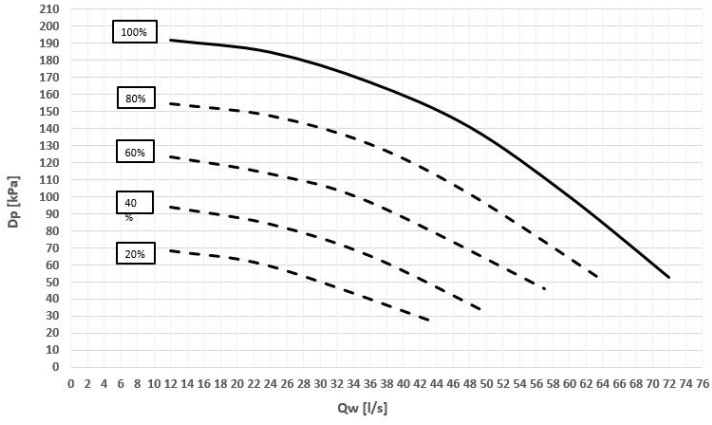
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 200.1-240.1-250.2-280.2-320.2-340.2-360.2 EXC/PRM Size 400.2 PRM



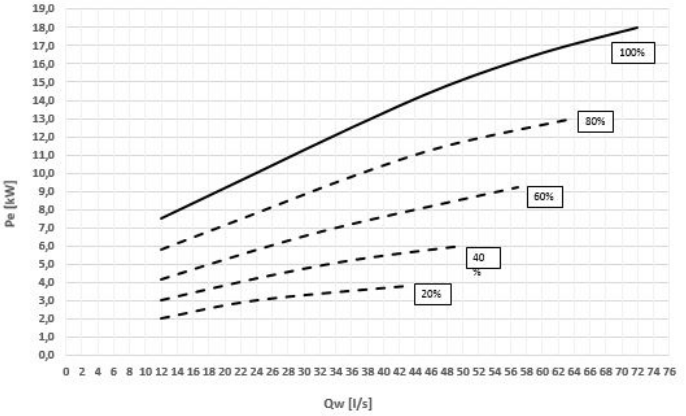
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head - Size 400.2 EXC 440.2-480.2-540.5-580.2 EXC/PRM



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

Power input - Size 400.2 EXC 440.2-480.2-540.5-580.2 EXC/PRM

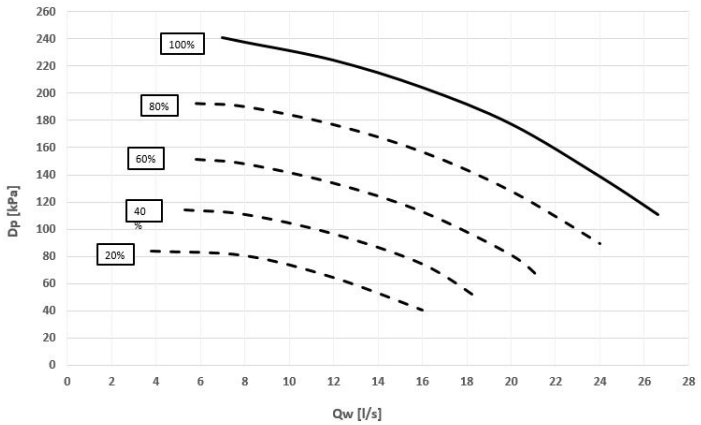


Pe = Power input [kW]
QW = Water flow-rate [l/s]

⚠ 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).

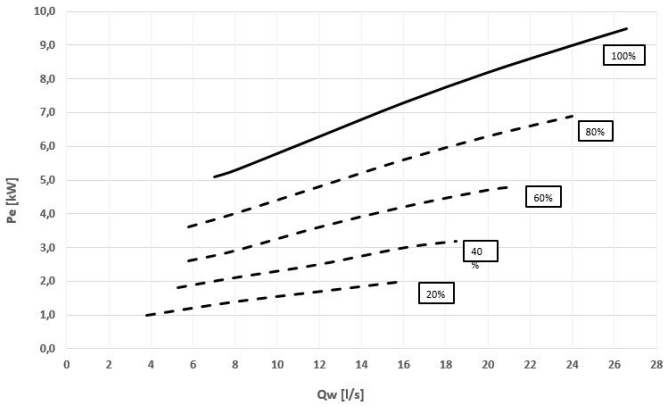
2PMVH - HYDROPACK WITH N° 2 HIGH STATIC PRESSURE INVERTER PUMPS

Head - Size 120.1 -160.1 EXC/PRM



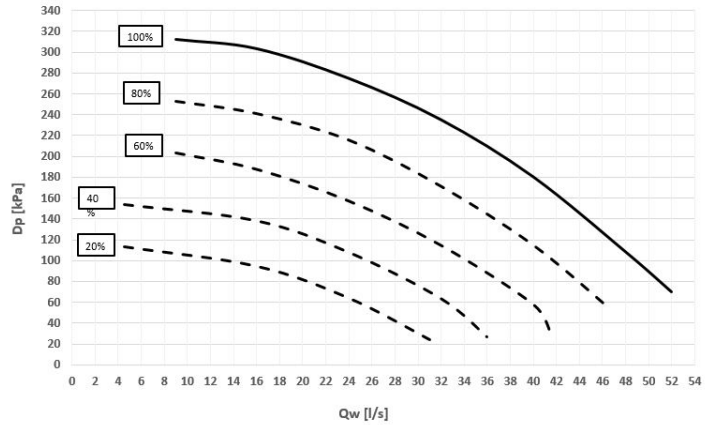
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 120.1 -160.1 EXC/PRM



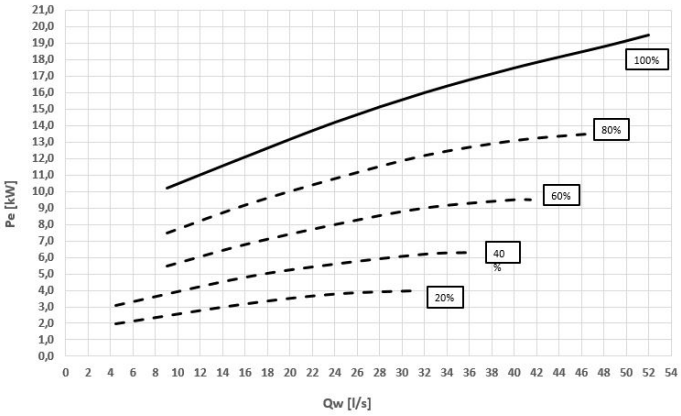
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head - Size 200.1-240.1-250.2-280.2-320.2-340.2-360.2 EXC/PRM Size 400.2 PRM



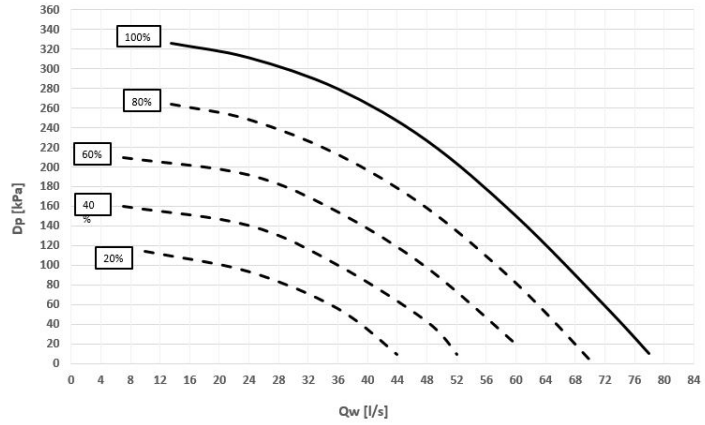
Dp = Pump head [kPa]
QW = Water flow-rate [l/s]

Power input - Size 200.1-240.1-250.2-280.2-320.2-340.2-360.2 EXC/PRM Size 400.2 PRM



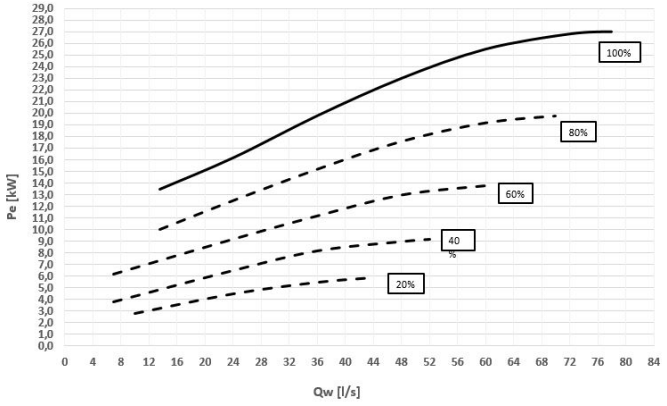
Pe = Power input [kW]
QW = Water flow-rate [l/s]

Head - Size 400.2 EXC 440.2-480.2-540.5-580.2 EXC/PRM



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

Power input - Size 400.2 EXC 440.2-480.2-540.5-580.2 EXC/PRM



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

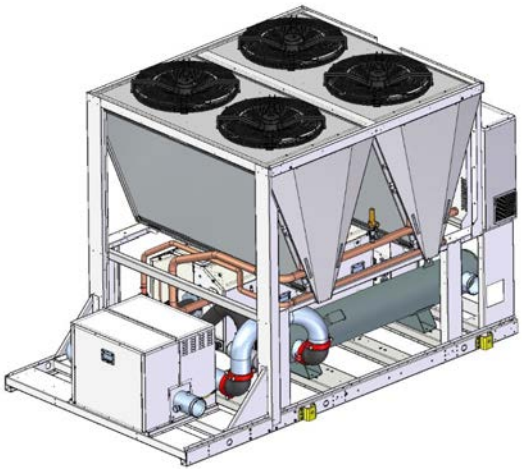
⚠ Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
Internal exchanger pressure drop
IFVX accessory –Steel mesh filter on the water side (where applicable)

Arrangement of hydronic groups

The hydronic assemblies are supplied as an built-in options.
Compared to the standard unit, the length of the complete hydronic assembly varies according to the following indications.

⚠ With the standard acoustic configuration, if the hydronic assemblies are installed on board, they are supplied without casing.
⚠ With the acoustic configuration with compressor soundproofing if the hydronic assemblies are installed on board, they are supplied without casing.
⚠ With the super-silenced acoustic configuration, if the hydronic assemblies are installed on board, they are supplied with casing.

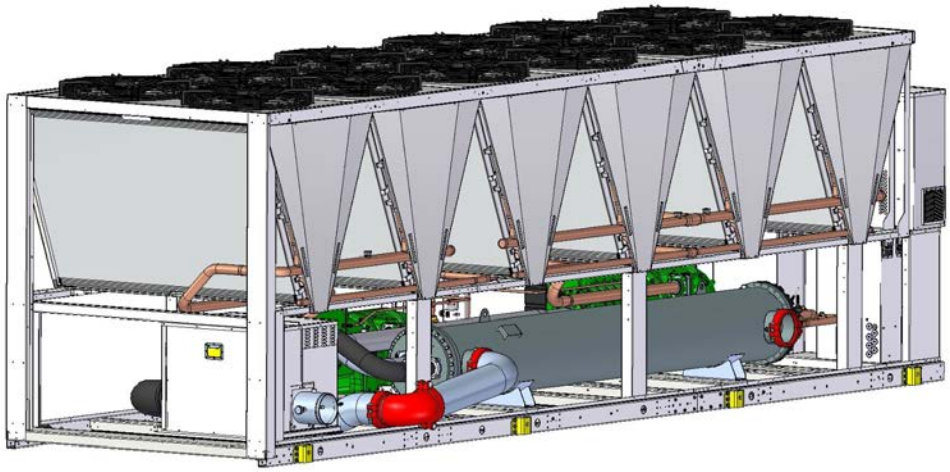
Size 120.1 ÷ 200.1 Excellence and 120.1 ÷ 320.2 Premium



SIZE - EXCELLENCE		120.1	160.1	200.1
Standard length	[mm]	4175	4175	5425
Length with hydronic assembly option	[mm]	5175	5175	6425

SIZE - PREMIUM		120.1	160.1	200.1	240.1	250.2	280.2	320.2
Standard length	[mm]	2925	2925	4175	5425	5424	5424	5424
Length with hydronic assembly option	[mm]	3925	3925	5175	6425	6424	6424	6424

Size 240.1 ÷ 580.2 Excellence and 340.2 ÷ 580.2 Premium

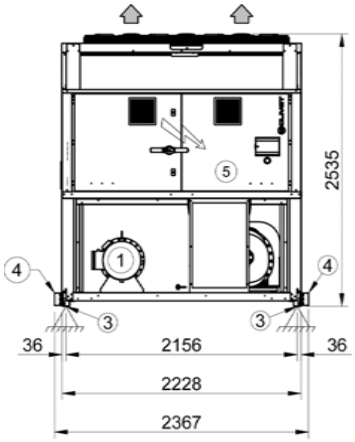


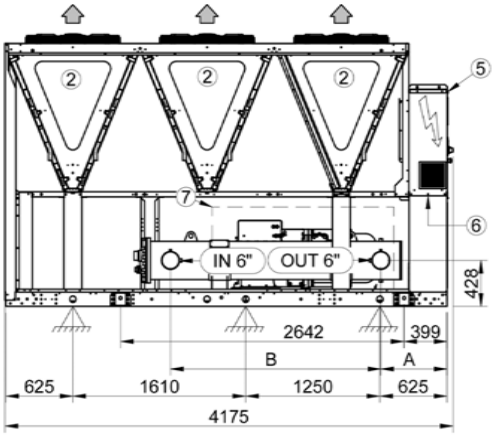
SIZE - EXCELLENCE		240.1	250.2	280.2	320.2	340.2	360.2	400.2	440.2	480.2	540.2	580.2
Standard length	[mm]	6675	7925	7925	7925	9175	10425	10425	10425	12923	12923	12923
Length with hydronic assembly option	[mm]	6675	7925	7925	7925	9175	10425	10425	10425	12923	12923	12923

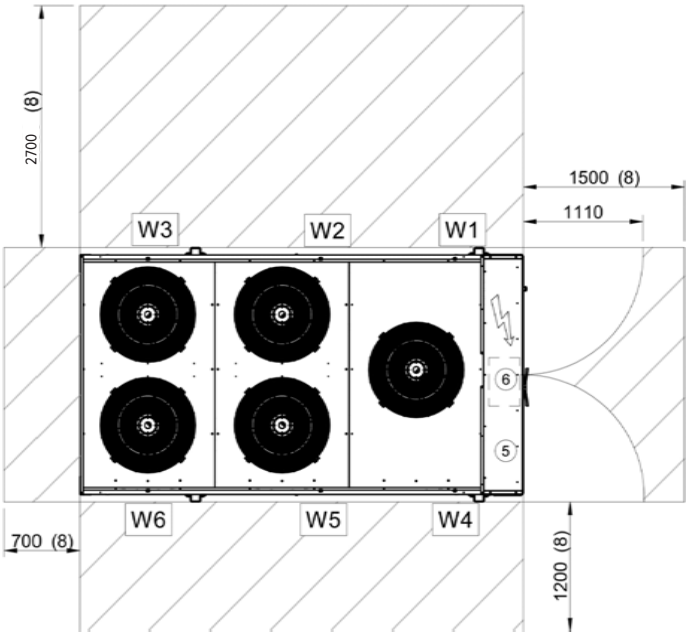
SIZE - PREMIUM		340.2	360.2	400.2	440.2	480.2	540.2	580.2
Standard length	[mm]	6675	7924	7924	7924	10425	10425	10425
Length with hydronic assembly option	[mm]	6675	7924	7924	7924	10425	10425	10425

DAAF50008_00
DATA/DATE 15/05/2020

SIZE 120.1 - 160.1 - EXCELLENCE







1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

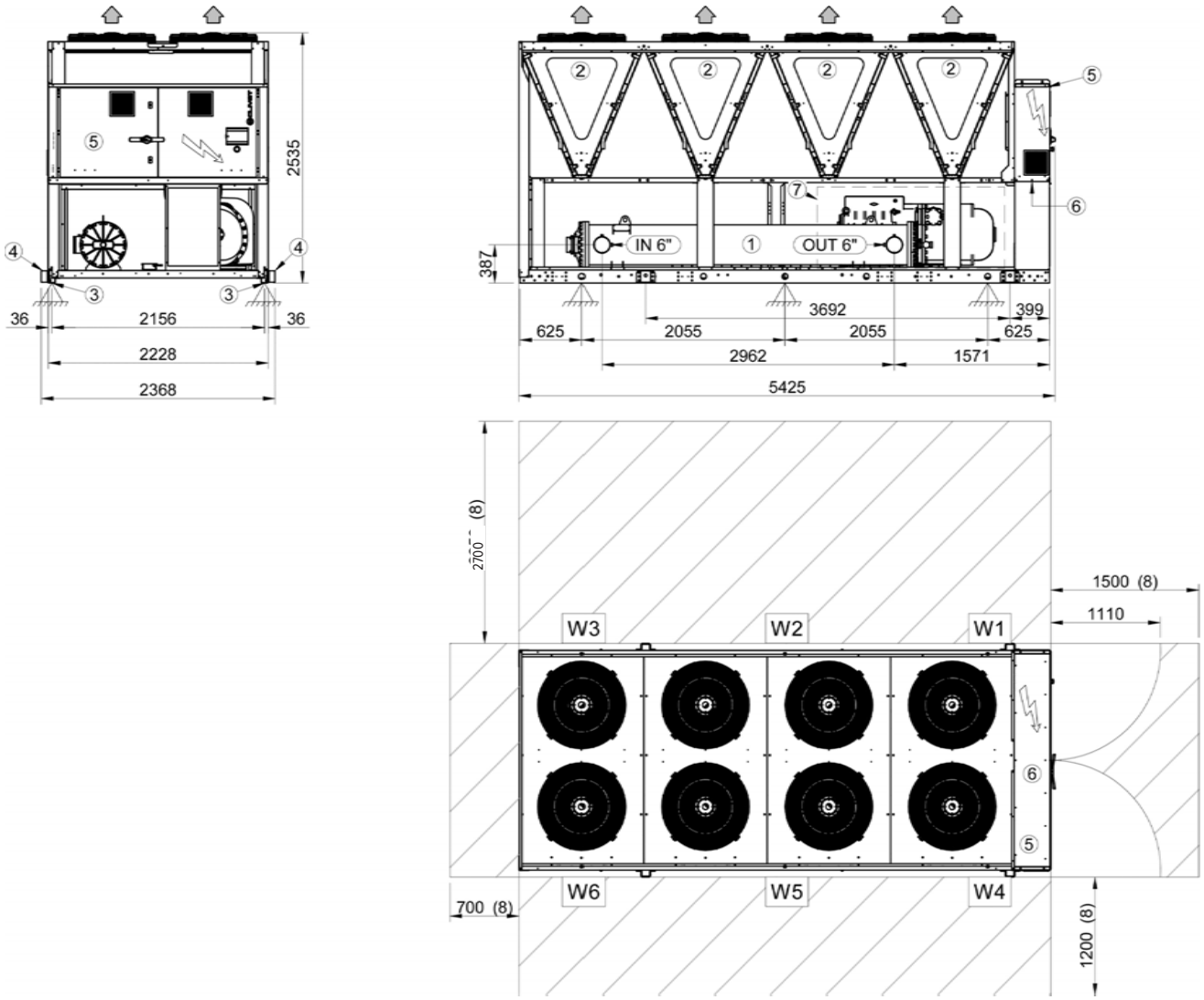
SIZE		120.1		160.1	
		ST	SC/EN	ST	SC/EN
Length	mm	4175	4175	4175	4175
Depth	mm	2228	2228	2228	2228
Height	mm	2535	2535	2535	2535
W1 Supporting point	kg	619	657	633	671
W2 Supporting point	kg	700	829	726	855
W3 Supporting point	kg	252	242	256	246
W4 Supporting point	kg	541	552	574	586
W5 Supporting point	kg	614	653	686	725
W6 Supporting point	kg	279	276	284	281
Operating weight	kg	3004	3209	3159	3364
Shipping weight	kg	2826	3031	2911	3116

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Dimensional drawings

SIZE 200.1 - EXCELLENCE

DAAF50009_00
DATA/DATE 15/05/2020



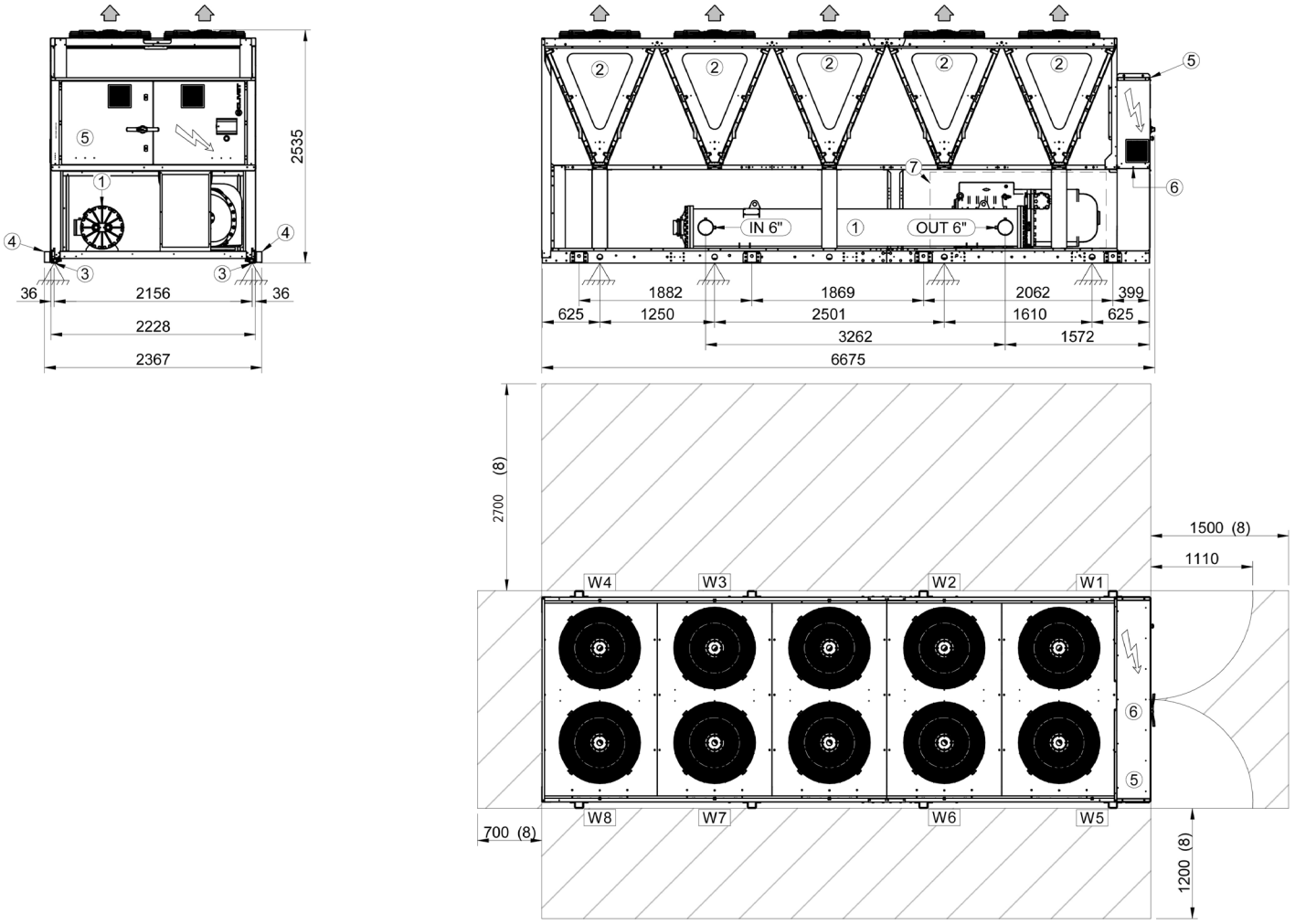
1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

SIZE		200.1 EXC	
		ST	SC/EN
Length	mm	5425	5425
Depth	mm	2228	2228
Height	mm	2535	2535
W1 Supporting point	kg	913	1006
W2 Supporting point	kg	943	1057
W3 Supporting point	kg	289	272
W4 Supporting point	kg	645	677
W5 Supporting point	kg	881	920
W6 Supporting point	kg	491	485
Operating weight	kg	4162	4417
Shipping weight	kg	3834	4089

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

SIZE 240.1 - EXCELLENCE

DAAF50010_00
DATA/DATE 18/05/2020



1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

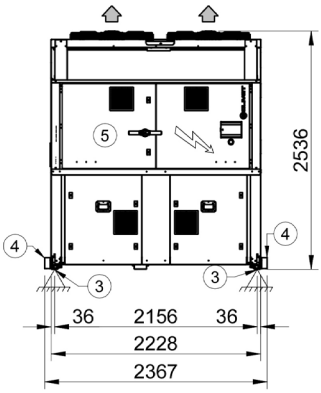
GRANDEZZE		240.1 EXC	
		ST	SC/EN
Length	mm	6675	6675
Depth	mm	2228	2228
Height	mm	2535	2535
W1 Supporting point	kg	764	835
W2 Supporting point	kg	1011	1143
W3 Supporting point	kg	367	347
W4 Supporting point	kg	205	212
W5 Supporting point	kg	527	551
W6 Supporting point	kg	903	948
W7 Supporting point	kg	658	651
W8 Supporting point	kg	161	164
Operating weight	kg	4595	4850
Shipping weight	kg	4247	4502

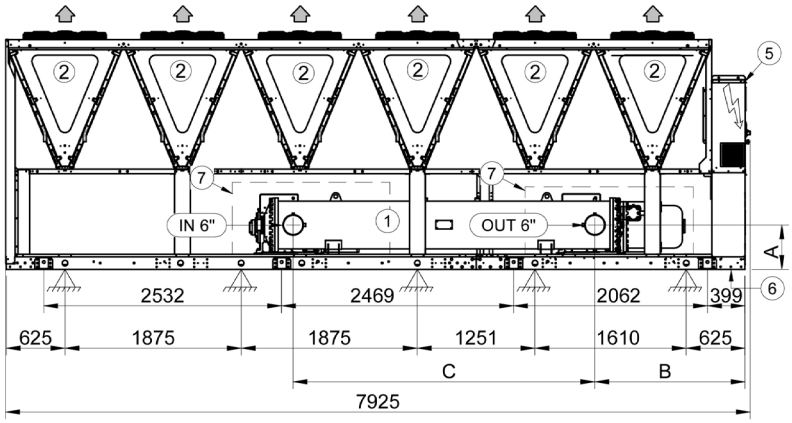
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

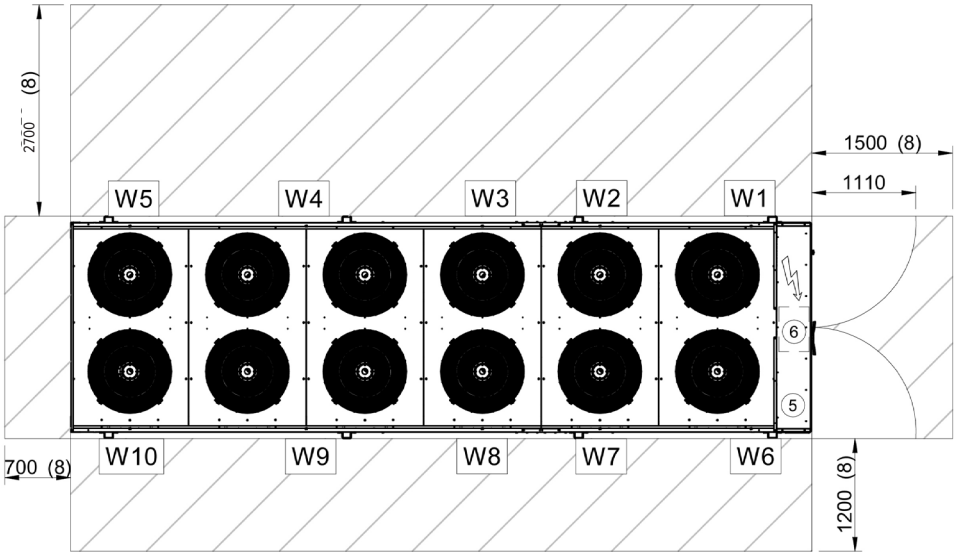
Dimensional drawings

SIZE 250.2 - 280.2 - 320.2 - EXCELLENCE

DAAF50011_00
DATA/DATE 18/05/2020







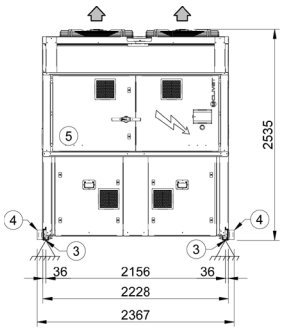
1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

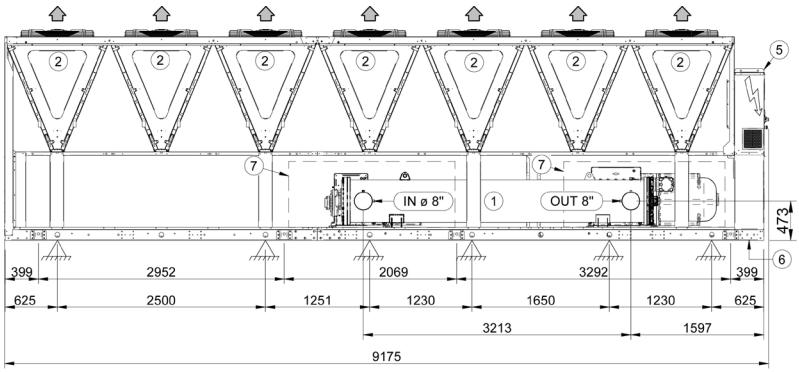
SIZE		250.2		280.2		320.2	
		ST	SC/EN	ST	SC/EN	ST	SC/EN
Length	mm	7925	7925	7925	7925	7925	7925
Depth	mm	2228	2228	2228	2228	2228	2228
Height	mm	2535	2535	2535	2535	2535	2535
W1 Supporting point	kg	753	815	759	818	760	819
W2 Supporting point	kg	580	682	625	724	626	725
W3 Supporting point	kg	562	609	599	645	601	647
W4 Supporting point	kg	747	864	776	889	777	891
W5 Supporting point	kg	206	194	204	192	205	193
W6 Supporting point	kg	616	634	629	649	630	650
W7 Supporting point	kg	562	593	695	729	698	732
W8 Supporting point	kg	597	611	707	722	709	724
W9 Supporting point	kg	611	647	693	732	695	734
W10 Supporting point	kg	220	216	210	206	211	207
Operating weight	kg	5454	5864	5896	6306	5912	6322
Shipping weight	kg	5106	5516	5304	5714	5344	5754

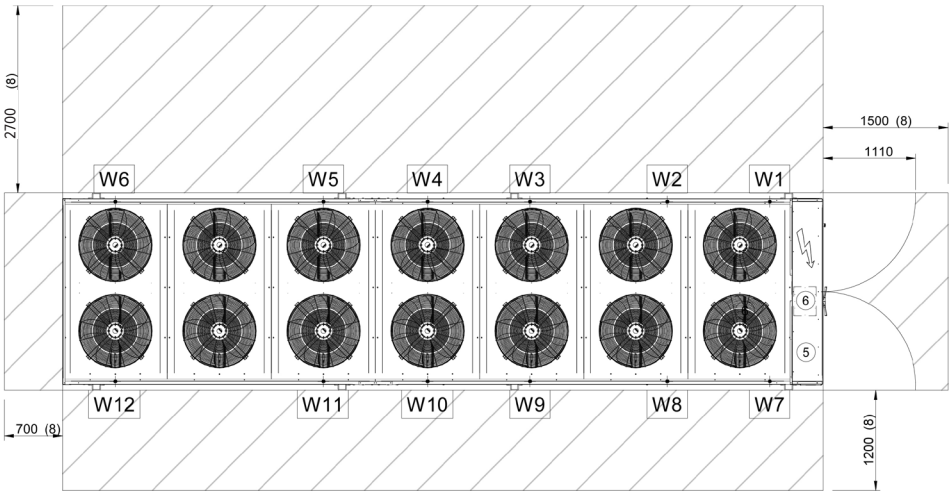
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

SIZE 340.2 - EXCELLENCE

DAAF50012_00
DATA/DATE 20/05/2020







1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

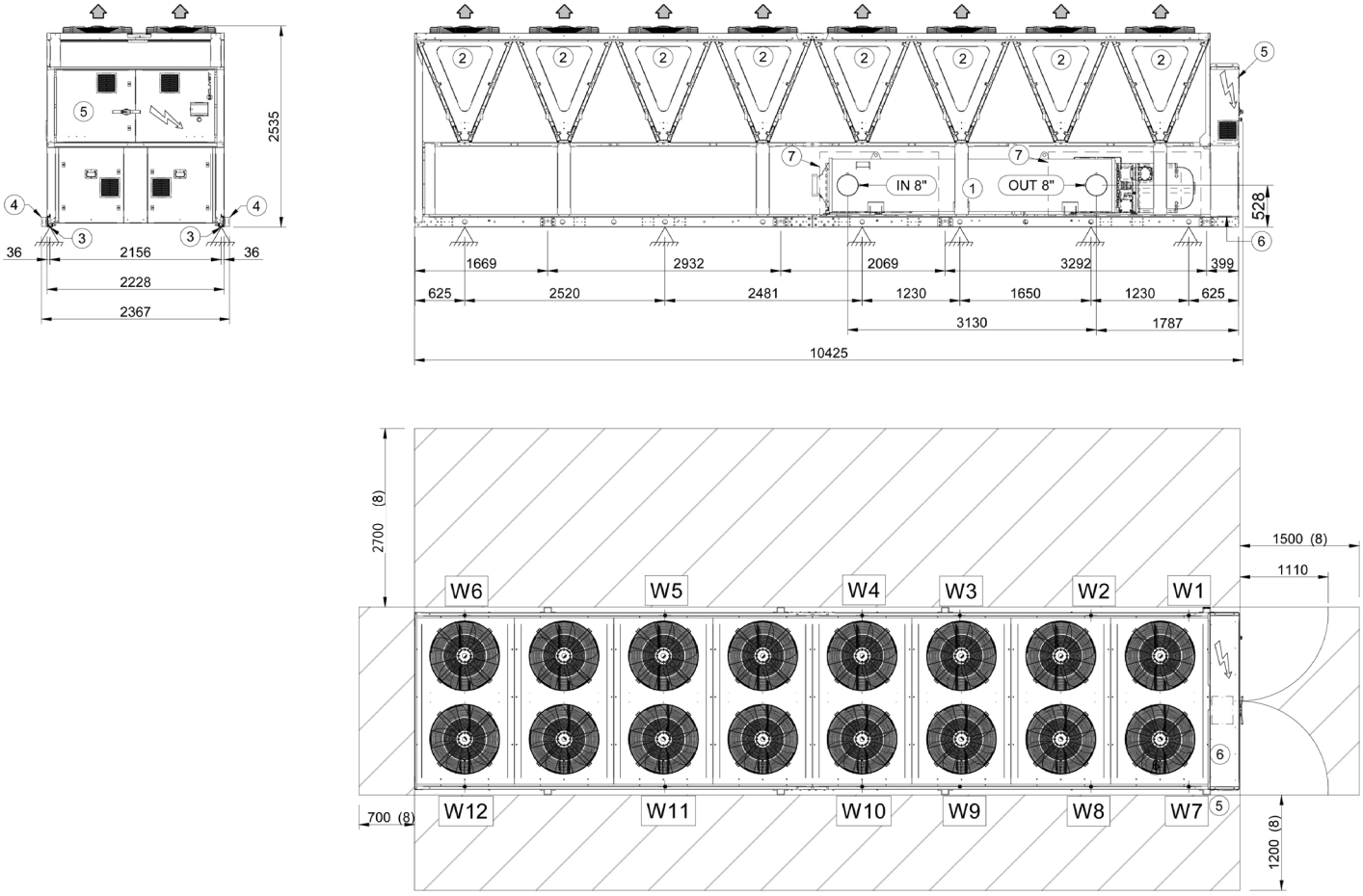
SIZE		340.2	
		ST	SC/EN
Length	mm	9175	9175
Depth	mm	2228	2228
Height	mm	2535	2535
W1 Supporting point	kg	689	729
W2 Supporting point	kg	1004	1168
W3 Supporting point	kg	322	307
W4 Supporting point	kg	815	978
W5 Supporting point	kg	308	303
W6 Supporting point	kg	298	298
W7 Supporting point	kg	552	566
W8 Supporting point	kg	885	942
W9 Supporting point	kg	469	464
W10 Supporting point	kg	745	795
W11 Supporting point	kg	297	295
W12 Supporting point	kg	298	299
Operating weight	kg	6683	7143
Shipping weight	kg	6109	6569

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Dimensional drawings

SIZE 360.2 - 400.2 - EXCELLENCE

DAAF50017_00
DATA/DATE 25/06/2020



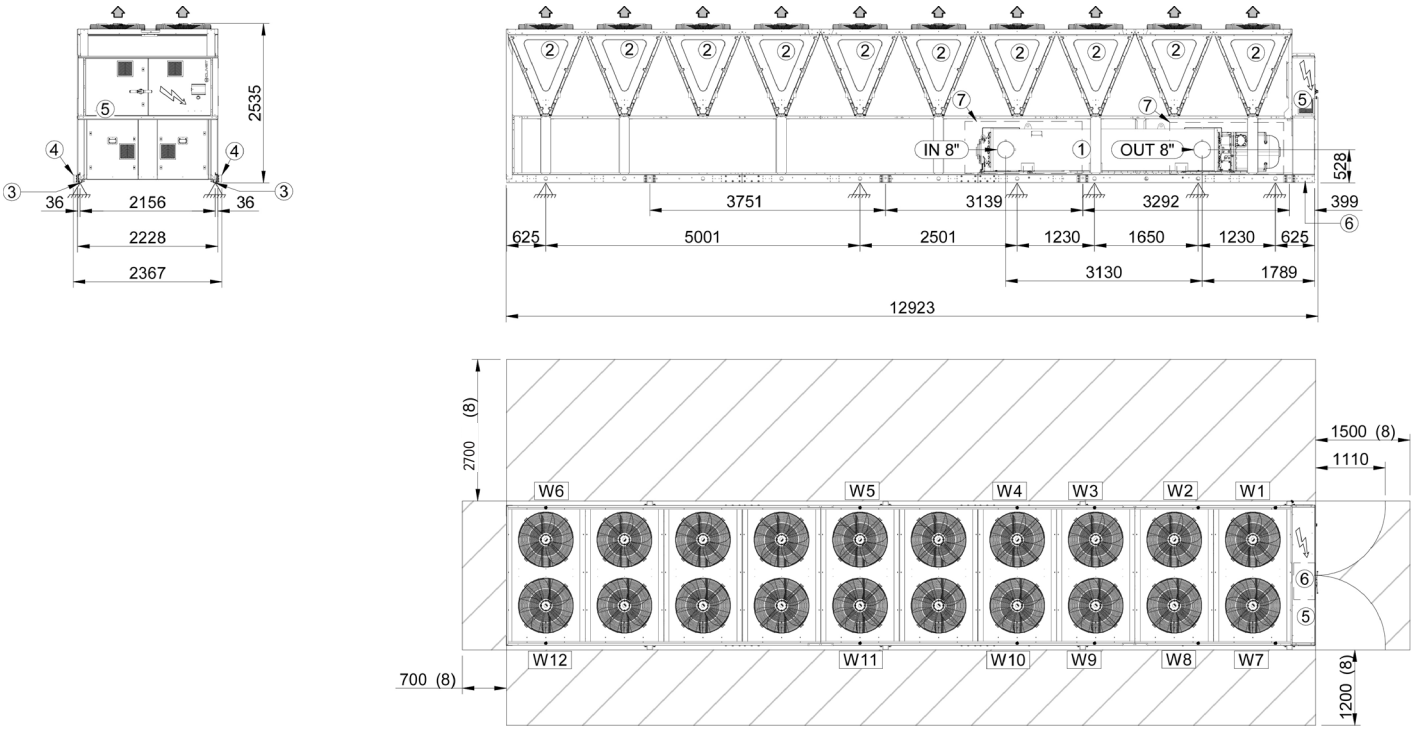
1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

SIZE		360.2		400.2		440.2	
		ST	SC/EN	ST	SC/EN	ST	SC/EN
Length	mm	10425	10425	10425	10425	10425	10425
Depth	mm	2228	2228	2228	2228	2228	2228
Height	mm	2535	2535	2535	2535	2535	2535
W1 Supporting point	kg	669	709	670	710	670	710
W2 Supporting point	kg	993	1157	994	1158	995	1159
W3 Supporting point	kg	485	472	487	474	487	474
W4 Supporting point	kg	992	1150	993	1151	994	1152
W5 Supporting point	kg	382	379	383	381	384	382
W6 Supporting point	kg	276	276	277	277	277	277
W7 Supporting point	kg	510	524	511	525	511	525
W8 Supporting point	kg	867	924	870	926	871	927
W9 Supporting point	kg	983	978	986	981	987	983
W10 Supporting point	kg	951	999	953	1001	954	1003
W11 Supporting point	kg	383	383	385	384	386	385
W12 Supporting point	kg	275	275	276	276	277	277
Operating weight	kg	7766	8226	7785	8245	7793	8253
Shipping weight	kg	6794	7254	6831	7291	6863	7323

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

SIZE 480.2 - 540.2 - 580.2 - EXCELLENCE

DAAF50007_00
DATA/DATE 12/05/2020



1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

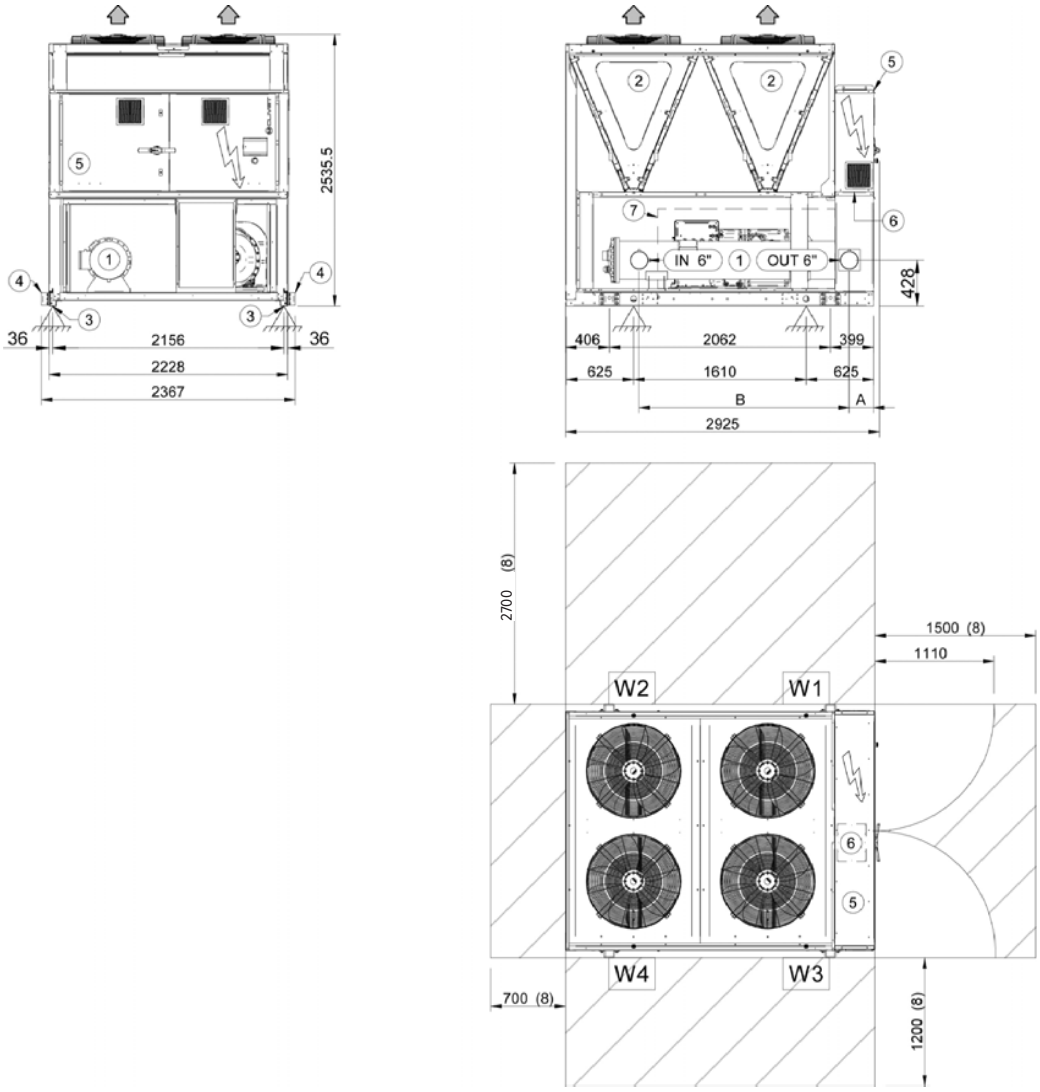
SIZE		480.2		540.2		580.2	
		ST	SC/EN	ST	SC/EN	ST	SC/EN
Length	mm	12923	12923	12923	12923	12923	12923
Depth	mm	2228	2228	2228	2228	2228	2228
Height	mm	2535	2535	2535	2535	2535	2535
W1 Supporting point	kg	663	703	664	704	664	704
W2 Supporting point	kg	1072	1236	1073	1237	1073	1237
W3 Supporting point	kg	662	645	663	646	663	646
W4 Supporting point	kg	1136	1330	1137	1331	1137	1331
W5 Supporting point	kg	743	742	745	744	745	744
W6 Supporting point	kg	419	419	420	420	420	420
W7 Supporting point	kg	507	520	507	521	507	521
W8 Supporting point	kg	937	994	939	996	939	996
W9 Supporting point	kg	1145	1140	1148	1142	1148	1142
W10 Supporting point	kg	888	955	890	956	890	956
W11 Supporting point	kg	743	743	745	745	745	745
W12 Supporting point	kg	419	419	420	420	420	420
Operating weight	kg	9335	9845	9350	9860	9350	9860
Shipping weight	kg	8361	8871	8421	8931	8376	8886

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Dimensional drawings

SIZE 120.1 - 160.1 - PREMIUM

DAAF50004_00
DATA/DATE 21/05/2020



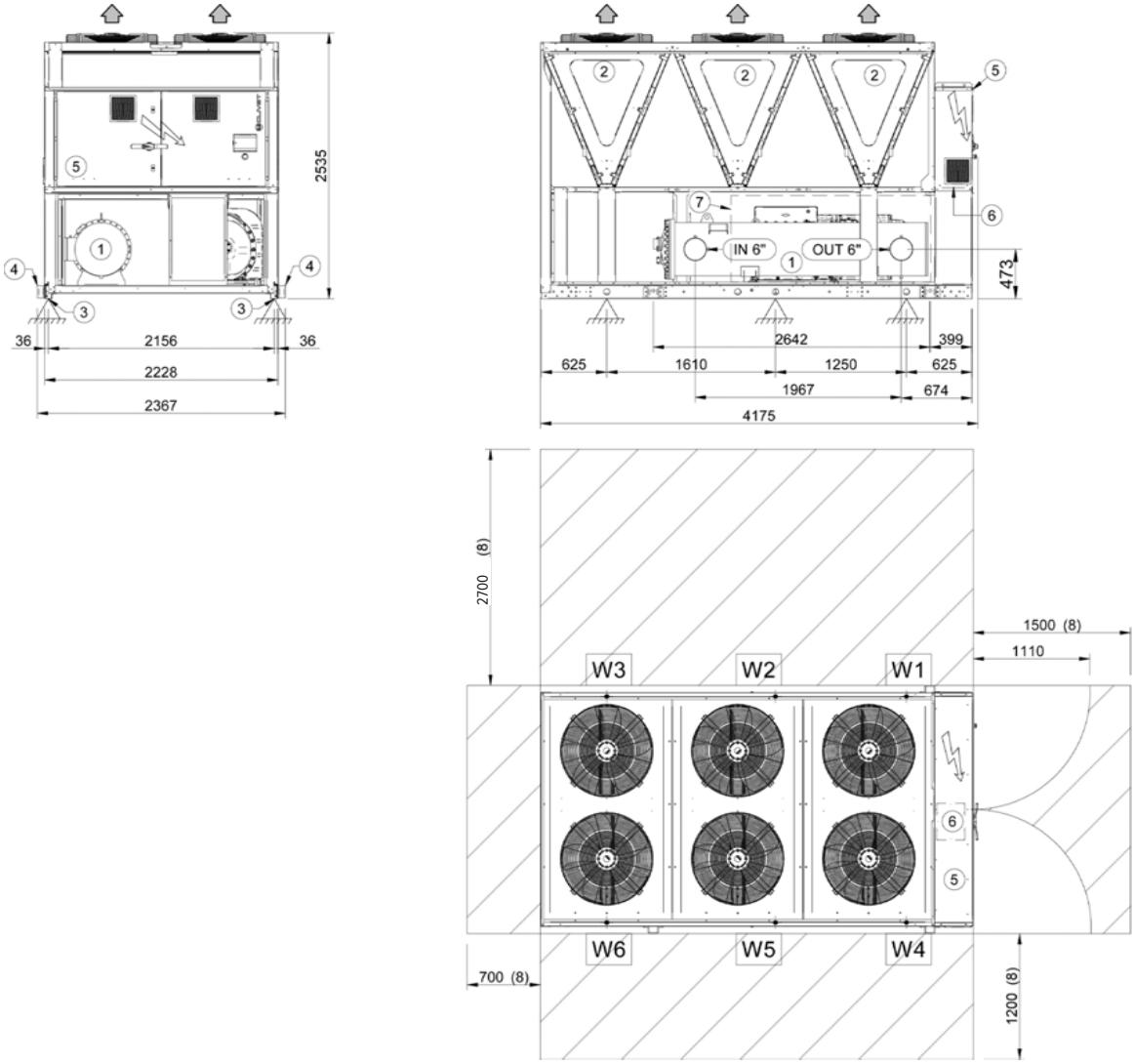
1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

SIZE		120.1		160.1	
		ST	SC/EN	ST	SC/EN
Length	mm	2925	2925	2925	2925
Depth	mm	2228	2228	2228	2228
Height	mm	2535	2535	2535	2535
W1 Supporting point	kg	745	815	769	838
W2 Supporting point	kg	605	670	626	691
W3 Supporting point	kg	713	751	752	790
W4 Supporting point	kg	574	606	610	643
Operating weight	kg	2637	2842	2757	2962
Shipping weight	kg	2459	2664	2515	2720

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

DAAF50014_00
DATA/DATE 21/05/2020

SIZE 200.1 - PREMIUM



1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

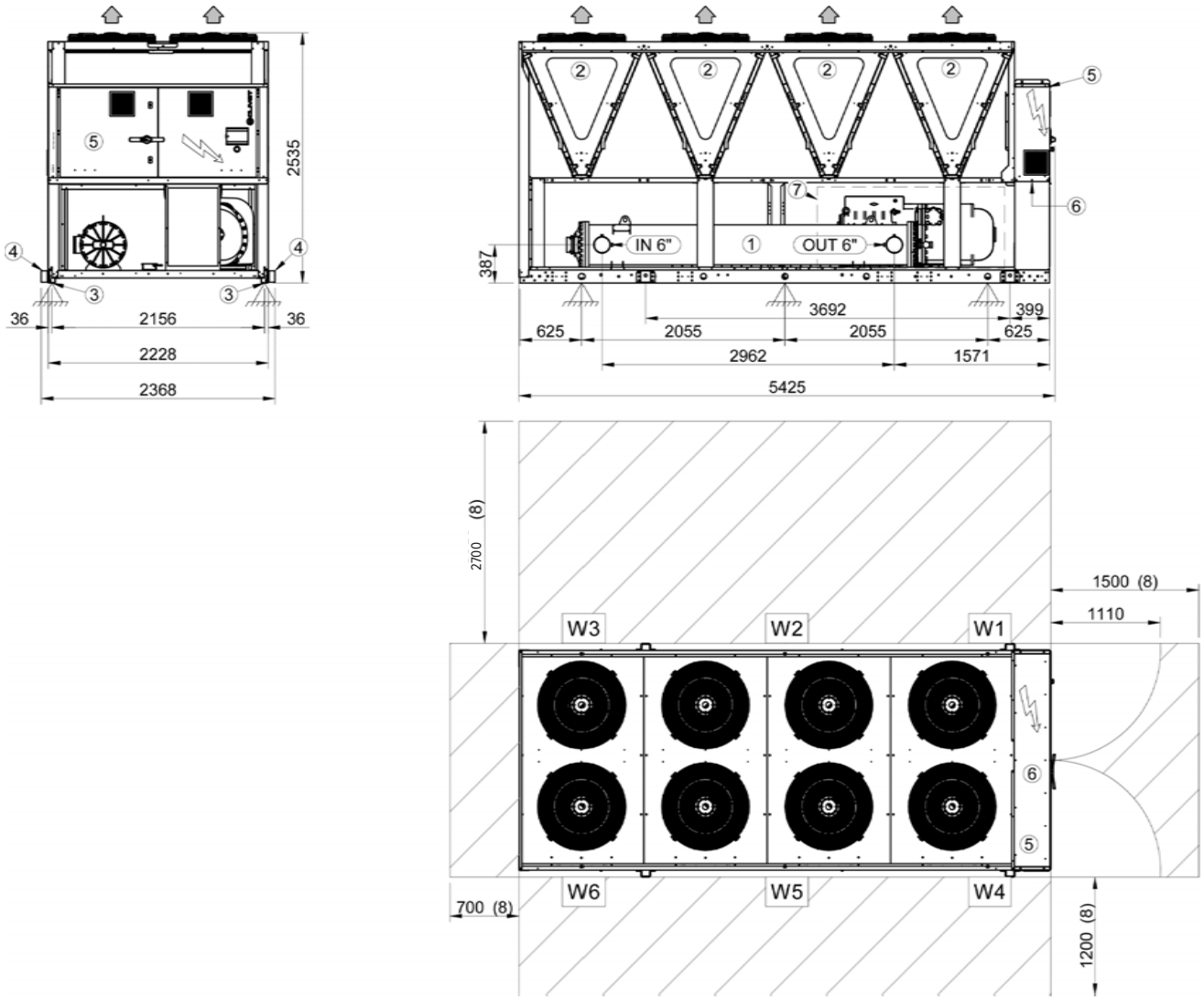
SIZE		200.1	
		ST	SC/EN
Length	mm	4175	4175
Depth	mm	2228	2228
Height	mm	2535	2535
W1 Supporting point	kg	700	734
W2 Supporting point	kg	1050	1178
W3 Supporting point	kg	250	240
W4 Supporting point	kg	648	659
W5 Supporting point		934	977
W6 Supporting point		291	288
Operating weight	kg	3872	4077
Shipping weight	kg	3480	3685

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Dimensional drawings

SIZE 240.1 - PREMIUM

DAAF50009_00
DATA/DATE 15/05/2020



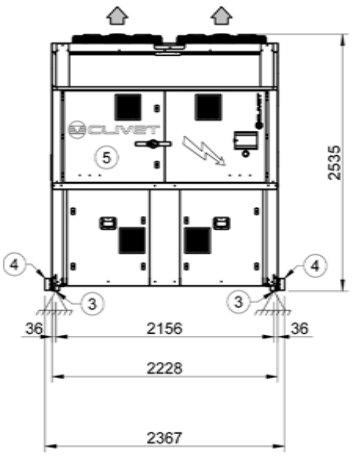
1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

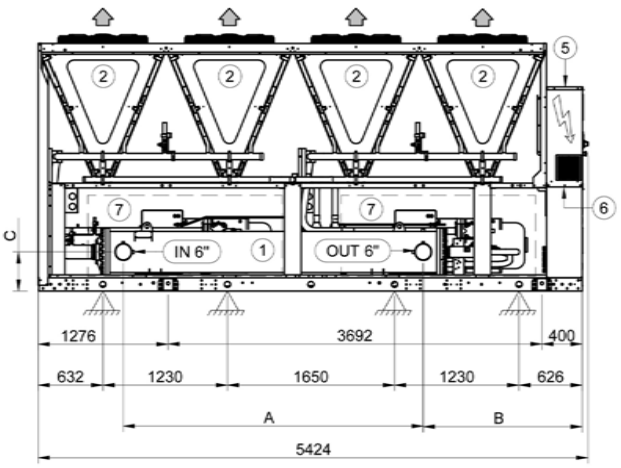
SIZE		240.1	
		ST	SC/EN
Length	mm	5425	5425
Depth	mm	2228	2228
Height	mm	2535	2535
W1 Supporting point	kg	913	1006
W2 Supporting point	kg	944	1058
W3 Supporting point	kg	289	272
W4 Supporting point	kg	645	677
W5 Supporting point		881	920
W6 Supporting point		492	486
Operating weight	kg	4164	4419
Shipping weight	kg	3844	4099

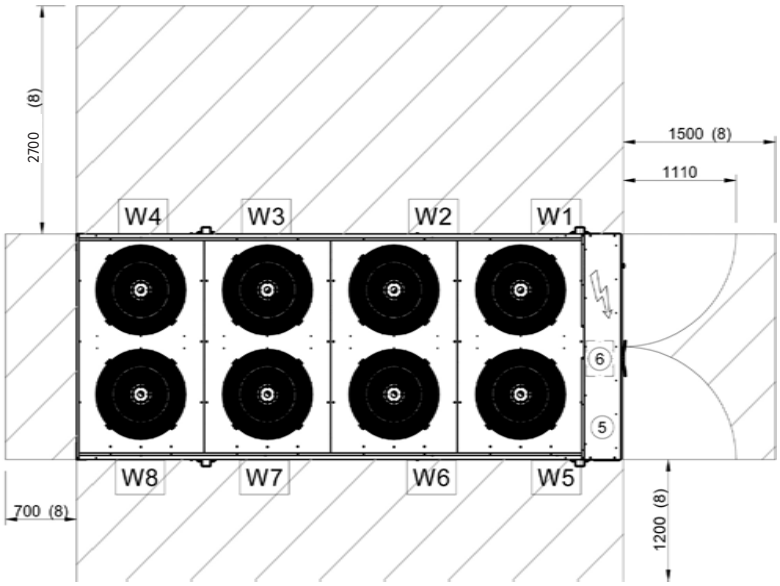
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

SIZE 250.2 - 280.2 - 320.2 - PREMIUM

DAAF50013_00
DATA/DATE 16/04/2020







1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

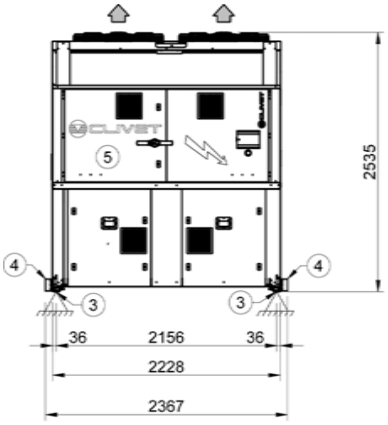
SIZE		250.2		280.2		320.2	
		ST	SC/EN	ST	SC/EN	ST	SC/EN
Length	mm	5424	5424	5424	5424	5424	5424
Depth	mm	2228	2228	2228	2228	2228	2228
Height	mm	2535	2535	2535	2535	2535	2535
W1 Supporting point	kg	683	742	683	743	683	742
W2 Supporting point	kg	622	721	622	721	673	772
W3 Supporting point	kg	777	895	778	895	817	934
W4 Supporting point	kg	380	419	381	419	409	447
W5 Supporting point	kg	584	602	585	603	580	598
W6 Supporting point	kg	585	615	586	616	733	763
W7 Supporting point	kg	663	699	664	700	776	812
W8 Supporting point	kg	444	456	445	457	525	537
Operating weight	kg	4738	5149	4744	5154	5196	5605
Shipping weight	kg	4449	4859	4464	4874	4694	5104

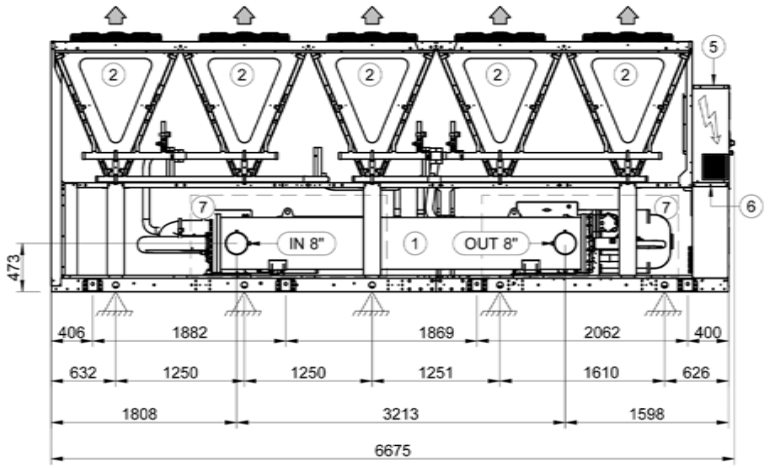
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

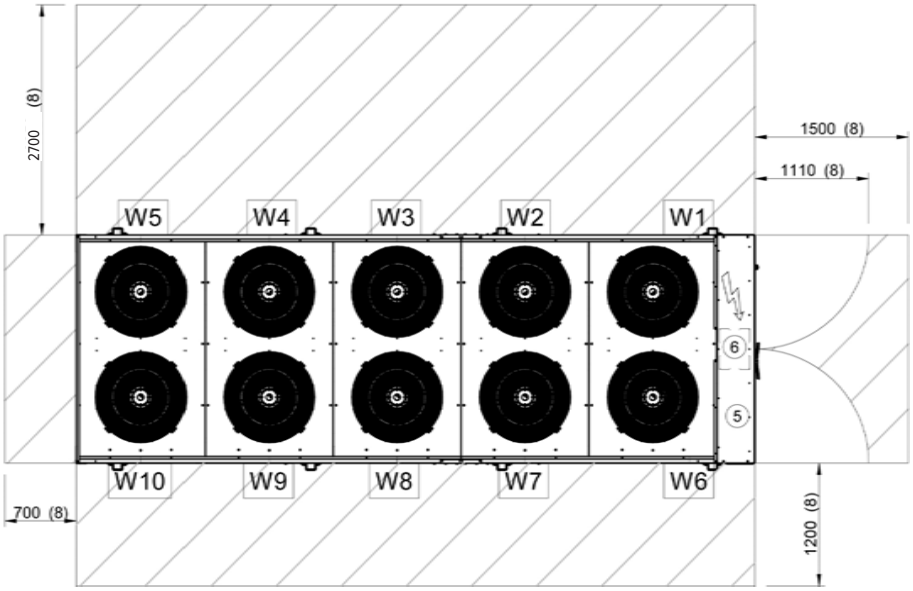
Dimensional drawings

SIZE 340.2 - PREMIUM

DAAF50002_00
DATA/DATE 22/04/2020







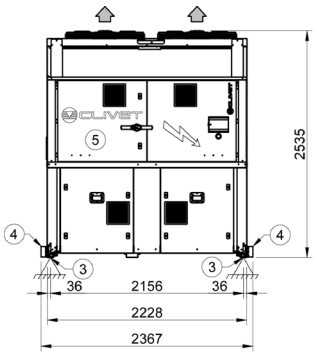
1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

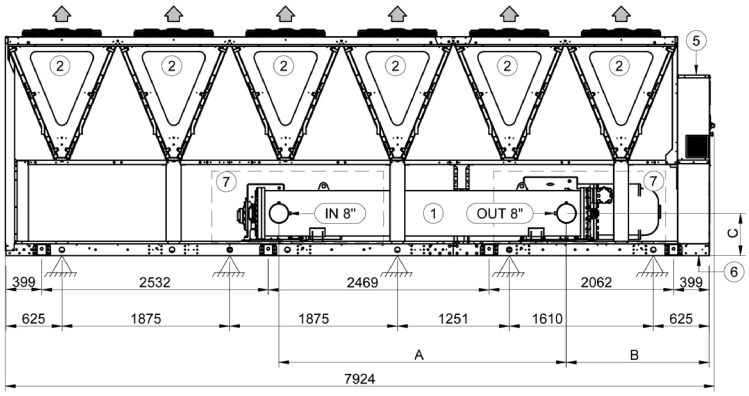
SIZE		340.2	
		ST	SC/EN
Length	mm	6675	6675
Depth	mm	2228	2228
Height	mm	2535	2535
W1 Supporting point	kg	843	909
W2 Supporting point	kg	1041	1196
W3 Supporting point	kg	172	144
W4 Supporting point	kg	923	1084
W5 Supporting point	kg	178	169
W6 Supporting point	kg	706	728
W7 Supporting point	kg	913	966
W8 Supporting point	kg	261	250
W9 Supporting point	kg	891	940
W10 Supporting point	kg	179	176
Operating weight	kg	6107	6562
Shipping weight	kg	5612	6072

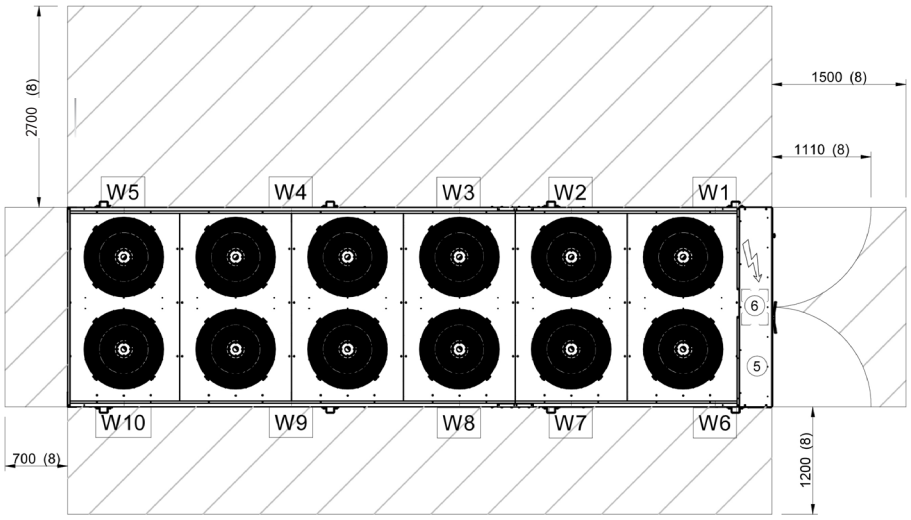
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

SIZE 360.2 - 400.2 - 440.2 - PREMIUM

DAAF50003_00
DATA/DATE 23/04/2020







1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

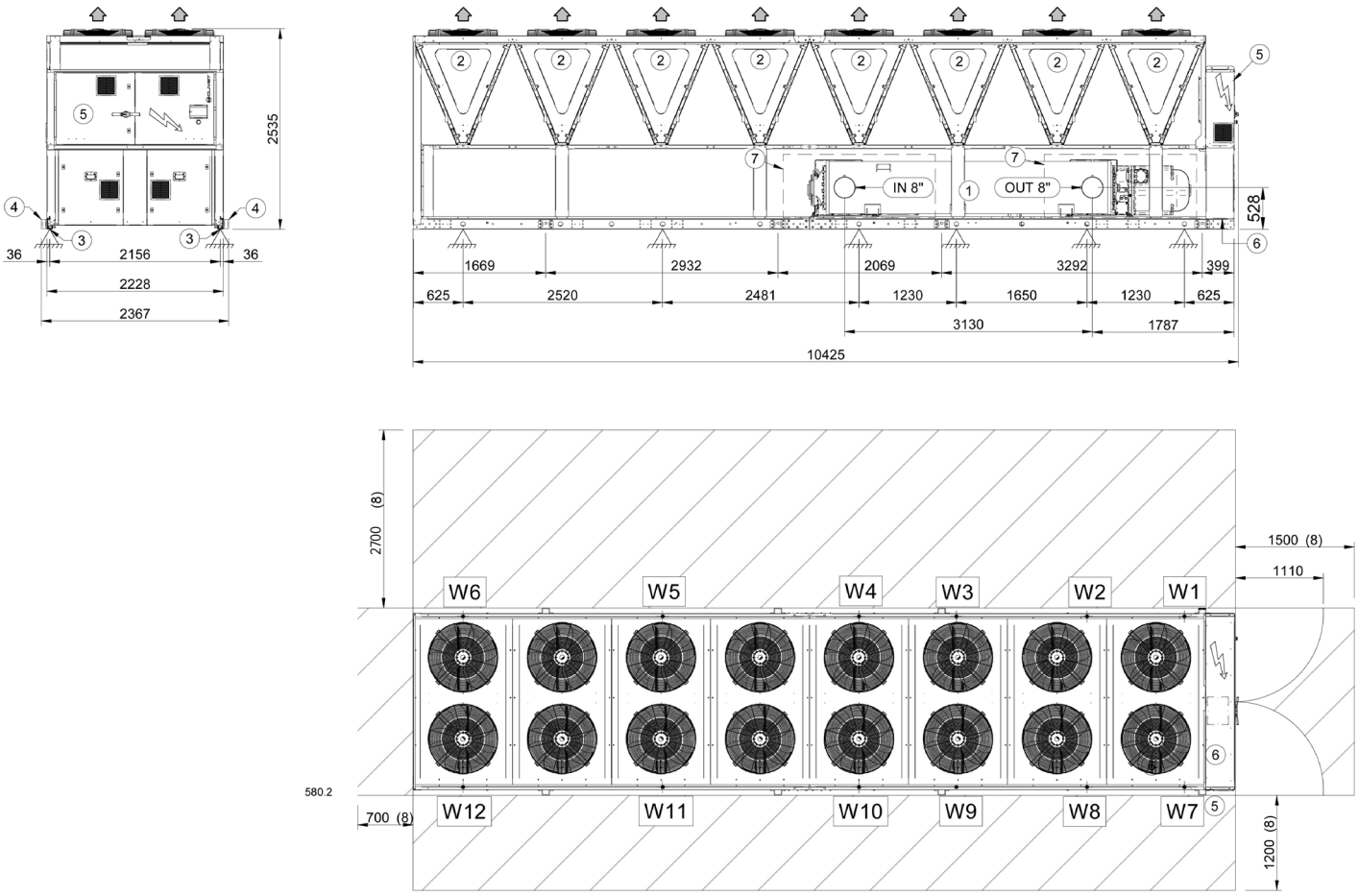
SIZE		360.2		400.2		440.2	
		ST	SC/EN	ST	SC/EN	ST	SC/EN
Length	mm	7924	7924	7924	7924	7924	7924
Depth	mm	2228	2228	2228	2228	2228	2228
Height	mm	2535	2535	2535	2535	2535	2535
W1 Supporting point	kg	927	1012	927	1012	849	918
W2 Supporting point	kg	996	1117	995	1116	918	1052
W3 Supporting point	kg	760	856	766	862	705	743
W4 Supporting point	kg	402	453	403	454	825	940
W5 Supporting point	kg	218	212	218	212	208	195
W6 Supporting point	kg	779	808	779	808	660	684
W7 Supporting point	kg	946	988	946	988	835	881
W8 Supporting point	kg	848	875	850	877	1170	1183
W9 Supporting point	kg	346	362	347	363	808	847
W10 Supporting point	kg	225	223	225	223	210	205
Operating weight	kg	6447	6906	6456	6915	7189	7649
Shipping weight	kg	5927	6387	5937	6397	6207	6667

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Dimensional drawings

SIZE 480.2 - 540.2 - 580.2 - PREMIUM

DAAF50015_00
DATA/DATE 26/05/2020



1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable)
5. Electrical panel
6. Power input
7. Sound proof enclosure, only SC and EN version
8. Clearance access recommended

SIZE		480.2		540.2		580.2	
		ST	SC/EN	ST	SC/EN	ST	SC/EN
Length	mm	10425	10425	10425	10425	10425	10425
Depth	mm	2228	2228	2228	2228	2228	2228
Height	mm	2535	2535	2535	2535	2535	2535
W1 Supporting point	kg	674	713	674	714	674	714
W2 Supporting point	kg	1003	1167	1004	1168	1005	1169
W3 Supporting point	kg	477	459	478	460	479	462
W4 Supporting point	kg	1317	1511	1318	1512	1320	1513
W5 Supporting point	kg	400	399	401	400	402	401
W6 Supporting point	kg	282	282	283	283	283	284
W7 Supporting point	kg	516	529	516	530	516	530
W8 Supporting point	kg	874	930	876	932	878	934
W9 Supporting point	kg	984	978	986	980	989	983
W10 Supporting point	kg	1079	1145	1081	1147	1083	1149
W11 Supporting point	kg	400	400	401	401	402	402
W12 Supporting point	kg	282	282	283	283	283	283
Operating weight	kg	8287	8797	8300	8810	8314	8824
Shipping weight	kg	7342	7852	7382	7892	7414	7924

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

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