

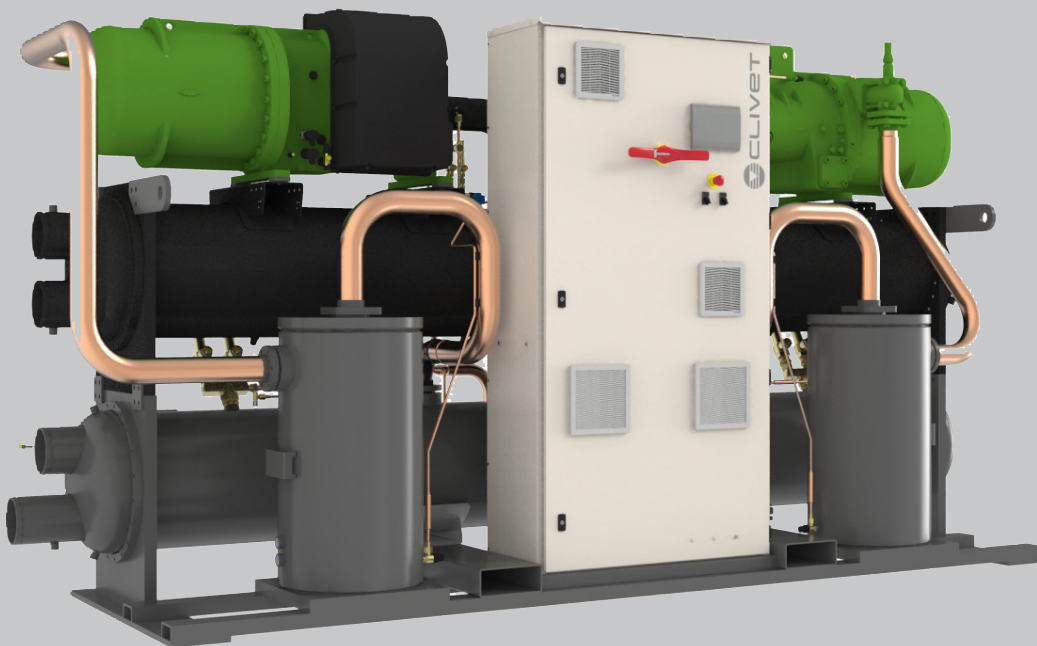


*Water Cooled Liquid Chiller
with inverter technology
for indoor installation*

SCREWLine⁴-i

WDH-iK4 120.1 - 540.2 RANGE

TECHNICAL BULLETIN



SIZE	120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2
COOLING CAPACITY [kW]	340	415	520	610	690	760	830	705	800	900	1065	1280	1385	1520

Page

3	Features and benefits
4	Standard unit technical specifications
5	Unit configuration
6	Built-in options
9	Accessories separately supplied
11	Configurations
13	General technical data
20	Performances
26	General technical data - HWT Version
32	Performances - HWT Version
38	Dimensional drawings



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

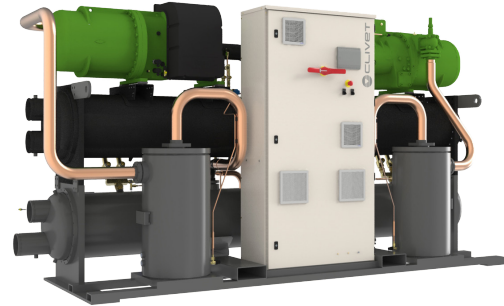
SCREWLine: Screw technology for an efficient and versatile product

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.

WDH-iK4

Water Cooled Liquid Chiller with inverter technology

- Range 340 ÷ 1520 kW
- Spray shell & tube evaporator
- Continuous capacity control
- Seasonal efficiency up to 8,60
- Cooling only, heating only or operation with water circuit change-over
- Operation up to + 55°C inlet water temperature to the condenser
- High water temperature +65°C version



Compressor

Compact, semi hermetic, helicoidal twin-screw compressors with high efficiency integrated 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 with the surface treatment in Zinc–Magnesium painted, that guarantees excellent mechanical characteristics and high corrosion strength over time.

Evaporator

Spray shell & tube evaporator. The exchanger is made of a carbon steel sleeve. The tubes, still anchored to the tubular plate with a mechanical tube expansion, are copper, highly efficient, internally and externally striped in order to optimise thermal exchange. It is also complete with differential pressure switch protecting the water side and coating of closed cell heat insulating material, which keeps condensation from forming and heat exchange with the outside. Removable heads to allow cleaning and maintenance of the exchanger. Maximum operating pressure of the water side of the exchanger: 10 bar. Quick coupling hydraulic connection with grooved joint.

Condenser

Highly efficient shell & tube exchanger. The exchanger is made of a carbon steel sleeve. The tubes, still anchored to the tubular plate with a mechanical tube expansion, are copper, highly efficient, internally and externally striped in order to optimise thermal exchange. It is also complete with differential pressure switch protecting the water side. Removable heads to allow cleaning and maintenance of the exchanger. Maximum operating pressure of the water side of the exchanger: 10 bar. Quick coupling hydraulic connection with grooved joint.

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 and low pressure gauges;
- high pressure safety valve (safety valve with sealed tap open for inspection);
- low pressure safety valve (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;

- oil separator;
- oil recovery circuit;
- double safety valves with change-over valve

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;
- main power supply terminals (400 V/3 Ph/50 Hz);
- insulation transformer for powering the auxiliary circuit (230 V/24 V);
- fuses and thermal relays for protecting the compressors;

The control section includes:

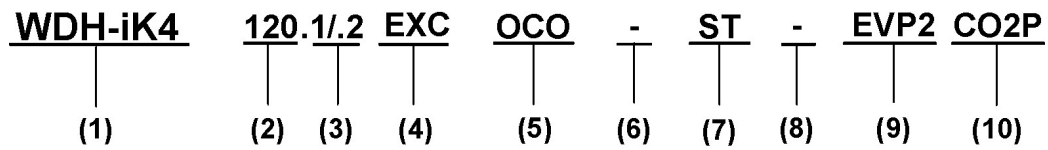
- interface terminal with graphic display;
- set values, error codes and parameters can be displayed;
- proportional-integral-derivative adjustment of water temperature;
- management of unit start-up from local or remote device;
- ON/OFF keys and alarm reset;
- daily, weekly temperature set point and start-up/shutdown scheduler;
- anti-freeze protection water side;
- compressor protection and timer;
- pre-alarm function for water anti-frost and refrigerant gas high pressure functions;
- self-diagnosis system with instant error code visualisation;
- control of compressor start-up automatic rotation;
- visualisation of no. of hours of compressor operation;
- remote ON/OFF control;
- remote relay to signal cumulative alarms;
- demand limit input (absorbed power limit depending on external signal 0÷10V or 4÷20 mA);
- potential-free contacts for compressor status;
- digital input to enable double set point;;
- multifunctional phase monitor;
- refrigerant gas high pressure pre-alarm function (prevents automatic unit shutdown in many cases);
- remote HEAT/COOL command.

All device functions can be replicated with a normal laptop computer connected to the unit via an Ethernet cable and with a browser. All electrical cables are coloured and numbered according to the wiring diagram.

Test

Unit subjected to factory-tested in specific steps and test pressure of the piping of the refrigerant circuit (with nitrogen and hydrogen), before shipping them. After the approval, the moisture contents present in all circuits are analyzed, in order to ensure the respect of the limits set by the manufacturers of the different components.

Unit configuration



(1) Range

WDH = Water Cooled Liquid Chiller with screw compressors

iK4 = SCREWLine⁴ series with screw compressor driven by inverter and refrigerant R513A

(2) Size

120 = Nominal compressor capacity (HP)

(3) Compressors

.1/.2 = Number of compressors

(4) Energy version

EXC = EXCELLENCE version

(5) Operation

OCO = Cooling only operation (standard)

OHO = Heating only operation

OHI = Operation with water circuit change-over

(6) High water temperature version

(-) not required High water temperature (standard)

HWT = High water temperature +65°C

(7) Acoustic configuration

ST = Standard acoustic configuration (standard)

EN = Super-silenced acoustic configuration

(8) Low evaporator water temperature

(-) = Low water temperature: not required (standard)

B = Low water temperature, down to -8°C (Brine)

(9) Evaporator

EV2P = 2 pass evaporator (standard)

EV3P = 3 pass evaporator

(10) Condenser

CO2P = 2 pass condenser (standard)

CO3P = 3 pass condenser

AAL SX evaporator water connections

Spray shell & tube evaporator.

Complete with differential pressure switch protecting the water side and coating of closed cell with a thickness of 20mm. Removable heads to allow cleaning and maintenance of the exchanger. Maximum operating pressure of the water side of the exchanger: 10 bar. Quick coupling hydraulic connection with grooved joint with exits to the left of the control panel.

Standard configuration.

AAR DX evaporator water connection

Spray shell & tube evaporator.

Complete with differential pressure switch protecting the water side and coating of closed cell with a thickness of 20mm. Removable heads to allow cleaning and maintenance of the exchanger. Maximum operating pressure of the water side of the exchanger: 10 bar. Quick coupling hydraulic connection with grooved joint with exits to the right of the control panel.

AACT Opposing evaporator water connections

Spray shell & tube evaporator.

In case the project evaporator flow is below than the nominal standard unit flow (>7K delta T between input and output), you must use a three pass evaporator on the water side. In this configuration the input connection of the water will be in the standard location (left hovering in front of the control panel) while the output will be on the other side.

CDL SX condenser water connections

Highly efficient shell and tube exchanger.

Complete with differential pressure switch protecting the water side. Removable heads to allow cleaning and maintenance of the exchanger. Maximum operating pressure of the water side of the exchanger: 10 bar. Quick coupling hydraulic connection with grooved joint, with exits to the left of the control panel.

Standard configuration.

CDR DX condenser water connections

Highly efficient shell and tube exchanger.

Complete with differential pressure switch protecting the water side. Removable heads to allow cleaning and maintenance of the exchanger. Maximum operating pressure of the water side of the exchanger: 10 bar. Quick coupling hydraulic connection with grooved joint, with exits to the right of the control panel.

CDCT Condenser water connections on the opposite sides

Highly efficient shell and tube exchanger.

In case the project condenser flow is below than the nominal standard unit flow (>7K delta T between input and output), you must use a three steps condenser on the water side. In this configuration the input connection of the water will be in the standard location (left hovering in front of the control panel) while the output will be on the other side.

EHWP User side water piping antifreeze electric heaters

The option makes it possible to avoid the formation of ice the evaporator and to preserve its correct operation.

This is an electric heating element insert in the exchanger. It activates if the water temperature drops below a set limit.

The device is recommended during the winter when the unit is in stand-by or if the system is not in use for long periods of time.

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

⚠ When the unit is electrically disconnected, the device is not in operation.

⚠ The device only protects the water side exchanger. Anti-freeze protection of the plumbing connections is the responsibility of the client.

EHCS Source side antifreeze electric heaters

The option makes it possible to avoid the formation of ice in the condenser and to preserve its correct operation.

This is an electric heating element insert in the exchanger. It activates if the water temperature drops below a set limit.






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

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⚠ The device only protects the water side exchanger. Anti-freeze protection of the plumbing connections is the responsibility of the client.

Built-in options

IM	20 mm thickness insulation for increased evaporator Increased evaporator insulation with thickness of 20 mm. Ideal solution in case of water production at low temperatures (< 5°C) or for conditions of high air temperature and high humidity.
ISS	Condenser insulation Increased condenser insulation with thickness of 10 mm. Ideal solution in case of high water production to condenser.
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.
RPR	Refrigerant drops detector Leak detector device built-in installed and placed inside the compressor box, it detects leaks of the internal refrigeration circuit.
FC2	EMC filtering for residential-industrial environment EN 61800-3 cat C2) Reduces electromagnetic interferences. Increase the inverter compressor (VFD) immunity level according to residential-industrial environment requirements (EN61800-3) and allow its compliancy with emissions level required in category C2.
SCP4	Set-point compensation with 0-10 V signal This device enables the set-point to be varied which is pre-set using an external 0÷10 V signal. The device is installed and wired built-in the unit.
SPC1	Set-point compensation with 0-10 V signal This device enables the set-point to be varied which is pre-set using an external 4-20 mA signal. The device is installed and wired built-in the unit.
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.
CONTA2	Energy meter Allows to display and record the unit's main electrical parameters. The data can be displayed with the user interface on the unit or via the supervisor through the specific protocol variables. It is possible to control: voltage (V), absorbed current (A), frequency (Hz), cosfi, power input (kW), absorbed energy (kWh), harmonic components (%) The device is installed and wired built-in the unit.
CMSC9	Serial communication module for Modbus supervisor This enables the serial connection of the supervision system, using Modbus as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems. The device is installed and wired built-in the unit.  The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out).
CMSC10	Serial communication module for LonWorks supervisor This enables the serial connection of the supervision system which uses the LonWorks communication protocol. It enables access to a list of operating variables, commands and alarms which comply with the Echelon® standard. The device is installed and wired built-in the unit.  The configuration and management activities for the LonWorks networks are the responsibility of the client.  LonWorks technology uses the LonTalk® protocol for communicating between the network nodes. Contact the service supplier for further information.  The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

CMSC11 Serial communication module for BACnet/IP supervisor

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

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

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

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.

RDVS Switching valve with dual safety valves

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

Standard configuration.

SDV Cutoff valve on compressor supply and return

An option which integrates the supply cutoff valve, which is supplied as standard. The presence of the cock at the intake as well enables the compressors to be isolated and substituted without discharging the refrigerant from within the refrigeration circuit. This means that the extraordinary maintenance activities are facilitated.

Device installed built-in the unit.

Accessories separately supplied

AMRX

Rubber antivibration mounts

Mat in thermoplastic elastomer composed of 4 inner layers. Hardness 45 ShA, thickness 37.5 mm.

Thermoplastic Elastomer is ideal for temperature range -45° C to 110° C

It has a high resistance to aging, pollutants, hydrocarbons, saline mists, UV rays and detergents and is composed of recyclable material.

High degree of thermal and electrical insulation.

AMMX

Spring antivibration mounts

The spring antivibration mounts must be fixed to the heat exchanger support plates are used to dampen the vibrations produced by the unit by reducing the noise transmitted to the structures. They consist of:

- n° 7 springs in harmonic steel UNI EN 10270-1 SH with surface protected by cathodic treatment.
- n° 2 "plate" containment bodies made of 5 mm thick galvanized steel plates, coated with thermoplastic with high mechanical resistance, injection molded. The contact surfaces of the plates have deformable non-slip reliefs, which allow the anti-vibration mount to stand for friction. The springs are fixed with a special adhesive in the relative seats provided on the plates.
- n° 1 galvanized steel screw jack to record the level of suspended machine in various points of support.

AMMSX

Anti-seismic spring antivibration mounts

The anti-seismic spring antivibration mounts be secured to the support plates of the exchangers. The containment structure is designed to ensure high resistance to multi-directional forces acting on the surface of the suspended unit in case of earthquakes. They consist of:

- n° 4 springs in harmonic steel UNI EN 10270-1 SH with surface protected by cathodic treatment
- n° 8 nylon discs that block the spring to the structure and prevent metal contact
- n° 2 rubber side seals to prevent metallic contact between base and cover insulation and ensure continuity even in the presence of axial thrusts
- n° 2 TCEI M16 side safety screws, to lock the cover to the base guides and prevent the spring from coming out
- n° 1 screw and nut M24 1 to record the fee of the suspended machine
- n° 1 intermediate plate to evenly distribute the load on the springs
- n° 1 base and 1 cover made of sandblasted Fe420 steel, protected by cathodic treatment and epoxy powder coated
- n° 1 neoprene pad applied to the base, which features deformable slip, allowing the vibration station by friction

IVMSX

Modulating valve source side

Recommended option in applications with disposable water with relatively low temperatures (well, groundwater, water mains).

The two-way modulating motorised valve is located on the thermal source side and is controlled by the unit.

It operates in conjunction with the refrigeration circuit: the modulation via the 0-10V signal - based on the pressure of the refrigerant in the exchanger on the source side - reduces water consumption and ensures the units stays in the expected operating range.

The valves, if not supplied by CLIVET, must have a fast stroke actuator, with an actuation times of 35 sec.

- ⚠ Warning: to allow for correct opening and closure the differential pressure value must be at least 200 kPa.
- ⚠ Option to be installed outside the unit on the water outlet pipe on the source side. The Customer is responsible for conducting the hydraulic and electrical connection. The Customer is responsible for the 230V AC power supply.
- ⚠ Option not compatible with sea water. In these cases fit an intermediate exchanger outside the unit.

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.

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.

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.

- ⚠ Installation is the responsibility of the Client, externally to the unit.
- ⚠ Check for the presence of the required hydraulic shut-off valves in the system, in order to undertake periodical maintenance.

Configurations

OCO - Cooling only operation (Standard)

Configuration that allows the water - water unit to operate with the thermoregulation active when chilled water is produced at a controlled temperature.

OHO - Heating only operation

Configuration that allows operation as water-water heat pump to produce hot water for civil and industrial use.

OHI - Operation with water circuit change-over

Configuration that allows operation as water-water heat pump to produce hot water for civil and industrial use.

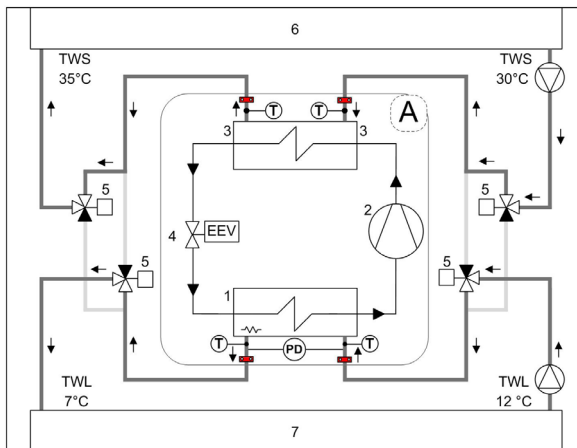
It consists of:

- suitable exchangers with extra-thick closed-cell insulation
- temperature probes at the exchanger's water inlet and outlet.

The system must be fitted with switching valves. The hydraulic switching must be carried out when the unit's operating mode is changed. In summer operation mode, the unit automatically controls the evaporation temperature based on the selected set-point value. Likewise, in winter operation mode, the unit automatically adjusts the condensation temperature based on the selected set-point value and checks the temperature on the evaporator to prevent the water from freezing.

- ⚠ The Customer is responsible for installing and managing the hydraulic switching valve
- ⚠ The Customer can change the operating mode using the interface on board the machine or the designated potential-free contact.
- ⚠ Possible non-freeze solutions must be fitted both on the utilisation circuit and the source circuit, as hydraulic switching involves mixing fluids.
- ⚠ During operation with Dry coolers or Evaporative towers, the temperatures of the fluid on the source side need to be always positive as there is no defrosting function.
- ⚠ The device includes two temperature probes to be positioned at the input and output of the connection manifold between the two condensers. The manifolds and the probe installation are provided by the Customer. The connection cable length is 3 m.

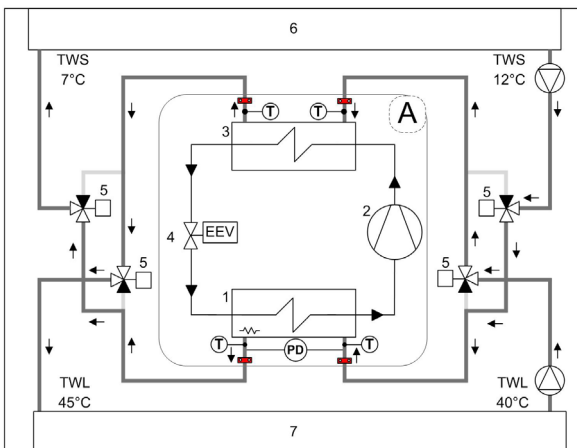
Operation mode: cooling



1. Internal exchanger (evaporator)
2. Compressor
3. External exchanger (condenser)
4. Electronic expansion valve
5. Switching valves (provided by Customer)
6. Thermal source (heat rejection)
7. Use (cold)

T - Water temperature probe
 PD - Differential pressure switch
 TWS - Water source side
 TWL - Water user side

Operation mode: heating



1. Internal exchanger (evaporator)
2. Compressor
3. External exchanger (condenser)
4. Electronic expansion valve
5. Switching valves (provided by Customer)
6. Thermal source (heat withdrawal)
7. Use (heat)

T - Water temperature probe
 PD - Differential pressure switch
 TWS - Water source side
 TWL - Water user side

EN - Super-silenced acoustic configuration

Configuration used to increase the unit's silent operation by acting on the source of the noise. Equipped with sound-proof cover coating which envelop the compressors.

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

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	0.803	0.749	0.691
Compressor power input factor	0.896	0.878	0.859	0.840

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

HWT - High water temperature

Enhanced efficiency version in applications with high condenser water temperature:

- chiller operation (configuration OCO) with dry-cooler
- heat Pump operation (configuration OHI / OHO), with leaving temperature extended up to +65°C

Includes.

- dedicated compressor for high condensing temperature;
- condenser designed for high pressures;
- settings and safety equipment: suitable for this application.

General technical data

Performance

SIZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2
Cooling															
Cooling capacity	(1) kW	340	416	520	611	690	760	831	705	801	900	1066	1281	1386	1521
Compressor power input	(1) kW	63,7	77,5	97,8	115	132	144	160	132	150	171	200	240	263	292
Total power input	(2) kW	64,7	78,5	98,8	116	133	145	161	133	151	172	201	241	264	293
EER	(1) -	5,26	5,29	5,26	5,28	5,18	5,23	5,17	5,29	5,31	5,23	5,29	5,31	5,26	5,19
Water flow rate (evaporator)	(1) l/s	16,3	19,9	24,8	29,2	33,0	36,3	39,7	33,7	38,3	43,0	50,9	61,2	66,2	72,7
Pressure drops (evaporator)	(1) kPa	23,1	19,4	19,9	24,6	44,0	43,1	34,5	46,5	40,7	39,1	50,3	44,2	45,0	53,6
Water flow rate (condenser)	(1) l/s	19,4	23,6	29,5	34,7	39,4	43,3	47,4	40,1	45,5	51,2	60,6	72,7	78,8	86,7
Pressure drops (condenser)	(1) kPa	25,3	25,6	29,7	28,1	38,4	36,6	37,3	40,5	35,6	28,9	40,6	38,4	31,0	29,5
Cooling capacity (EN14511:2018)	(3) kW	340	415	520	610	690	760	830	705	800	900	1065	1280	1385	1520
Total power input (EN 14511:2018)	(3) kW	66,3	80,1	101	118	138	150	165	138	155	177	208	249	270	300
EER (EN 14511:2018)	(3) -	5,13	5,18	5,13	5,15	5,01	5,06	5,02	5,11	5,15	5,10	5,12	5,14	5,12	5,07
SEER	(4) -	8,41	8,46	8,53	8,57	8,55	8,60	8,57	8,59	8,38	8,47	8,56	8,38	8,51	8,58
SEPR	(5) -	8,45	8,32	8,24	8,55	8,29	8,76	8,31	8,54	8,57	8,22	8,88	8,74	8,77	8,84
Cooling capacity (AHRI 550/590)	(6) kW	342	413	517	607	687	756	826	701	797	896	1060	1274	1379	1513
Total power input (AHRI 550/590)	(6) kW	67,0	80,2	101	118	138	150	165	137	154	177	208	249	268	300
COP _R	(6) -	5,10	5,15	5,11	5,13	4,99	5,04	5,00	5,13	5,17	5,07	5,09	5,12	5,15	5,04
IPLV	(6) -	7,94	7,74	7,78	7,82	7,83	7,52	7,73	7,62	7,82	7,77	7,68	7,62	7,64	7,74
Heating															
Heating capacity	(7) kW	392	490	595	698	796	884	977	783	882	991	1167	1467	1595	1764
Compressor power input	(7) kW	85,3	105	128	149	176	194	216	173	190	210	253	326	347	393
Total power input	(2) kW	86,3	106	129	150	177	195	217	174	191	211	254	327	348	394
COP	(7) -	4,54	4,61	4,62	4,65	4,51	4,53	4,50	4,50	4,61	4,71	4,59	4,49	4,58	4,48
Water flow rate (condenser)	(7) l/s	19,0	23,9	28,7	34,0	38,4	42,7	47,4	38,0	43,0	48,3	56,4	70,8	77,9	85,1
Pressure drops (condenser)	(7) kPa	24,3	26,2	28,0	27,0	36,7	35,7	37,3	36,8	32,3	25,6	35,1	36,4	30,2	28,4
Water flow rate (evaporator)	(7) l/s	24,3	30,6	37,1	43,6	49,3	54,9	60,5	48,5	55,0	62,2	72,7	90,8	99,3	109
Pressure drops (evaporatore)	(7) kPa	51,4	45,6	44,3	62,8	91,0	90,5	84,2	89,6	78,2	78,3	98,0	92,6	96,2	115
Heating capacity (EN 14511:2018)	(8) kW	398	500	602	713	804	894	993	797	901	1011	1181	1483	1631	1781
Total power input (EN 14511:2018)	(8) kW	90,3	111	134	158	186	206	229	185	203	223	269	344	370	411
COP (EN 14511:2018)	(8) -	4,41	4,49	4,50	4,51	4,32	4,35	4,33	4,32	4,44	4,54	4,39	4,31	4,41	4,33
SCOP - Average climate - W55	(4) -	4,97	5,23	5,02	5,18	5,07	5,18	5,15	5,01	5,02	5,05	5,13	5,09	5,01	5,21

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

1. Data referred to the following conditions: Evaporator water temperature = 12/7 °C. Condenser water temperature = 30/35°C. Evaporator fouling factor = $0,44 \times 10^{(-4)}$ m² 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. Data compliant to Standard EN 14511:2018 referred to the following conditions: Evaporator water temperature = 12/7 °C. Condenser water temperature = 30/35°C
4. Data compliant to Standard EN14825:2018
5. Data compliant to Standard EU 2016/2281
6. Data compliant to Standard AHRI 550/590 referred to the following conditions: Evaporator water temperature 12,22°C / 6,7°C. Water flow-rate 0,043 l/s per kW. Condenser water temperature 29,44 °C / 34,61°C. Evaporator fouling factor = $0,18 \times 10^{(-4)}$ m² K/W
7. Data referred to the following conditions: Condenser water temperature = 40/45°C. Evaporator water temperature = 12/7°C. Evaporator fouling factor = $0,18 \times 10^{(-4)}$ m² K/W
8. Data compliant to Standard EN 14511:2018 referred to the following conditions: Condenser water temperature = 40/45°C. Evaporator water temperature = 12/7°C.

Construction

SIZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2	
Compressor																
Compressor type	(1)	ISW														
Refrigerant		R-513A														
N° compressor	Nr	1						2								
Nominal capacity (C1)	HP	125	160	200	240	240	290	290	125	125	160	160	200	240	240	
Nominal capacity (C2)	HP	-	-	-	-	-	-	-	125	160	160	200	240	240	290	
Std capacity steps	(2)	24% - 100%						12% - 100%								
Oil charge (C1)	l	18	18	35	35	35	35	35	18	18	18	18	35	35	35	
Oil charge (C2)	l	-	-	-	-	-	-	-	18	18	18	35	35	35	35	
Refrigerant charge (C1)	(3) kg	110	110	130	130	160	160	170	125	125	135	135	150	150	155	
Refrigerant charge (C2)	(3) kg	-	-	-	-	-	-	-	115	115	125	125	140	140	145	
Refrigerant circuits	Nr	1						2								
Internal exchanger / Evaporator																
Type of exchanger	(4)	S&T SPRAY														
N° of exchanger	Nr	1														
Water content	l	106	124	141	152	187	203	146	187	213	229	236	322	339	339	
Minimum system water content	(5) l	2600	2600	5600	5600	5700	5800	5900	5200	5300	5400	7900	10800	10800	10800	
External exchanger/ Condenser																
Type of exchanger	(4)	S&T														
N° of exchanger	Nr	1														
Water content	l	78	91	111	130	187	209	224	185	221	353	353	423	489	539	
Minimum system water content	(5) l	2500	2500	5400	5500	5600	5700	5800	4800	5200	5300	7600	10400	10700	10700	
Connections																
Evaporator water connections	-	5"	5"	5"	5"	5"	5"	6	5"	5"	6"	6"	8"	8"	8"	
Condenser water connections	-	5"	5"	6"	6"	6"	6"	6"	6"	6"	6"	6"	8"	8"	8"	
Power supply																
Standard power supply	V	400/3~/50														

1. ISW = Screw compressor with integrated inverter
2. The unit is able to modulate STEPLESS continuously. The following data refers to a continuous operation of the unit.
3. Indicative values for standard units with possible variation +/- 10%. Actual data are shown on the unit's matricular label.
4. S&T = Shell and tube exchanger
5. The calculated water volume to the system does not consider the volume of water contained in the internal exchanger.

Electrical data

Supply voltage 400/3/50

SIZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2
F.L.A. Full load current at max admissible conditions															
F.L.A. - Total	[A]	195,2	236,3	318,3	374,3	374,3	466,3	466,3	390,1	431,2	472,3	554,3	692,3	748,3	840,3
F.L.I. Full load power input at max admissible conditions															
F.L.I. - Total	[kW]	118,7	144,5	198,2	233,2	233,2	289,2	289,2	237,2	263,0	288,8	342,5	431,2	466,2	522,2
M.I.C. Maximum inrush current															
M.I.C. - Value	[A]	195,2	236,3	318,3	374,3	374,3	466,3	466,3	390,1	431,2	472,3	554,3	692,3	748,3	840,3

Maximum Phase Unbalance: 2%.

Power supply: 400/3/50 Hz +/-10%

Electrical data refer to standard units; according to the installed accessories, the data can suffer light variations.

General technical data

Sound levels

ST configuration

SIZE	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	DB(A)	DB(A)
120.1	73	72	72	83	93	89	80	66	75	94
160.1	81	80	77	86	91	91	82	67	77	96
200.1	83	74	84	87	91	88	86	75	78	97
220.1	87	87	79	89	91	88	84	74	78	97
240.1	71	63	76	89	98	89	75	62	78	97
270.1	77	69	79	89	98	90	76	62	79	98
290.1	79	71	80	92	97	91	77	63	79	98
250.2	85	78	85	91	97	94	89	78	81	100
280.2	89	92	82	87	97	91	90	76	82	101
320.2	83	79	83	91	99	90	82	67	82	101
360.2	77	70	82	96	98	93	82	70	83	102
400.2	92	95	85	88	96	92	91	79	83	102
480.2	90	93	86	95	98	98	93	81	83	102
540.2	69	68	85	99	99	96	85	74	84	103

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. Measurements are carried out according to the UNI EN ISO 9614-2 standard, in compliance with the EUROVENT 8/1 certification.

Data referred to the following conditions: Evaporator water temperature= 12/7°C; Condenser water temperature = 30/35°C.

EN configuration

SIZE	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	DB(A)	DB(A)
120.1	71	70	70	81	91	87	78	64	72	91
160.1	79	78	75	84	89	89	80	65	74	93
200.1	81	72	82	85	89	86	84	73	75	94
220.1	85	85	77	87	89	86	82	72	75	94
240.1	69	61	74	87	96	87	73	60	75	94
270.1	75	67	77	87	96	88	74	60	76	95
290.1	77	69	78	90	95	89	75	61	76	95
250.2	83	76	83	89	95	92	87	76	78	97
280.2	87	90	80	85	95	89	88	74	79	98
320.2	81	77	81	89	97	88	80	65	79	98
360.2	75	68	80	94	96	91	80	68	80	99
400.2	90	93	83	86	94	90	89	77	80	99
480.2	88	91	84	93	96	96	91	79	80	99
540.2	67	66	83	97	97	94	83	72	81	100

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. Measurements are carried out according to the UNI EN ISO 9614-2 standard, in compliance with the EUROVENT 8/1 certification.

Data referred to the following conditions: Evaporator water temperature= 12/7°C; Condenser water temperature = 30/35°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	-23,4	-27,8	-32,7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23,8	-29,4
Evaporator cooling Capacity Factor	-	0,995	0,989	0,983	0,977	0,971	0,964	0,956	0,949	0,941	0,933
Compressor power input Factor (evaporator)	-	0,998	0,997	0,995	0,994	0,992	0,990	0,989	0,987	0,986	0,984
Evaporator pressure drop Factor	-	1,041	1,085	1,131	1,180	1,231	1,285	1,341	1,400	1,461	1,525
Condenser cooling Capacity Factor	-	0,998	0,996	0,994	0,992	0,990	0,988	0,986	0,984	0,982	0,980
Compressor power input Factor (condenser)	-	1,003	1,006	1,009	1,012	1,015	1,018	1,021	1,024	1,027	1,030
Condenser heating Capacity Factor	-	0,999	0,998	0,997	0,996	0,995	0,994	0,993	0,992	0,991	0,990
Condenser pressure drop Factor	-	1,037	1,077	1,118	1,162	1,208	1,257	1,307	1,360	1,415	1,473

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	-23,4	-27,8	-32,7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23,8	-29,4
Evaporator cooling Capacity Factor	-	0,993	0,985	0,977	0,968	0,958	0,947	0,936	0,925	0,912	0,899
Compressor power input Factor (evaporator)	-	0,998	0,995	0,993	0,990	0,987	0,983	0,980	0,976	0,972	0,968
Evaporator pressure drop Factor	-	1,052	1,108	1,170	1,237	1,309	1,386	1,467	1,554	1,646	1,743
Condenser cooling Capacity Factor	-	0,996	0,992	0,987	0,982	0,977	0,971	0,965	0,959	0,952	0,945
Compressor power input Factor (condenser)	-	1,004	1,007	1,011	1,014	1,018	1,021	1,025	1,028	1,032	1,035
Condenser heating Capacity Factor	-	0,998	0,996	0,994	0,991	0,988	0,984	0,980	0,976	0,971	0,966
Condenser pressure drop Factor	-	1,047	1,098	1,153	1,213	1,278	1,347	1,421	1,499	1,581	1,669

Fouling Correction Factors

SIZE	External exchanger (condenser)		Internal exchanger (evaporator)	
M2 C / W	F1	FK1	F2	FK2
0.44 X 10 (-4)	1,0	1,0	1,0	1,0
0.88 X 10 (-4)	0,97	0,99	0,97	1,08
1.76 X 10 (-4)	0,94	0,98	0,92	1,05

F1 = Cooling power correction factor

FK1 = Compressor power input correction factor

F2 = Cooling power correction factor

FK2 = Compressor power input correction factor

General technical data

Operating range



To = Evaporator outlet water temperature
Tws = Condenser outlet water temperature

1. Standard unit operating range
2. Unit operating range in 'Brine - Low water temperature' configuration

Exchanger operating range

INTERNAL EXCHANGER (EVAPORATOR)

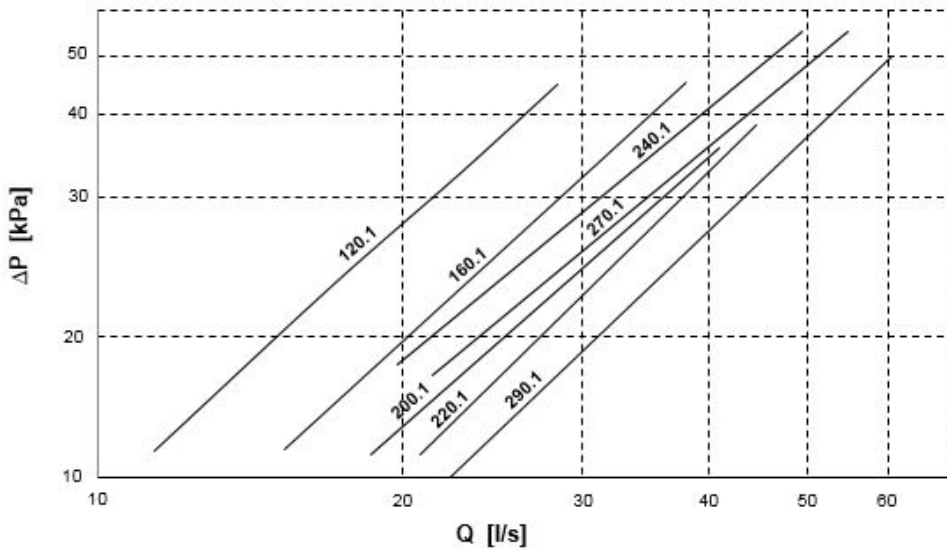
	DPR	DPW
PED (CE)	2150	1000

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]	1900	1400	-
Antifreeze protection	[°C]	3	5,5	-
High pressure safety valve	[kPa]	-	-	2150
Low pressure safety valve	[kPa]	-	-	1500
Max no. of compressor starts per hour	[n°]	-	-	6
Discharge safety thermostat	[°C]	-	-	120

Evaporator pressure drop - Size 120.1 - 290.1



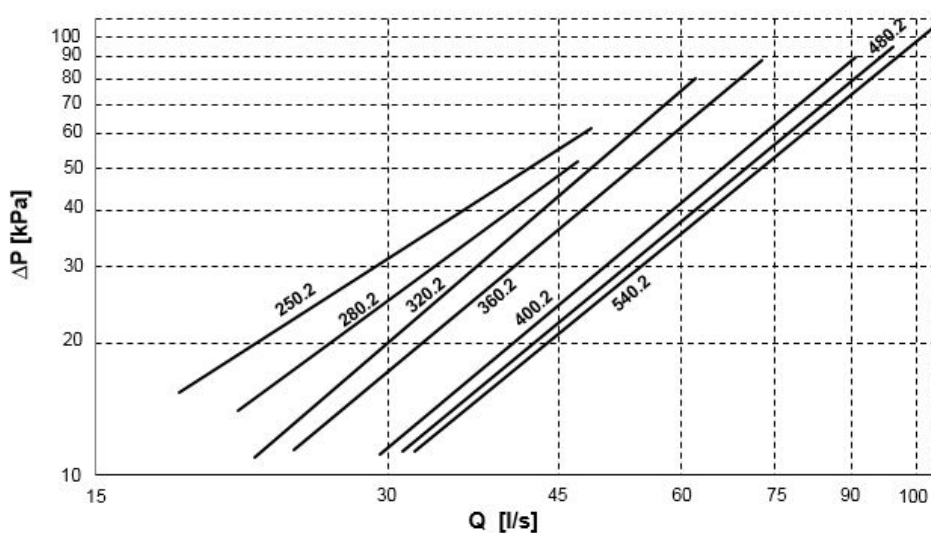
Pressure drops on the water side are calculated considering an average water temperature of 30°C.
 Q = water flow-rate [l/s]
 DP = pressure drop [kPa]

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

$$Q [l/s] = kWf / (4,186 \times DT)$$

kWf = Cooling capacity in kW
 DT = Temperature difference between entering / leaving water

Evaporator pressure drop - Size 250.2 - 540.2



Pressure drops on the water side are calculated considering an average water temperature of 30°C.
 Q = water flow-rate [l/s]
 DP = pressure drop [kPa]

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

$$Q [l/s] = kWf / (4,186 \times DT)$$

kWf = Cooling capacity in kW
 DT = Temperature difference between entering / leaving water

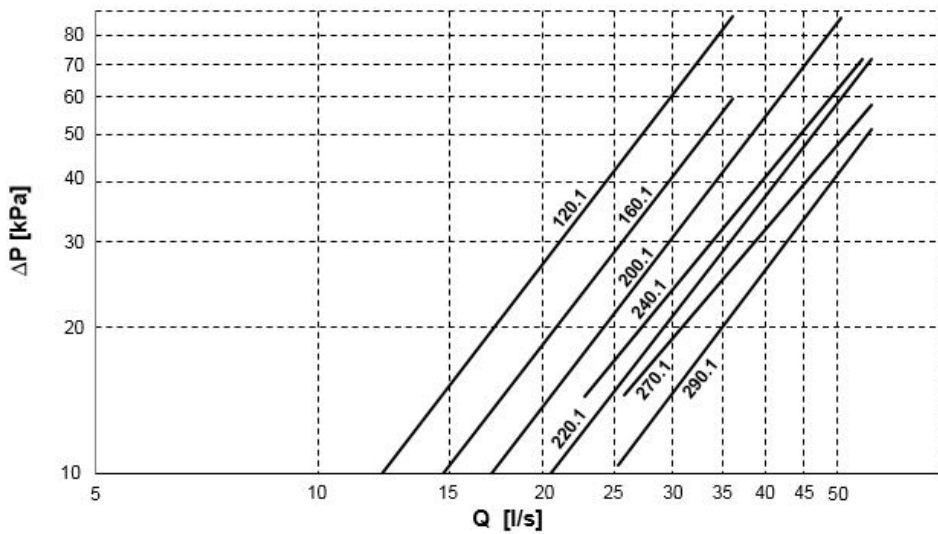
Admissible water flow rates

Min. (Qmin) and max. (Qmax) water flow-rates admissible for the correct unit operation.

SIZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2
Qmin	[l/s]	11,4	15,3	18,6	20,8	19,7	21,4	22,2	18,3	21,1	21,9	23,0	29,4	31,7	31,7
Qmax	[l/s]	56,0	50,0	48,0	70,0	70,0	99,0	93,0	97,0	85,0	85,0	107,0	101,0	105,0	126,0

General technical data

Condenser pressure drop - Size 120.1 - 290.1



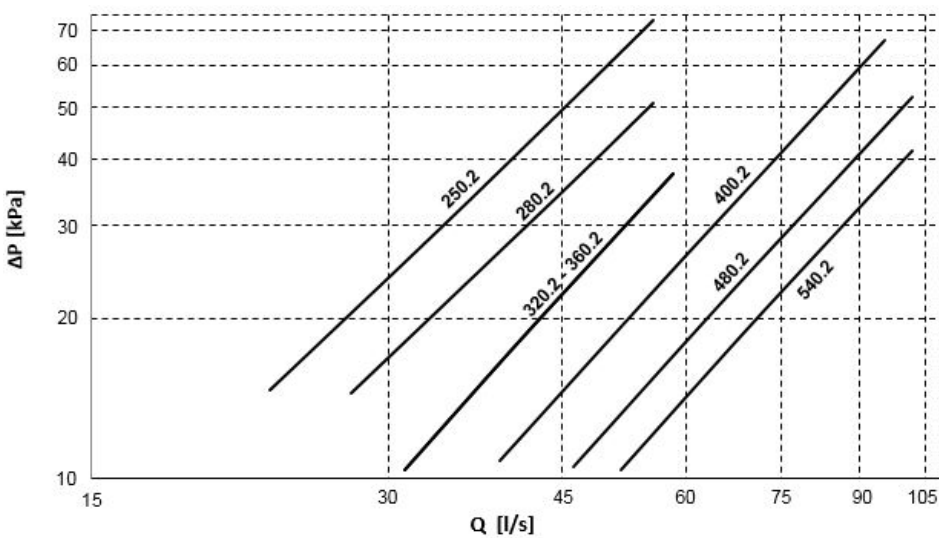
Pressure drops on the water side are calculated considering an average water temperature of 30°C.
 Q = water flow-rate (l/s)
 DP = pressure drop [kPa]

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

$$Q [l/s] = kWf / (4,186 \times DT)$$

kWf = Cooling capacity in kW
 DT = Temperature difference between entering / leaving water

Condenser pressure drop - Size 250.2 - 540.2



Pressure drops on the water side are calculated considering an average water temperature of 30°C.
 Q = water flow-rate (l/s)
 DP = pressure drop [kPa]

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

$$Q [l/s] = kWf / (4,186 \times DT)$$

kWf = Cooling capacity in kW
 DT = Temperature difference between entering / leaving water

Admissible water flow rates

Min. (Qmin) and max. (Qmax) water flow-rates admissible for the correct unit operation.

SIZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2
Qmin	[l/s]	11,9	14,4	16,9	20,3	22,8	25,8	25,3	22,8	27,5	31,1	31,0	38,8	46,1	51,7
Qmax	[l/s]	36,1	36,1	50,6	55,5	55,5	55,5	55,5	55,5	55,5	58,3	58,1	95,3	101,6	101,6

Cooling OCO - OHI - Size 120.1 ÷ 290.1

Size	To (°C)	Condenser inlet / outlet temperature (°C)											
		25 / 30		30 / 35		35 / 40		40 / 45		45 / 50		50 / 55	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
120.1	5	329	55,8	313	65,3	291	75,8	270	86,7	247	98,7	223	112
	6	346	55,4	329	65,0	307	75,5	284	86,5	261	98,6	236	112
	7	363	54,9	340	64,7	322	75,2	299	86,3	274	98,5	249	112
	10	406	53,6	387	63,6	362	74,3	337	85,7	311	98,2	283	112
	15	-	-	457	61,8	429	72,8	401	84,7	371	97,6	341	111
	18	-	-	-	-	468	71,9	438	84,1	406	97,3	374	111
160.1	5	398	69,1	378	78,7	353	89,2	327	101	300	113	273	125
	6	418	68,9	397	78,6	371	89,2	345	101	317	113	288	125
	7	438	68,7	416	78,5	390	89,2	362	101	333	114	304	125
	10	490	68,1	466	78,2	437	89,3	407	101	376	114	345	126
	15	-	-	550	77,6	517	89,4	483	102	448	116	413	126
	18	-	-	-	-	564	89,4	527	103	490	116	453	126
200.1	5	496	87,3	473	99,2	445	112	414	126	383	140	350	157
	6	520	87,0	497	99,0	467	112	436	126	403	140	369	157
	7	544	86,7	520	98,7	489	112	457	125	424	140	389	157
	10	606	85,9	580	98,0	547	111	513	125	478	140	441	157
	15	-	-	682	96,9	645	110	607	125	568	140	528	158
	18	-	-	-	-	701	110	661	124	620	140	581	158
220.1	5	584	102	556	116	521	132	485	147	446	166	408	184
	6	612	102	584	116	547	131	511	147	470	166	431	184
	7	641	101	611	116	574	131	536	147	494	165	454	184
	10	715	101	683	115	642	131	602	147	557	165	514	184
	15	-	-	803	114	758	130	713	146	663	165	615	185
	18	-	-	-	-	825	130	777	146	725	165	674	185
240.1	5	663	116	629	134	588	152	545	171	501	191	455	213
	6	696	116	661	133	618	152	574	171	528	191	481	213
	7	729	116	690	133	648	152	603	171	556	191	507	213
	10	814	115	775	133	727	151	678	170	627	191	575	214
	15	-	-	913	132	859	150	804	170	747	191	689	214
	18	-	-	-	-	936	150	877	170	816	191	759	215
270.1	5	726	128	692	146	650	164	606	184	560	204	513	226
	6	762	128	727	145	683	164	637	184	590	205	541	226
	7	798	128	760	145	716	164	669	184	620	205	569	226
	10	889	127	850	145	801	164	750	184	698	205	643	226
	15	-	-	1000	144	944	164	887	184	828	206	768	227
	18	-	-	-	-	1027	164	967	184	904	206	844	227
290.1	5	795	141	756	161	708	182	660	204	609	228	557	252
	6	834	141	794	161	745	182	694	204	642	228	585	252
	7	874	140	831	161	781	182	729	204	674	228	619	252
	10	977	140	931	160	875	182	818	205	760	228	700	252
	15	-	-	1098	159	1034	181	969	205	903	228	836	253
	18	-	-	-	-	1126	181	1056	205	987	229	915	253

To (°C) = Evaporator outlet water temperature

kWf = Cooling capacity kW

kWe = Compressor power input in kW

Performances in function of the inlet/outlet water temperature differential = 5°C

Performances

Cooling OCO - OHI - Size 250.2 ÷ 540.2

Size	To (°C)	Condenser inlet / outlet temperature (°C)											
		25 / 30		30 / 35		35 / 40		40 / 45		45 / 50		50 / 55	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
250.2	5	676	114	641	135	599	156	555	179	508	204	460	231
	6	711	113	675	134	631	156	585	178	537	204	487	231
	7	746	113	705	133	663	156	616	178	566	203	514	231
	10	838	109	798	131	747	152	695	176	641	202	586	230
	15	-	-	946	125	888	148	829	173	768	200	707	228
	18	-	-	-	-	971	146	907	171	842	199	777	227
280.2	5	765	130	726	151	677	173	627	197	575	223	522	251
	6	805	129	764	151	713	173	661	197	607	223	552	251
	7	845	129	801	151	750	173	696	197	640	223	583	251
	10	949	126	902	148	845	171	786	196	726	223	663	251
	15	-	-	1070	144	1004	169	937	195	869	223	798	252
	18	-	-	-	-	1097	168	1025	195	952	223	877	252
320.2	5	863	151	818	173	763	197	706	222	647	250	587	276
	6	907	150	860	173	803	197	744	223	683	251	621	277
	7	951	150	900	172	843	197	782	223	719	251	655	277
	10	1066	148	1013	171	948	196	881	224	813	252	744	277
	15	-	-	1198	170	1123	196	1048	225	971	255	892	277
	18	-	-	-	-	1225	196	1144	225	1063	256	979	278
360.2	5	1024	175	971	201	908	228	843	257	775	288	706	320
	6	1075	175	1020	201	955	228	888	257	817	288	746	320
	7	1126	174	1066	201	1002	228	933	257	860	289	786	320
	10	1258	173	1197	200	1124	227	1049	257	971	289	892	321
	15	-	-	1410	198	1329	226	1245	256	1158	289	1069	321
	18	-	-	-	-	1448	226	1359	256	1266	290	1178	322
400.2	5	1227	211	1166	242	1091	275	1014	310	933	347	849	387
	6	1288	211	1225	242	1146	275	1067	309	983	346	898	387
	7	1349	210	1281	241	1203	275	1121	309	1034	346	946	387
	10	1506	208	1436	240	1348	274	1260	308	1167	345	1073	387
	15	-	-	1691	238	1592	272	1494	307	1390	344	1285	388
	18	-	-	-	-	1733	271	1630	306	1520	344	1416	388
480.2	5	1327	228	1259	262	1177	298	1092	335	1003	375	912	419
	6	1386	227	1322	263	1237	297	1149	335	1058	375	964	419
	7	1460	228	1386	264	1298	298	1207	335	1113	375	1017	419
	10	1624	225	1553	261	1457	296	1359	334	1258	374	1153	419
	15	-	-	1831	257	1723	294	1612	332	1499	373	1383	420
	18	-	-	-	-	1878	293	1760	332	1640	372	1517	420
540.2	5	1457	257	1385	294	1296	334	1204	375	1109	419	1011	465
	6	1529	256	1455	294	1362	333	1267	375	1169	418	1067	465
	7	1602	256	1521	293	1429	333	1331	374	1229	418	1124	465
	10	1789	254	1706	292	1601	332	1496	374	1386	418	1273	465
	15	-	-	2010	290	1892	331	1772	373	1649	418	1522	466
	18	-	-	-	-	2060	330	1933	372	1801	418	1676	466

To (°C) = Evaporator outlet water temperature

kWf = Cooling capacity kW

kWe = Compressor power input in kW

Performances in function of the inlet/outlet water temperature differential = 5°C

Cooling at part load OCO - OHI - Size 120.1 ÷ 290.1

Size	Load	Condenser inlet / outlet temperature (°C)											
		40 / 45			35 / 40			30 / 35			25 / 30		
		kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER
120.1	100	299	86,3	3,46	322	75,2	4,28	340	64,7	5,34	363	54,9	6,61
	75	232	62,2	3,73	249	54,4	4,58	266	47,1	5,65	279	40,7	6,86
	50	152	40,3	3,77	164	34,9	4,70	176	30,1	5,85	184	26,1	7,05
	25	64,8	20,4	3,18	73	16,5	4,45	82	13,1	6,24	88,1	10,6	8,31
	Min	64,8	20,4	3,18	73,4	16,5	4,45	81,8	13,1	6,24	88,1	10,6	8,31
160.1	100	362	101	3,58	390	89,2	4,37	416	78,5	5,30	438	68,7	6,38
	75	295	78,3	3,77	317	69,1	4,59	337	60,8	5,54	353	53,4	6,61
	50	197	52,2	3,77	212	45,4	4,67	225	39,4	5,71	236	34,3	6,88
	25	87,9	31,3	2,81	76,7	25,5	3,01	107	20,5	5,22	114	16,5	6,91
	Min	87,9	31,3	2,81	76,7	25,5	3,01	107	20,5	5,22	114	16,5	6,91
200.1	100	457	126	3,63	489	112	4,37	520	98,7	5,28	544	86,7	6,27
	75	364	96,3	3,78	389	85,2	4,57	413	75,1	5,50	431	66,0	6,53
	50	264	69,4	3,80	284	60,6	4,69	302	52,8	5,72	315	45,9	6,86
	25	152	48,4	3,14	167	40,5	4,12	181	33,7	5,37	191	27,9	6,85
	Min	152	48,4	3,14	167	40,5	4,12	181	33,7	5,37	191	27,9	6,85
220.1	100	536	147	3,65	574	131	4,38	611	116	5,28	641	101	6,35
	75	415	107	3,88	443	95,5	4,64	470	84,3	5,58	491	73,9	6,64
	50	289	73,4	3,94	309	64,5	4,79	328	56,3	5,83	343	49,0	7,00
	25	155	47,9	3,24	170	40,2	4,23	184	33,3	5,53	194	27,5	7,05
	Min	155	47,9	3,24	170	40,2	4,23	184	33,3	5,53	194	27,5	7,05
240.1	100	603	171	3,53	648	152	4,26	690	133	5,21	729	116	6,28
	75	482	126	3,83	516	112	4,61	548	98,9	5,54	574	86,6	6,63
	50	325	81,3	4,00	348	71,5	4,87	369	62,7	5,89	386	54,6	7,07
	25	155	49,3	3,14	170	41,0	4,15	184	34,0	5,41	195	27,9	6,99
	Min	155	49,3	3,14	170	41,0	4,15	184	34,0	5,41	195	27,9	6,99
270.1	100	669	184	3,64	716	164	4,37	760	145	5,26	798	128	6,23
	75	507	129	3,93	540	115	4,70	573	102	5,62	597	89,9	6,64
	50	353	85,7	4,12	378	75,5	5,01	401	66,3	6,05	418	58,1	7,19
	25	189	54,6	3,46	207	46,1	4,49	224	38,8	5,77	237	32,5	7,29
	Min	189	54,6	3,46	207	46,1	4,49	224	38,8	5,77	237	32,5	7,29
290.1	100	729	204	3,57	781	182	4,29	831	161	5,17	874	140	6,24
	75	585	152	3,85	624	135	4,62	662	120	5,52	691	105	6,58
	50	396	95,2	4,16	422	84,2	5,01	448	74,2	6,04	467	65,2	7,16
	25	190	56,1	3,39	208	47,3	4,40	224	39,8	5,63	237	33,5	7,07
	Min	190	56,1	3,39	208	47,3	4,40	224	39,8	5,63	237	33,5	7,07

Load = % of cooling capacity compared to the value at full load

kWf = Cooling capacity in kW

kWe = Compressor power input in kW

Evaporator water temperature = leaving 7°C / entering 12°C

Performances

Cooling at part load OCO - OHI - Size 250.2 ÷ 540.2

Size	Load	Condenser inlet / outlet temperature (°C)											
		40 / 45			35 / 40			30 / 35			25 / 30		
		kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER
250.2	100	616	178	3,46	663	156	4,25	705	133	5,32	746	113	6,60
	75	474	130	3,65	509	114	4,46	541	98,4	5,50	569	85,0	6,69
	50	310	84,5	3,67	335	73,1	4,58	358	63,0	5,68	377	54,6	6,90
	25	132	45,1	2,93	151	36,0	4,19	167	28,7	5,82	181	23,2	7,80
	Min	132	45,1	2,93	151	36,0	4,19	167	28,7	5,82	181	23,2	7,80
280.2	100	696	197	3,53	750	173	4,34	801	151	5,32	845	129	6,55
	75	528	144	3,67	566	127	4,46	604	111	5,44	632	96,1	6,58
	50	349	95,1	3,67	375	82,6	4,54	401	71,9	5,58	420	62,0	6,77
	25	153	50,6	3,02	172	40,8	4,22	189	32,9	5,74	203	26,3	7,72
	Min	153	50,6	3,02	172	40,8	4,22	189	32,9	5,74	203	26,3	7,72
320.2	100	782	223	3,51	843	197	4,28	900	172	5,26	951	150	6,34
	75	597	158	3,78	640	139	4,60	682	122	5,59	715	107	6,68
	50	395	105	3,76	425	91,4	4,65	452	79,3	5,70	473	68,8	6,88
	25	176	57,8	3,04	196	46,7	4,20	215	37,6	5,72	229	30,1	7,61
	Min	176	57,8	3,04	196	46,7	4,20	215	37,6	5,72	229	30,1	7,61
360.2	100	933	257	3,63	1002	228	4,39	1066	201	5,33	1126	174	6,47
	75	706	187	3,78	756	166	4,55	804	146	5,51	841	127	6,62
	50	466	123	3,79	501	107	4,68	535	92,8	5,77	559	80,3	6,96
	25	242	78,4	3,09	268	64,4	4,16	292	52,6	5,55	310	42,8	7,24
	0	242	78,4	3,09	268	64,4	4,16	292	52,6	5,55	310	42,8	7,24
400.2	100	1121	309	3,63	1203	275	4,37	1281	241	5,33	1349	210	6,42
	75	831	225	3,69	889	199	4,47	944	175	5,39	985	154	6,40
	50	568	151	3,76	610	132	4,62	648	115	5,63	677	100	6,77
	25	304	90,3	3,37	334	75,1	4,45	362	62,3	5,81	382	51,5	7,42
	Min	304	90,3	3,37	334	75,1	4,45	362	62,3	5,81	382	51,5	7,42
480.2	100	1207	335	3,60	1298	298	4,36	1386	264	5,27	1460	228	6,40
	75	954	257	3,71	1021	228	4,48	1088	203	5,36	1135	176	6,45
	50	642	166	3,87	687	147	4,67	731	129	5,67	761	112	6,79
	25	305	91,3	3,34	336	76,5	4,39	364	63,7	5,71	385	52,2	7,38
	Min	305	91,3	3,34	336	76,5	4,39	364	63,7	5,71	385	52,2	7,38
540.2	100	1331	374	3,56	1429	333	4,29	1521	293	5,20	1602	256	6,26
	75	1057	283	3,73	1129	252	4,48	1199	222	5,40	1253	196	6,39
	50	714	180	3,97	762	159	4,79	809	139	5,82	844	122	6,92
	25	340	97,4	3,49	373	81,9	4,55	404	68,1	5,93	427	56,9	7,50
	Min	340	97,4	3,49	373	81,9	4,55	404	68,1	5,93	427	56,9	7,50

Load = % of cooling capacity compared to the value at full load

kWf = Cooling capacity in kW

kWe = Compressor power input in kW

Evaporator water temperature = leaving 7°C / entering 12°C

Heating OHO - OHI - Size 120.1 ÷ 290.1

Size	To [°C]	Evaporator inlet / outlet temperature (°C)											
		10 / 5		11 / 6		12 / 7		15 / 10		20 / 15		23 / 18	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
120.1	30	385	55,8	402	55,4	418	54,9	460	53,6	531	51,5	-	-
	35	378	65,3	394	65,0	410	64,6	450	63,6	519	61,8	559	60,7
	40	367	75,8	382	75,5	397	75,2	436	74,3	502	72,8	540	71,9
	45	356	86,7	371	86,5	385	86,3	423	85,7	486	84,7	522	84,1
	50	346	98,7	359	98,6	373	98,5	409	98,2	469	97,6	504	97,3
	55	335	112	348	112	361	112	395	112	452	111	485	111
160.1	30	467	69,1	487	68,9	507	68,7	558	68,1	644	67,0	-	-
	35	457	78,7	476	78,6	495	78,5	545	78,2	628	77,6	677	77,3
	40	442	89,2	461	89,2	479	89,2	527	89,3	607	89,4	653	89,4
	45	428	101	445	101	463	101	508	101	585	102	630	103
	50	413	113	430	113	447	114	491	114	564	116	607	116
	55	398	125	414	125	429	125	470	126	539	126	579	126
200.1	30	584	87,3	607	87,0	631	86,7	692	85,9	795	84,5	-	-
	35	573	99,2	596	99,0	619	98,7	678	98,0	779	96,9	837	96,2
	40	557	112	579	112	601	112	659	111	755	110	811	110
	45	540	126	561	126	583	125	638	125	731	125	785	124
	50	523	140	544	140	564	140	618	140	708	140	760	140
	55	506	157	526	157	546	157	598	157	686	158	739	158
220.1	30	686	102	672	102	652	101	633	101	611	99,3	-	-
	35	714	116	700	116	679	116	658	115	635	114	615	114
	40	742	132	728	131	705	131	683	131	660	130	638	130
	45	815	147	798	147	773	147	749	147	722	146	698	146
	50	938	166	917	166	888	165	859	165	828	165	800	165
	55	1009	184	986	184	955	184	923	184	889	185	859	185
240.1	30	779	116	812	116	845	116	929	115	1071	114	-	-
	35	763	134	794	133	826	133	908	133	1045	132	1125	131
	40	740	152	770	152	800	152	878	151	1010	150	1086	150
	45	716	171	745	171	774	171	848	170	974	170	1047	170
	50	692	191	720	191	747	191	818	191	938	191	1007	191
	55	669	213	694	213	720	213	789	214	903	214	973	215
270.1	30	854	128	890	128	925	128	1017	127	1170	126	-	-
	35	838	146	872	145	907	145	995	145	1144	144	1231	144
	40	814	164	847	164	880	164	965	164	1108	164	1191	164
	45	790	184	821	184	853	184	934	184	1071	184	1151	184
	50	765	204	795	205	825	205	903	205	1034	206	1110	206
	55	739	226	767	226	796	226	870	226	995	227	1071	227
290.1	30	936	141	975	141	1014	140	1116	140	1288	138	-	-
	35	917	161	955	161	994	161	1092	160	1257	159	1353	159
	40	891	182	927	182	963	182	1057	182	1215	181	1307	181
	45	864	204	898	204	933	204	1023	205	1173	205	1261	205
	50	837	228	869	228	902	228	988	228	1132	228	1215	229
	55	809	252	837	252	871	252	952	252	1089	253	1168	253

To (°C) = Condenser outlet water temperature

kWt = Heating capacity to the condenser (kW)

kWe = Compressor power input in kW

Performances in function of the inlet/outlet water temperature differential = 5°C

Performances

Heating OHO - OHI -Size 250.2 ÷ 540.2

Size	To [°C]	Evaporator inlet / outlet temperature (°C)											
		10 / 5		11 / 6		12 / 7		15 / 10		20 / 15		23 / 18	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
250.2	30	790	114	824	113	859	113	947	109	1095	103	-	-
	35	776	135	809	134	841	133	928	131	1071	125	1154	122
	40	754	156	786	156	819	156	900	152	1036	148	1116	146
	45	733	179	763	178	794	178	871	176	1002	173	1079	171
	50	712	204	741	204	769	203	843	202	968	200	1041	199
	55	691	231	718	231	745	231	816	230	935	228	1004	227
280.2	30	895	130	934	129	974	129	1075	126	1245	121	-	-
	35	876	151	915	151	955	151	1050	148	1214	144	1310	142
	40	850	173	886	173	923	173	1016	171	1173	169	1264	168
	45	824	197	858	197	893	197	982	196	1132	195	1219	195
	50	798	223	831	223	863	223	949	223	1092	223	1175	223
	55	772	251	803	251	834	251	915	251	1050	252	1129	252
320.2	30	1014	151	1057	150	1101	150	1214	148	1404	145	-	-
	35	991	173	1033	173	1076	172	1184	171	1368	170	1475	169
	40	959	197	999	197	1040	197	1144	196	1320	196	1422	196
	45	928	222	966	223	1005	223	1105	224	1272	225	1370	225
	50	898	250	934	251	970	251	1066	252	1226	255	1319	256
	55	864	276	898	277	932	277	1020	277	1170	277	1257	278
360.2	30	1199	175	1250	175	1300	174	1431	173	1650	170	-	-
	35	1173	201	1221	201	1272	201	1396	200	1608	198	1731	197
	40	1136	228	1183	228	1230	228	1351	227	1555	226	1674	226
	45	1100	257	1145	257	1190	257	1306	257	1502	256	1615	256
	50	1063	288	1106	288	1149	289	1260	289	1447	289	1556	290
	55	1026	320	1066	320	1107	320	1212	321	1390	321	1499	322
400.2	30	1439	211	1499	211	1559	210	1715	208	1976	205	-	-
	35	1409	242	1467	242	1526	241	1676	240	1928	238	2075	236
	40	1366	275	1421	275	1477	275	1621	274	1863	272	2004	271
	45	1323	310	1376	309	1430	309	1568	308	1800	307	1935	306
	50	1279	347	1330	346	1380	346	1513	345	1735	344	1864	344
	55	1236	387	1284	387	1333	387	1460	387	1673	388	1804	388
480.2	30	1555	228	1613	227	1687	228	1849	225	2143	222	-	-
	35	1521	262	1585	263	1654	264	1814	261	2089	257	2249	256
	40	1474	298	1535	297	1597	298	1753	296	2017	294	2171	293
	45	1427	335	1484	335	1542	335	1692	334	1945	332	2091	332
	50	1379	375	1433	375	1488	375	1632	374	1872	373	2012	372
	55	1331	419	1383	419	1435	419	1573	419	1803	420	1937	420
540.2	30	1714	257	1786	256	1858	256	2044	254	2356	252	-	-
	35	1679	294	1749	294	1818	293	1998	292	2300	290	2475	289
	40	1629	334	1695	333	1762	333	1934	332	2222	331	2390	330
	45	1579	375	1642	375	1705	374	1870	374	2145	373	2306	372
	50	1527	419	1587	418	1647	418	1804	418	2067	418	2219	418
	55	1475	465	1532	465	1589	465	1738	465	1988	466	2142	466

To (°C) = Condenser outlet water temperature

kWt = Heating capacity to the condenser (kW)

kWe = Compressor power input in kW

Performances in function of the inlet/outlet water temperature differential = 5°C

Performance

SIZE			120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2
Cooling																
Cooling capacity	(1)	kW	344	418	517	608	688	761	828	705	796	901	1062	1281	1393	1527
Compressor power input	(1)	kW	64,6	80,7	98,3	116	136	156	175	136	156	177	208	259	277	317
Total power input	(2)	kW	65,6	81,7	99,3	117	137	157	176	137	157	178	209	260	278	318
EER	(1)	-	5,25	5,12	5,20	5,21	5,01	4,85	4,70	5,16	5,06	5,06	5,08	4,92	5,00	4,80
Water flow rate (evaporator)	(1)	l/s	16,4	20,0	24,7	29,1	32,9	36,3	39,6	33,7	38,0	43,0	50,7	61,2	66,6	72,9
Pressure drops (evaporator)	(1)	kPa	23,8	19,6	19,7	24,5	43,9	43,3	34,5	46,5	40,5	39,3	50,2	44,2	45,7	54,2
Water flow rate (condenser)	(1)	l/s	19,6	23,9	29,4	34,6	39,4	43,8	48,0	40,2	45,5	51,6	60,7	73,7	79,9	88,2
Pressure drops (condenser)	(1)	kPa	25,9	26,2	29,6	28,1	38,7	37,6	38,4	40,9	35,9	29,4	41,1	39,6	32,0	30,7
Cooling capacity (EN14511:2018)	(3)	kW	344	418	516	608	687	760	828	704	795	900	1061	1280	1393	1526
Total power input (EN 14511:2018)	(3)	kW	67,3	83,6	102	119	142	161	181	141	162	183	216	268	285	326
EER (EN 14511:2018)	(3)	-	5,11	5,00	5,08	5,10	4,85	4,71	4,58	4,99	4,92	4,93	4,92	4,78	4,88	4,69
SEER	(4)	-	7,91	7,59	7,82	7,88	7,84	7,78	7,74	8,05	7,79	7,73	7,77	7,76	7,79	7,79
SEPR	(5)	-	8,23	8,11	8,03	8,34	8,08	8,54	8,10	8,33	8,35	8,01	8,65	8,52	8,55	8,62
Cooling capacity (AHRI 550/590)	(6)	kW	342	416	514	605	684	756	824	701	792	896	1056	1274	1386	1519
Total power input (AHRI 550/590)	(6)	kW	67,9	84,3	103	120	143	163	182	143	163	184	218	270	288	328
COP _r	(6)	-	5,04	4,93	5,01	5,03	4,79	4,64	4,52	4,92	4,85	4,86	4,85	4,71	4,81	4,62
IPLV	(6)	-	7,44	7,29	7,29	7,25	7,27	7,12	7,25	7,17	7,25	7,14	7,13	7,00	7,02	7,18
Heating																
Heating capacity	(7)	kW	405	507	616	722	824	915	1011	810	913	1026	1208	1518	1651	1825
Compressor power input	(7)	kW	83,9	104	125	148	174	192	215	171	188	209	252	323	343	386
Total power input	(2)	kW	84,9	105	126	149	175	193	216	172	189	210	253	324	344	387
COP	(7)	-	4,77	4,85	4,90	4,86	4,71	4,73	4,69	4,71	4,83	4,90	4,77	4,69	4,80	4,72
Water flow rate (condenser)	(7)	l/s	19,4	24,2	29,4	34,5	39,4	43,7	48,3	38,7	43,6	49,0	57,7	72,5	78,9	87,2
Pressure drops (condenser)	(7)	kPa	43,8	47,1	51,9	48,7	63,0	61,2	65,0	62,4	65,0	70,0	72,0	80,0	82,0	88,0
Water flow rate (evaporator)	(7)	l/s	25,5	32,1	39,0	45,7	51,7	57,5	63,4	50,8	57,7	65,0	76,0	95,1	104	115
Pressure drops (evaporatore)	(7)	kPa	56,8	50,2	48,9	70,3	99,4	98,8	93,2	97,5	85,4	85,5	107	101	105	126
Heating capacity (EN 14511:2018)	(8)	kW	411	514	624	732	835	927	1024	820	924	1037	1221	1534	1667	1844
Total power input (EN 14511:2018)	(8)	kW	88,9	110	132	156	183	202	226	180	198	219	264	338	360	405
COP (EN 14511:2018)	(8)	-	4,63	4,70	4,75	4,71	4,56	4,58	4,54	4,56	4,68	4,74	4,62	4,54	4,64	4,56
SCOP - Average climate - W55	(4)	-	4,64	4,88	4,69	4,84	4,73	4,84	4,81	4,72	4,74	4,76	4,83	4,80	4,73	4,91

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

1. Data referred to the following conditions: Evaporator water temperature = 12/7 °C. Condenser water temperature = 30/35°C. Evaporator fouling factor = $0,44 \times 10^{(-4)}$ m² 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. Data compliant to Standard EN 14511:2018 referred to the following conditions: Evaporator water temperature = 12/7 °C. Condenser water temperature = 30/35°C
4. Data compliant to Standard EN14825:2018
5. Data compliant to Standard EU 2016/2281
6. Data compliant to Standard AHRI 550/590 referred to the following conditions: Evaporator water temperature 12,22°C / 6,7°C. Water flow-rate 0,043 l/s per kW. Condenser water temperature 29,44 °C / 34,61°C. Evaporator fouling factor = $0,18 \times 10^{(-4)}$ m² K/W
7. Data referred to the following conditions: Condenser water temperature = 40/45°C. Evaporator water temperature = 12/7°C. Evaporator fouling factor = $0,18 \times 10^{(-4)}$ m² K/W
8. Data compliant to Standard EN 14511:2018 referred to the following conditions: Condenser water temperature = 40/45°C. Evaporator water temperature = 12/7°C.

General technical data - HWT Version

Construction

SIZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2	
Compressor																
Compressor type	(1)	ISW														
Refrigerant		R-513A														
N° compressor	Nr	1							2							
Nominal capacity(C1)	HP	125	160	200	240	240	290	290	125	125	160	160	200	240	240	
Nominal capacity (C2)	HP	-	-	-	-	-	-	-	125	160	160	200	240	240	290	
Std capacity steps	(2)	24% - 100%							12% - 100%							
Oil charge (C1)	l	18	18	35	35	35	35	35	18	18	18	18	35	35	35	
Oil charge (C2)	l	-	-	-	-	-	-	-	18	18	18	35	35	35	35	
Refrigerant charge (C1)	(3) kg	110	110	130	130	160	160	170	125	125	135	135	150	150	155	
Refrigerant charge (C2)	(3) kg	-	-	-	-	-	-	-	115	115	125	125	140	140	145	
Refrigerant circuits	Nr	1							2							
Internal exchanger / Evaporator																
Type of exchanger	(4)	S&T SPRAY														
N° of exchanger	Nr	1														
Water content	l	106	124	141	152	187	203	146	187	213	229	236	322	339	339	
Minimum system water content	(5) l	2600	2600	5600	5600	5700	5800	5900	5200	5300	5400	7900	10800	10800	10800	
External exchanger/ Condenser																
Type of exchanger	(4)	S&T														
N° of exchanger	Nr	1														
Water content	l	78	91	111	130	187	209	224	185	221	353	353	423	489	539	
Minimum system water content	(5) l	2500	2500	5400	5500	5600	5700	5800	4800	5200	5300	7600	10400	10700	10700	
Connections																
Evaporator water connections	-	5"	5"	5"	5"	5"	5"	6	5"	5"	6"	6"	8"	8"	8"	
Condenser water connections	-	5"	5"	6"	6"	6"	6"	6"	6"	6"	6"	6"	8"	8"	8"	
Power supply																
Standard power supply	V	400/3~/50														

1. ISW = Screw compressor with integrated inverter
2. The unit is able to modulate STEPLESS continuously. The following data refers to a continuous operation of the unit.
3. Indicative values for standard units with possible variation +/- 10%. Actual data are shown on the unit's matricular label.
4. S&T = Shell and tube exchanger
5. The calculated water volume to the system does not consider the volume of water contained in the internal exchanger.

Electrical data

Supply voltage 400/3/50

SIZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2
F.L.A. Full load current at max admissible conditions															
F.L.A. - Total	[A]	183,9	225,3	326,3	403,3	403,3	467,3	467,3	367,5	408,9	450,3	551,3	729,3	806,3	870,3
F.L.I. Full load power input at max admissible conditions															
F.L.I. - Total	[kW]	113,3	140,5	202,2	250,2	250,2	290,2	290,2	226,4	253,6	280,8	342,5	452,2	500,2	540,2
M.I.C. Maximum inrush current															
M.I.C. - Value	[A]	184,0	225,0	326,0	403,0	403,0	467,0	467,0	368,0	409,0	450,0	551,0	729,0	806,0	870,0

Maximum Phase Unbalance: 2%.

Power supply: 400/3/50 Hz +/-10%

Electrical data refer to standard units; according to the installed accessories, the data can suffer light variations.

Sound levels

ST configuration

SIZE	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	DB(A)	DB(A)
120.1	73	72	72	83	93	89	80	66	75	94
160.1	81	80	77	86	91	91	82	67	77	96
200.1	83	74	84	87	91	88	86	75	78	97
220.1	87	87	79	89	91	88	84	74	78	97
240.1	71	63	76	89	98	89	75	62	78	97
270.1	77	69	79	89	98	90	76	62	79	98
290.1	79	71	80	92	97	91	77	63	79	98
250.2	85	78	85	91	97	94	89	78	81	100
280.2	89	92	82	87	97	91	90	76	82	101
320.2	83	79	83	91	99	90	82	67	82	101
360.2	77	70	82	96	98	93	82	70	83	102
400.2	92	95	85	88	96	92	91	79	83	102
480.2	90	93	86	95	98	98	93	81	83	102
540.2	69	68	85	99	99	96	85	74	84	103

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. Measurements are carried out according to the UNI EN ISO 9614-2 standard, in compliance with the EUROVENT 8/1 certification.
Data referred to the following conditions: Evaporator water temperature= 12/7°C; Condenser water temperature = 30/35°C.

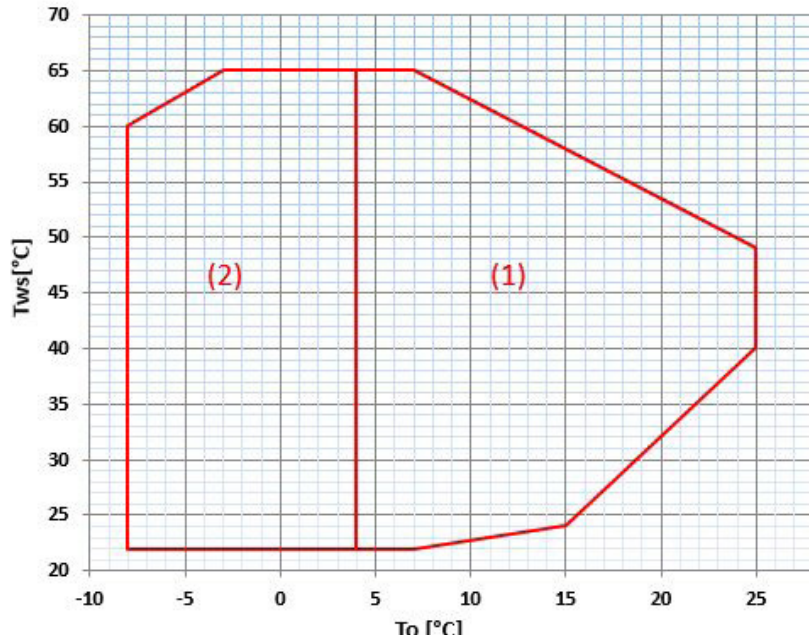
EN configuration

SIZE	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	DB(A)	DB(A)
120.1	71	70	70	81	91	87	78	64	72	91
160.1	79	78	75	84	89	89	80	65	74	93
200.1	81	72	82	85	89	86	84	73	75	94
220.1	85	85	77	87	89	86	82	72	75	94
240.1	69	61	74	87	96	87	73	60	75	94
270.1	75	67	77	87	96	88	74	60	76	95
290.1	77	69	78	90	95	89	75	61	76	95
250.2	83	76	83	89	95	92	87	76	78	97
280.2	87	90	80	85	95	89	88	74	79	98
320.2	81	77	81	89	97	88	80	65	79	98
360.2	75	68	80	94	96	91	80	68	80	99
400.2	90	93	83	86	94	90	89	77	80	99
480.2	88	91	84	93	96	96	91	79	80	99
540.2	67	66	83	97	97	94	83	72	81	100

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. Measurements are carried out according to the UNI EN ISO 9614-2 standard, in compliance with the EUROVENT 8/1 certification.
Data referred to the following conditions: Evaporator water temperature= 12/7°C; Condenser water temperature = 30/35°C.

General technical data - HWT Version

Operating range



To = Evaporator outlet water temperature
TwS = Condenser outlet water temperature

1. Standard unit operating range
2. Unit operating range in 'Brine - Low water temperature' configuration

Exchanger operating range

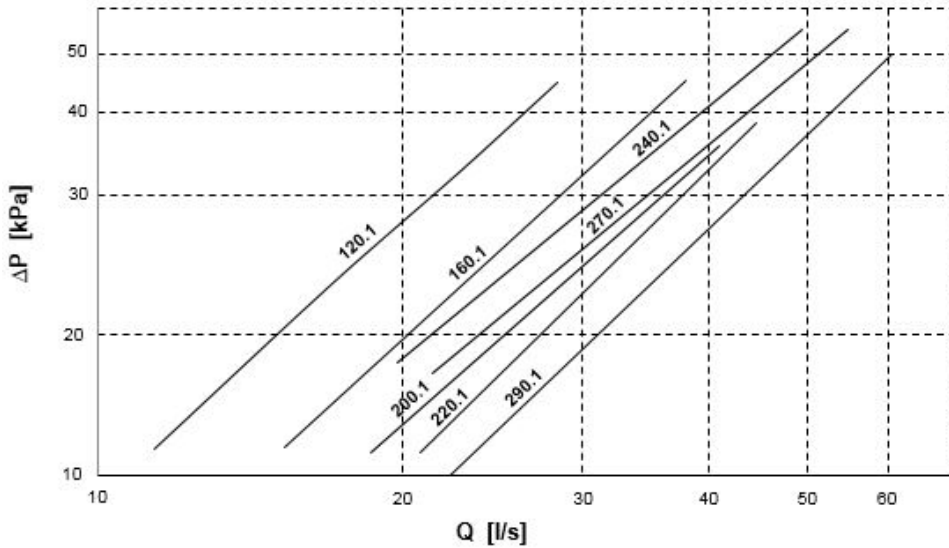
	INTERNAL EXCHANGER (EVAPORATOR)	
	DPR	DPW
PED (CE)	2400	1000

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]	1900	1400	-
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

Evaporator pressure drop - Size 120.1 - 290.1



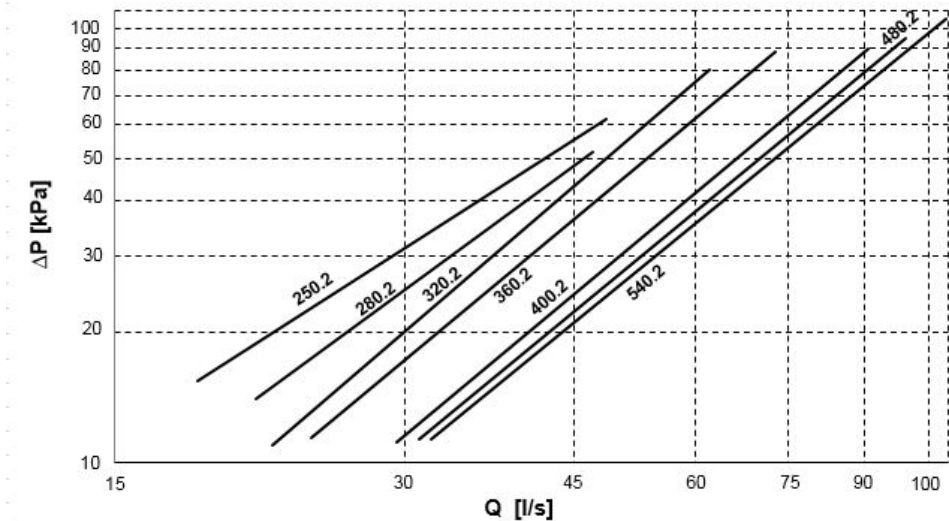
Pressure drops on the water side are calculated considering an average water temperature of 30°C.
 Q = water flow-rate [l/s]
 DP = pressure drop [kPa]

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

$$Q [l/s] = kWf / (4,186 \times DT)$$

kWf = Cooling capacity in kW
 DT = Temperature difference between entering / leaving water

Evaporator pressure drop - Size 250.2 - 540.2



Pressure drops on the water side are calculated considering an average water temperature of 30°C.
 Q = water flow-rate [l/s]
 DP = pressure drop [kPa]

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

$$Q [l/s] = kWf / (4,186 \times DT)$$

kWf = Cooling capacity in kW
 DT = Temperature difference between entering / leaving water

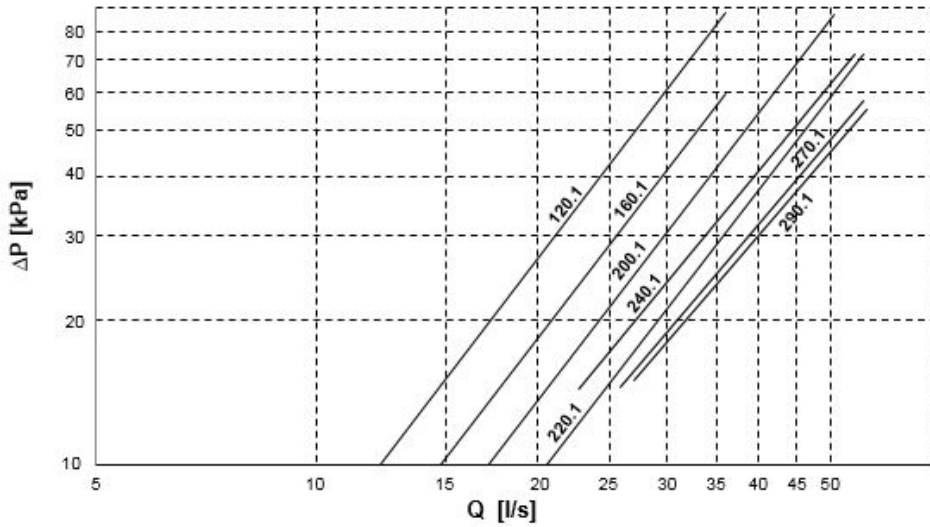
Admissible water flow rates

Min. (Qmin) and max. (Qmax) water flow-rates admissible for the correct unit operation.

GRANDEZZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2
Qmin	[l/s]	11,4	15,3	18,6	20,8	19,7	21,4	22,2	18,3	21,1	21,9	23,0	29,4	31,7	31,7
Qmax	[l/s]	56,0	50,0	48,0	70,0	70,0	99,0	93,0	97,0	85,0	85,0	107,0	101,0	105,0	126,0

General technical data - HWT Version

Condenser pressure drop - Size 120.1 - 290.1



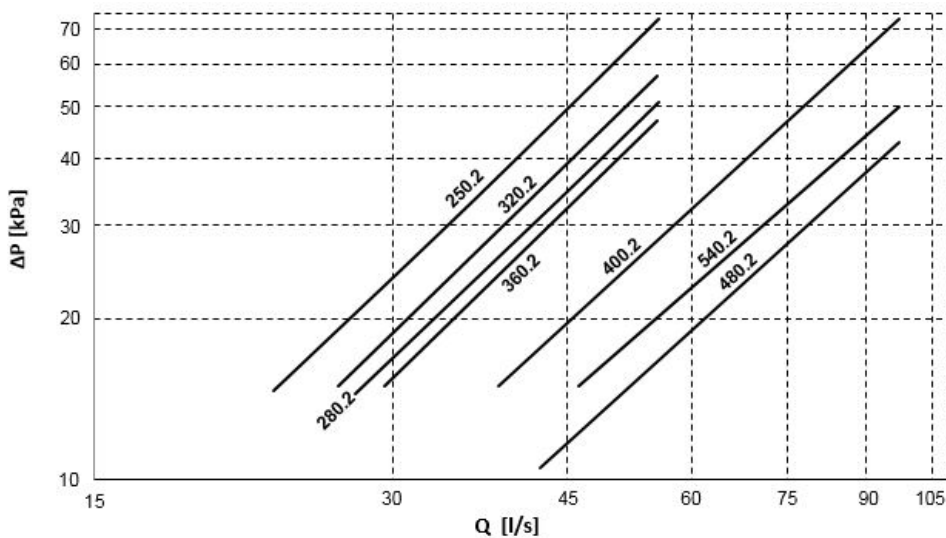
Pressure drops on the water side are calculated considering an average water temperature of 30°C.
 Q = water flow-rate (l/s)
 DP = pressure drop [kPa]

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

$$Q [l/s] = kWf / (4,186 \times DT)$$

kWf = Cooling capacity in kW
 DT = Temperature difference between entering / leaving water

Condenser pressure drop - Size 250.2 - 540.2



Pressure drops on the water side are calculated considering an average water temperature of 30°C.
 Q = water flow-rate (l/s)
 DP = pressure drop [kPa]

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

$$Q [l/s] = kWf / (4,186 \times DT)$$

kWf = Cooling capacity in kW
 DT = Temperature difference between entering / leaving water

Admissible water flow rates

Min. (Qmin) and max. (Qmax) water flow-rates admissibles for the correct unit operation.

GRANDEZZE		120.1	160.1	200.1	220.1	240.1	270.1	290.1	250.2	280.2	320.2	360.2	400.2	480.2	540.2	
Qmin	[l/s]	11,9	14,4	16,9	20,3	22,8	25,8	27,2	22,8	27,5	26,4	29,4	38,3	42,2	46,1	
Qmax	[l/s]	36,1	36,1	50,6	55,5	55,5	55,5	55,5	55,5	55,5	55,5	55,5	55,5	97,2	97,2	97,2

Cooling OCO - OHI - Size 120.1 ÷ 290.1

Size	To (°C)	Condenser inlet / outlet temperature (°C)											
		25 / 30		30 / 35		35 / 40		40 / 45		45 / 50		50 / 55	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
120.1	5	331	58,7	315	65,1	294	72,1	274	79,4	252	87,4	229	95,9
	6	346	58,9	330	65,4	309	72,4	288	79,8	265	87,8	242	96,4
	7	361	59,1	344	65,6	323	72,7	301	80,1	278	88,2	254	96,9
	10	401	59,6	383	66,3	360	73,5	337	81,2	312	89,5	287	98,4
	15	467	60,4	447	67,4	422	75,0	396	83,0	369	91,7	341	101
	18	-	-	484	68,1	458	75,8	431	84,1	402	93,0	373	102
160.1	5	400	73,2	382	80,7	359	88,6	334	97,1	309	106	283	112
	6	419	73,7	400	81,2	376	89,2	351	97,8	325	107	298	112
	7	438	74,2	418	81,8	394	89,9	368	98,5	341	108	314	112
	10	486	75,7	466	83,5	440	91,8	412	101	384	110	354	112
	15	568	78,1	546	86,3	516	94,9	486	104	455	114	422	113
	18	-	-	592	87,9	561	96,8	529	106	496	116	462	113
200.1	5	491	89,6	471	98,2	445	108	418	118	390	130	359	139
	6	514	90,1	494	98,7	468	108	439	119	410	130	378	139
	7	538	90,6	517	99,3	490	109	461	120	430	131	397	139
	10	598	92,1	577	101	547	111	516	122	483	133	448	139
	15	700	94,5	677	104	644	114	608	125	572	137	533	140
	18	-	-	735	105	700	116	662	127	623	139	585	140
220.1	5	578	105	555	115	525	126	494	138	459	151	426	160
	6	606	106	582	116	551	127	519	139	483	152	448	160
	7	633	107	608	117	577	128	544	139	507	153	471	160
	10	704	109	679	119	644	130	609	142	570	156	531	160
	15	824	112	796	123	758	134	719	147	675	161	631	161
	18	-	-	863	125	823	137	782	149	736	164	690	161
240.1	5	656	124	629	135	594	148	558	161	520	176	481	186
	6	687	124	659	136	624	149	586	163	547	177	506	186
	7	718	125	688	137	653	150	615	164	575	179	532	186
	10	799	128	769	140	730	153	689	167	645	182	600	186
	15	934	132	902	145	858	159	812	173	764	189	714	187
	18	-	-	979	148	932	162	884	177	833	193	784	187
270.1	5	724	143	694	154	655	166	616	179	574	193	530	201
	6	758	144	728	155	688	167	647	181	604	195	559	201
	7	793	146	761	157	721	169	679	182	634	197	588	201
	10	883	150	849	161	806	173	760	187	712	202	662	201
	15	1033	156	997	168	948	181	897	195	843	210	788	202
	18	-	-	1082	172	1030	185	977	199	920	215	866	202
290.1	5	789	161	755	173	713	186	669	200	623	216	576	223
	6	827	162	792	174	748	188	703	202	656	218	604	223
	7	865	164	828	176	784	189	738	204	689	220	639	223
	10	963	168	926	181	877	195	827	209	775	225	721	223
	15	1129	176	1087	189	1033	203	977	218	919	234	859	224
	18	-	-	1181	193	1123	208	1064	224	1003	240	939	224

To (°C) = Evaporator outlet water temperature

kWf = Cooling capacity kW

kWe = Compressor power input in kW

Performances in function of the inlet/outlet water temperature differential = 5°C

Performances - HWT Version

Cooling OCO - OHI - Size 250.2 ÷ 540.2

Size	To (°C)	Condenser inlet / outlet temperature (°C)											
		25 / 30		30 / 35		35 / 40		40 / 45		45 / 50		50 / 55	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
250.2	5	679	121	646	135	605	149	563	165	518	181	472	199
	6	711	122	677	136	635	150	591	165	546	182	498	200
	7	743	123	705	137	665	152	620	167	573	183	524	201
	10	825	123	789	138	742	152	694	168	644	185	593	204
	15	964	124	924	139	873	154	819	171	764	189	707	208
	18	-	-	1002	139	948	156	892	173	833	192	774	211
280.2	5	762	139	726	154	681	170	634	187	585	205	534	218
	6	799	140	761	156	714	171	666	188	616	207	564	218
	7	835	141	796	157	748	173	698	189	647	208	593	218
	10	929	142	888	159	836	175	783	193	728	211	670	219
	15	1086	146	1041	162	983	180	924	198	863	217	800	219
	18	-	-	1130	165	1069	183	1006	202	942	221	875	219
320.2	5	864	159	824	176	772	193	719	212	664	232	608	244
	6	905	160	863	177	810	195	756	214	699	233	641	244
	7	946	161	901	178	848	196	792	215	734	235	674	244
	10	1050	164	1005	182	946	201	887	220	825	240	761	244
	15	1226	170	1176	188	1111	208	1045	228	977	249	906	245
	18	-	-	1276	192	1207	212	1137	233	1066	254	991	245
360.2	5	1013	187	969	206	913	226	855	248	793	271	730	286
	6	1061	188	1015	208	958	228	898	249	835	273	770	286
	7	1110	189	1062	209	1003	229	942	251	877	275	810	286
	10	1233	193	1183	213	1120	234	1055	256	985	280	913	287
	15	1441	199	1386	220	1316	242	1244	264	1167	289	1087	287
	18	-	-	1503	225	1430	246	1354	269	1272	294	1194	288
400.2	5	1220	234	1170	257	1105	281	1038	307	967	336	894	355
	6	1278	236	1227	259	1160	283	1091	309	1018	338	942	355
	7	1337	237	1281	260	1215	285	1144	311	1069	340	990	355
	10	1488	242	1431	266	1357	291	1282	317	1201	347	1117	355
	15	1740	250	1678	274	1596	301	1512	328	1422	358	1329	356
	18	-	-	1822	279	1734	306	1646	334	1551	365	1460	356
480.2	5	1325	248	1270	272	1200	297	1127	325	1050	355	971	374
	6	1381	250	1331	275	1260	300	1184	327	1105	357	1023	374
	7	1452	253	1393	279	1320	303	1242	330	1161	359	1076	374
	10	1608	256	1554	283	1475	308	1391	336	1305	367	1214	374
	15	1891	265	1823	291	1735	318	1642	348	1546	379	1445	375
	18	-	-	1980	297	1886	325	1788	355	1686	386	1580	375
540.2	5	1455	289	1395	313	1316	340	1235	368	1151	398	1063	415
	6	1525	292	1463	316	1381	342	1298	371	1211	402	1120	415
	7	1595	294	1527	318	1447	345	1362	374	1272	405	1178	415
	10	1774	301	1706	326	1617	353	1526	382	1429	414	1329	416
	15	2076	313	2001	339	1903	367	1801	397	1693	430	1582	416
	18	-	-	2172	347	2068	375	1960	406	1847	439	1738	416

To (°C) = Evaporator outlet water temperature

kWf = Cooling capacity kW

kWe = Compressor power input in kW

Performances in function of the inlet/outlet water temperature differential = 5°C

Performances - HWT Version

Cooling at part load OCO - OHI - Size 120.1 ÷ 290.1

Size	Load	Condenser inlet / outlet temperature (°C)											
		40 / 45			35 / 40			30 / 35			25 / 30		
		kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER
120.1	100	301	80,1	3,76	323	72,7	4,44	345	65,6	5,26	361	59,1	6,11
	75	246	59,6	4,13	263	54,1	4,86	280	48,9	5,73	292	44,2	6,61
	50	165	40,2	4,10	177	36,0	4,92	189	32,2	5,87	198	28,9	6,85
	25	72,8	21,7	3,35	82,1	18,4	4,46	91,1	15,5	5,88	98,0	13,0	7,54
	Min	72,8	21,7	3,35	82,1	18,4	4,46	91,1	15,5	5,88	98,0	13,0	7,54
160.1	100	368	98,5	3,74	394	89,9	4,38	419	81,8	5,12	438	74,2	5,90
	75	301	77,1	3,90	322	70,3	4,58	342	63,9	5,35	357	58,0	6,16
	50	201	52,3	3,84	217	47,1	4,61	231	42,3	5,46	243	38,0	6,39
	25	90,3	31,2	2,89	103	26,8	3,84	114	22,7	5,02	123	19,1	6,44
	Min	90,3	31,2	2,89	103	26,8	3,84	114	22,7	5,02	123	19,1	6,44
200.1	100	461	120	3,84	490	109	4,5	518	99,3	5,22	538	90,6	5,94
	75	359	88,6	4,05	384	80,0	4,8	407	72,2	5,64	423	65,5	6,46
	50	258	64,9	3,98	279	57,6	4,84	298	51,3	5,81	312	45,8	6,81
	25	150	46,3	3,24	168	39,6	4,24	185	34,1	5,43	197	29,4	6,70
	Min	150	46,3	3,24	168	39,6	4,24	185	34,1	5,43	197	29,4	6,70
220.1	100	544	139	3,91	577	128	4,51	610	117	5,21	633	107	5,92
	75	433	105	4,12	460	95,6	4,81	486	86,9	5,59	505	79,0	6,39
	50	298	71,6	4,16	320	64,2	4,98	341	57,4	5,94	356	51,6	6,90
	25	152	45,9	3,31	171	39,4	4,34	188	33,8	5,56	201	29,1	6,91
	Min	152	45,9	3,31	171	39,4	4,34	188	33,8	5,56	201	29,1	6,91
240.1	100	615	164	3,75	653	150	4,35	690	137	5,04	718	125	5,74
	75	505	124	4,07	536	113	4,74	566	103	5,50	588	94,1	6,25
	50	337	79,5	4,24	360	71,5	5,03	382	64,3	5,94	399	58,0	6,88
	25	149	47,7	3,12	168	40,7	4,13	184	34,9	5,27	198	30,0	6,60
	Min	149	47,7	3,12	168	40,7	4,13	184	34,9	5,27	198	30,0	6,60
270.1	100	679	182	3,73	721	169	4,27	763	157	4,86	793	146	5,43
	75	510	127	4,02	542	116	4,67	572	106	5,40	595	97,7	6,09
	50	353	84,5	4,18	378	75,6	5,00	402	67,8	5,93	420	60,9	6,90
	25	182	56,2	3,24	202	47,8	4,23	221	40,5	5,46	236	34,3	6,88
	Min	182	56,2	3,24	202	47,8	4,23	221	40,5	5,46	236	34,3	6,88
290.1	100	738	204	3,62	784	189	4,15	831	176	4,72	865	164	5,27
	75	588	147	4,00	624	135	4,62	659	125	5,27	685	115	5,96
	50	397	93,7	4,24	423	84,4	5,01	449	76,2	5,89	468	69,1	6,77
	25	182	57,8	3,15	203	49,0	4,14	221	41,6	5,31	236	35,3	6,69
	Min	182	57,8	3,15	203	49,0	4,14	221	41,6	5,31	236	35,3	6,69

Load = % of cooling capacity compared to the value at full load

kWf = Cooling capacity in kW

kWe = Compressor power input in kW

Evaporator water temperature = leaving 7°C / entering 12°C

Performances - HWT Version

Cooling at part load OCO - OHI - Size 250.2 ÷ 540.2

Size	Load	Condenser inlet / outlet temperature (°C)											
		40 / 45			35 / 40			30 / 35			25 / 30		
		kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER
250.2	100	620	167	3,71	665	152	4,38	707	137	5,16	743	123	6,04
	75	491	122	4,01	525	111	4,72	556	101	5,53	582	90,9	6,40
	50	330	58,4	5,65	355	65,1	5,46	378	72,8	5,19	397	81,1	4,89
	25	144	45,8	3,14	164	38,7	4,24	181	32,5	5,57	195	27,4	7,12
	Min	144	45,8	3,14	164	38,7	4,24	181	32,5	5,57	195	27,4	7,12
280.2	100	698	189	3,69	748	173	4,32	798	157	5,08	835	141	5,92
	75	543	140	3,89	580	127	4,56	617	116	5,32	644	104	6,16
	50	364	94,4	3,85	392	85,1	4,60	419	76,7	5,46	438	68,4	6,40
	25	161	53,0	3,04	183	45,1	4,06	203	38,3	5,30	219	32,0	6,84
	Min	161	53,0	3,04	183	45,1	4,06	203	38,3	5,30	219	32,0	6,84
320.2	100	792	215	3,68	848	196	4,33	904	178	5,08	946	161	5,88
	75	607	155	3,91	649	141	4,59	690	128	5,37	720	116	6,20
	50	403	104	3,88	435	93,4	4,66	465	83,9	5,54	487	75,2	6,48
	25	180	60,4	2,98	206	51,6	3,99	228	43,7	5,22	246	36,6	6,72
	Min	180	60,4	2,98	206	51,6	3,99	228	43,7	5,22	246	36,6	6,72
360.2	100	942	189	4,98	1003	209	4,80	1064	229	4,65	1110	251	4,42
	75	727	186	3,91	775	169	4,59	822	154	5,36	856	139	6,15
	50	477	123	3,88	515	110	4,70	551	97,9	5,63	576	87,5	6,59
	25	240	77,8	3,08	272	66,3	4,10	302	56,3	5,36	323	47,9	6,74
	0	240	77,8	3,08	272	66,3	4,10	302	56,3	5,36	323	47,9	6,74
400.2	100	1144	311	3,68	1215	285	4,26	1285	260	4,94	1337	237	5,64
	75	868	216	4,02	923	196	4,71	976	178	5,48	1013	162	6,25
	50	586	145	4,03	631	129	4,87	672	116	5,80	702	104	6,73
	25	292	91,4	3,19	329	77,9	4,22	362	66,8	5,42	386	57,6	6,70
	Min	292	91,4	3,19	329	77,9	4,22	362	66,8	5,42	386	57,6	6,70
480.2	100	1242	330	3,76	1320	303	4,36	1398	279	5,01	1452	253	5,74
	75	987	248	3,98	1050	227	4,63	1111	208	5,35	1151	188	6,11
	50	657	159	4,12	704	144	4,90	750	130	5,77	780	117	6,69
	25	297	92,4	3,21	334	79,2	4,22	368	68,2	5,40	393	58,4	6,73
	Min	297	92,4	3,21	334	79,2	4,22	368	68,2	5,40	393	58,4	6,73
540.2	100	1362	374	3,64	1447	345	4,19	1531	318	4,81	1595	294	5,43
	75	2122	279	7,61	2242	256	8,77	2356	234	10,1	2460	216	11,41
	50	1423	177	8,05	1514	159	9,52	1599	143	11,2	1674	130	12,92
	25	331	99,4	3,33	370	84,8	4,36	406	71,9	5,65	433	61,6	7,03
	Min	331	99,4	3,33	370	84,8	4,36	406	71,9	5,65	433	61,6	7,03

Load = % of cooling capacity compared to the value at full load

kWf = Cooling capacity in kW

kWe = Compressor power input in kW

Evaporator water temperature = leaving 7°C / entering 12°C

Performances - HWT Version

Heating OHO - OHI - Size 120.1 ÷ 290.1

Size	To [°C]	Evaporator inlet / outlet temperature (°C)											
		10 / 5		11 / 6		12 / 7		15 / 10		20 / 15		23 / 18	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
120.1	35	380	65,1	395	65,4	410	65,6	449	66,3	514	67,4	552	68,1
	40	367	72,1	381	72,4	396	72,7	434	73,5	497	75,0	534	75,8
	45	353	79,4	367	79,8	381	80,1	418	81,2	479	83,0	515	84,1
	50	339	87,4	353	87,8	366	88,2	402	89,5	461	91,7	495	93,0
	60	312	105	324	106	336	106	367	108	-	-	-	-
	65	300	115	309	115	319	116	-	-	-	-	-	-
160.1	35	463	80,7	482	81,2	501	81,8	550	83,5	632	86,3	680	87,9
	40	448	88,6	466	89,2	484	89,9	532	91,8	611	94,9	658	96,8
	45	432	97,1	449	97,8	467	98,5	513	101	590	104	635	106
	50	415	106	432	107	449	108	493	110	568	114	611	116
	60	382	125	397	126	412	127	452	130	-	-	-	-
	65	367	136	380	137	392	138	-	-	-	-	-	-
200.1	35	569	98,2	593	98,7	617	99,3	678	101	780	104	840	105
	40	553	108	576	108	599	109	658	111	757	114	815	116
	45	536	118	558	119	580	120	637	122	733	125	789	127
	50	519	130	540	130	561	131	616	133	709	137	762	139
	60	485	156	502	156	521	157	569	160	-	-	-	-
	65	470	170	484	171	498	172	-	-	-	-	-	-
220.1	35	670	115	698	116	726	117	798	119	918	123	988	125
	40	651	126	678	127	705	128	775	130	892	134	960	137
	45	632	138	658	139	684	139	751	142	865	147	931	149
	50	611	151	635	152	660	153	726	156	835	161	899	164
	60	559	180	579	181	599	182	651	186	-	-	-	-
	65	551	195	570	196	588	197	-	-	-	-	-	-
240.1	35	764	135	795	136	827	137	909	140	1047	145	1127	148
	40	742	148	773	149	803	150	883	153	1016	159	1094	162
	45	720	161	749	163	779	164	856	167	985	173	1061	177
	50	696	176	725	177	753	179	828	182	953	189	1025	193
	60	653	208	675	210	701	211	767	216	-	-	-	-
	65	633	226	652	228	671	230	-	-	-	-	-	-
270.1	35	848	154	883	155	919	157	1010	161	1164	168	1254	172
	40	821	166	856	167	890	169	979	173	1128	181	1216	185
	45	795	179	827	181	861	182	947	187	1092	195	1176	199
	50	767	193	799	195	830	197	914	202	1053	210	1134	215
	60	715	225	741	227	769	229	843	235	-	-	-	-
	65	693	243	714	245	736	247	-	-	-	-	-	-
290.1	35	928	173	967	174	1007	176	1107	181	1276	189	1374	193
	40	899	186	936	188	974	189	1072	195	1236	203	1331	208
	45	869	200	905	202	942	204	1036	209	1195	218	1287	224
	50	839	216	874	218	909	220	1000	225	1154	234	1243	240
	60	780	250	808	252	842	254	924	260	-	-	-	-
	65	755	269	779	271	805	273	-	-	-	-	-	-

To (°C) = Condenser outlet water temperature

kWt = Heating capacity to the condenser (kW).

kWe = Compressor power input in kW

Performances in function of the inlet/outlet water temperature differential = 5°C

Performances - HWT Version

Heating OHO - OHI - Size 250.2 ÷ 540.2

Size	To [°C]	Evaporator inlet / outlet temperature (°C)											
		10 / 5		11 / 6		12 / 7		15 / 10		20 / 15		23 / 18	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
250.2	35	781	135	813	136	844	137	927	138	1063	139	1142	139
	40	754	149	785	150	817	152	895	152	1027	154	1104	156
	45	728	165	757	165	787	167	862	168	990	171	1065	173
	50	700	181	728	182	756	183	830	185	953	189	1025	192
	60	645	218	670	219	695	220	760	224	-	-	-	-
	65	620	238	641	239	662	240	-	-	-	-	-	-
280.2	35	880	154	917	156	955	157	1047	159	1203	162	1295	165
	40	851	170	886	171	921	173	1011	175	1163	180	1252	183
	45	821	187	854	188	888	189	975	193	1122	198	1208	202
	50	790	205	822	207	855	208	939	211	1081	217	1163	221
	60	729	244	757	246	786	247	861	252	-	-	-	-
	65	700	266	724	268	748	269	-	-	-	-	-	-
320.2	35	999	176	1040	177	1082	178	1187	182	1364	188	1468	192
	40	966	193	1005	195	1045	196	1147	201	1319	208	1419	212
	45	931	212	969	214	1007	215	1106	220	1273	228	1370	233
	50	896	232	932	233	969	235	1065	240	1226	249	1320	254
	60	826	274	858	276	891	277	976	283	-	-	-	-
	65	792	297	819	299	846	301	-	-	-	-	-	-
360.2	35	1175	206	1223	208	1273	209	1396	213	1606	220	1728	225
	40	1139	226	1186	228	1233	229	1354	234	1558	242	1677	246
	45	1102	248	1147	249	1193	251	1310	256	1508	264	1623	269
	50	1064	271	1107	273	1151	275	1265	280	1456	289	1567	294
	60	992	322	1027	324	1066	326	1167	332	-	-	-	-
	65	959	349	989	352	1018	354	-	-	-	-	-	-
400.2	35	1427	257	1485	259	1546	260	1697	266	1953	274	2101	279
	40	1386	281	1443	283	1500	285	1648	291	1896	301	2041	306
	45	1345	307	1400	309	1456	311	1599	317	1840	328	1980	334
	50	1303	336	1356	338	1409	340	1547	347	1780	358	1915	365
	60	1223	398	1266	401	1313	403	1436	411	-	-	-	-
	65	1188	432	1224	435	1259	438	-	-	-	-	-	-
480.2	35	1542	272	1607	275	1676	279	1837	283	2114	291	2276	297
	40	1497	297	1559	300	1623	303	1782	308	2053	318	2211	325
	45	1452	325	1511	327	1571	330	1727	336	1990	348	2142	355
	50	1405	355	1462	357	1520	359	1671	367	1925	379	2073	386
	60	1312	419	1363	422	1415	425	1549	434	-	-	-	-
	65	1269	454	1312	457	1356	461	-	-	-	-	-	-
540.2	35	1708	313	1778	316	1849	318	2032	326	2340	339	2519	347
	40	1656	340	1724	342	1792	345	1971	353	2270	367	2444	375
	45	1603	368	1669	371	1735	374	1908	382	2198	397	2366	406
	50	1549	398	1612	402	1676	405	1843	414	2123	430	2286	439
	60	1447	466	1499	470	1556	473	1705	484	-	-	-	-
	65	1403	503	1446	507	1489	510	-	-	-	-	-	-

To (°C) = Condenser outlet water temperature

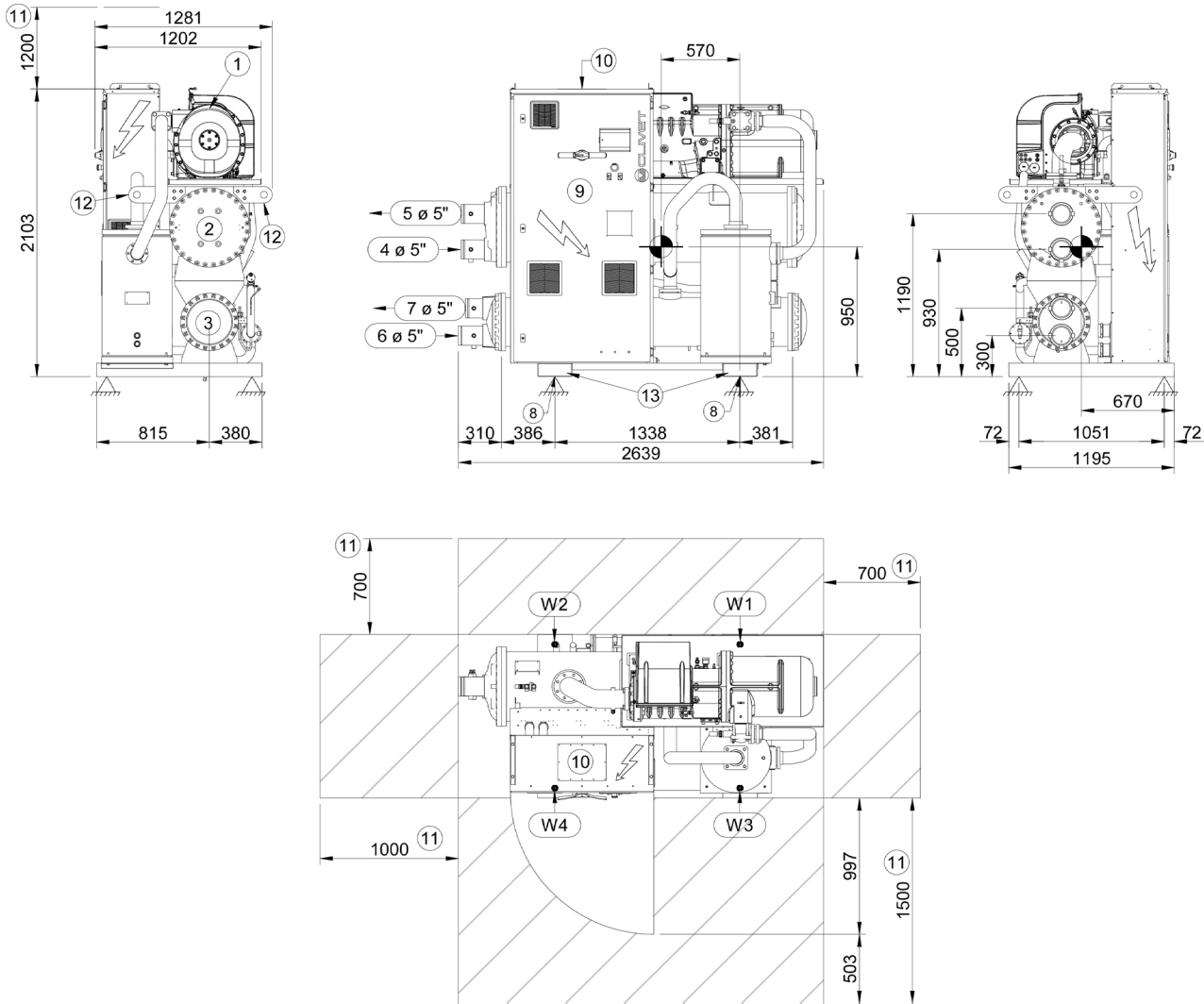
kWt = Heating capacity to the condenser (kW).

kWe = Compressor power input in kW

Performances in function of the inlet/outlet water temperature differential = 5°C

SIZE 120.1 - 160.1

DAAF10002_00
DATA/DATE 10/11/2020



- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD) 139.7 | 11. Maintenance spaces |
| 5. Internal exchanger water outlet (OD) 139.7 | 12. Lifting bracket (removed) |
| 6. External exchanger water inlet (OD) 139.7 | 13. Lift with forklift |
| 7. External exchanger water outlet (OD) 139.7 | |

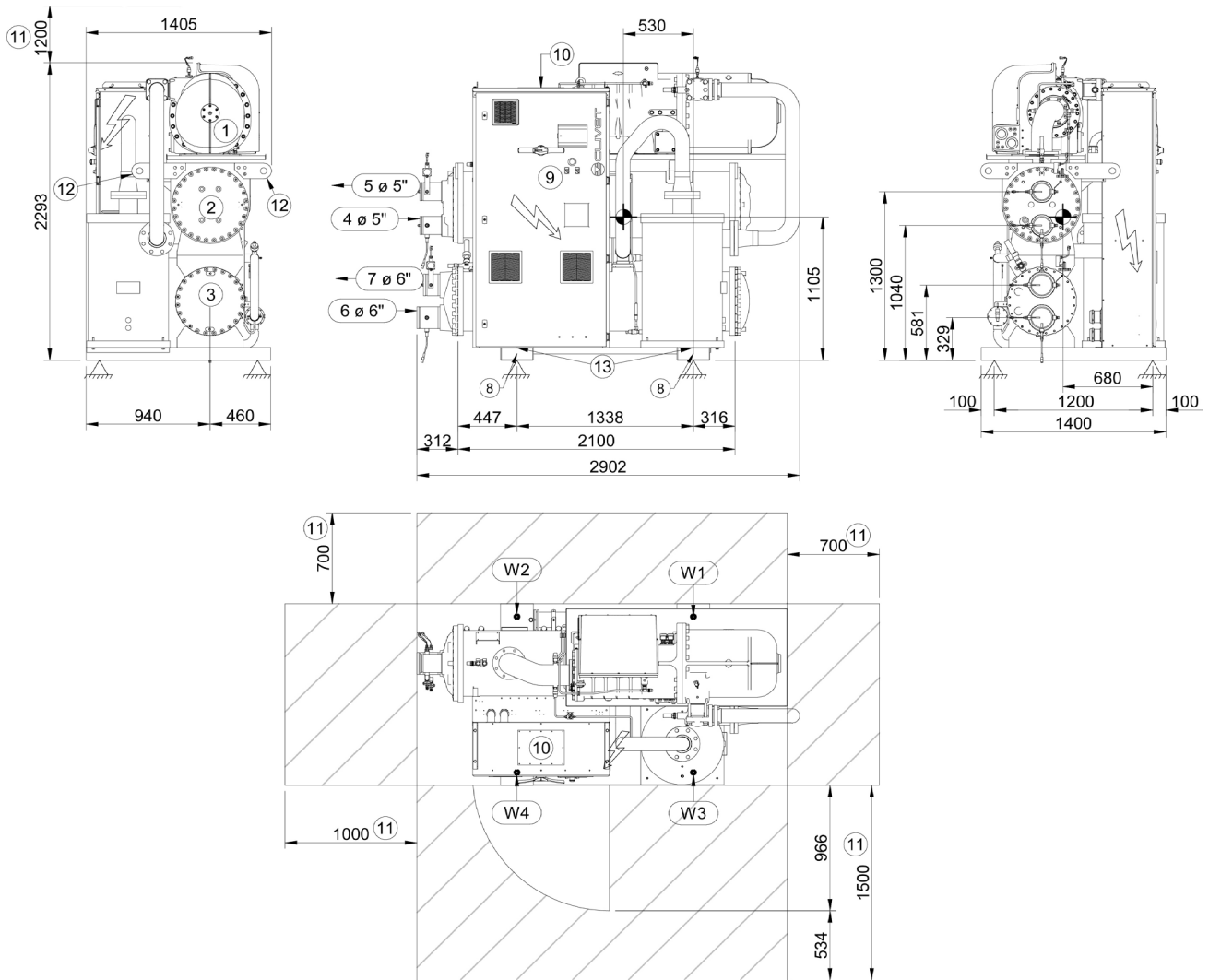
SIZE		120.1	160.1
Length	mm	2639	2639
Depth	mm	1195	1195
Height	mm	2103	2103
W1 Supporting point	kg	1047	1092
W2 Supporting point	kg	805	841
W3 Supporting point	kg	788	790
W4 Supporting point	kg	601	606
Operating weight	kg	3241	3328
Shipping weight	kg	3057	3113

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 - 220.1

DAAF10005_00
DATA/DATE 11/11/2020



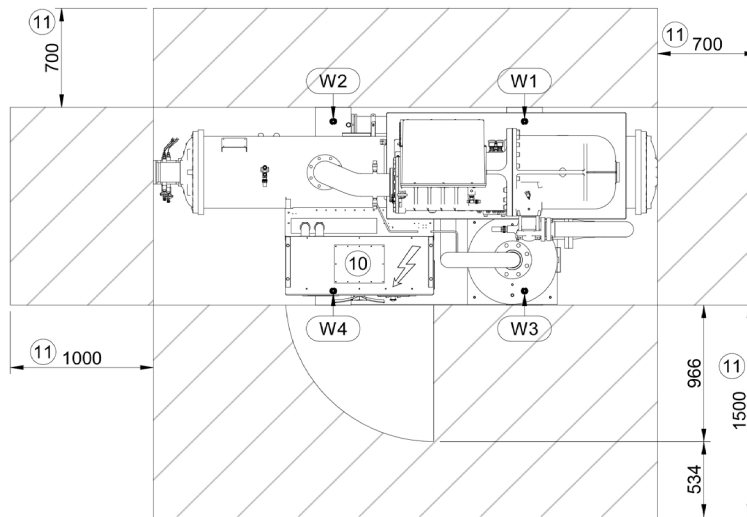
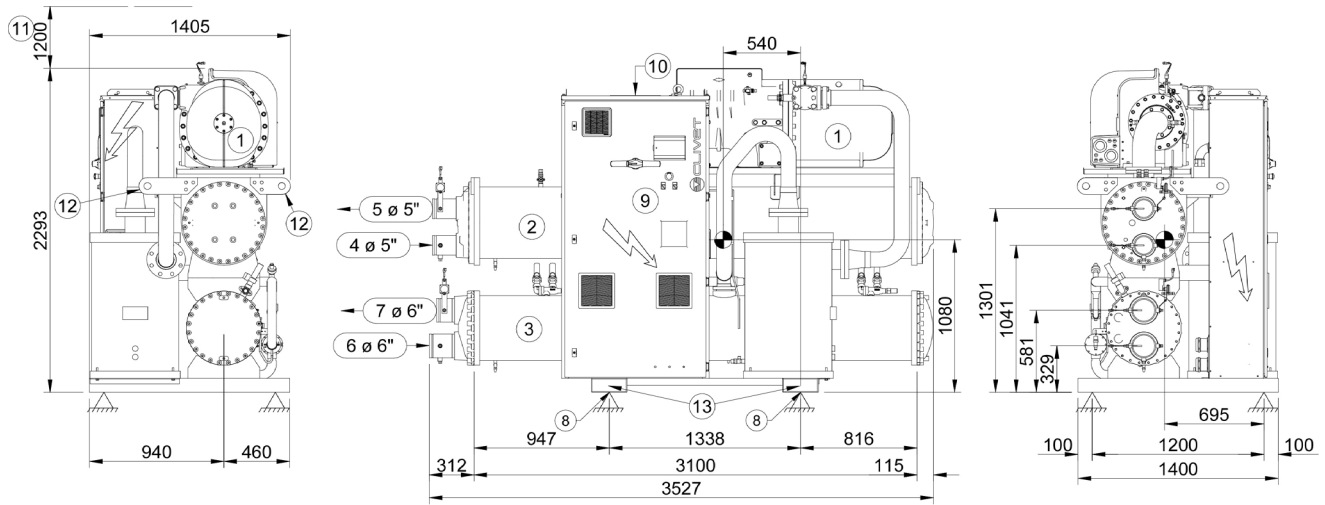
- | | |
|---|-------------------------------------|
| 1. Compressor | 8. Antivibration holes $\phi 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD) 139.7 | 11. Maintenance spaces |
| 5. Internal exchanger water outlet (OD) 139.7 | 12. Lifting bracket (removed) |
| 6. External exchanger water inlet (OD) 168.3 | 13. Lift with forklift |
| 7. External exchanger water outlet (OD) 168.3 | |

SIZE		200.1	220.1
Length	mm	2902	2902
Depth	mm	1400	1400
Height	mm	2293	2293
W1 Supporting point	kg	1556	1554
W2 Supporting point	kg	870	870
W3 Supporting point	kg	1157	1152
W4 Supporting point	kg	634	631
Operating weight	kg	4217	4207
Shipping weight	kg	3965	3955

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 - 270.1

DAAF10004_00
DATA/DATE 11/11/2020



- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD) 139.7 | 11. Maintenance spaces |
| 5. Internal exchanger water outlet (OD) 139.7 | 12. Lifting bracket (removed) |
| 6. External exchanger water inlet (OD) 168.3 | 13. Lift with forklift |
| 7. External exchanger water outlet (OD) 168.3 | |

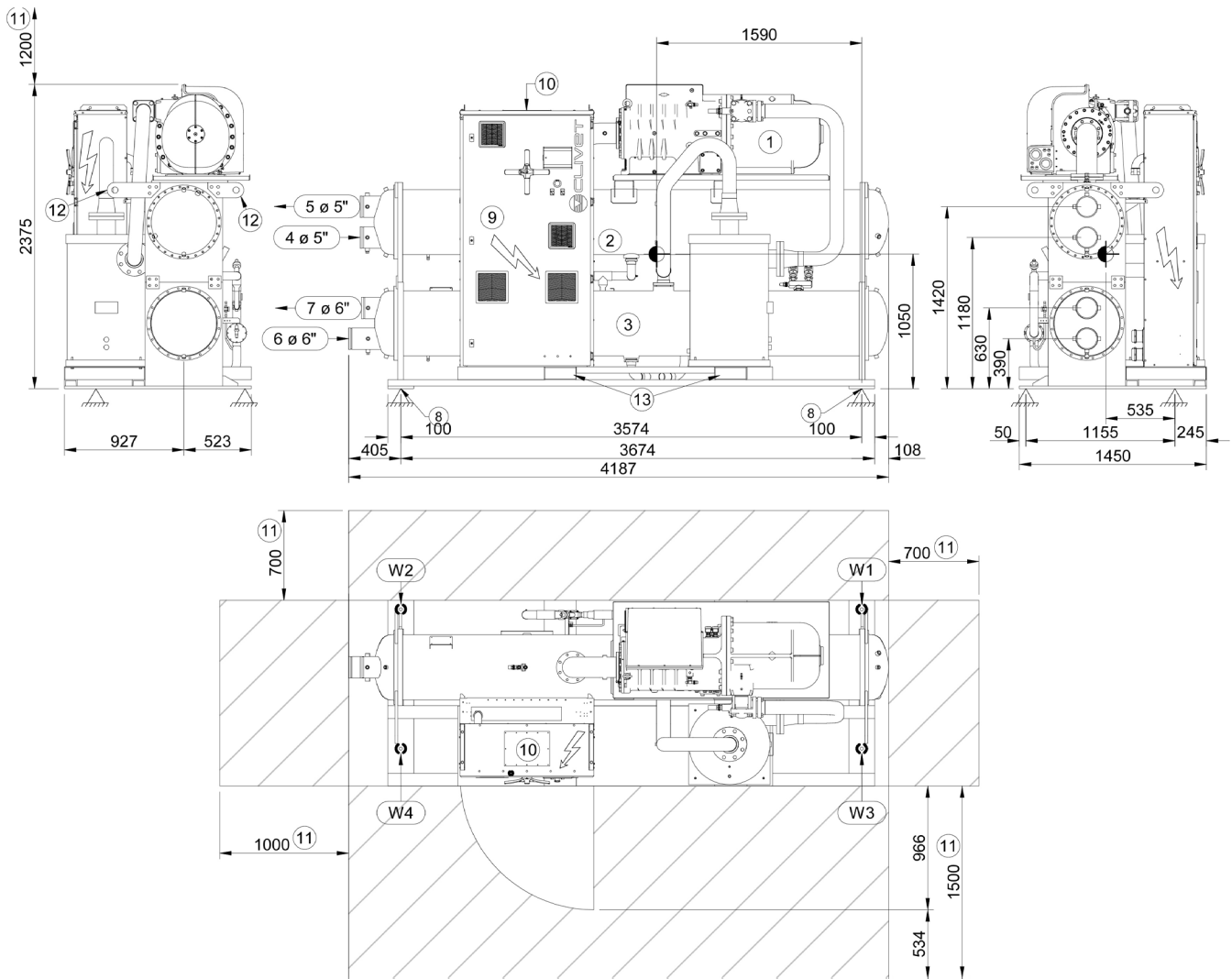
SIZE		240.1	270.1
Length	mm	3527	3527
Depth	mm	1400	1400
Height	mm	2293	2293
W1 Supporting point	kg	1785	1797
W2 Supporting point	kg	1082	1096
W3 Supporting point	kg	1244	1247
W4 Supporting point	kg	737	744
Operating weight	kg	4849	4884
Shipping weight	kg	4422	4472

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 290.1

DAAF10009_00
DATA/DATE 25/11/2020



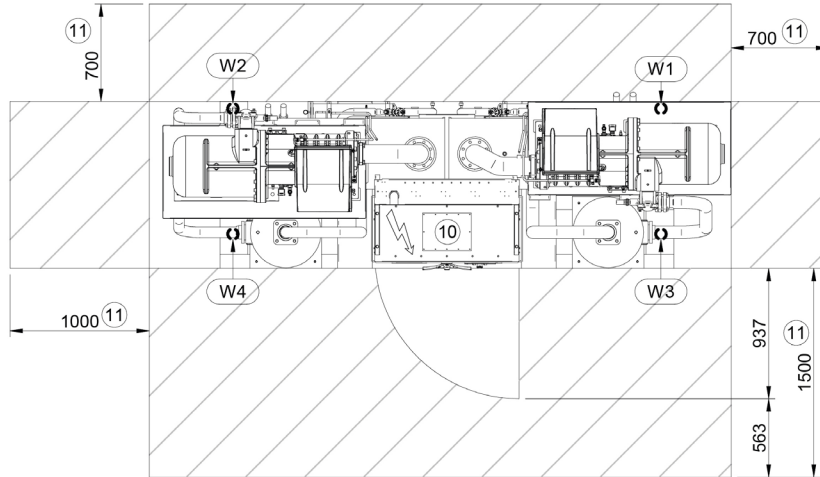
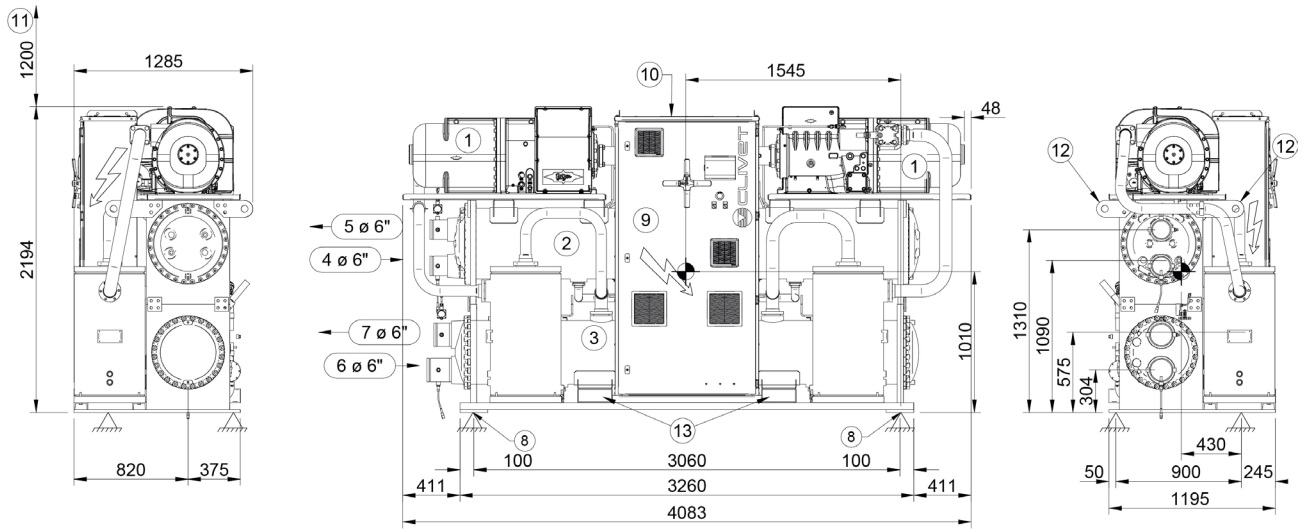
- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD)168.3 | 11. Maintenance spaces |
| 5. Internal exchanger water outlet (OD) 168.3 | 12. Lifting bracket (removed) |
| 6. External exchanger water inlet (OD) 168.3 | 13. Lift with forklift |
| 7. External exchanger water outlet (OD) 168.3 | |

SIZE		290.1
Length	mm	4187
Depth	mm	1450
Height	mm	2375
W1 Supporting point	kg	1547
W2 Supporting point	kg	1263
W3 Supporting point	kg	1218
W4 Supporting point	kg	985
Operating weight	kg	5013
Shipping weight	kg	4643

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

DAAF10007_00
DATA/DATE 24/11/2020



1. Compressor
2. Internal exchanger (evaporator)
3. External exchanger (condenser)
4. Internal exchanger water inlet (OD)168.3
5. Internal exchanger water outlet (OD) 168.3
6. External exchanger water inlet (OD) 168.3
7. External exchanger water outlet (OD) 168.3

8. Antivibration holes $\varnothing 25$ mm
9. Electrical panel
10. Power input
11. Maintenance spaces
12. Lifting bracket (removed)
13. Lift with forklift

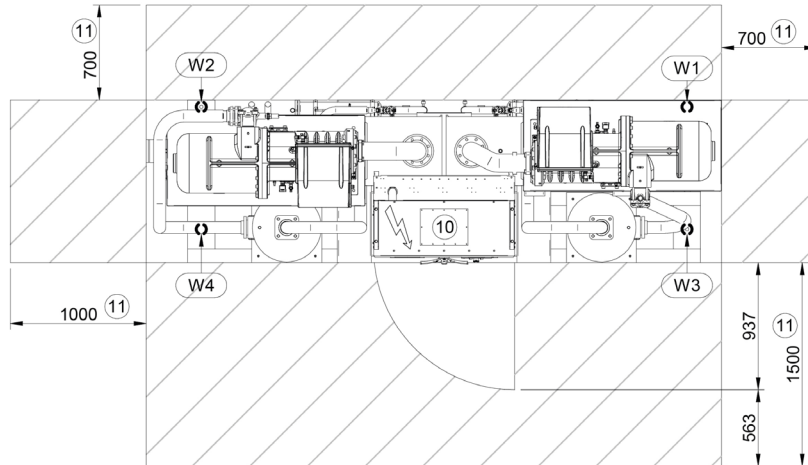
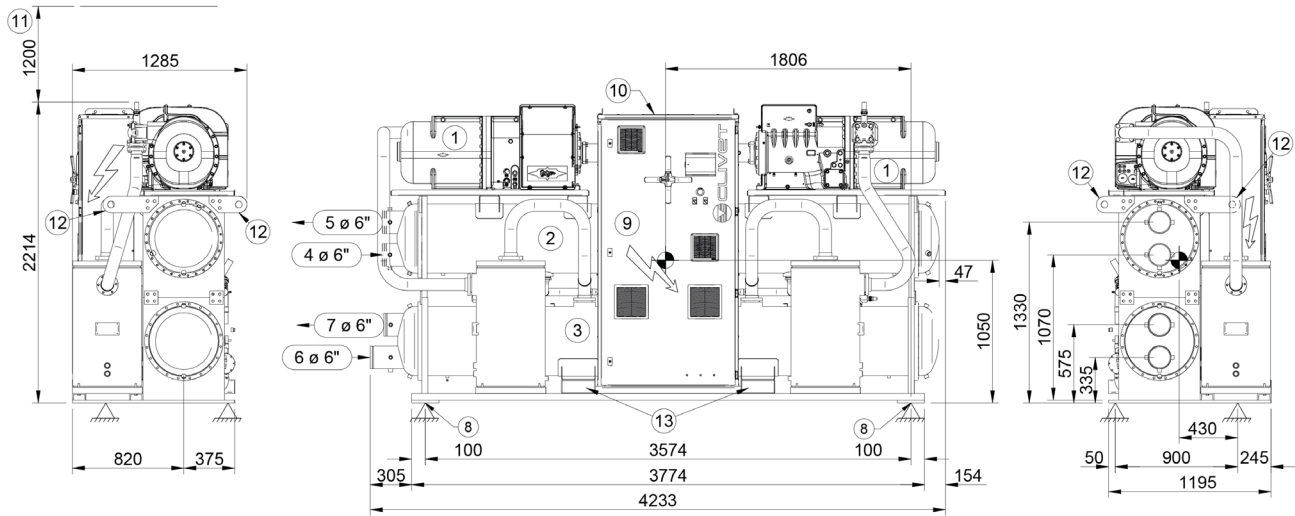
SIZE		250.2	280.2
Length	mm	4083	4083
Depth	mm	1195	1195
Height	mm	2194	2194
W1 Supporting point	kg	1601	1677
W2 Supporting point	kg	1622	1695
W3 Supporting point	kg	1123	1154
W4 Supporting point	kg	1139	1167
Operating weight	kg	5484	5694
Shipping weight	kg	5115	5260

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 320.2

DAAF10006_00
DATA/DATE 24/11/2020



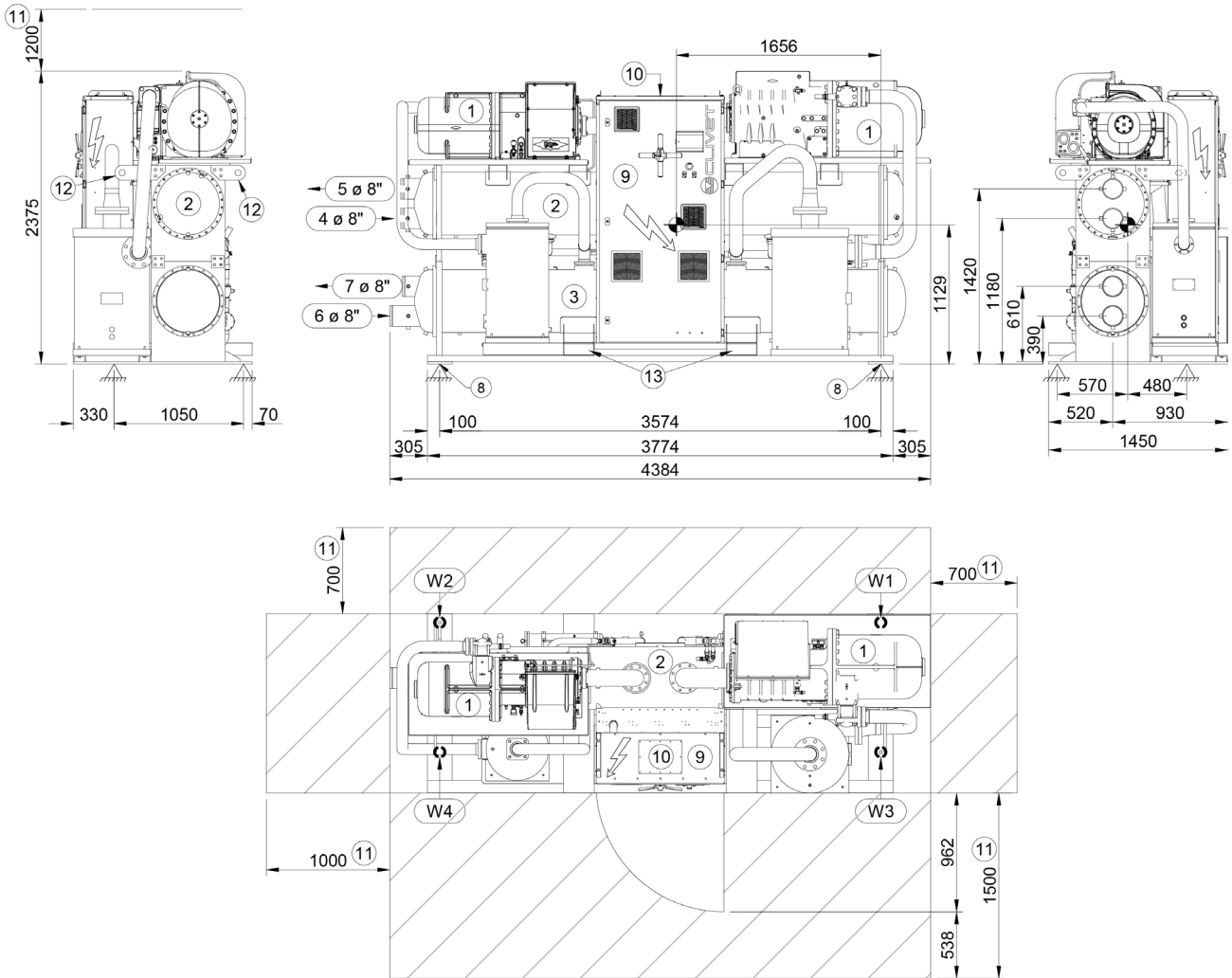
- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD)168.3 | 11. Maintenance spaces |
| 5. Internal exchanger water outlet (OD) 168.3 | 12. Lifting bracket (removed) |
| 6. External exchanger water inlet (OD) 168.3 | 13. Lift with forklift |
| 7. External exchanger water outlet (OD) 168.3 | |

SIZE		320.2
Length	mm	4233
Depth	mm	1195
Height	mm	2214
W1 Supporting point	kg	1980
W2 Supporting point	kg	2007
W3 Supporting point	kg	1235
W4 Supporting point	kg	1253
Operating weight	kg	6475
Shipping weight	kg	5893

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

DAAF10008_00
DATA/DATE 25/11/2020



- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD) 168.3 | 11. Maintenance spaces |
| 5. Internal exchanger water outlet (OD) 168.3 | 12. Lifting bracket (removed) |
| 6. External exchanger water inlet (OD) 168.3 | 13. Lift with forklift |
| 7. External exchanger water outlet (OD) 168.3 | |

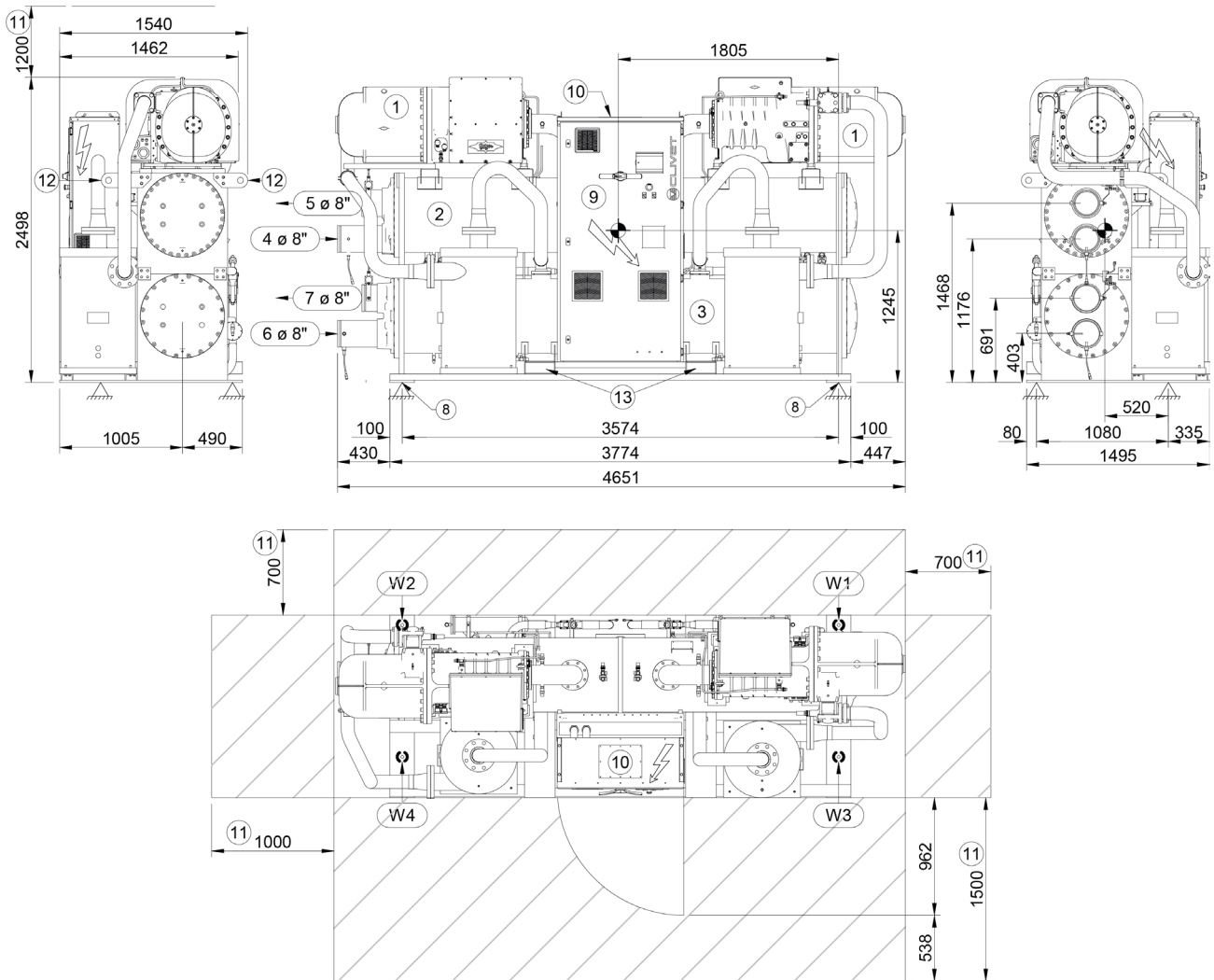
SIZE		360.2
Length	mm	4384
Depth	mm	1450
Height	mm	2375
W1 Supporting point	kg	2468
W2 Supporting point	kg	2129
W3 Supporting point	kg	1422
W4 Supporting point	kg	1222
Operating weight	kg	7241
Shipping weight	kg	6652

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 400.2 - 480.2 - 540.2

DAAF10003_00
DATA/DATE 10/11/2020



- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD) 219.1 | 11. Maintenance spaces |
| 5. Internal exchanger water outlet (OD) 219.1 | 12. Lifting bracket (removed) |
| 6. External exchanger water inlet (OD) 219.1 | 13. Lift with forklift |
| 7. External exchanger water outlet (OD) 219.1 | |

SIZE		400.2	480.2	540.2
Length	mm	4651	4651	4651
Depth	mm	1495	1495	1495
Height	mm	2498	2498	2498
W1 Supporting point	kg	2782	2761	2782
W2 Supporting point	kg	2918	2902	2918
W3 Supporting point	kg	1718	1711	1718
W4 Supporting point	kg	1807	1803	1807
Operating weight	kg	9225	9177	9225
Shipping weight	kg	8397	8349	8397

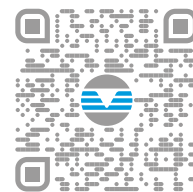
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

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