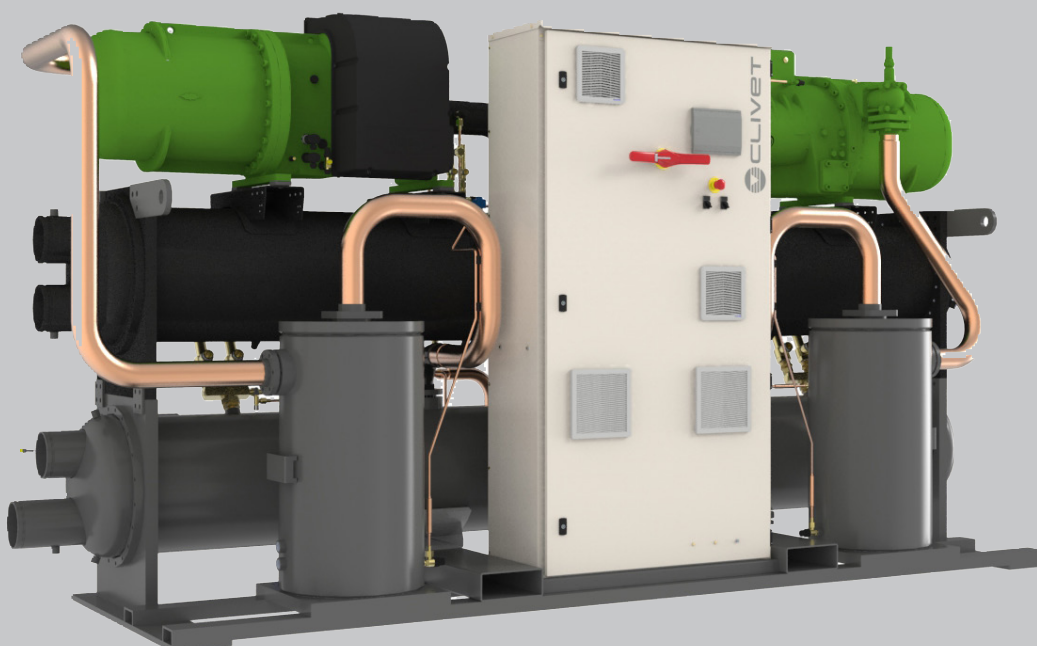


*Water Cooled Liquid Chiller
with inverter technology
for indoor installation*

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	416	520	611	689	759	830	704	800	899	1065	1280	1355	1440

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Clivet participates in the ECP Programme for "Liquid Chillers and Hydronic Heat Pumps".
Check ongoing validity of certificate on www.eurovent-certification.com"

Features and benefits

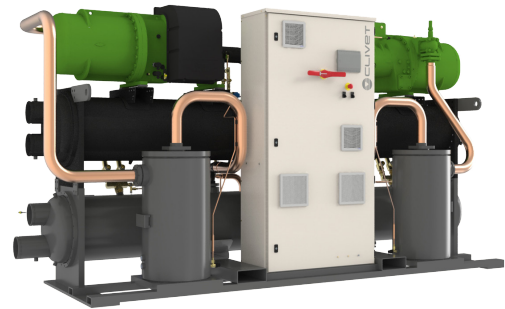
SCREWLine: Screw technology for an efficient and versatile product

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:

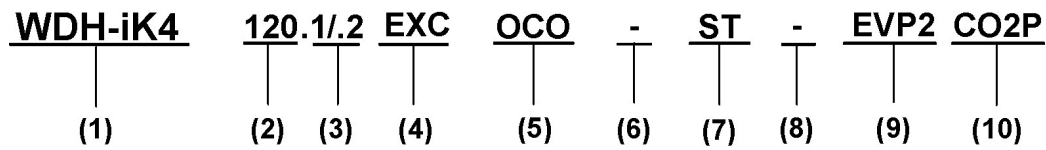
- interface terminal with graphic display;
- set values, error codes and parameters can be displayed;
- proportional-integral-derivative adjustment of water temperature;
- management of unit start-up from local or remote device;
- ON/OFF keys and alarm reset;
- daily, weekly temperature set point and 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. 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.

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 leak 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 cataphoretic 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 cataphoretic 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 cataphoretic 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.

IFU2X

Steel mesh strainer on the user 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.

IFS2X

Steel mesh strainer on the source 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.

IOTX

IoT industrial module for cloud based interoperability & services

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

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

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

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

Web interface at www.clivete.com.

Clivet Eye app available in Google Play and Apple Store

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



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.

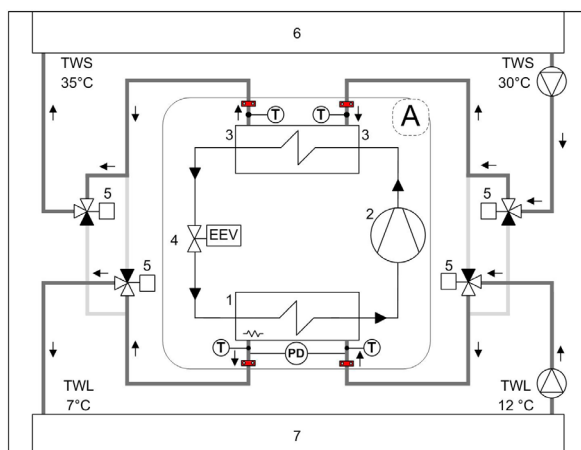
It consists of:

- 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.

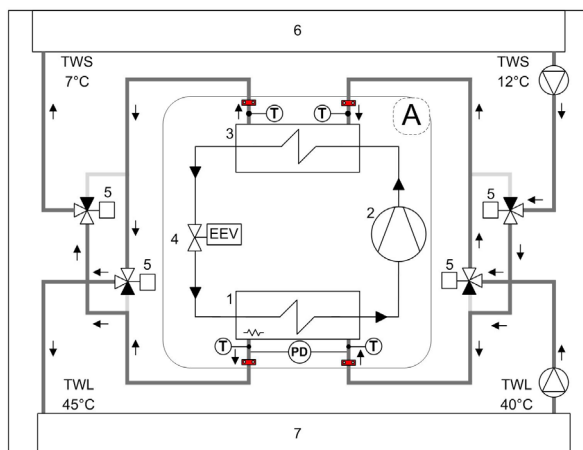
Operation mode: cooling



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	1356	1441
Compressor power input	(1)	kW	63,7	77,5	97,8	115	132	144	160	132	150	171	200	240	261	280
Total power input	(2)	kW	64,7	78,5	98,8	116	133	145	161	133	151	172	201	241	262	281
EER	(1)	-	5,26	5,30	5,26	5,27	5,19	5,24	5,16	5,30	5,30	5,23	5,30	5,32	5,18	5,13
Water flow rate (evaporator)	(1)	l/s	16,1	19,8	24,7	29,0	32,8	36,1	39,5	33,5	38,0	42,7	50,6	60,8	64,4	68,4
Pressure drops (evaporator)	(1)	kPa	26,4	22,4	23,3	28,2	46,9	46,9	38,8	50,5	44,5	43,3	53,8	47,9	46,9	52,0
Water flow rate (condenser)	(1)	l/s	19,5	23,8	29,8	35,0	39,6	43,5	47,7	40,3	45,8	51,6	61,0	73,2	77,9	82,9
Pressure drops (condenser)	(1)	kPa	26,0	26,4	30,4	29,0	38,3	37,6	37,1	41,4	36,8	28,6	40,5	39,4	31,1	26,6
Cooling capacity (EN14511:2022)	(3)	kW	340	416	520	611	689	759	830	704	800	899	1065	1280	1355	1440
Total power input (EN 14511:2022)	(3)	kW	66,8	81,0	102	119	138	150	166	138	156	177	209	249	270	289
EER (EN 14511:2022)	(3)	-	5,08	5,13	5,11	5,13	5,00	5,06	5,00	5,10	5,12	5,08	5,11	5,13	5,02	4,98
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	8,44	8,53
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	339	413	516	607	686	755	825	701	795	894	1060	1273	1341	1439
Total power input (AHRI 550/590)	(6)	kW	64,5	78,5	98,4	115	132	144	160	132	150	171	199	239	260	283
COP _R	(6)	-	5,26	5,26	5,25	5,27	5,20	5,25	5,17	5,31	5,32	5,24	5,32	5,32	5,16	5,09
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	385	463	582	683	774	853	933	794	893	1005	1190	1430	1507	1679
Compressor power input	(7)	kW	86,3	101	125	147	171	184	204	178	197	223	257	309	335	374
Total power input	(2)	kW	87,3	102	126	148	172	185	205	179	198	224	258	310	336	375
COP	(7)	-	4,41	4,54	4,62	4,61	4,50	4,61	4,55	4,44	4,51	4,49	4,61	4,61	4,49	4,48
Water flow rate (condenser)	(7)	l/s	18,6	22,4	28,1	33,0	37,4	41,2	45,1	38,4	43,2	48,6	57,5	69,1	72,9	81,2
Pressure drops (condenser)	(7)	kPa	23,8	23,5	27,2	25,9	34,6	34,2	33,0	37,9	33,2	25,3	35,9	35,1	27,2	25,4
Water flow rate (evaporator)	(7)	l/s	23,7	28,7	36,2	42,4	47,7	53,0	57,7	48,8	55,1	61,9	73,9	88,7	92,8	103
Pressure drops (evaporatore)	(7)	kPa	52,7	43,9	46,1	63,0	88,0	87,7	79,8	92,9	81,3	81,2	102,0	90,6	87,3	105
Heating capacity (EN 14511:2022)	(8)	kW	385	463	582	683	775	854	934	795	894	1006	1191	1431	1508	1680
Total power input (EN 14511:2022)	(8)	kW	88,9	104	129	152	179	193	213	186	205	232	270	323	348	390
COP (EN 14511:2022)	(8)	-	4,33	4,45	4,52	4,49	4,33	4,43	4,39	4,26	4,35	4,34	4,41	4,43	4,33	4,30
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 14511:2022 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 14511:2022 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	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
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
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		
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 9614-1 standard. Sound power and sound pressure data are not Eurovent certified. 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 9614-1 standard. Sound power and sound pressure data are not Eurovent certified. 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

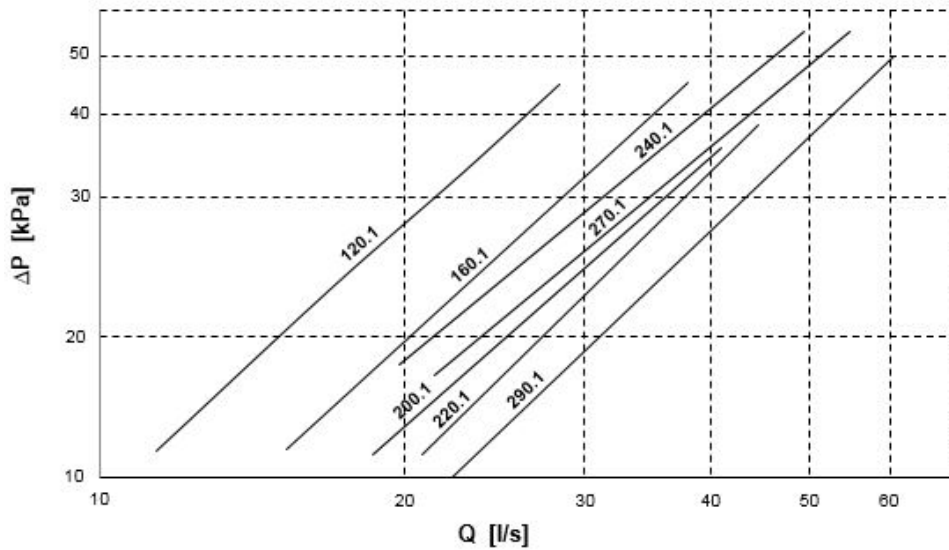
	INTERNAL EXCHANGER (EVAPORATOR)	
	DPR	DPW
PED (CE)	2150	1000

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



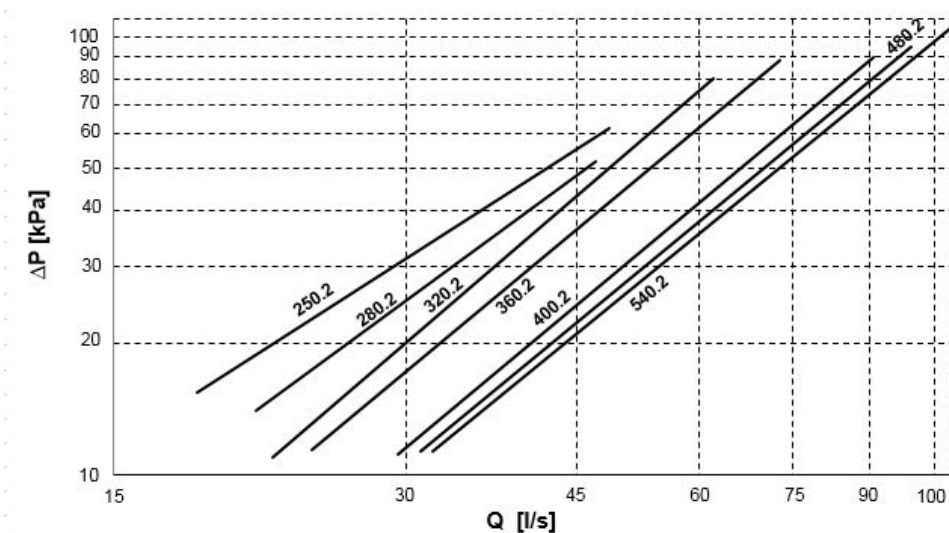
Pressure drops on the water side are calculated considering an average water temperature of 30°C.
Q = water flow-rate (l/s)
DP = pressure drop [kPa]

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:

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

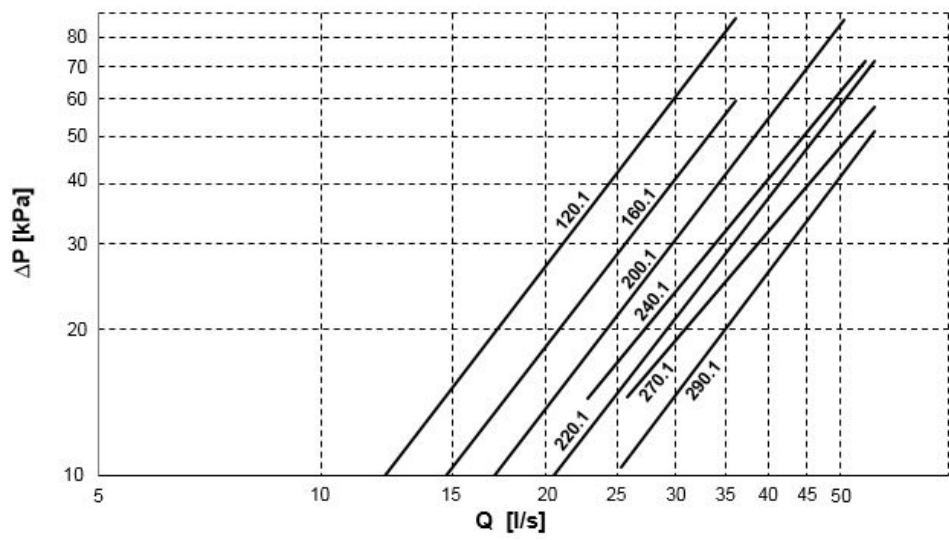
kWf = Cooling capacity in kW
DT = Temperature difference between entering / leaving water

Admissible water flow rates

Min. (Qmin) and max. (Qmax) water flow-rates admissibles 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]	37,5	50,0	61,1	58,3	58,3	63,9	72,2	58,3	69,4	77,8	80,6	103	111	111

Condenser pressure drop - Size 120.1 - 290.1



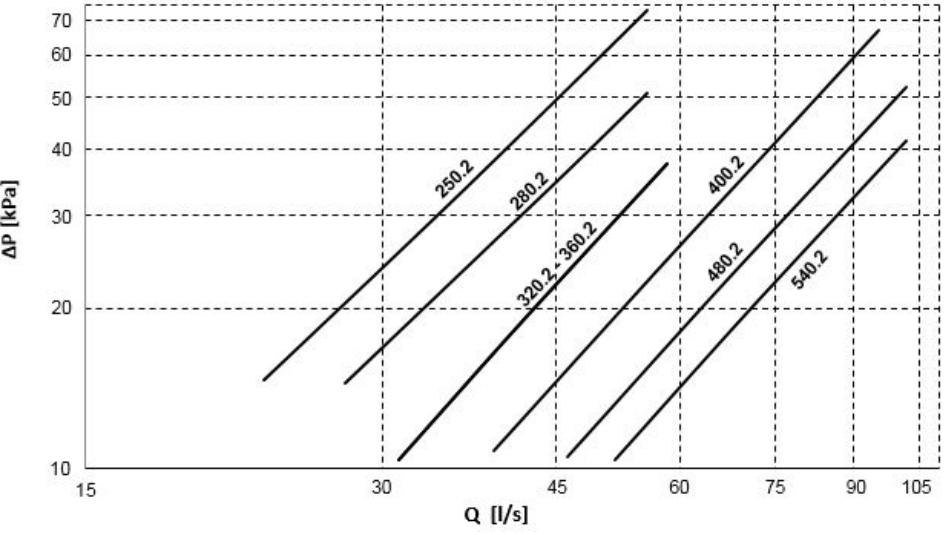
Pressure drops on the water side are calculated considering an average water temperature of 30°C.
Q = water flow-rate (l/s)
DP = pressure drop [kPa]

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

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

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	41,7	52,8	61,1	66,7	75,0	83,3	72,2	83,3	88,9	102,8	127,8	133,3	138,9

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	63,7	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	77,5	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	97,8	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	115	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	132	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	144	716	164	669	184	620	205	569	226
	10	889	127	850	144	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	160	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	132	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	150	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	171	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	200	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	240	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	1295	228	1222	262	1148	298	1070	335	988	375	903	419
	6	1353	227	1278	263	1201	297	1121	335	1037	375	950	419
	7	1411	228	1356	261	1254	298	1172	335	1086	375	997	419
	10	1584	225	1500	261	1414	296	1325	334	1233	374	1136	419
	15	-	-	1778	257	1681	294	1581	332	1477	373	1369	420
	18	-	-	-	-	1841	293	1734	332	1624	372	1509	420
540.2	5	1436	257	1358	294	1276	334	1193	375	1103	419	1011	465
	6	1499	256	1390	294	1335	333	1249	375	1157	418	1062	465
	7	1563	256	1441	280	1394	333	1305	374	1211	418	1113	465
	10	1754	254	1664	292	1570	332	1474	374	1372	418	1267	465
	15	-	-	1970	290	1864	331	1755	373	1640	418	1522	466
	18	-	-	-	-	2040	330	1923	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	63,7	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	73,4	16,5	4,45	81,8	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	77,5	5,37	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	125	3,66	489	112	4,37	520	97,8	5,32	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	115	5,31	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	132	5,23	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	144	5,28	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	160	5,19	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	132	5,34	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	150	5,34	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	171	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	200	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	240	5,34	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	1172	335	3,50	1254	298	4,21	1356	261	5,20	1411	228	6,19
	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	1305	374	3,49	1394	333	4,19	1441	280	5,15	1563	256	6,11
	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	401	55,4	418	54,9	460	53,6	531	51,5	-	-
	35	378	65,3	394	65,0	404	63,7	451	63,6	519	61,8	559	60,7
	40	367	75,8	383	75,5	397	75,2	436	74,3	502	72,8	540	71,9
	45	357	86,7	371	86,5	385	86,3	423	85,7	486	84,7	522	84,1
	50	346	98,7	360	98,6	373	98,5	409	98,2	469	97,6	503	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	494	77,5	544	78,2	628	77,6	676	77,3
	40	442	89,2	460	89,2	479	89,2	526	89,3	606	89,4	653	89,4
	45	428	101	446	101	463	101	508	101	585	102	630	103
	50	413	113	430	113	447	114	490	114	564	116	606	116
	55	398	125	413	125	429	125	471	126	539	126	579	126
200.1	30	583	87,3	607	87,0	631	86,7	692	85,9	795	84,5	-	-
	35	572	99,2	596	99,0	618	97,8	678	98,0	779	96,9	837	96,2
	40	557	112	579	112	601	112	658	111	755	110	811	110
	45	540	126	562	126	582	125	638	125	732	125	785	124
	50	523	140	543	140	564	140	618	140	708	140	760	140
	55	507	157	526	157	546	157	598	157	686	158	739	158
220.1	30	686	102	714	102	742	101	816	101	938	99,3	-	-
	35	672	116	700	116	726	115	798	115	917	114	987	114
	40	653	132	678	131	705	131	773	131	888	130	955	130
	45	632	147	658	147	683	147	749	147	859	146	923	146
	50	612	166	636	166	659	165	722	165	828	165	890	165
	55	592	184	615	184	638	184	698	184	800	185	859	185
240.1	30	779	116	812	116	845	116	929	115	1071	114	-	-
	35	763	134	794	133	822	132	908	133	1045	132	1125	131
	40	740	152	770	152	800	152	878	151	1009	150	1086	150
	45	716	171	745	171	774	171	848	170	974	170	1047	170
	50	692	191	719	191	747	191	818	191	938	191	1007	191
	55	668	213	694	213	720	213	789	214	903	214	974	215
270.1	30	854	128	890	128	926	128	1016	127	1170	126	-	-
	35	838	146	872	145	904	144	994	144	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	764	204	795	205	825	205	903	205	1034	206	1110	206
	55	739	226	767	226	795	226	869	226	995	227	1071	227
290.1	30	936	141	975	141	1014	140	1117	140	1287	138	-	-
	35	917	161	955	161	991	160	1091	160	1257	159	1353	159
	40	890	182	927	182	963	182	1057	182	1215	181	1307	181
	45	864	204	898	204	933	204	1023	205	1174	205	1261	205
	50	837	228	870	228	902	228	988	228	1131	228	1216	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	837	132	929	131	1071	125	1154	122
	40	755	156	787	156	819	156	899	152	1036	148	1117	146
	45	734	179	763	178	794	178	871	176	1002	173	1078	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	877	151	915	151	951	150	1050	148	1214	144	1310	142
	40	850	173	886	173	923	173	1016	171	1173	169	1265	168
	45	824	197	858	197	893	197	982	196	1132	195	1220	195
	50	798	223	830	223	863	223	949	223	1092	223	1175	223
	55	773	251	803	251	834	251	914	251	1050	252	1129	252
320.2	30	1014	151	1057	150	1101	150	1214	148	1404	145	-	-
	35	991	173	1033	173	1071	171	1184	171	1368	170	1475	169
	40	960	197	1000	197	1040	197	1144	196	1319	196	1421	196
	45	928	222	967	223	1005	223	1105	224	1273	225	1369	225
	50	897	250	934	251	970	251	1065	252	1226	255	1319	256
	55	863	276	898	277	932	277	1021	277	1169	277	1257	278
360.2	30	1199	175	1250	175	1300	174	1431	173	1650	170	-	-
	35	1172	201	1221	201	1266	200	1397	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	1501	256	1615	256
	50	1063	288	1105	288	1149	289	1260	289	1447	289	1556	290
	55	1026	320	1066	320	1106	320	1213	321	1390	321	1500	322
400.2	30	1438	211	1499	211	1559	210	1714	208	1976	205	-	-
	35	1408	242	1467	242	1521	240	1676	240	1929	238	2075	236
	40	1366	275	1421	275	1478	275	1622	274	1864	272	2004	271
	45	1324	310	1376	309	1430	309	1568	308	1801	307	1936	306
	50	1280	347	1329	346	1380	346	1512	345	1734	344	1864	344
	55	1236	387	1285	387	1333	387	1460	387	1673	388	1804	388
480.2	30	1523	228	1580	227	1639	228	1809	225	2096	222	-	-
	35	1484	262	1541	263	1618	262	1761	261	2035	257	2201	256
	40	1446	298	1498	297	1552	298	1710	296	1975	294	2134	293
	45	1405	335	1456	335	1507	335	1659	334	1913	332	2066	332
	50	1363	375	1412	375	1461	375	1607	374	1850	373	1996	372
	55	1322	419	1369	419	1416	419	1555	419	1789	420	1929	420
540.2	30	1693	257	1755	256	1819	256	2008	254	2325	252	-	-
	35	1652	294	1684	294	1722	281	1956	292	2260	290	2443	289
	40	1610	334	1668	333	1727	333	1902	332	2195	331	2370	330
	45	1568	375	1624	375	1679	374	1848	374	2128	373	2295	372
	50	1522	419	1575	418	1629	418	1790	418	2058	418	2219	418
	55	1476	465	1527	465	1578	465	1732	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)	-	5,24	5,12	5,21	5,20	5,02	4,85	4,70	5,15	5,07	5,06	5,08	4,93	5,01	4,80
Water flow rate (evaporator)	(1)	l/s	16,3	19,9	24,6	28,9	32,7	36,1	39,3	33,5	37,8	42,8	50,4	60,8	66,2	72,5
Pressure drops (evaporator)	(1)	kPa	26,9	22,6	23,0	27,9	46,6	47,0	38,5	50,5	44,0	43,4	53,4	47,9	49,1	57,4
Water flow rate (condenser)	(1)	l/s	19,7	24,0	29,6	34,9	39,7	44,2	48,3	40,5	45,8	51,9	57,7	74,1	80,4	88,8
Pressure drops (condenser)	(1)	kPa	26,7	26,8	30,2	28,9	38,8	38,2	42,8	41,7	36,5	50,6	52,0	44,4	32,2	38,6
Cooling capacity (EN14511:2018)	(3)	kW	344	418	517	608	687	760	827	704	795	900	1061	1280	1392	1526
Total power input (EN 14511:2018)	(3)	kW	67,9	84,1	102	120	142	162	182	142	162	185	216	269	286	329
EER (EN 14511:2018)	(3)	-	5,06	4,97	5,09	5,06	4,85	4,69	4,56	4,95	4,90	4,87	4,92	4,76	4,86	4,64
SEER	(4)	-	7,90	7,62	7,82	7,87	7,84	7,78	7,74	8,05	7,79	7,72	7,77	7,76	7,76	7,75
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	415	513	604	683	756	822	701	791	896	1055	1273	1367	1504
Total power input (AHRI 550/590)	(6)	kW	65,5	81,4	98,7	116	136	156	175	136	156	177	207	258	275	316
COP _R	(6)	-	5,22	5,10	5,20	5,20	5,02	4,85	4,71	5,16	5,08	5,07	5,08	4,93	4,96	4,76
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	381	466	581	683	779	861	942	787	887	1007	1193	1455	1509	1632
Compressor power input	(7)	kW	80,1	98,5	120	139	164	182	204	167	189	215	251	311	327	364
Total power input	(2)	kW	81,1	99,5	121	140	165	183	205	168	190	216	252	312	328	365
COP	(7)	-	4,70	4,68	4,80	4,88	4,72	4,70	4,60	4,68	4,67	4,66	4,73	4,66	4,60	4,47
Water flow rate (condenser)	(7)	l/s	18,4	22,6	28,1	33,0	37,7	41,6	45,5	38,0	42,9	48,7	57,7	70,3	73,0	78,9
Pressure drops (condenser)	(7)	kPa	23,5	23,7	27,2	26,0	35,3	34,5	38,5	37,3	32,5	45,1	52,1	40,7	28,7	32,6
Water flow rate (evaporator)	(7)	l/s	23,8	29,1	36,5	43,1	48,7	53,8	58,4	49,1	55,3	62,7	74,6	90,6	93,6	100
Pressure drops (evaporatore)	(7)	kPa	53,4	45,1	46,9	65,0	90,9	89,8	81,7	93,9	81,7	82,9	104,0	93,8	88,6	99,9
Heating capacity (EN 14511:2018)	(8)	kW	381	467	581	683	780	862	943	788	888	1008	1194	1456	1510	1633
Total power input (EN 14511:2018)	(8)	kW	82,9	102	124	145	172	191	213	176	197	225	265	326	341	380
COP (EN 14511:2018)	(8)	-	4,60	4,57	4,69	4,73	4,53	4,52	4,42	4,49	4,50	4,47	4,50	4,47	4,43	4,29
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 = 0.44×10^{-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 = 0.18×10^{-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 = 0.18×10^{-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

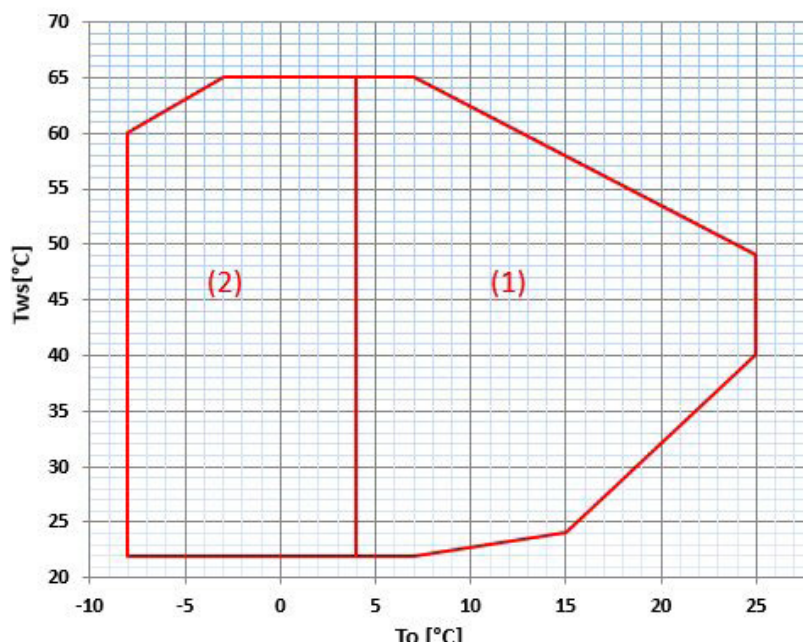
Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measurements are carried out according to the UNI EN ISO 9614-1 standard. Sound power and sound pressure data are not Eurovent certified. 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 9614-1 standard. Sound power and sound pressure data are not Eurovent certified. Data referred to the following conditions: Evaporator water temperature= 12/7°C; Condenser water temperature = 30/35°C.

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

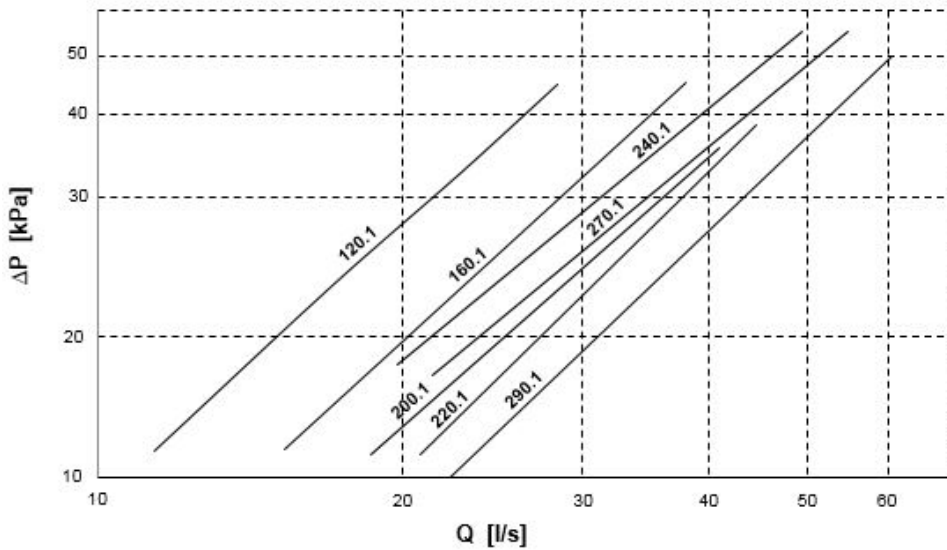
	INTERNAL EXCHANGER (EVAPORATOR)	
	DPR	DPW
PED (CE)	2400	1000

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



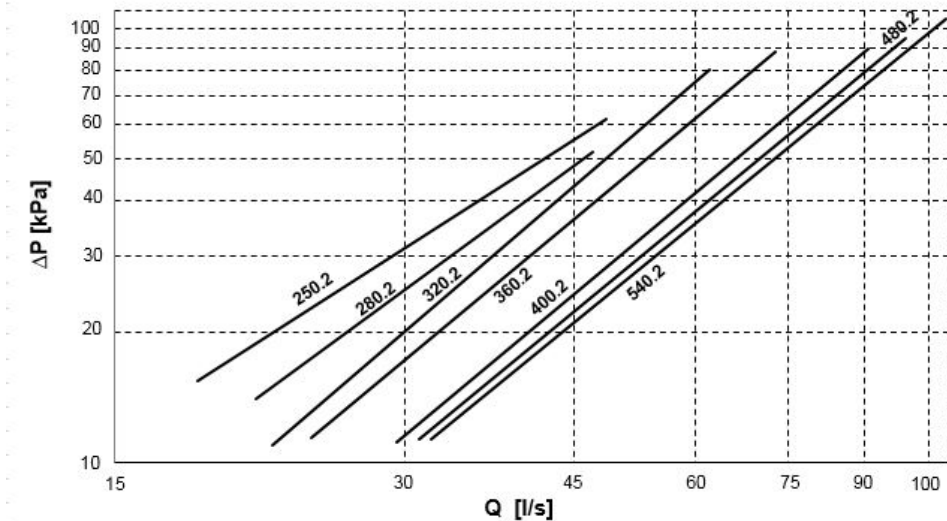
Pressure drops on the water side are calculated considering an average water temperature of 30°C.
Q = water flow-rate (l/s)
DP = pressure drop [kPa]

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:

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

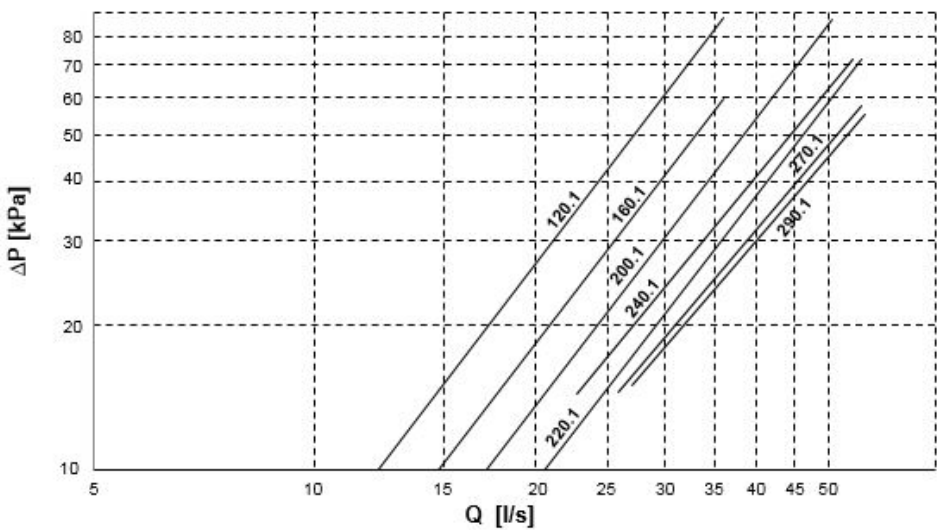
kWf = Cooling capacity in kW
DT = Temperature difference between entering / leaving water

Admissible water flow rates

Min. (Qmin) and max. (Qmax) water flow-rates 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]	11,4	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]	37,5	50,0	61,1	58,3	58,3	63,9	72,2	58,3	69,4	77,8	80,6	103	111	111

Condenser pressure drop - Size 120.1 - 290.1



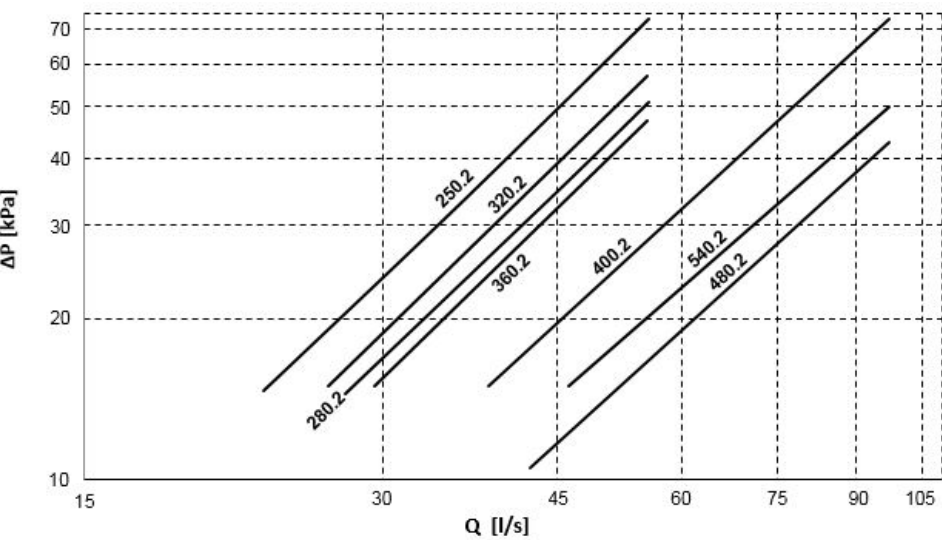
Pressure drops on the water side are calculated considering an average water temperature of 30°C.
Q = water flow-rate [l/s]
DP = pressure drop [kPa]

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	60,0	97,2	97,2	97,2

Performances - HWT Version

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	64,6	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	80,7	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	98,3	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	116	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	136	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	156	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	175	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	136	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	156	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	177	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	208	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	259	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	1292	248	1233	272	1171	297	1104	325	1035	355	961	374
	6	1348	250	1286	275	1223	300	1155	327	1084	357	1008	374
	7	1403	253	1393	277	1275	303	1182	327	1132	359	1055	374
	10	1569	256	1501	283	1432	308	1357	336	1279	367	1196	374
	15	1845	265	1770	291	1693	318	1610	348	1523	379	1431	375
	18	-	-	1931	297	1849	325	1761	355	1670	386	1572	375
540.2	5	1434	289	1367	313	1296	340	1203	368	1145	398	1063	415
	6	1495	292	1427	316	1354	342	1234	371	1169	402	1115	415
	7	1556	294	1527	317	1412	345	1268	364	1210	405	1167	415
	10	1739	301	1665	326	1585	353	1503	382	1415	414	1323	416
	15	2045	313	1962	339	1874	367	1783	397	1685	430	1582	416
	18	-	-	2140	347	2048	375	1951	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

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	344	64,6	5,33	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	418	80,7	5,18	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	4,50	517	98,3	5,26	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	608	116	5,24	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	688	136	5,06	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	761	156	4,88	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	828	175	4,73	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	705	136	5,18	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	796	156	5,10	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	901	177	5,09	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	251	3,75	1003	229	4,38	1062	208	5,11	1110	189	5,87
	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	1281	259	4,95	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	1182	327	3,61	1275	303	4,21	1393	277	5,03	1403	253	5,55
	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	1268	364	3,48	1412	345	4,09	1527	317	4,82	1556	294	5,29
	75	1082	279	3,88	1149	256	4,49	1213	234	5,18	1261	216	5,85
	50	726	177	4,11	776	159	4,88	824	143	5,76	858	130	6,62
	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

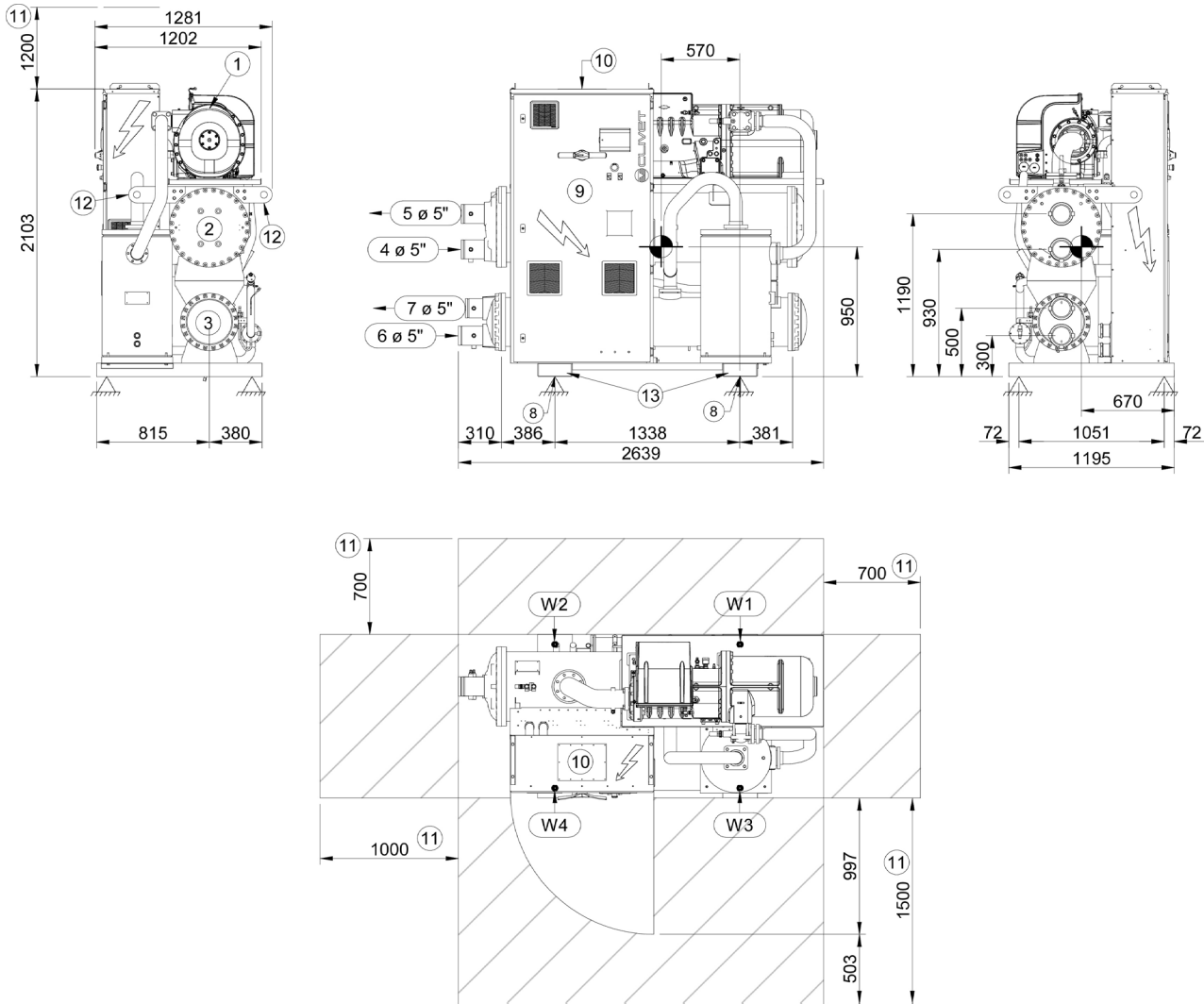
kWt = Heating capacity to the condenser (kW).

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
2. Internal exchanger (evaporator)
3. External exchanger (condenser)
4. Internal exchanger water inlet (OD) 139.7
5. Internal exchanger water outlet (OD) 139.7
6. External exchanger water inlet (OD) 139.7
7. External exchanger water outlet (OD) 139.7

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

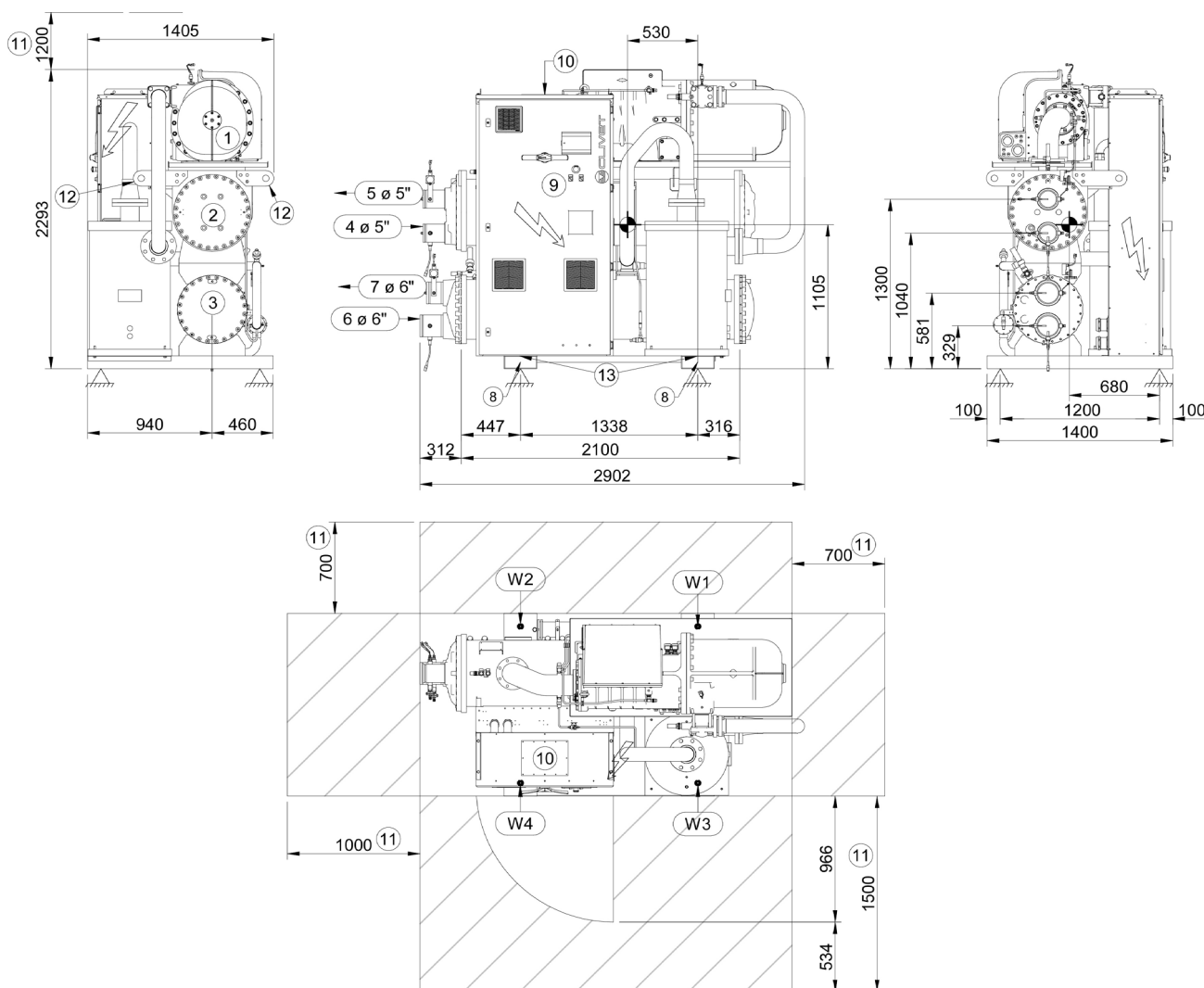
SIZE		120.1	160.1
Length	mm	2639	2639
Depth	mm	1195	1195
Height	mm	2103	2103
W1 Supporting point	kg	1047	1092
W2 Supporting point	kg	805	841
W3 Supporting point	kg	788	790
W4 Supporting point	kg	601	606
Operating weight	kg	3241	3328
Shipping weight	kg	3057	3113

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



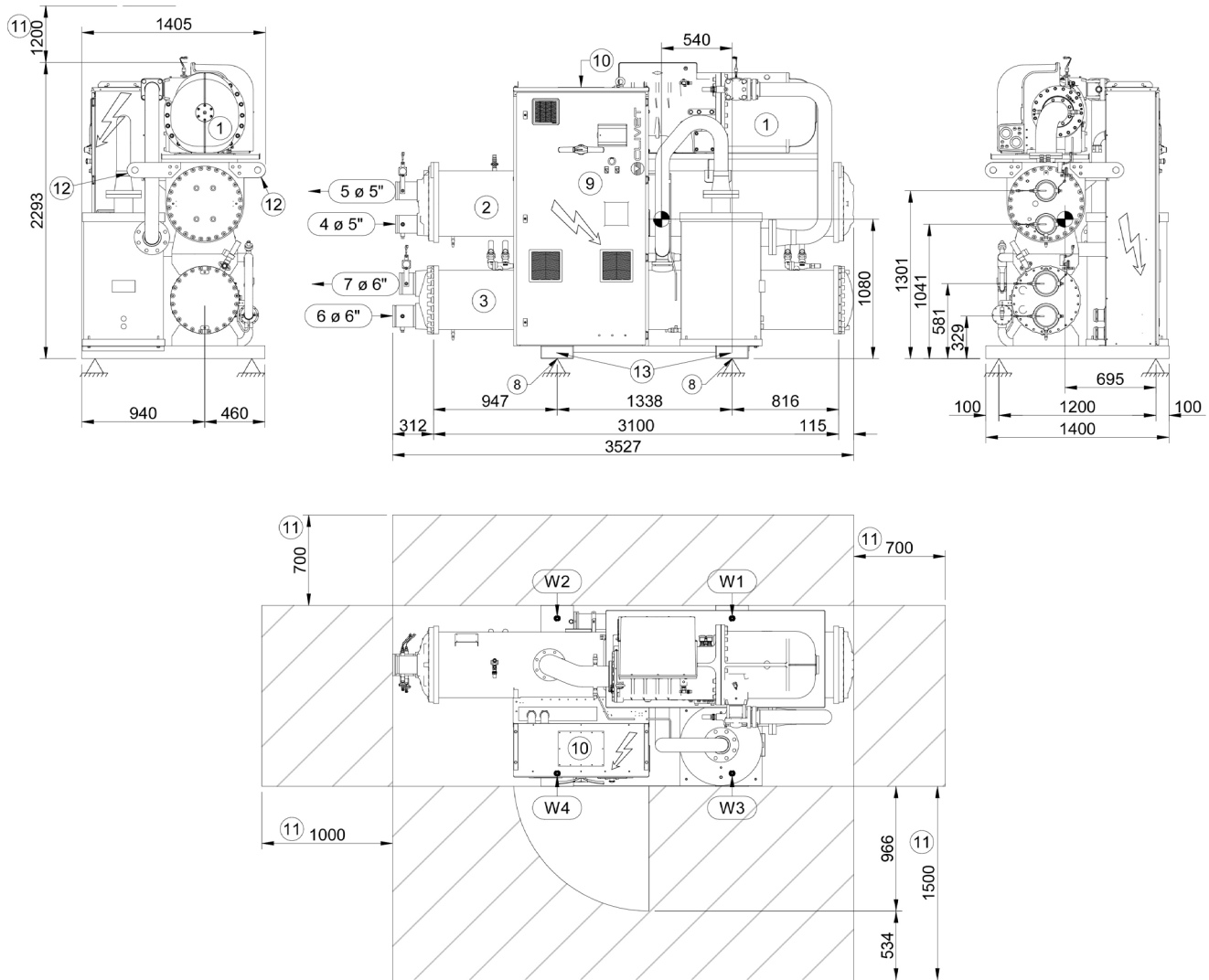
- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD) 139.7 | 11. Maintenance spaces |
| 5. Internal exchanger water 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		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 | |

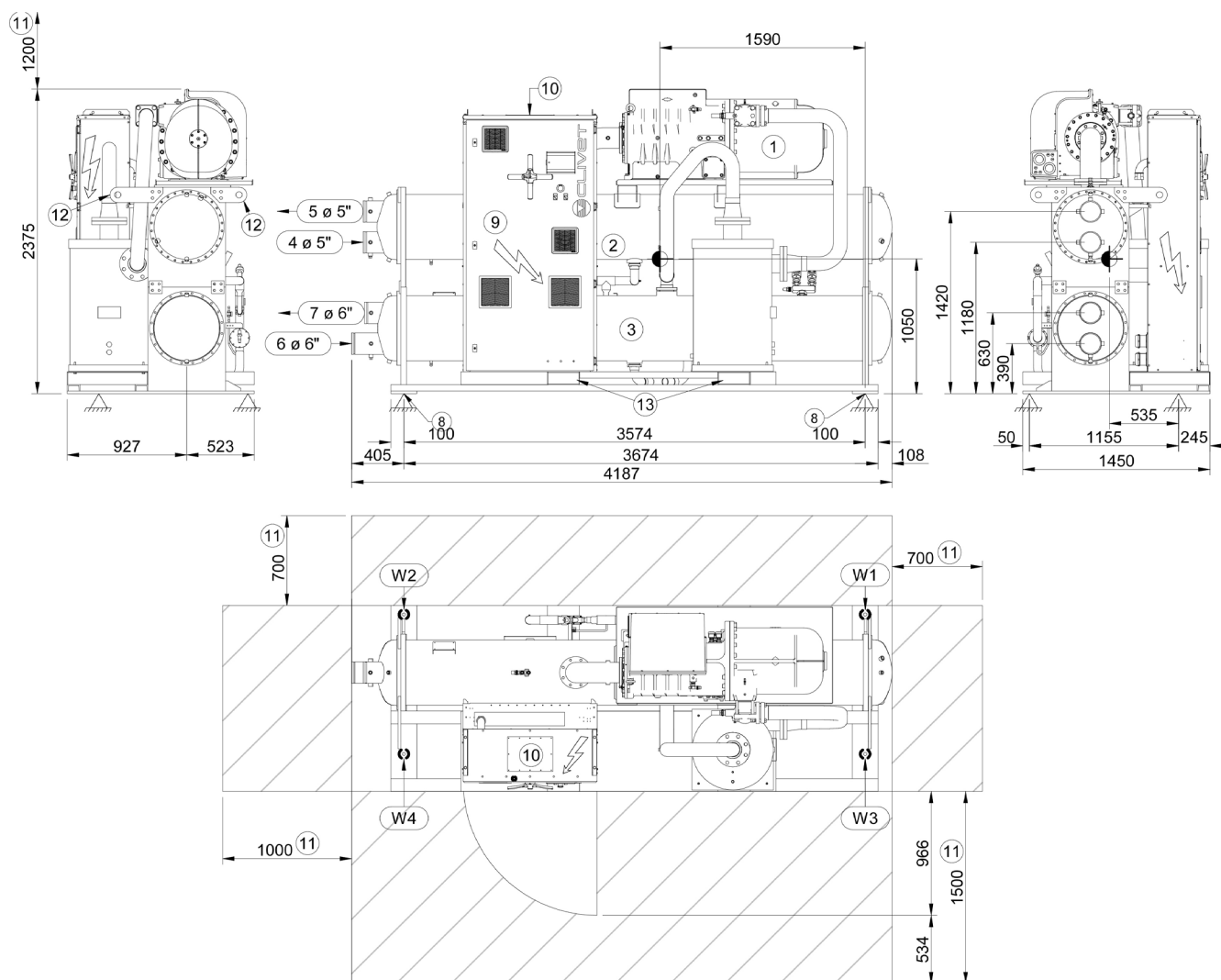
SIZE		240.1	270.1
Length	mm	3527	3527
Depth	mm	1400	1400
Height	mm	2293	2293
W1 Supporting point	kg	1785	1797
W2 Supporting point	kg	1082	1096
W3 Supporting point	kg	1244	1247
W4 Supporting point	kg	737	744
Operating weight	kg	4849	4884
Shipping weight	kg	4422	4472

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



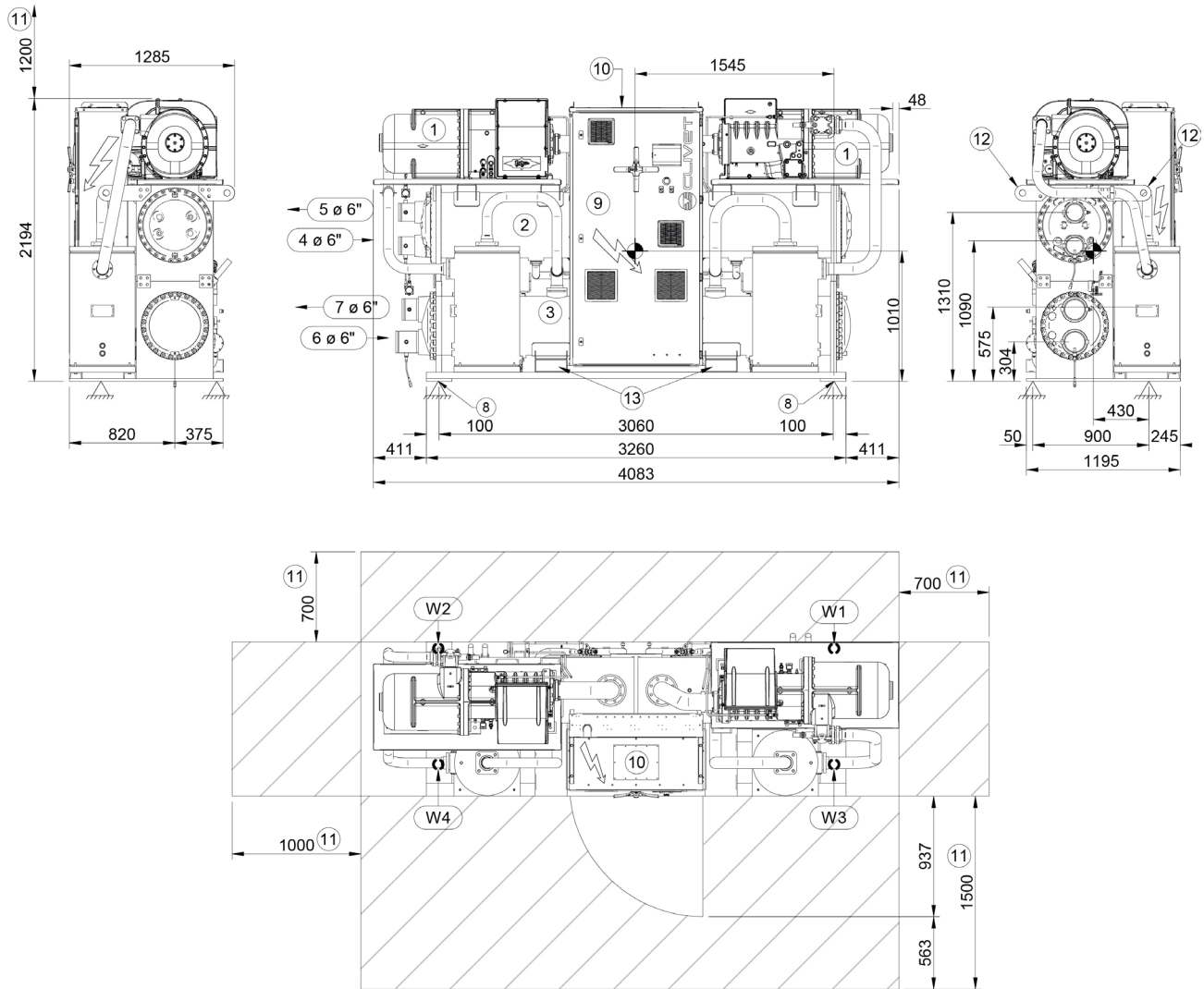
- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD) 168.3 | 11. Maintenance spaces |
| 5. Internal exchanger water 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 | 8. Antivibration holes Ø25 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 | |

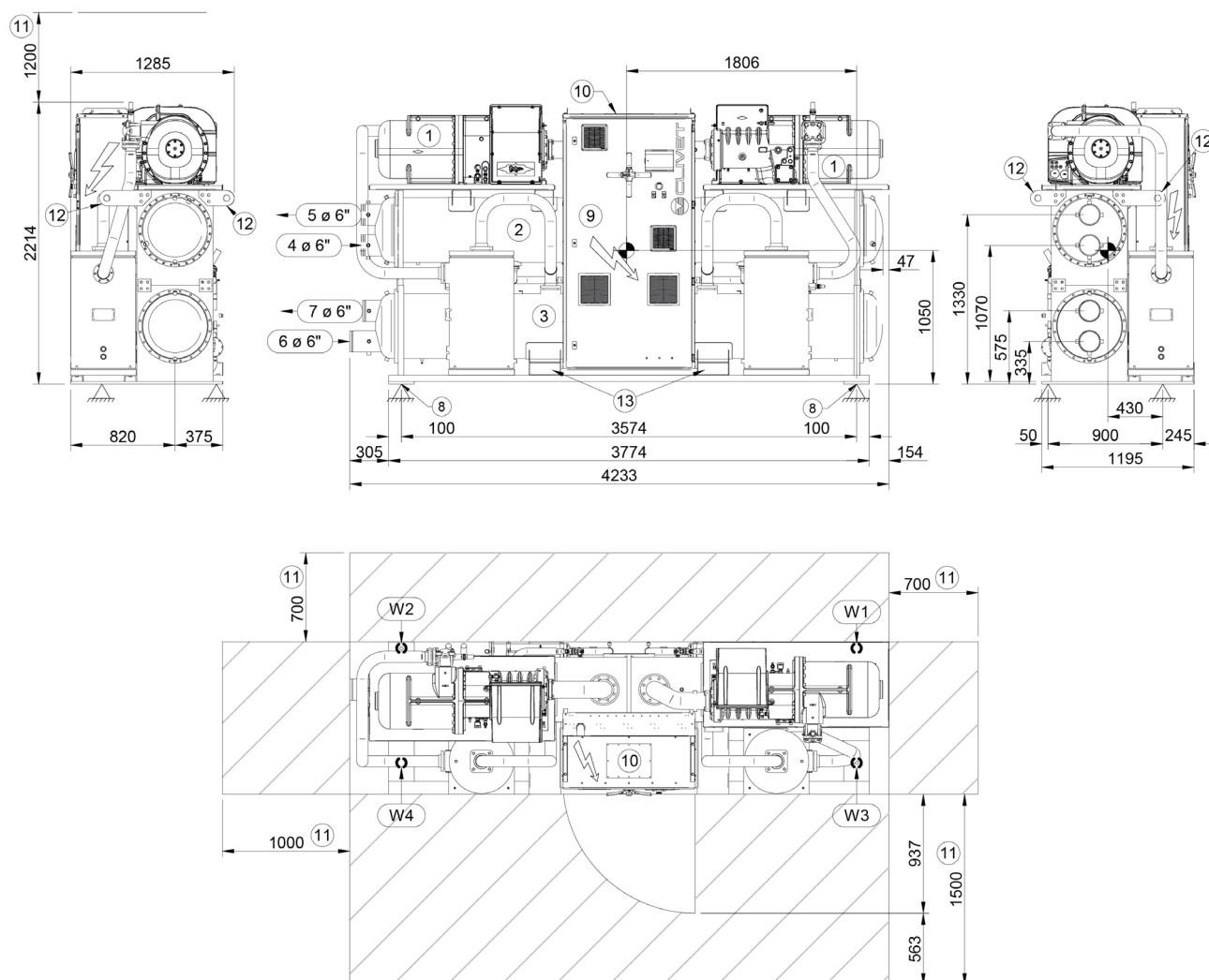
SIZE		250.2	280.2
Length	mm	4083	4083
Depth	mm	1195	1195
Height	mm	2194	2194
W1 Supporting point	kg	1601	1677
W2 Supporting point	kg	1622	1695
W3 Supporting point	kg	1123	1154
W4 Supporting point	kg	1139	1167
Operating weight	kg	5484	5694
Shipping weight	kg	5115	5260

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



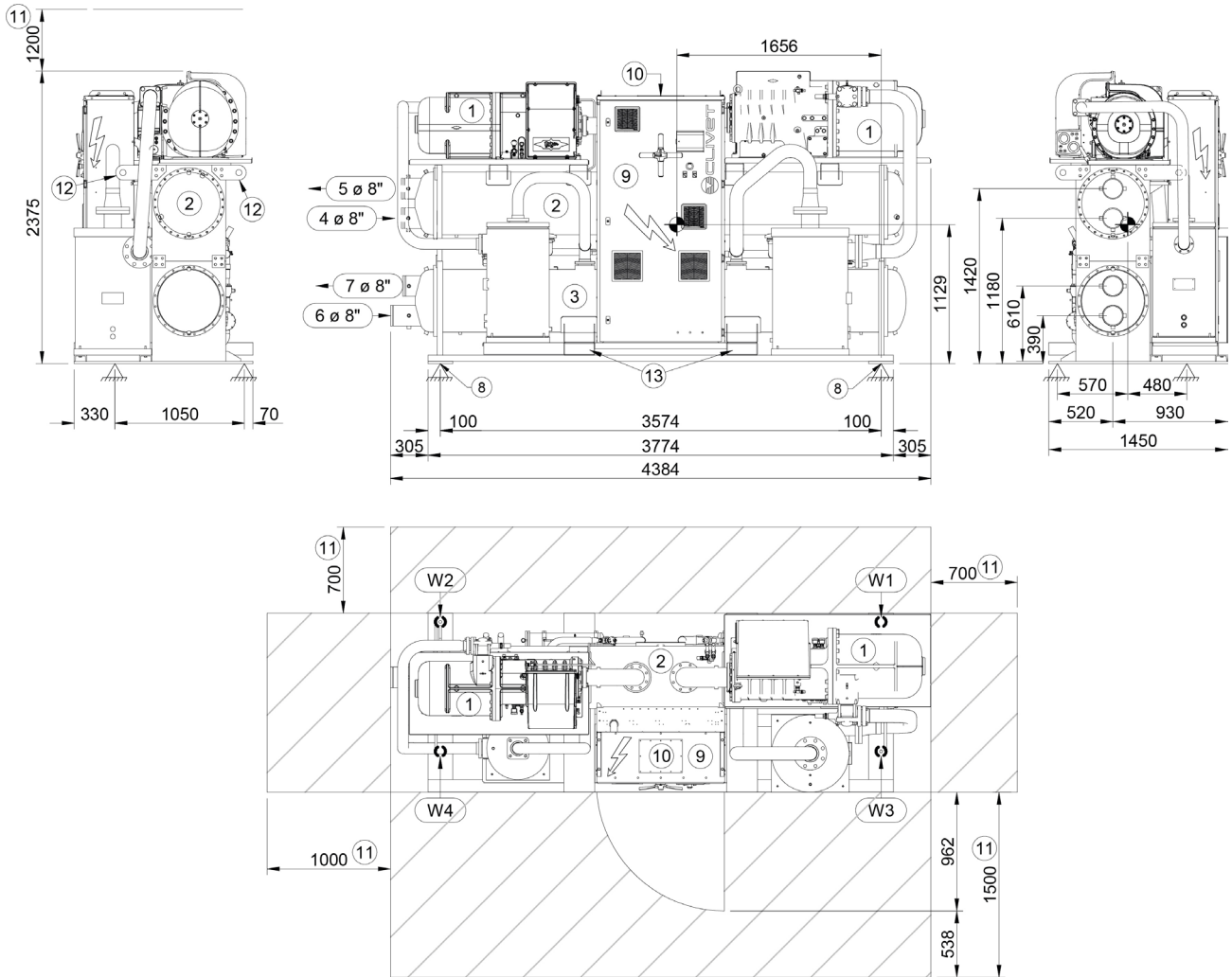
- | | |
|---|--|
| 1. Compressor | 8. Antivibration holes $\varnothing 25$ mm |
| 2. Internal exchanger (evaporator) | 9. Electrical panel |
| 3. External exchanger (condenser) | 10. Power input |
| 4. Internal exchanger water inlet (OD)168.3 | 11. Maintenances spaces |
| 5. Internal exchanger water 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 ø25 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 | |

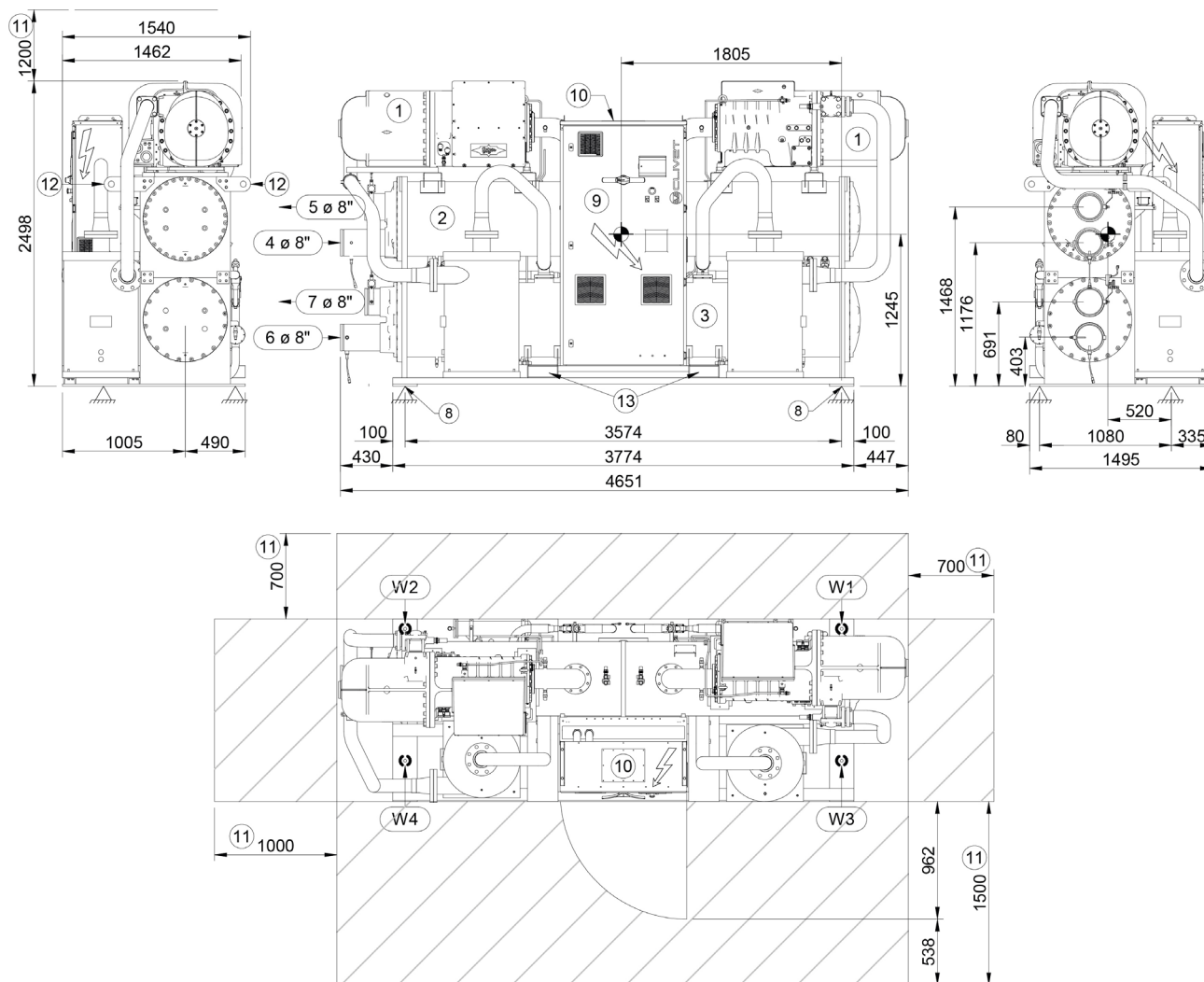
SIZE		360.2
Length	mm	4384
Depth	mm	1450
Height	mm	2375
W1 Supporting point	kg	2468
W2 Supporting point	kg	2129
W3 Supporting point	kg	1422
W4 Supporting point	kg	1222
Operating weight	kg	7241
Shipping weight	kg	6652

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
2. Internal exchanger (evaporator)
3. External exchanger (condenser)
4. Internal exchanger water inlet (OD) 219.1
5. Internal exchanger water outlet (OD) 219.1
6. External exchanger water inlet (OD) 219.1
7. External exchanger water outlet (OD) 219.1

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

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

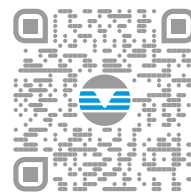
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

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