

SCREWLine³-i

Air cooled liquid chiller with inverter technology
for outdoor installation

WDAT-iL3 250.2 - 580.2 RANGE

Nominal cooling capacity from 558 kW to 1286 kW



- ▶ Screw compressors with integrated inverter R-134a
- ▶ Two independent refrigeration circuits
- ▶ Chilled water down to -12°C
- ▶ Partial recovery of the condensing heat

PREMIUM version

- ▶ Eurovent Class C / Compact version

Screw Inverter



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

Clivet hydronic system

Designed to provide high energy efficiency and sustainability of the investment, the wide range of Clivet liquid chillers and heat pumps for high efficiency air conditioning of Residential and Commercial spaces and for Industrial applications it is available with air or water source.

HYDRONIC System - Air Source

	Small and Medium Commercial			Large Commercial and Industry		
Capacity (kW/RT)	ELFOEnergy Extended Inverter ELFOEnergy Edge ELFOEnergy Duct Inverter 4 + 58 kW	ELFOEnergy Medium / Large ELFOEnergy Vulcan Medium ELFOEnergy Duct Medium 28 + 270 kW	ELFOEnergy Magnet 28 + 375 kW	Remote Multi Scroll Technology 737 + 7050 kW	SPNchiller / SPNchiller Duct Multi Scroll Technology 175 + 1350 kW	SCREWLine [®] 987 + 7573 kW
EFPOptions (See options only)						
Product						
Chiller	WSAT-XM TSC PRM	WSAT-XEE TSC PRM	WSA-XM TSC PRM	MRT-XSC3 TSC PRM	WSAT-XSC3 TSC PRM	WUM-SL3 WUM-A-S TSC PRM
High Temperature/Defrost Inverter Kit			WSAT-XEM TSC	MRT-XSC3 TSC	WSAT-XSC3 TSC	WUM-SL3 TSC
Free Cooling Options		WSA-XEL-FC A	WSA-XEM-FC TSC		WSAT-XSC3-FC TSC	WUM-SL3-FC TSC
Water Output	WSAN-XN TSC PRM	WSAN-XEE A	WSAN-XM TSC	MRT-XSC3 TSC	WSAN-XSC3 TSC	
High temperature water Refrigerant		WSN A	WSN-XEM-HV TSC			
Multi function Refrigerant			WSAN-XM-M TSC		WSAN-XSC3-MF TSC	
ElectronixKit	WSA-XN TSC PRM	WSA-XEE TSC PRM			WSA-XSC3 TSC	

Specialization

Every intended use has specific requirements which determine the overall efficiency. For this, the Clivet hydronic system always offers the best solution in every project.

- Modular range with over 8000 kW of overall capacity
- Capacity control with Screw and modular Scroll technology
- Multifunction versions
- Outdoor or indoor (ductable type) installation

Centrality of the Air Renewal

From the Air Renewal depends the comfort in the spaces. Since it often represents the main building energetic load, it also determines the running costs of the entire system.



ZEPHIR3
Packaged Primary Air supply system with thermodynamic energy recovery.

- Simplifies the system, reduces the heating and cooling generators
- Purifies the air with standard electronic filters
- Increases the energy efficiency and it also allows a savings of 40% on the running costs
- From -40°C to +50°C of outdoor air temperature

Terminal and AHU complete system

The hydronic terminal units are very diffused for their versatility and reliability. The Clivet range includes many versions that simplify the application in different types of installation and building.



ELFOspace
High energy efficiency hydronic terminal units
AQX
Air-conditioning unit

- Cased and uncased terminal units, from 1 to 90 kW
- Horizontal and vertical installation
- Energy-saving DC fans
- Modular air conditioning units up to 160.000 m³/h
- EUROVENT certification

SCREWLine³-i: Screw technology for an efficient and versatile product

SCREWLine³-i is the new generation of Clivet liquid chillers with Screw compression technology: high energy efficiency, great operating reliability and maximum choice versatility, with many versions and models for different types of installation.

WDAT-iL3

Air cooled water chiller with inverter technology

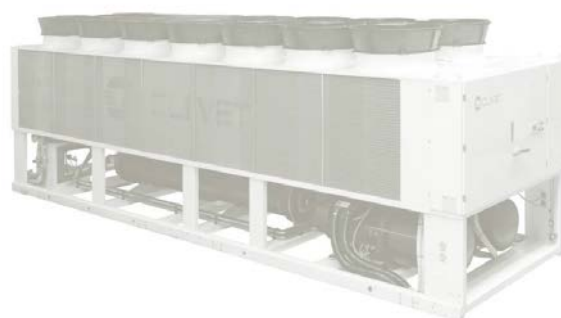
- PREMIUM compact version
- Continuous capacity control
- Operating with 50°C of outdoor air temperature
- Partial recovery of the condensing heat
- Eurovent certification



WDAT-SL3

Air cooled water chiller

- EXCELLENCE high efficiency version
- PREMIUM compact version (Sales available only out of EU)
- Continuous capacity control
- Operating with 52°C of outdoor air temperature
- Total / partial recovery of the condensing heat
- Eurovent certification



Dedicated series separately documented

WDAT-SL3 FREE-COOLING

Air cooled water chiller with FREE-COOLING

- EXCELLENCE high efficiency version version
- Continuous capacity control
- Direct FREE-COOLING
- Indirect FREE-COOLING (No-Glycol)



Dedicated series separately documented

Technology at the service of comfort

Energy used by a chiller in its lifecycle accounts more than 60% of the total cost. Just 15% is the capital investment and the remaining part is maintenance and service. For this reason, the total life cost is for Clivet the main aspect in its solution design, specialised by application and installation location. Even the most stringent international standards adopt the same guidelines.

The European Regulation 2281:2016, also known as the Ecodesign LOT 21, in force from 1 January 2018, defines the minimum efficiency requirements for air-conditioning units. The basic requirements become the performance at part loads and the seasonal efficiencies. The performance at full load are thus much less relevant, both from the regulatory point of view and in the real operating seasonal cycle.

SCREWLine³-i with full inverter technology matches these requirements and even offers responses more performing.

With seasonal efficiency SEER up to 4.79 it represents the best solution of screw chillers available in the market above 500 kW of capacity.

The combination of inverter driven technology on both compressors with a compact size results in a valuable and effective choice both in terms of capital investment and running cost.

Precise and economic operation

In air conditioning of buildings and in industrial processes, thermal loads vary over time.

The modulating capacity control frequency inverter driven on two refrigeration circuits continuously keeps balanced the unit with the installation, allowing to:

- follow the load also with a great staging
- energy saving, supplying only the necessary energy without fluctuations of electric power input
- stabilize the supplied water temperature



Next compressor generation

The core of the chiller is since ever considered the compressor.

Clivet believes it is one of the key elements to achieve the maximum seasonal efficiency.

SCREWLine³-i is equipped with two screw compressors with built-in inverter, which represent the most advanced technology solution on the Market.

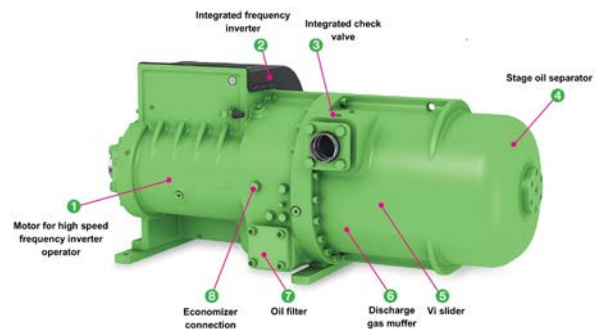
Compressors are specifically designed for inverter technology, to boost all the benefits that this technology offers:

- a capacity modulation performed by both compressors;
- a very high seasonal efficiency;
- reduced overall dimensions;
- a regular and balanced absorbed capacity;
- a null starting current;
- a perfectly balanced operating hour distribution.

Each compressor includes a pre-assembled kit including:

- built-in frequency inverter;
- protection and monitoring compressor sensors;
- compression control (Vi) for an optimal performance in all load conditions.

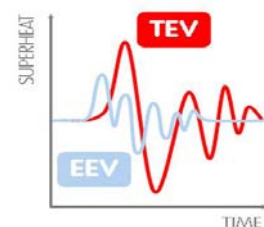
The solution with two screw compressors with built-in inverter is much more efficient than the hybrid solutions available on the market, equipped with one single compressor inverter driven and one on/off type with continuous capacity control (Stepless) and guarantees and ensures a operation continuity over time.



Reliable

The load variability involves the continuous variation of the refrigerant volume moved by compressors. The electronic expansion valve (EEV), standard on Clivet units, adapts rapidly and precisely to the actual load required for usage, allowing stable and reliable control in comparison with mechanical thermostatic valves (TEV). This results also in a further increase in efficiency and longer compressor life.

The overheating control allows preventing phenomena that are hazardous to the compressors, such as overtemperature and return of liquid, thereby increasing even more efficiency and durability. The dual inverter compressor technology guarantees a fine modulation thanks to both compressors and consequently a balanced runtime for a longer lifetime.



Innovative shell and tube heat exchangers

The Clivet thermodynamic research and the development focused on geometries and materials have led to the use of a new direct expansion shell and tube evaporator for both circuits:

- minimum temperature difference (approach) between refrigerant and leaving water
- the efficiency further increases in all load conditions where only one compressor is operating
- minimum quantity of refrigerant inside the installation



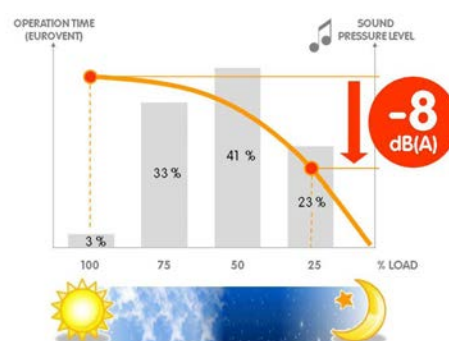
Efficient and silent ventilation technology

Fans at variable speed for minimal noise emission

All units are supplied with a condensation electronic control. It automatically reduces the fan speed as the heat load drops.

Since fans are the unit's main noise source, the benefits are evident especially during the night hours, when the load is reduced but sensitivity to noise is enhanced.

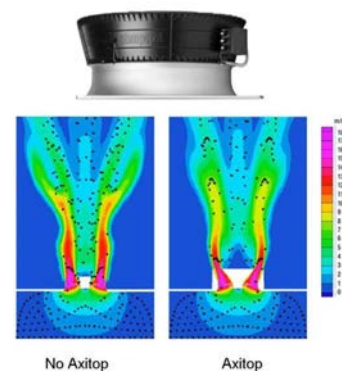
All this translates into a reduction of sound pressure down to 8 dB(A) compared to full load operation in 90% of operating time of the unit.



Diffusers for fans (optional)

The innovative air handling system on the external exchangers is the result of the Clivet design evolution. The new AxiTop diffuser creates an ideal air distribution: it aerodynamically decelerates the flow and transforms a big part of its dynamic energy in static pressure, obtaining:

- reduction of 3% of the absorbed energy



Energy efficiency improved by Axitop

ECOBREEZE fans, electronically controlled (optional)

With ECOBREEZE, the electric motor with an external rotor is driven by the continuous magnetic switching of the stator, deriving from the integrated electronic control.

The advantages are:

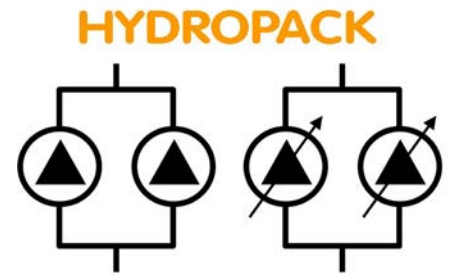
- **70% increase in efficiency** thanks to the brushless technology and the special electricity supply;
- **increase in the working life**, thanks to the elimination of the brush wear;
- **Reduction in the electrical consumption by the system**, thanks to a drastic reduction of the inrush current for the fans obtained using the integrated 'Soft starter' function.



The built-in pumps are versatile, ready-to-use and reliable

The different available solutions are:

- HYDROPACK, the modular solution with two parallel pumps. Automatically reduces the water flow rate when in critical conditions, thereby preventing jams due to overloading, requiring the subsequent intervention of specialised technical Personnel, it is very useful during start-ups, when restarting after operating breaks (e.g. at the weekend) or after a long period of inactivity.
- Inverter driven HYDROPACK allows water flow-rate-head calibration.

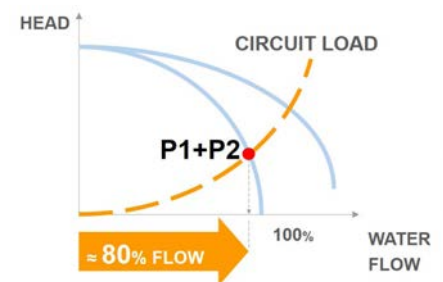


The exceptional HydroPack operation continuity

Due to its modularity, HYDROPACK maintains good water flow in the system even in the event of one of the pumps being temporarily unavailable.

In fact, with a deactivated pump, the residual flow is:

- about 80% of the rated flow (2 pump configuration).



Variable flow-rate advantages

Pumping energy for moving the water has a heavy impact on seasonal efficiency. The variable flow control is available for all units and drives to energy savings during partial load.

Pump energy consumption is proportional with cubic rotation speed. Evident the advantage when reducing flow-rate of 40% comparing to nominal conditions: energy saving is of 75% on pump energy consumption.

The control logic is based on keeping stable the water temperature entering and leaving difference, guaranteeing at the same time the best efficiency and a working envelope within an acceptable range for the heat exchanger (pressure losses).

The control logic applies to both flow-rate and compressor regulation thanks to inverter. Proportional-Integral-Derivative guarantees a precise and stable operation.

The possibility of independent pump management in case of failure is embedded in the unit keeping operative the system.

Remote system management

The unit is standard equipped with:

- potential-free contact for remote On/Off control
- potential-free contacts for the compressor status display
- setting from user interface: Off / local On / serial On
- potential-free contact to remote a general alarm

The unit is able to exchange information with the main supervisory systems using serial connections (Modbus).

Modbus®



Perfect for LEED certification

SCREWLine³-i satisfies both EA Prerequisite 2 (Minimum Energy Performance) and EA Prerequisite 3 (Fundamental Refrigerant Management) of Energy and Atmosphere within LEED 2009 certification section (Size 250.2 ÷ 400.2, 440.2, 540.2 and 580.2).

It also meets EA Credit 4 (Enhanced Refrigerant Management), resulting in two more points.

Clivet is committed in promoting the green building principles and has become a member of GBC Italia. This organization collaborates with USGBC, the U.S. nonprofit organization that promotes worldwide the LEED system of independent certification.



Further considerations on the installation

The vast operating field of SCREWLine³-i allows it to adapt to most system applications.

In some cases, special duty conditions may exceed the unit operating range.

Simple devices on the system allow proper operation and meeting any requirement.

Here are two examples.

Water flow-rate values outside the limits

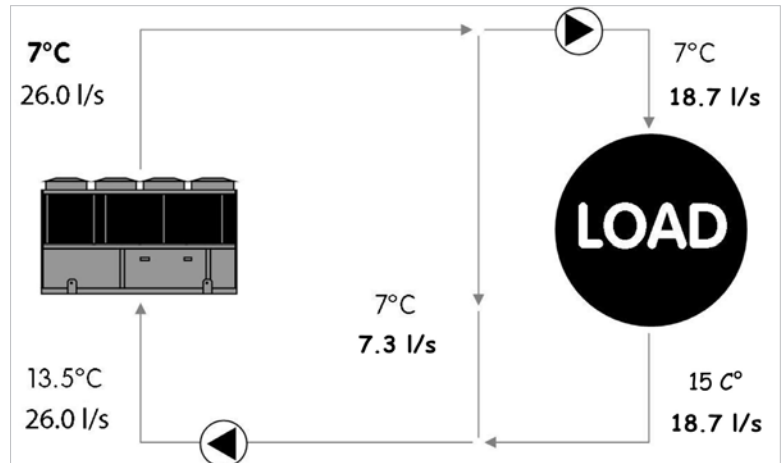
SCREWLine³-i operates with constant water flow-rate to the evaporator, between a minimum and maximum value indicated in the technical documents.

Flow-rate values below the limit may cause unwanted formation of ice, incrustations, reduced control precision, and the unit to stop following the intervention of built-in safety devices.

Flow values above the limit may cause high pressure drops, high pumping costs, and reduced control precision, and erosion damages to the exchangers.

In this example, the required flow-rate is lower than the maximum value allowed to the evaporator, while the operating temperatures fall within the functional field of the unit.

A properly sized bypass piping resolves the problem.



Example referred to WDAT-SL3 280.2.
Appropriate water flow-rate for the correct unit operation.

Temperature values outside the limits

SCREWLine³-i operates with the system supply temperatures indicated in the technical documentation.

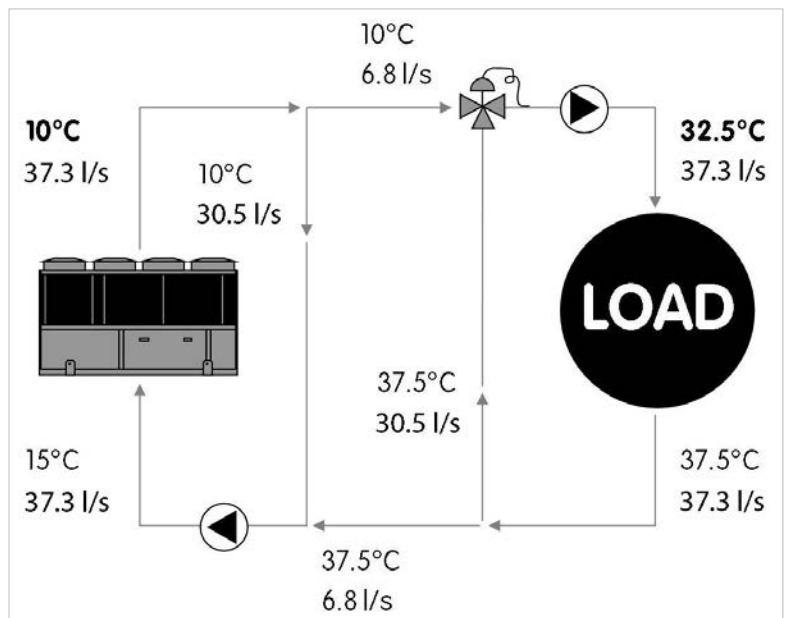
Temperature limits below the limit may cause unwanted formation of ice and the unit to stop following the intervention of built-in safety devices.

Temperature values under the limit may cause malfunctions and damages to the compressors, reduced control precision, and the unit to stop following the intervention of built-in safety devices.

In this example, the required temperature exceeds the maximum value allowed to the evaporator, while the water flow-rate falls within the functional field of the unit.

A properly sized bypass piping and mixing system resolve the problem.

Should both the water flow-rate and the operating temperature exceed the values intended for the chiller, all you have to do is combine the two cases described above.



Example referred to WDAT-SL3 280.2.
Appropriate supply water temperature for the correct unit operation. Nominal water flow-rate with water 15°C-10°C

Evaporator thermal gradient

SCREWLine³-i nominal capacities refer to an evaporator thermal gradient equal to 5 °C. A different thermal gradient may be used in full load operation, provided that both the operating flow and temperatures fall within the limits. As an indication, this corresponds to a minimum thermal gradient of approximately 4 °C and a maximum of 7 °C (the exact values must be determined based on the allowed flows and temperatures).

Standard unit technical specifications

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

Internal exchanger (evaporator)

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

The water connections of the exchanger are quick-release with splined joint

External exchanger (condenser)

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

Fan

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

Device for consumption reduction of the external section at variable speed (phase-cutting)

Automatic device for reducing of the outdoor section consumption with variable speed fans. The speed of the fan motors is continuously adjusted according to the condensing pressure to ensure the right working of the unit at low outside temperatures.

Refrigeration circuit

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.

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

Electrical panel

Entirely manufactured and wired in conformity to the EN 60204 standard.

The power section includes:

- door locking main circuit breaker;
- insulation transformer for powering the auxiliary circuit;
- fuses and thermal relays for protecting the compressors;
- magneto-thermal cut-out switches to protect fans;
- electrical panel ventilation.

The control section includes:

- proportional-integral-derivative adjustment of water temperature;
- anti-freeze protection;
- management of unit start-up from local or remote device (serial);
- compressor overload protection and timer;
- potential-free contacts for compressor status and enabling;
- self-diagnosis system with instant error code visualisation;
- pre-alarm function for water anti-frost and refrigerant gas high pressure functions;
- visualisation of no. of hours of compressor operation;
- interface terminal with graphic display;
- multifunction phase monitor;
- remote ON/OFF control;
- second set-point enabling by potential-free contact;
- control of compressor start-up automatic rotation;
- relay for remote cumulative fault signal;
- set values, error codes and parameters can be displayed;
- high refrigerant gas pressure pre-alarm function that in many cases prevents the unit from being shut-down;
- input for demand limit (absorbed power limit according to an external signal 0÷10V or 4÷20mA);
- interface terminal with graphic display.

Accessories

- Finned coil protection grilles and compressor compartment
- Anti-hail protection grilles
- Copper / aluminium condenser coil with acrylic lining
- Condenser coil with Aluminium Energy Guard DCC treatment
- Device for consumption reduction of the external section of the ECOBREEZE type
- High efficiency diffuser for axial fan - AxiTop
- Energy meter
- Set-point compensation with outdoor air temperature probe
- Set point compensation with 0-10 V signal
- Device for fan consumption reduction of the external section at variable speed (phase-cutting)
- Serial communication module for Modbus supervisor
- Serial communication module for LonWorks supervisor
- Serial communication module for BACnet-IP supervisor
- Inverter driven variable flow-rate user side control depending on the temperature differential
- Refrigerant leak detector assembled on the casing
- Remote control via microprocessor control (separately supplied accessories)
- Electrical panel antifreeze protection
- Device for the condensing coil partialization
- Spring antivibration mounts (separately supplied accessories)
- Anti-seismic spring antivibration mounts (separately supplied accessories)
- Couple of manually operated shut-off valves (separately supplied accessories)
- Steel mesh strainer on the water side (separately supplied accessories)
- Mains power supply (separately supplied accessories)

On special request is available:

- Copper / copper condenser coil
- Frame protective treatment

Test

All the units are factory-tested in specific steps, before shipping them.

Unit equipment with outdoor air low temperatures

Minimum outdoor air temperature		Operating unit	Unit in stand-by ⁽⁵⁾ (fed unit)	Unit in storage (unit not fed)
+11°C	1	√ standard unit	√ standard unit	
+2°C	2			
-7°C	3			
-10°C	4			
Between -10°C and -18°C		√ standard unit √ electrical panel antifreeze protection √ glycol in an appropriate percentage √ device for the condensing coil partialization	√ electrical panel antifreeze protection √ glycol in an appropriate percentage	√ standard unit ⁽⁶⁾
Between -18°C and -25°C		NOT POSSIBLE	√ water empty unit √ electrical panel antifreeze protection	√ water empty unit ✗ not suitable: built-in pumps
Between -25°C and -39°C			✗ not suitable: built-in pumps	NOT POSSIBLE

Data referred to the following conditions:

- internal exchanger water = 12/7°C

1. Part load unit and air speed equal to 1 m/s.
2. Part load unit and air speed equal to 0.5 m/s.
3. Part load unit and outdoor air temperature at rest.
4. Unit at full load and outdoor air temperature at rest.

⁽⁵⁾ The water pumping unit must be fed and connected to the unit according to the manual.

⁽⁶⁾ Unit without water or containing water with an appropriate quantity of glycol.

At the unit start-up the water temperature or water with glycol must be inside the operating range indicated in the "Operating range" graph.

To know the water freezing temperature on varying the glycol percentage refer to the specific 'Correction factors for glycol use' table.



Air conditions which are at rest are defined as the absence of air flowing towards the unit. Weak winds can induce air to flow through the exchanger and air-levels which can cause a reduction in the operating range. In the presence of predominant winds it is necessary to use suitable windbreak barriers.

Minimum system water content

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

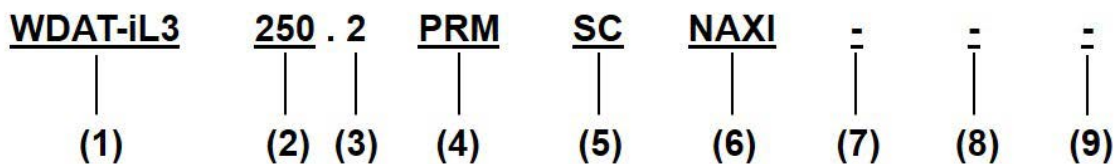
$$\begin{aligned} \text{Minimum water content [l]} &= 5 \times \text{kWf (air conditioning application)} \\ &= 10 \times \text{kWf (application with low outdoor temperature or low loads required)} \end{aligned}$$

kWf = Nominal cooling capacity unit



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

Unit configuration



(1) Range

WDAT = Air cooled liquid chiller
 iL3 = SCREWLine³-i range with inverter driver screw compressor

(2) Size

250 = Nominal compressor capacity (HP)

(3) Compressors

2 = Compressor quantity

(4) Energy efficiency

PRM = Compact PREMIUM version

(5) Acoustic configuration

SC = Acoustic configuration with compressor soundproofing

(6) Fan diffusers

NAXI - Diffuser not required (standard)
 AXIX - Diffuser for high efficiency fan (standard - separately supplied)

(7) Condensation heat recovery

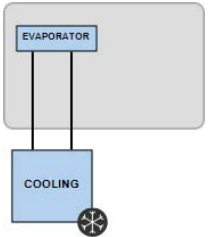
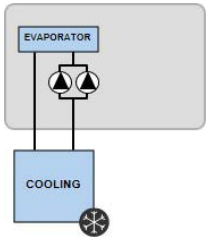
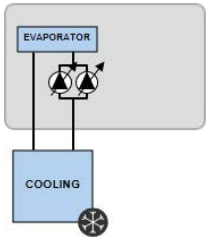
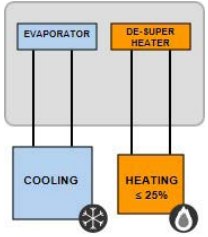
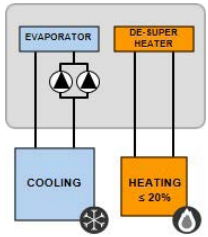
(-) Recovery not required (standard)
 D - Partial energy recovery (15% of available heat)

(8) Low evaporator water temperature configuration

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

(9) Pumping unit

(-) Not required
 2PM - Hydropack with no. 2 of pumps
 2PMV - Hydropack user side with no. 2 of inverter pumps

Functionalities	Hydronic units		
2-PIPE SYSTEM Chilled water production for installation	1.1 Standard unit 	1.2 Standard unit with HYDROPACK 	1.3 Standard unit with inverter driven HYDROPACK 
	2-PIPE SYSTEM + PARTIAL RECOVERY Production of chilled water Free production of hot water from partial recovery	2.1 Standard unit with partial recovery 	2.2 Standard unit with partial recovery and HYDROPACK 

Accessories separately supplied			
<ul style="list-style-type: none"> • RCMRX - Remote control via microprocessor remote control 	<ul style="list-style-type: none"> • PSX - Mains power supply unit 	<ul style="list-style-type: none"> • AMMX - Spring antivibration mounts 	<ul style="list-style-type: none"> • AMMSX - Anti-seismic spring antivibration mounts

General technical data - Performance

Acoustic configuration: compressor soundproofing (SC)

Size			250.2	280.2	320.2	360.2	400.2	420.2	440.2	480.2	540.2	580.2
Cooling												
Cooling capacity	1	[kW]	558	618	715	804	904	957	1000	1080	1173	1286
Compressor power input	1	[kW]	185	209	232	261	288	327	331	369	390	431
Total power input	2	[kW]	197	223	248	280	310	350	353	396	417	458
Partial recovery heating capacity	3	[kW]	112	124	142	160	179	193	200	217	234	258
EER	1	-	2,84	2,77	2,88	2,87	2,92	2,74	2,83	2,73	2,81	2,81
Water flow-rate (User Side)	1	[l/s]	26,7	29,5	34,2	38,4	43,2	45,7	47,8	51,6	56,0	61,5
Internal exchanger pressure drops	1	[kPa]	55	47	43	34	48	54	49	37	45	55
Cooling capacity (EN14511:2013)	4	[kW]	556	616	712	802	902	954	997	1077	1169	1282
Total power input (EN14511:2013)	4	[kW]	199	225	251	282	311	353	357	398	421	463
EER (EN 14511:2013)	4	-	2,80	2,74	2,84	2,84	2,90	2,71	2,79	2,71	2,78	2,77
SEER	6	-	4,63	4,57	4,59	4,61	4,68	4,68	4,67	4,72	4,77	4,79
SEPR	7	-	5,24	5,27	5,04	5,20	5,25	5,30	5,30	5,32	5,25	5,23
Cooling capacity (AHRI 550/590)	5	[kW]	555	615	710	799	898	950	986	1077	1159	1270
Total power input (AHRI 550/590)	5	[kW]	196	220	247	279	319	348	350	392	414	454
COPR	5	-	2,84	2,80	2,87	2,87	2,82	2,73	2,81	2,75	2,80	2,80
IPLV	5	-	5,04	5,03	5,01	5,01	5,06	5,12	5,08	5,18	5,20	5,20

1. Data referred to the following conditions: internal exchanger water = 12/7 °C. Entering external exchanger air temperature 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. Recovery exchanger water=40/45°C
4. Data compliant to Standard EN 14511:2013 referred to the following conditions: internal exchanger water temperature = 12/7°C. Entering external exchanger air temperature = 35°C
5. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Evaporator fouling factor = $0.18 \times 10^{(-4)}$ m² K/W
6. Data compliant to Standard EN 14825:2016
7. Data compliant according to EU regulation 2016/2281

General technical data - Construction

Acoustic configuration: compressor soundproofing (SC)

Size			250.2	280.2	320.2	360.2	400.2	420.2	440.2	480.2	540.2	580.2		
Compressor														
Type of compressors	1	-	ISW											
Refrigerant		-	R-134a											
No. of compressors		Nr	2											
Rated power (C1)		[HP]	125	125	160	160	200	200	220	240	270	290		
Rated power (C2)		[HP]	125	160	160	200	200	220	220	240	270	290		
Std Capacity control steps	6		17-100%											
Oil charge (C1)		[l]	18						35					
Oil charge (C2)		[l]	18						35					
Refrigerant charge (C1)		[kg]	52	61	75	92	108	108	108	133	141	141		
Refrigerant charge (C2)		[kg]	54	67	70	97	115	115	115	140	149	149		
Refrigeration circuits		-	2											
Internal exchanger														
Type of internal exchanger	2	-	S&T											
N. of internal exchanger		Nr	1											
Water content		[l]	222	240	307	280	481	481	481	514	514	514		
External exchanger														
Frontal surface		m ²	18,7	23,4	28,1	32,8	37,4	37,4	37,4	46,8	46,8	46,8		
External Section Fans														
Type of fans	3	-	AC/P											
Number of fans		Nr	8	10	12	14	16	16	16	20	20	20		
Type of motor	4	-	EC											
Standard airflow		[l/s]	46959	59689	72815	83566	93919	93919	93919	121358	121358	117399		
Connections														
Water fittings		-	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"		
Power supply														
Standard power supply		-	400/3~/50											
Electrical data														
FLA Total		A	386,2	438,9	491,6	568,2	644,8	714,8	784,8	864,0	904,8	976,0		
FLI Total		kW	233,4	266,6	299,8	348,9	398,0	436,2	474,4	483,0	521,0	591,0		
M.I.C. - Value		A	386,2	438,9	491,6	568,2	644,8	714,8	784,8	864,0	904,8	976,0		

1. ISW = double screw compressor
2. S&T = shell and tube
3. AX = axial fan
4. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control
5. M.I.C. = compressor 2 starting current + compressor 1 current at 75% of the max load + circuit 1 fan
 Unbalance between phase max 2 %
 Voltage variation: max +/- 10%
 Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations
6. The unit is able to perform a continuous capacity control. The following data refers to the unit operation.

Sound levels

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
250.2	107	96	80	89	100	81	77	72	100	80
280.2	112	103	85	98	99	85	80	73	101	80
320.2	115	106	87	101	98	88	82	74	102	80
360.2	116	107	88	101	98	88	83	75	102	81
400.2	116	107	88	102	98	89	83	76	102	81
420.2	117	108	89	102	99	89	84	76	103	81
440.2	117	108	89	103	99	90	84	76	103	81
480.2	118	109	90	103	100	90	85	78	104	82
540.2	118	109	90	103	100	90	85	78	104	82
580.2	118	109	90	103	100	90	85	78	104	82

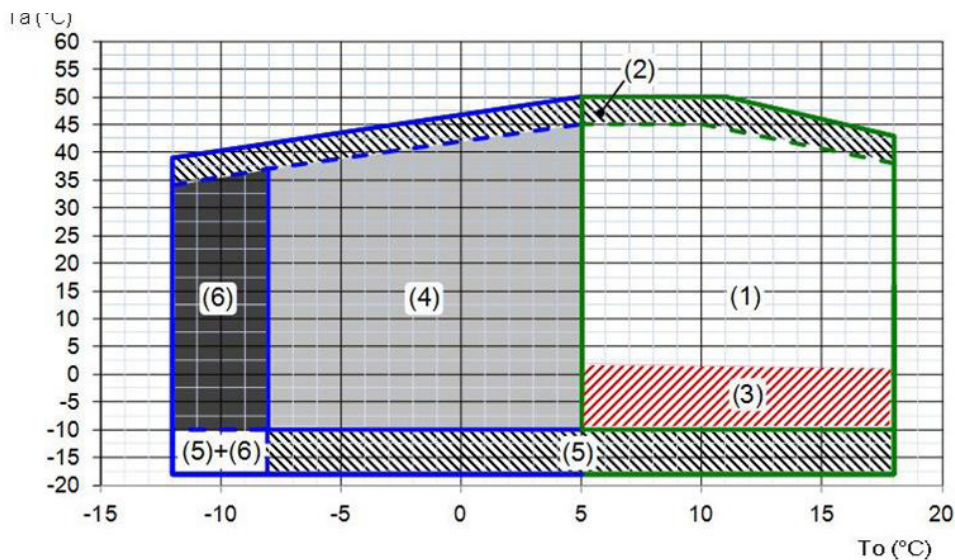
Sound levels refer to full load units, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field. Measures according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance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

Data referred to the following conditions:

- internal exchanger water = 12/7 °C
- ambient temperature = 35 °C

Operating range

Acoustic configuration: compressor soundproofing (SC)



Ta (°C) = external exchanger inlet air temperature (D.B.)

To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load
2. Unit operating range with automatic staging of the compressor capacity
3. Standard unit operating range with air flow automatic modulation
4. Unit operating range in 'B - Low water temperature' configuration (40% ethylene glycol)
5. Unit operating range with 'REGBT - device for the condensing coil partialization'
6. Extended operating range (extremely low water temperature option available on request)

Admissible water flow-rates

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

PREMIUM SC		250.2	280.2	320.2	360.2	400.2	420.2	440.2	480.2	540.2	580.2
Qmin	[l/s]	15,3	20,1	20,1	21,6	39,4	39,4	39,4	32,3	32,3	32,3
Qmax	[l/s]	37,3	45,2	45,2	53,4	86,6	86,6	86,6	72,5	72,5	72,5

Correction factors for glycol use

% ethylene glycol by weight		5%	10%	15%	20%	25%	30%	35%	40%
Freezing temperature	°C	-2,0	-3,9	-6,5	-8,9	-11,8	-15,6	-19,0	-23,4
Safety temperature	°C	3,0	1,0	-1,0	-4,0	-6,0	-10,0	-14,0	-19,0
Cooling Capacity Factor	No	0,995	0,989	0,983	0,977	0,971	0,964	0,956	0,949
Compressor power input Factor	No	1,0011	1,0022	1,003	1,004	1,006	1,007	1,008	1,009
Internal exchanger glycol solution flow factor	No	1,003	1,01	1,02	1,033	1,05	1,072	1,095	1,124
Pressure drop Factor	No	1,05	1,10	1,15	1,20	1,25	1,30	1,35	1,40

Fouling Correction Factors

	Internal exchanger (evaporator)	
	F1	FK1
m ² °C / W		
0.44 x 10 (-4)	1,0	1,0
0.88 x 10 (-4)	0,97	0,99
1.76 x 10 (-4)	0,94	0,98

F1 = Cooling capacity correction factors

FK1 = Compressor power input correction factor

Exchanger operating range

	Internal exchanger	
	DPr	DPw
PED (CE)	2450	1050

DPr = Maximum operating pressure on refrigerant side in kPa

DPw = Maximum operating pressure on water side in kPa

Overload and control device calibrations

		open	closed	value
High pressure switch	[kPa]	2000	1450	–
Antifreeze protection	[°C]	3	5.5	–
High pressure safety valve	[kPa]	–	–	2400
Low pressure safety valve	[kPa]	–	–	1650
Max no. of compressor starts per hour	[n°]	–	–	6
Discharge safety thermostat	[°C]	–	–	120

Cooling performance

Acoustic configuration: compressor soundproofing (SC)

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		50	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
250.2	5	575	153	549	166	523	180	499	193	472	206	378	181
	6	593	156	567	169	541	183	516	196	491	209	393	184
	7	617	160	584	172	558	185	533	199	508	211	406	186
	10	675	169	646	182	613	194	587	207	558	219	446	193
	15	771	183	744	196	717	209	680	220	597	208	515	-
	18	845	192	813	205	779	218	686	203	611	198	-	-
280.2	5	640	173	610	188	580	203	550	218	519	232	415	204
	6	659	176	628	191	597	200	569	221	535	234	428	206
	7	681	179	648	194	618	209	588	224	556	237	444	209
	10	744	189	711	204	678	218	648	232	608	245	487	215
	15	858	205	826	219	786	233	743	246	651	233	557	-
	18	926	213	890	227	851	242	751	226	662	219	-	-
320.2	5	737	193	702	209	668	225	634	240	597	255	478	225
	6	760	197	724	212	689	228	653	243	617	258	494	227
	7	782	200	746	216	715	232	678	247	640	261	512	230
	10	853	211	821	227	782	242	748	257	697	270	558	237
	15	978	231	939	244	901	260	846	271	746	256	638	-
	18	1055	241	1014	255	974	270	855	249	757	241	-	-
360.2	5	830	216	791	234	752	252	713	271	675	290	540	255
	6	860	222	817	239	777	257	740	276	697	295	558	259
	7	886	226	845	244	804	261	765	281	720	299	576	263
	10	968	241	927	259	884	276	842	296	793	314	635	276
	15	1129	270	1081	287	1029	306	970	321	849	298	724	-
	18	1215	286	1160	303	1103	320	980	295	860	284	-	-
400.2	5	936	236	894	257	846	278	807	302	764	327	611	288
	6	965	240	922	262	875	283	836	308	794	334	635	294
	7	1001	245	951	266	904	288	865	313	820	339	656	298
	10	1102	261	1053	283	1002	306	956	332	907	358	726	315
	15	1275	290	1225	314	1173	341	1109	365	971	340	833	-
	18	1389	309	1337	335	1274	361	1120	336	990	329	-	-
420.2	5	976	266	933	291	889	316	845	344	806	376	645	331
	6	1006	270	963	295	918	322	871	349	833	381	666	336
	7	1045	276	993	300	957	327	898	353	861	388	689	342
	10	1145	291	1097	317	1049	346	997	375	951	407	761	358
	15	1324	318	1263	345	1219	377	1164	410	1018	387	-	-
	18	1432	336	1375	354	1321	396	1175	377	-	-	-	-
440.2	5	995	264	952	290	902	317	861	349	820	381	656	335
	6	1027	268	983	294	939	322	889	352	847	386	678	340
	7	1058	272	1012	298	1000	331	918	357	875	391	700	344
	10	1166	285	1109	311	1061	342	1016	374	975	412	780	363
	15	1345	307	1295	337	1241	370	1179	404	1043	392	-	-
	18	1452	322	1394	352	1342	386	1191	371	-	-	-	-

kWf = Cooling capacity in kW

kWe = Compressor power input in kW

To (°C) = Internal exchanger outlet water temperature (evaporator)

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

The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers

Cooling performance

Acoustic configuration: compressor soundproofing (SC)

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		50	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
480.2	5	1127	294	1077	322	1028	353	975	384	928	421	742	370
	6	1162	299	1103	326	1054	356	1003	391	957	426	766	375
	7	1198	303	1147	331	1080	369	1044	397	996	434	797	382
	10	1320	319	1266	348	1204	379	1149	415	1097	453	877	399
	15	1525	346	1466	377	1395	410	1338	448	1174	430	-	-
	18	1675	367	1597	397	1534	433	1351	412	-	-	-	-
540.2	5	1191	326	1135	354	1082	385	1021	417	968	454	774	399
	6	1228	331	1173	359	1108	383	1055	423	1000	459	800	404
	7	1265	336	1207	365	1173	390	1094	431	1039	468	831	412
	10	1382	352	1331	383	1272	416	1201	450	1149	490	919	431
	15	1605	383	1521	413	1456	449	1391	486	1230	465	-	-
	18	1766	407	1677	438	1608	474	1405	447	-	-	-	-
580.2	5	1295	356	1235	385	1178	416	1127	452	1068	488	854	429
	6	1350	363	1286	392	1216	419	1163	458	1094	492	875	433
	7	1390	369	1326	398	1286	431	1201	463	1149	502	919	441
	10	1520	386	1449	415	1397	450	1328	485	1253	522	1002	459
	15	1750	417	1671	447	1599	481	1524	517	1340	496	-	-
	18	1941	445	1861	476	1766	507	1540	476	-	-	-	-

kWf = Cooling capacity in kW

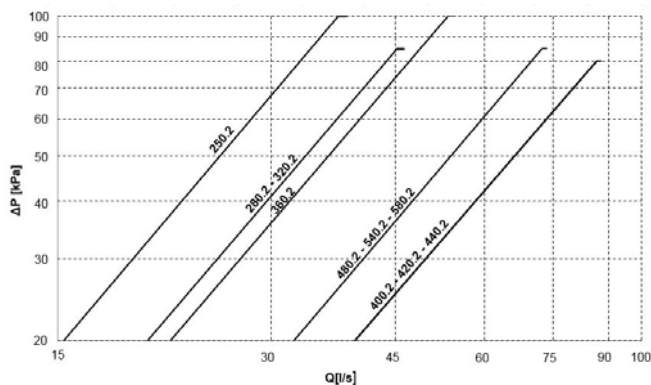
kWe = Compressor power input in kW

To (°C) = Internal exchanger outlet water temperature (evaporator)

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

The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers

Perdite di carico scambiatore interno - Evaporatore



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

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

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

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

kWf = Cooling capacity in kW

DT = Temperature difference between inlet / outlet water



To the internal exchanger pressure drops must be added the pressure drops of the steel mesh mechanical filter (not supplied) that must be placed on the water input line. It is a device compulsory for the correct unit operation and it must be selected and installed by the Customer. It is forbidden the use of filters with the mesh pitch higher than 1,0 mm. Filters with higher mesh pitch can cause a bad unit operation and also its serious damaging.

Cooling performance at part load

Acoustic configuration: compressor soundproofing (SC)

Size	Load	Entering external exchanger air temperature (°C)											
		35°C			30°C			25°C			20°C		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
250.2	100%	558	197	2,84	584	183	3,19	617	170	3,63	647	157	4,12
	75%	419	131	3,20	438	121	3,62	462	112	4,13	485	102	4,75
	50%	279	80,0	3,49	292	72,5	4,03	308	65,9	4,67	323	59,5	5,43
	25%	140	40,1	3,49	146	36,9	3,96	154	34,1	4,52	162	31,3	5,18
	Minimum	98,3	23,9	4,11	103	22,0	4,68	109	20,2	5,40	115	18,5	6,22
280.2	100%	618	223	2,77	648	208	3,12	681	193	3,53	714	178	4,01
	75%	464	149	3,11	486	138	3,52	511	127	4,02	536	116	4,62
	50%	309	91,5	3,38	324	83,0	3,90	340	75,3	4,52	357	68,1	5,24
	25%	154	46,2	3,33	162	42,7	3,79	170	39,3	4,33	179	36,1	4,96
	Minimum	109	27,5	3,96	115	25,4	4,53	121	23,3	5,19	127	21,4	5,93
320.2	100%	715	248	2,88	746	232	3,22	782	216	3,62	821	200	4,11
	75%	536	167	3,21	559	155	3,61	587	142	4,13	616	130	4,74
	50%	358	102	3,51	373	93,2	4,00	391	85,0	4,60	410	76,9	5,33
	25%	179	52,1	3,44	186	48,2	3,86	196	44,7	4,38	205	41,1	4,99
	Minimum	126	31,0	4,06	132	28,7	4,60	139	26,5	5,25	146	24,4	5,98
360.2	100%	804	280	2,87	845	262	3,23	886	245	3,62	930	227	4,10
	75%	603	188	3,21	634	175	3,62	665	162	4,10	697	148	4,71
	50%	402	116	3,47	423	106	3,99	443	96,8	4,58	465	87,7	5,30
	25%	201	59,3	3,39	211	55,1	3,83	222	51,1	4,34	232	47,1	4,93
	Minimum	142	35,3	4,02	149	32,8	4,54	157	30,3	5,18	165	28,0	5,89
400.2	100%	904	310	2,92	951	289	3,29	1001	267	3,75	1050	247	4,25
	75%	678	209	3,24	713	193	3,69	751	176	4,27	787	162	4,86
	50%	452	129	3,50	476	117	4,07	500	106	4,72	525	96,5	5,44
	25%	226	66,6	3,39	238	61,5	3,87	250	56,7	4,41	262	52,4	5,00
	Minimum	159	39,6	4,02	168	36,5	4,60	177	33,7	5,25	186	31,1	5,98
420.2	100%	957	350	2,74	993	322	3,09	1045	298	3,51	1096	275	3,98
	75%	718	234	3,07	745	214	3,47	784	196	4,00	822	179	4,59
	50%	479	144	3,33	496	129	3,85	522	117	4,47	548	106	5,19
	25%	270	69,4	3,89	281	63,4	4,43	296	58,2	5,08	311	53,6	5,81
	Minimum	169	43,4	3,89	176	39,6	4,44	185	36,4	5,08	195	33,5	5,82
440.2	100%	1000	353	2,83	1012	320	3,16	1058	294	3,60	1110	272	4,09
	75%	750	237	3,17	759	213	3,56	793	193	4,10	832	177	4,70
	50%	500	145	3,44	506	129	3,94	529	116	4,58	555	105	5,31
	25%	250	73,5	3,40	253	66,4	3,81	264	60,8	4,35	277	56,0	4,96
	Minimum	176	33,2	5,30	179	39,5	4,53	187	36,1	5,18	197	33,2	5,93
480.2	100%	1080	396	2,73	1147	358	3,21	1198	330	3,63	1256	305	4,12
	75%	810	266	3,04	860	239	3,60	898	218	4,12	942	199	4,72
	50%	540	164	3,29	574	145	3,95	599	131	4,57	628	119	5,29
	25%	305	79,9	3,81	325	72,0	4,50	339	66,1	5,13	357	61,0	5,85
	Minimum	190	50,0	3,80	203	45,0	4,51	212	41,3	5,13	223	38,1	5,85
540.2	100%	1173	417	2,81	1207	392	3,08	1265	362	3,49	1327	335	3,96
	75%	880	280	3,15	905	261	3,47	949	238	3,98	995	218	4,56
	50%	586	172	3,41	604	157	3,84	633	142	4,44	664	129	5,15
	25%	331	83,2	3,97	342	77,3	4,42	358	71,0	5,05	377	65,3	5,77
	Minimum	207	52,0	3,98	213	48,3	4,41	224	44,4	5,05	236	40,8	5,78
580.2	100%	1286	458	2,81	1326	425	3,12	1390	396	3,51	1458	366	3,98
	75%	965	312	3,09	995	293	3,39	1042	269	3,88	1094	247	4,43
	50%	643	194	3,31	663	178	3,73	695	160	4,33	729	145	5,04
	25%	331	83,2	3,97	342	77,3	4,42	358	71,0	5,05	377	65,3	5,77
	Minimum	207	52,0	3,98	213	48,3	4,41	224	44,4	5,05	236	40,8	5,78

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

kWf = cooling capacity in kW

kWe_tot = unit total power input in kW

The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers

Internal exchanger water = leaving 7°C / entering 12°C / variable flow-rate with external exchanger air temperature

Configurations

SC - Acoustic configuration with compressor soundproofing


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

 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".

 The "Extremely low water temperature" option for the chilled water production down to -12°C is available on request.

Correction factor for water low temperature

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

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

Example: Determine the performance with leaving water temperature -4°C for WDAT-iL3 250.2 PRM SC B ('Premium' version, acoustic configuration with compressor soundproofing (SC), 'Water low temperature (Brine)' configuration) with external exchanger water (condenser) 35°C, 30% glycol.

From the performance table referred to entering external exchanger water temperature (condenser) 35 °C and leaving internal exchanger water temperature (evaporator) 7°C:

Cooling capacity = 558 kW, Compressor power input = 185 kW

From the correction factor table for water low temperature: 0.692 for cooling capacity and 0.879 for compressor power input (supply water temperature -4°C)

From the glycol correction factor: 0.964 for cooling capacity, 1.007 for compressor power input, 1.072 the glycol solution flow, 1.3 for the evaporator pressure drop (glycol 30%)

Calculation WDAT-iL3 250.2 PRM SC B: Cooling capacity = 558 x 0.692 x 0.964 = 372.2 kW, Compressor power input = 185 x 0.879 x 1.007 = 163.7 kW

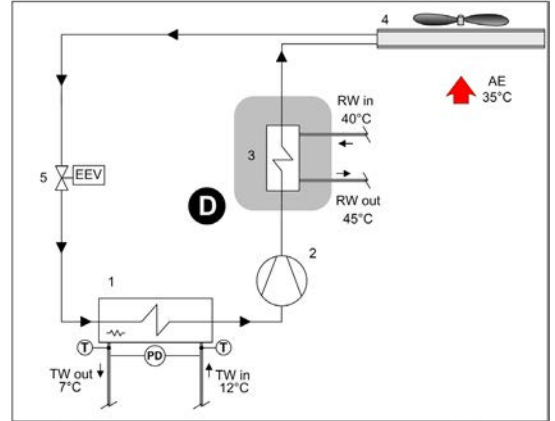
Water flow-rate = 17.8 (calculated on 372.2 kW) x 1.072 = 19.1 l/s, Evaporator pressure drop = 28 (calculated on 19.1 l/s) x 1.3 = 36.4 kPa

D - Partial energy recovery

A configuration which enables the production of hot water free-of-charge while operating in the cooling mode, thanks to the partial recovery of condensation heat that would otherwise be rejected to the external heat source. This option is also called 'desuperheater'. It consists of shell and tube heat exchangers, suitable to recover part of the unit heating capacity (equal to the sum of the cooling capacity and the capacity absorbed by the compressors).

The partial recovery device is considered to be operating when it is powered by the water flow which is to be heated. This condition improves the unit performance, since it reduces the condensation temperature: in nominal conditions the cooling capacity increases indicatively by 3.2% and the power input of the compressors is reduced by 3.6%.

When the temperature of the water to be heated is particularly low, it is wise to insert a flow control valve into the system water circuit, in order to maintain the temperature at the recovery output at above 35°C and thus avoid the condensation of the refrigerant into the partial energy recovery device.



D - Partial recovery device

- 1 - Internal exchanger
 - 2 - Compressors
 - 3 - Recovery exchanger
 - 4 - External exchanger
 - 5 - Expansion electronic valve
- TW in chilled water inlet
 - TW out chilled water outlet
 - RW in - Recovery water inlet
 - RW out - Recovery water outlet
 - T - Temperature probe
 - PD - Differential pressure switch
 - AE - Outdoor air

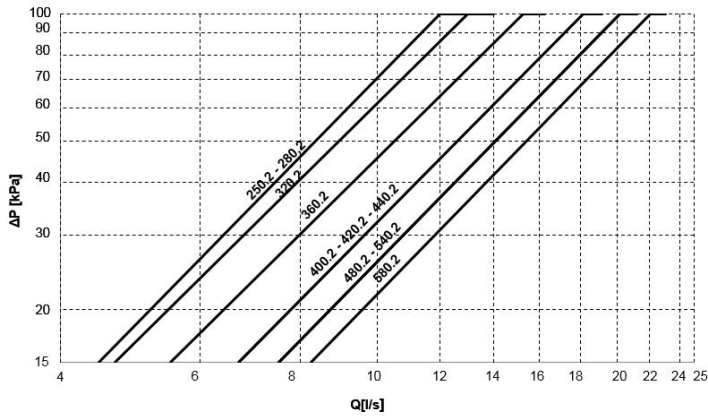


The maximum capacity available from the partial recovery is equal to the 20% of the rejected heating capacity (cooling capacity + compressor power input).



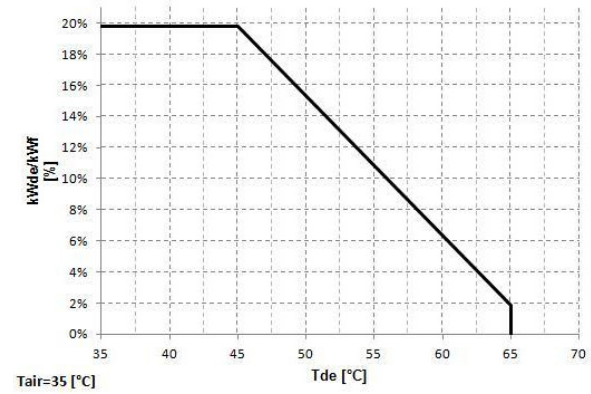
Option not available for size 250.2.

Pressure drops of partial energy recovery exchanger



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

Partial recovery heating capacity



kWde/kWf = Heat recovered/Cooling capacity [%]
Tde = Heat recovering device outlet water temperature [°C]



Data refer to outdoor air conditions T=35°C

Example: Required cooling capacity: 600 kW at 12/7°C chilled water and 35°C outdoor air.

Size purpose of the study: WDAT-iL3 280.2 PRM SC

Hot water required temperature: +45°C

Recovery capacity: 19% di 600 kW = 114 kW

Design flow-rate: 5.4 l/s

Application of the partial / total energy recovery

In almost all systems fitted with a chiller used to produce chilled water there is also the need to have hot water. The recovery of condensation heat is an efficient way of producing hot water while the chiller is in operation. It has the double benefit of both reducing the heat load to the condenser, thereby eliminating dissipation costs and generating free hot water, thereby reducing the costs of the auxiliary heater.

Application versatility of recovery devices

The hot water produced by heat recovery can be used in a number of ways: to reheat air in handling units, to preheat hot water for domestic use or industrial processes, to heat up water in swimming pools, showers and spas, to preheat hot water for laundries or industrial kitchens.



Post-heating in air handling units to control humidity levels in hospitals and labs



Preheating of hot water for domestic use or for industrial process



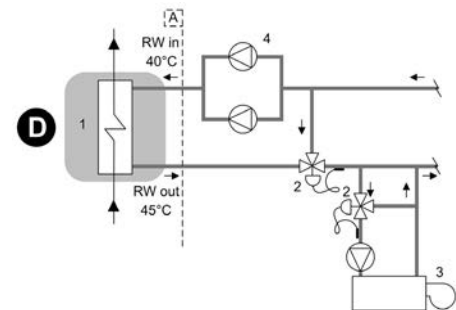
Heating of water in swimming pools, showers and SPAS



Preheating of hot water for laundries and industrial kitchens

Water heating up

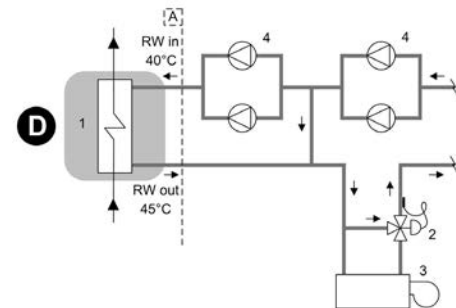
The heat recovery device can be used to cover the entire heat load required. The hot water supply temperature is controlled via a modulating control valve that needs to be fitted on the system at the outlet of the recovery unit. The auxiliary heating device is recommended to cover the thermal energy demand when the chiller is not in operation or is operating at part load.



Example of how heat recovery is used to cover the entire heat demand and control the operating temperature

Water preheating

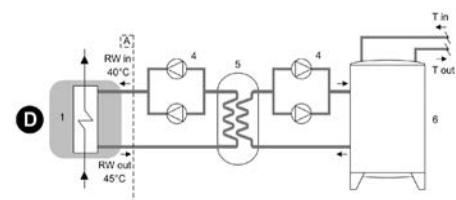
The heat recovery device can be used to preheat water at the inlet of the main heating device (e.g. boiler). In this case, the demand for hot water is greater than the amount of heat recovered by condensation and the recovery device only covers part of the required heat load. By preheating the water, heating consumption levels are therefore reduced and the main heating device has a lower installed power requirement.



Example of how heat recovery is used to preheat hot water in the system

Domestic hot water production

The heat recovery device can be used to produce water for domestic use. In order to prevent contamination of domestic water with the chiller's process fluid, it is necessary to insert an intermediate heat exchanger. Using an inertial heat storage tank allows to have a reserve of preheated water and enables the intermediate exchanger to operate more efficiently.



Example of how heat recovery is used to preheat hot water for domestic use

- A - Unit supply limit
- 1 - Recovery exchanger
- 3 - Auxiliary heating device (ex.boiler)
- 5 - Intermediate heat exchanger
- RW in - Recovery water inlet
- T in - Drinkable water inlet

- D - Partial energy recovery
- 2 - Control modulating valve
- 4 - Electric pump with standby pump
- 6 - Inertial heat storage
- RW out - Recovery water outlet
- T out - Drinkable water outlet to the auxiliary heater

The diagrams refer to partial energy recovery, though they also apply to total energy recovery (Clivet R). Please note that the diagrams are only meant as a guide.

Accessories - Hydronic assembly

2PM - HydroPack user side with no.2 of pumps

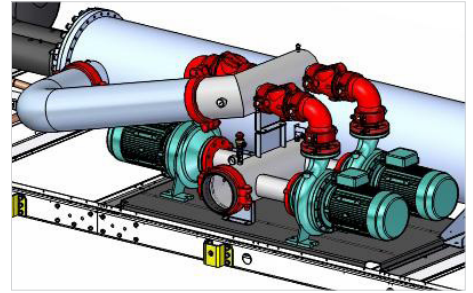
Option supplied built-in the unit. Pumping unit made up of two electric pumps laid out in parallel, with auto-adaptive modular logic activation.

It enables the automatic reduction of the liquid flow-rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel.

Centrifugal electric pump, with the pump body made of cast iron and the impeller made of AISI 316 stainless steel.

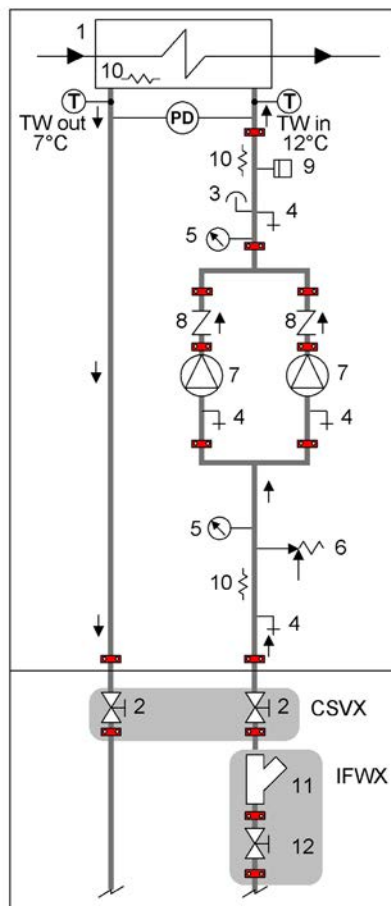
Mechanical seal using ceramic, carbon and EPDM elastomer components.

Three-phase electric motor with IP55 degree of protection. Complete with a thermoformed insulating casing, quick connections with insulated casing, non-return valve, safety valve, pressure gauges, system safety pressure switch, stainless steel antifreeze, intake, immersion-type heaters.



In order to increase the unit's silent operation, as an alternative to electric pumps with a 2-pole motor (2950 rpm), there are also electric pumps with 4-pole motors (1450 rpm), subject to a check regarding the maximum available pressure. The super-silent acoustic configuration (EN) only comes with electric pumps fitted with 4-pole motors.

CONNECTION DIAGRAM - GROUP WITH 2 PUMPS



- 1 - Internal exchanger
- 2 - Cutoff valve
- 3 - Purge valve
- 4 - Discharge stop valve
- 5 - Pressure gauge
- 6 - Safety valve (6 Bar)
- 7 - Packaged electric pump with high efficiency impeller

- 8 - Non return valve
- 9 - System load safety pressure switch (it avoids the pump operation if water is not present)
- 10 - Antifreeze heater
- 11 - Steel mesh strainer water side
- 12 - Cutoff valve with quick joints

- T - Temperature probe
- PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

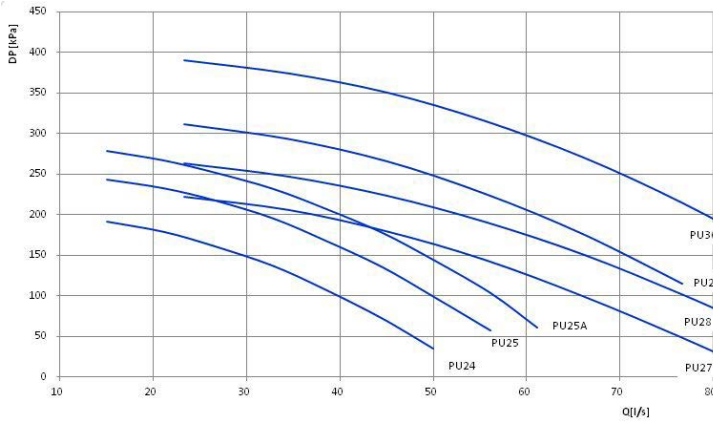
CSVX - Couple of manually operated shut-off valves

The grey area indicates further optional components.



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

2PM option performances (electric pump with 2-pole motor)



Attention: the evaporator pressure drops have to be taken from the heads represented in these diagrams in order to obtain the available head values.

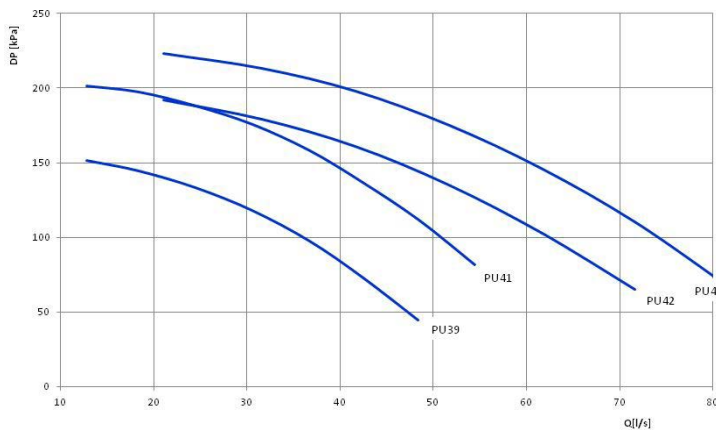


Not available with unit in extremely low noise configuration (EN)



Check availability of the different type of pump with size in the 'Option compatibility' table.

2PM option performances (electric pump with 4-pole motor)



Attention: the evaporator pressure drops have to be taken from the heads represented in these diagrams in order to obtain the available head values.



Check availability of the different type of pump with size in the 'Option compatibility' table.



To the internal exchanger pressure drops must be added the pressure drops of the steel mesh mechanical filter (not supplied) that must be placed on the water input line. It is a device compulsory for the correct unit operation and it must be selected and installed by the Customer. It is forbidden the use of filters with the mesh pitch higher than 1,0 mm. Filters with higher mesh pitch can cause a bad unit operation and also its serious damaging.

Electrical data - HydroPack

To obtain the electrical consumption of the unit including the HydroPack accessory, the electrical data of the selected accessory are added to the standard electrical data indicated in the Electrical Data table.

PUMP	Rated power [kW]	Nominal power [A]
2 X PU24 L	2 x 4	2 x 7.6
2 X PU25 L	2 x 5.5	2 x 10.5
2 X PU25A L	2 x 7.5	2 x 14.1
2 X PU27 L	2 x 7.5	2 x 14.1
2 X PU28 L	2 x 9.2	2 x 16.7
2 X PU29 L	2 x 11	2 x 20.2

PUMP	Rated power [kW]	Nominal power [A]
2 X PU30 L	2 x 15	2 x 26.6
2 X PU39	2 x 4	2 x 8.3
2 X PU41	2 x 5.5	2 x 11.5
2 X PU42	2 x 7.5	2 x 15.2
2 X PU43	2 x 11	2 x 21.4

2PMV - Hydropack user side with no. 2 of inverter pumps

Option supplied on the unit. Pumping unit consisting of parallel electric pumps and controlled by inverter to adapt to the different application conditions. It enables the automatic reduction of the liquid flow-rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel.

Through the inverter calibration, standard supplied, it is possible to adapt the pump flow-rate/head to the installation feature.

Centrifugal electric pump with impeller made with AISI 304 steel and AISI 304 stainless steel body or grey cast iron (depending on models).

Mechanical seal using ceramic, carbon and EPDM elastomer components.

Three-phase electric motor with IP44-protection. Complete with thermoformed insulated casing, quick connections with insulated casing, non return valve, safety valve, pressure gauges, system load safety pressure switch, stainless steel antifreeze immersion heaters located at the return and supply point.

In combination with the "IVFDT" - Variable flow-rate control option, it allows the water flow-rate variation to the installation in part load operation to obtain the maximum unit efficiency and lower pumping unit consumption.



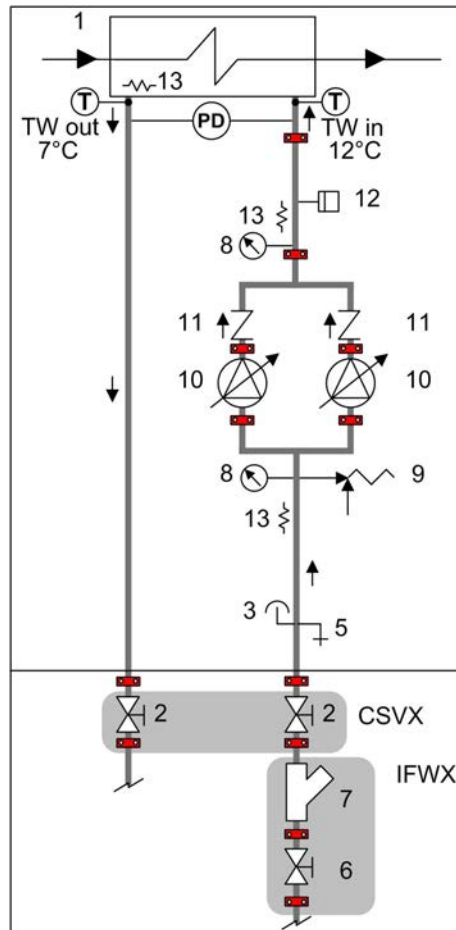
The 2PMV option is supplied with a kit made up of 2 quick blind connections, for the removal of one pump in case of maintenance.



Check the option compatibility table for combinations with storage tank.



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



- 1 - Internal exchanger
- 2 - Cutoff valve
- 3 - Purge valve
- 4 - Discharge stop valve
- 5 - Pressure gauge
- 6 - Safety valve (6 Bar)
- 7 - Packaged electric pump with high efficiency impeller controlled by inverter

- 8 - Non return valve
- 9 - System load safety pressure switch (it avoids the pump operation if water is not present)
- 10 - Antifreeze heater
- 11 - Steel mesh strainer water side
- 12 - Cutoff valve with quick joints
- T - Temperature probe
- PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

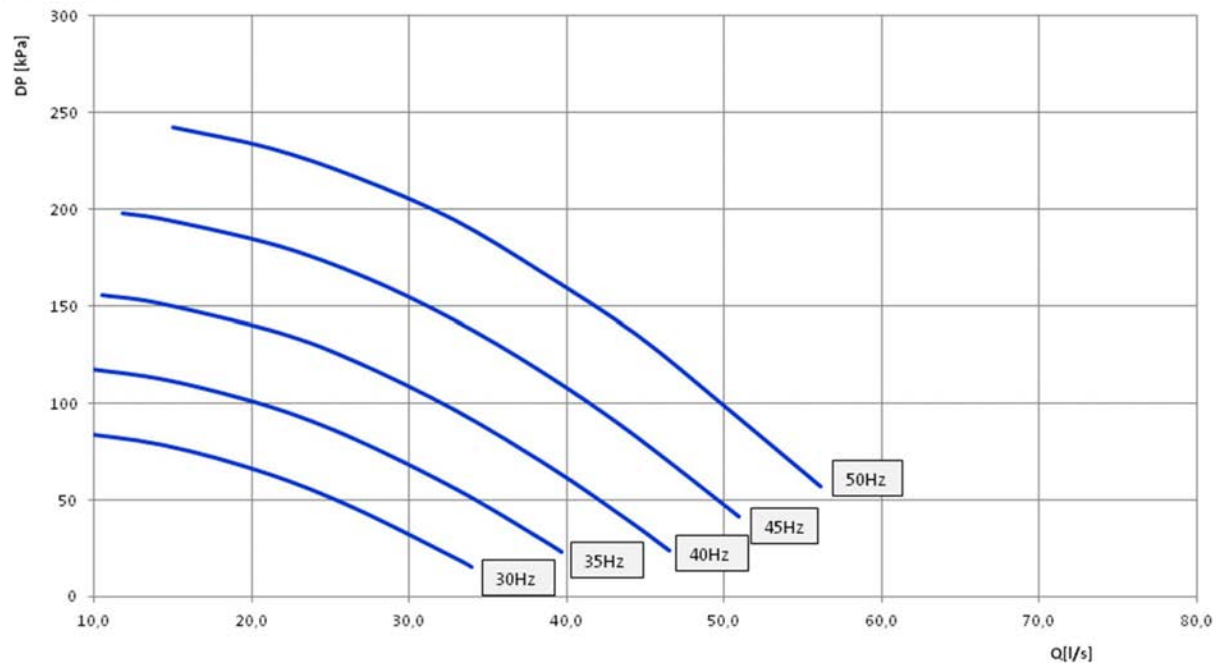
CSVX - Couple of manually operated shut-off valves

The grey area indicates further optional components.

2PMV option performances

Head

2 X PU25L



Q [l/s] = Water flow-rate
 Δ [kPa] = Pump head

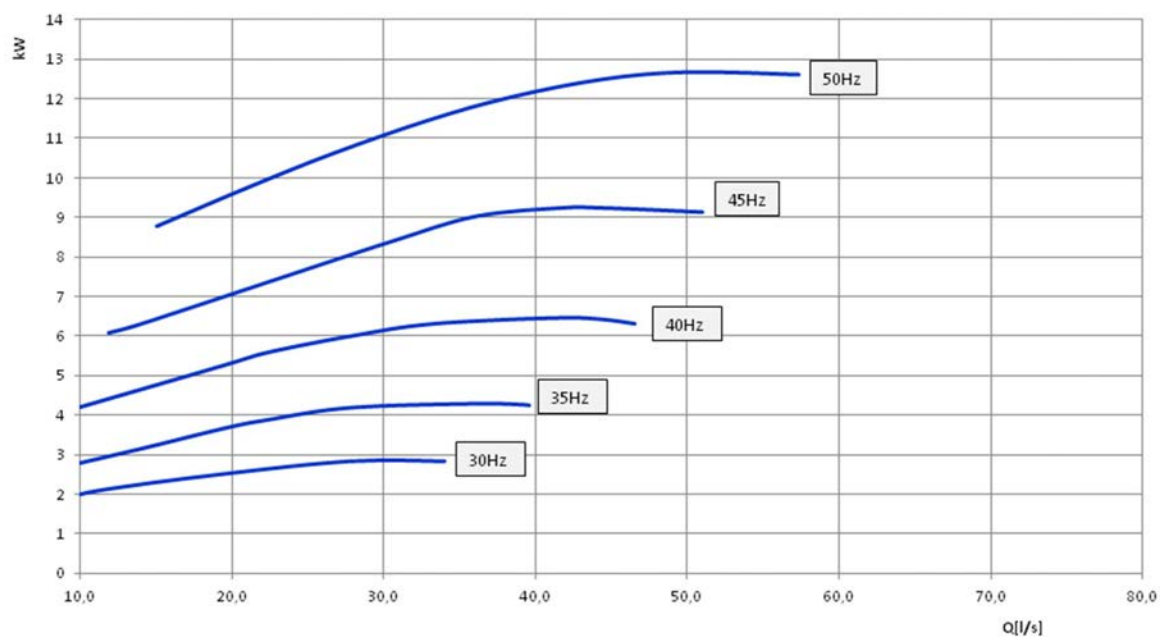


Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:

- internal exchanger pressure drops
- IFVX accessory –Steel mesh filter on the water side (where applicable)

Power input

2 X PU25L

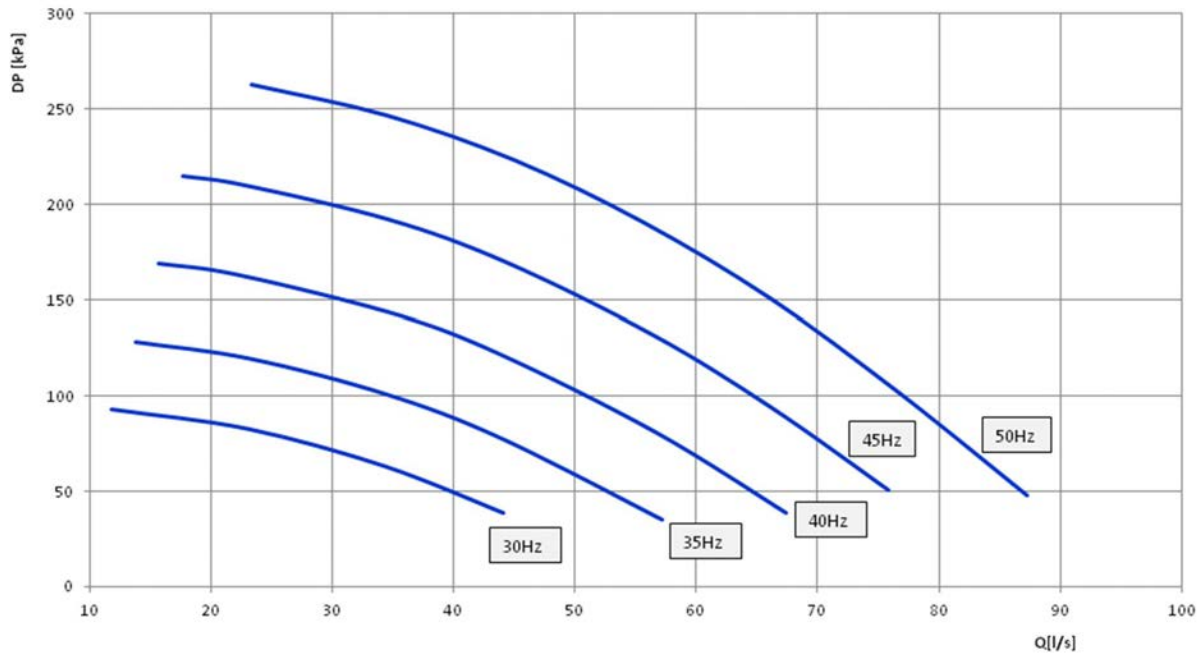


Q [l/s] = Water flow-rate
 kW = Power input

2PMV option performances

Head

2 X PU28L



Q[l/s]= Water flow-rate
 Δ [kPa] = Pump head

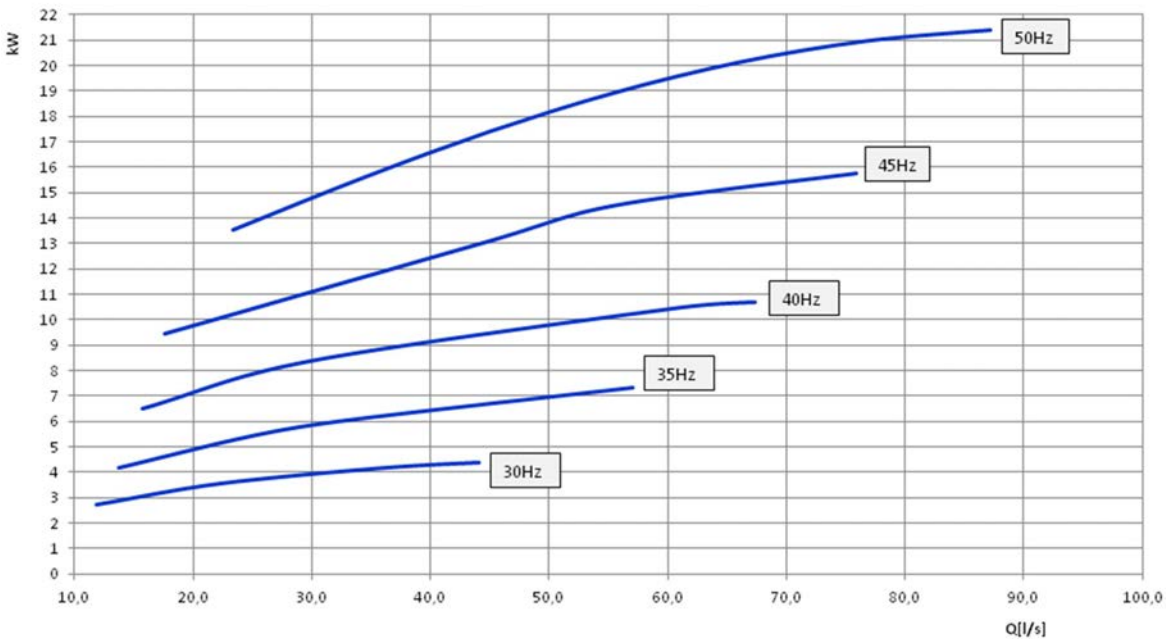
Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:



- internal exchanger pressure drops
- IFVX accessory –Steel mesh filter on the water side (where applicable)

Power input

2 X PU28L



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

Accessories

PGCC - Finned coil protection grilles and compressor compartment

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

Ideal for installation in places where persons can pass from, such as car parks, terraces, etc.

The accessory is provided and installed built-in the unit.



This option is not suitable for application in sulphuric environments.

PGCCH - Anti-hail protection grilles

These accessories are to protect the external coil from hail damage. Indeed, hail impact can deform the coil fins worsening the heat exchange with the air.

The accessory is provided and installed built-in the unit.

CCCA - Copper / aluminium condenser coil with acrylic lining

Coils with copper pipes and aluminium fins with acrylic lacquering. Can be used in settings with moderately aggressive saline concentrations and other chemical agents.

Attention!

- cooling capacity variation -2.7%
- variation in compressor power input +4.2%
- operating range reduction -2.1°C

CCCA1 - Condenser coil with Aluminium Energy Guard DCC treatment

A treatment which offers an optimal thermal exchange and guarantees and protects the finned coil exchangers from corrosion over time. Can be used in settings with very aggressive saline concentrations and other chemical agents in the air thus maintaining the performance of the coils over time.

CCCC - Copper / copper condenser coil

Coils with copper pipes, copper fins and brass structure. Can be used in settings with moderately aggressive saline concentrations and other chemical agents.



This option is not suitable for application in sulphuric environments



Option available on special request

REGBT - Device for the condensing coil partialization

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

CMSC9 - Serial communication module for Modbus supervisor

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

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



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

CMSC10 - Serial communication module for LonWorks supervisor

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

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



The configuration and management activities for the LonWorks networks are the responsibility of the client.



LonWorks technology uses the LonTalk® protocol for communicating between the network nodes. Contact the service supplier for further information.



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

CMSC11 - Serial communication module for BACnet/IP supervisor

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

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



The configuration and management activities for the BACnet networks are the responsibility of the client.



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

CONTA2 - Energy meter

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

It is possible to control:

- voltage (V),
- absorbed current (A),
- frequency (Hz),
- cosfi,
- power input (kW),
- absorbed energy (kWh),
- harmonic components (%).

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

CREFB - Device for fan consumption reduction of the external section, ECOBREEZE type

An option which regards the external helical fans, as an alternative to the phase-cut device which is supplied as standard in SC and EN version. It provides for an IP54 brushless electronically commutated electrical motor and incorporated thermal protection. Supplied with variable speed control.

The height of the unit with this option is 2510 mm for all sizes.

AXIX - High efficiency diffuser for axial fan - AXITOP

The new AxiTop diffuser creates an ideal air distribution: it aerodynamically decelerates the flow and transforms a big part of its kinetic energy in static pressure. Obtaining:

- reduction of 3% of the absorbed energy

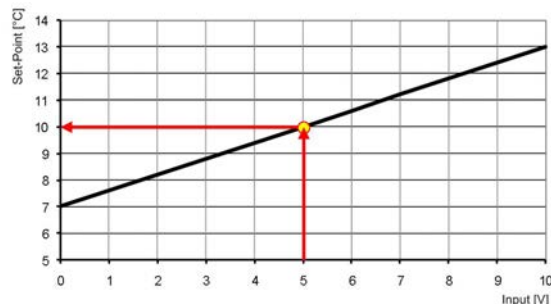
Since the fans are the unit's main noise source, the benefits are evident especially during the night hours, when the load is reduced but sensitivity to noise is enhanced.

The height of the unit with this option is 2668 mm for all sizes.

SCP4 - Set-point compensation with 0-10 V signal

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

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



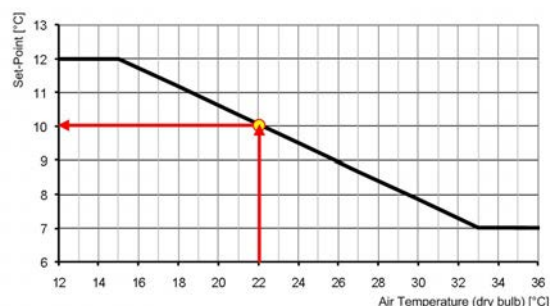
SPC2 - Set-point compensation with outdoor air temperature probe

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

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



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



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

This option allows water flow-rate modulation to the unit during partial load conditions, maintaining stable the temperature difference between inlet and outlet to the heat exchanger. Designed for systems with primary circuit variable flow-rate systems decoupled from secondary circuit. With no building load the unit switches off the compressors while concerning pumps is possible to select:

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

Flow-rate modulation is managed by embedded logic thanks to built-in flow-rate control device and temperature probes. This device is installed and wired.



This option is available only with inverter driven HYDROPACK selected (2PMV / 3PMV).

RE-20 / RE-25 / RE-30 / RE-35 / RE-39 - Electrical panel antifreeze protection

This option is necessary for very cold climates, where the external temperature can be between -10°C and -39°C. It includes self-regulating temperature maintaining resistances which are able to protect the electrical panel against condensation and frost guaranteeing that it functions correctly. The choice of device should be carried out on the basis of the minimum temperatures reached at the unit installation site.

The device is built-in the unit.



It is necessary to make precautions against build up of snow and ice in front of the exhaust and outdoor air inlet locations.



This accessory operates even when the unit is switched off provided that the power supply is maintained active and the unit continues to be connected.



This accessory does not lead to substantial variations in the electrical data for the unit which has been declared in the Electrical Data section.

RPRI - Refrigerant leak detector assembled on the casing

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

TPS - Frame protective treatment

Transparent protective coating, waxy type, which is applied to the whole structure (excluding exchange coils) and guarantees 1000 hours of salt spray / 50 microns (SST Salt Spray Test) resistance.

For a better adhesion of the protective paint, a two-component epoxy primer is previously applied.



Option available on special request

Accessories separately supplied

RCMRX - Remote control via microprocessor control

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



All device functions can be repeated with a normal portable PC connected to the unit with an Ethernet cable and equipped with an internet navigation browser.



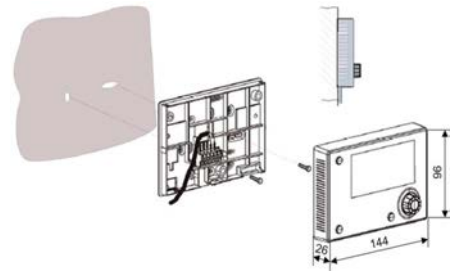
The device must be installed on the wall with suitable plugs and connected to the unit (installation and wiring to be conducted by the Customer). Maximum remote control distance 350 m without auxiliary power supply. For distances greater than 350 m and in any case less than 700 m it is necessary to install the 'PSX - Mains power unit' accessory.



Data and power supply serial connection cable n.1 twisted and shielded pair. Diameter of the individual conductor 0.8 mm.



Installation is a responsibility of the Customer.

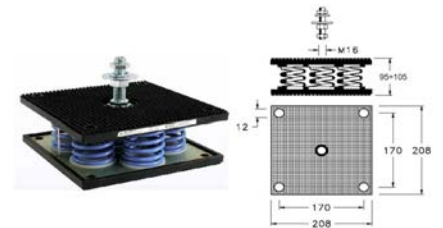


AMMX - Spring antivibration mounts

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



Installation is a responsibility of the Customer.



AMMSX - Anti-seismic spring antivibration mounts

The anti-seismic spring antivibration mounts must be fastened in special housings on the supporting metal struts.

The containment structure is designed to ensure high resistance multidirectional forces acting on the surface of the unit in the presence of wind and / or telluric movements.

The antivibration mounts have been tested according to ANSI/ASHRAE 171-2008 standard (Method of Testing Seismic Restraint devices for HVAC&R Equipment). The performance levels and the test methodology have been validated and certified by Lloyd's Register.



Installation is a responsibility of the Customer.



CSVX - Couple of manually operated shut-off valves

The kit allows to isolated the input and output water circuit. It includes:

- no. 2 of cast-iron shut-off butterfly valves with fast fittings and activation lever with a mechanical setting lock
- no. 2 of quick connections



Installation is a responsibility of the Customer, outside the unit.

PSX - Mains power supply

The device allows the unit and the remote control to communicate with the user interface even when the serial line is longer than 350m.

It must be connected to the serial line at a distance of 350m from the unit and allows to extend the length to 700m maximum in total. The device requires an external power supply at 230V AC.



Power supply at 230V AC provided by Customer.



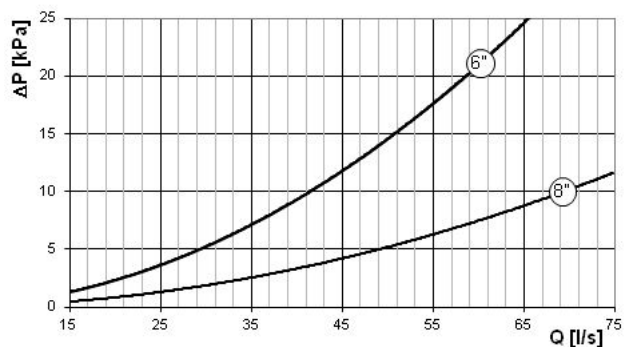
Installation is a responsibility of the Customer.

IFWX - Steel mesh strainer on the water side

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

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

STEEL MESH FILTER PRESSURE DROP



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

STEEL MESH FILTER FEATURES

PREMIUM		
Size	250.2 - 360.2	400.2 - 580.2
Diameter	6"	8"
Degree of filtration	1,6 mm	



Pressure drop referred to a clean filter.



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



Check for the presence of the required hydraulic shut-off valves in the system, in order to undertake periodical maintenance.

Option compatibility

REF.	DESCRIPTION	250.2	280.2	320.2	360.2	400.2	420.2	440.2	480.2	540.2	580.2
CONFIGURATIONS AND MAIN ACCESSORIES											
B	Low water temperature	0	0	0	0	0	0	0	0	0	0
D	Partial energy recovery	-	0	0	0	0	0	0	0	0	0
B + D	Low water temperature + Partial energy recovery	-	0	0	0	0	0	0	0	0	0
2PM - HYDROPACK USER SIDE WITH NO.2 PUMPS											
PU24 L	Pump type 24 L	Δ	Δ	Δ	0	0	0	-	-	-	-
PU25 L	Pump type 25 L	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	0	-
PU25A L	Pump type 25A L	0	0	0	0	0	0	0	0	0	-
PU27 L	Pump type 27 L	0	0	0	Δ	Δ	Δ	Δ	Δ	Δ	Δ
PU28 L	Pump type 28 L	0	0	0	0	0	Δ	Δ	Δ	Δ	Δ
PU29 L	Pump type 29 L	0	0	0	0	0	0	0	0	0	0
PU30 L	Pump type 30 L	0	0	0	0	0	0	0	0	Δ	Δ
PU39	Pump 39	Δ	Δ	Δ	Δ	Δ	0	-	-	-	-
PU41	Pump type 41	0	0	0	0	0	0	0	-	-	-
PU42	Pump type 42	0	0	0	0	0	0	0	0	0	0
PU43	Pump type 43	0	0	0	0	0	0	0	0	0	0
2PMV - HYDROPACK USER SIDE WITH NO.2 INVERTER PUMPS											
PU25 L	Pump type 25 L	0	0	0	0	-	-	-	-	-	-
PU28 L	Pump type 28 L	0	0	0	0	0	0	0	0	0	0
IVFDT - INVERTER DRIVEN VARIABLE FLOW-RATE USER SIDE CONTROL DEPENDING ON THE TEMPERATURE DIFFERENTIAL											
2PM	Hydropack user side with no. 2 of pumps	0	0	0	0	0	0	0	0	0	0
2PMV	Hydropack user side with no.2 of inverter pumps	0	0	0	0	0	0	0	0	0	0
OTHER ACCESSORIES											
CREFP	Device for consumption reduction of the external section at variable speed (phase-cutting)	•	•	•	•	•	•	•	•	•	•
CREFB	Device for fan consumption reduction of the external section, ECOBREEZE type	0	0	0	0	0	0	0	0	0	0

• = Standard

- = Option not available

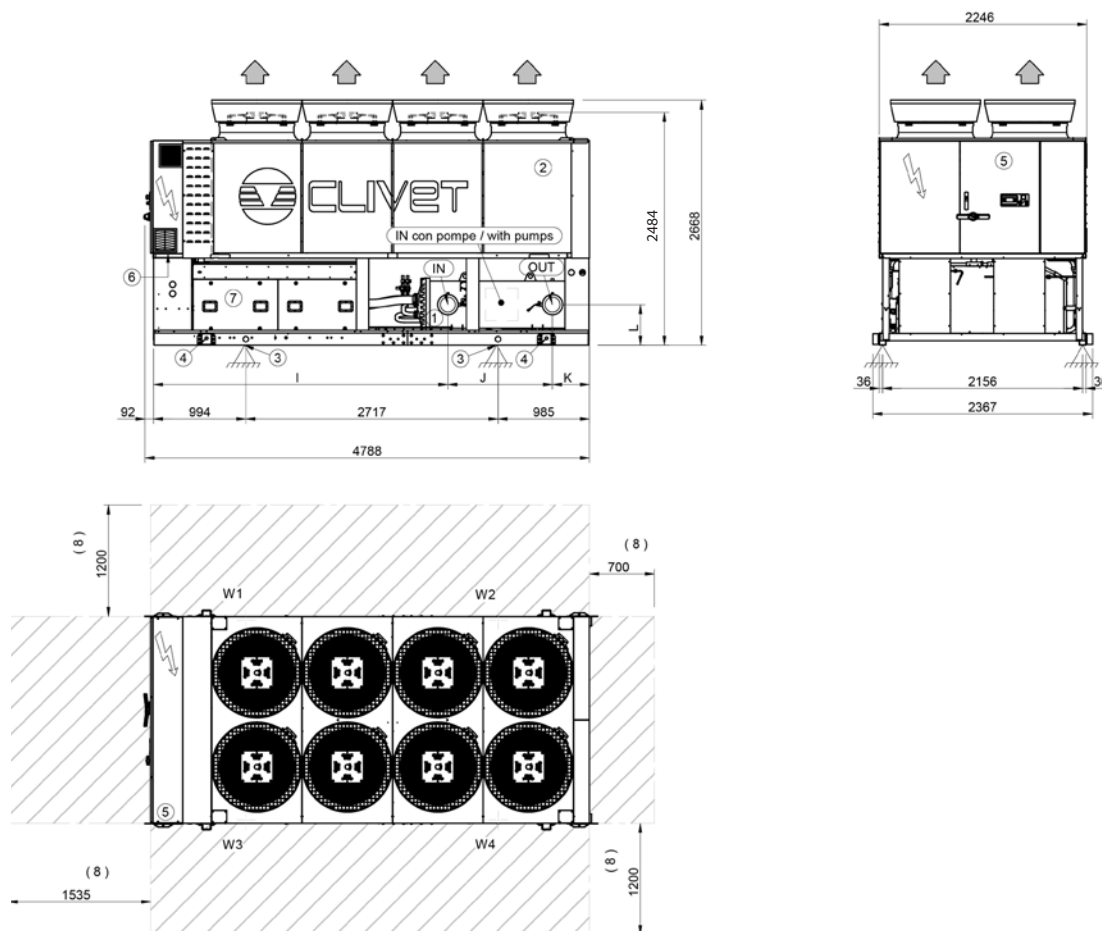
o = Available option

Δ = Recommended option (low-mid high head, wherever available)

Dimensional drawings

Size 250.2 - Acoustic configuration: compressor soundproofing (SC)

DAA4Z250.2_PRM_SC_1_01
DATA/DATE 23/03/2018



- 1. Internal exchanger (evaporator)
- 2. External exchanger (condenser)
- 3. Unit fixing holes
- 4. Lifting brackets (removable, if required, after the unit positioning)
- 5. Electrical panel
- 6. Power input
- 7. Sound proof enclosure (only in the relevant versions)
- 8. Clearance access recommended

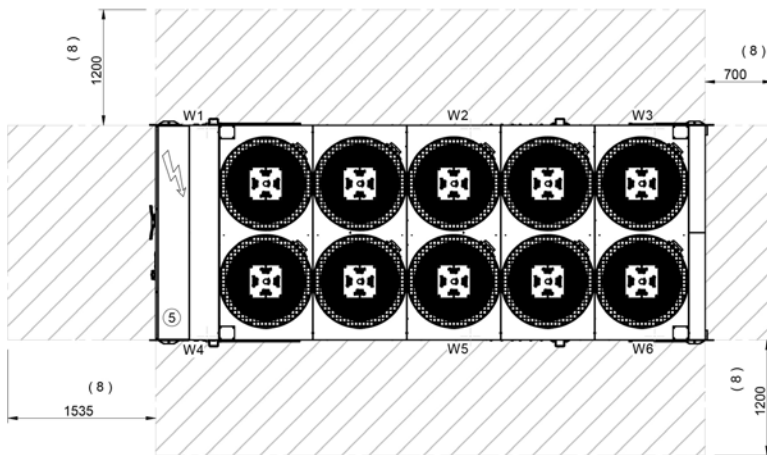
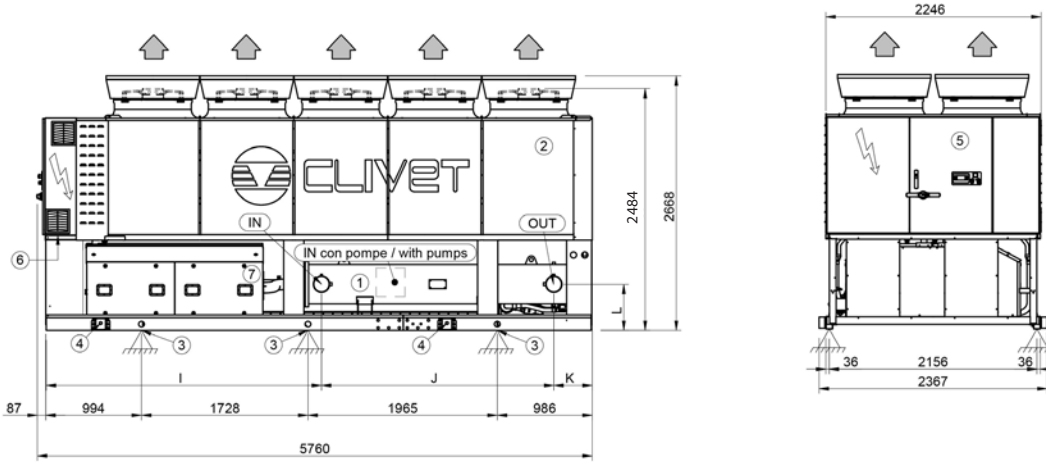
Size		SC-PRM
		250.2
I	mm	3171
J	mm	1127
K	mm	398
L	mm	437
OD	mm	6"
A - Length	mm	4788
B - Depth	mm	2246
C - Height	mm	2484
C - Height with AXITOP	mm	2668
W1 Supporting point	kg	1402
W2 Supporting point	kg	1121
W3 Supporting point	kg	1408
W4 Supporting point	kg	1127
Shipping weight	kg	4824
Operating weight	kg	5058

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 280.2 - Acoustic configuration: compressor soundproofing (SC)

DAA4Z280.2_PRM_SC_1_01
DATA/DATE 26/03/2018



- 1. Internal exchanger (evaporator)
- 2. External exchanger (condenser)
- 3. Unit fixing holes
- 4. Lifting brackets (removable, if required, after the unit positioning)
- 5. Electrical panel
- 6. Power input
- 7. Sound proof enclosure (only in the relevant versions)
- 8. Clearance access recommended

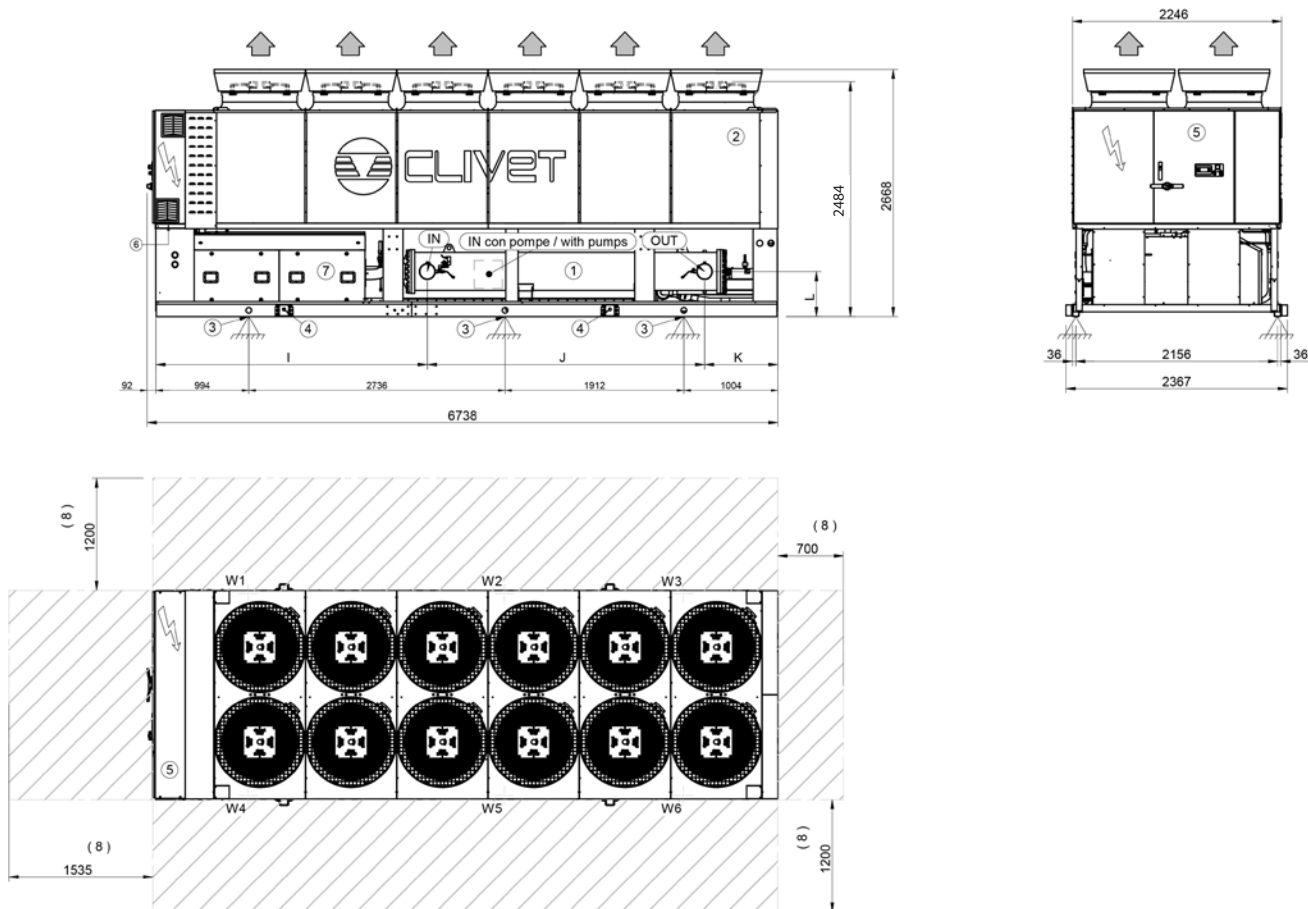
Size		SC-PRM	
		280.2	
I	mm	2857	
J	mm	2412	
K	mm	399	
L	mm	480	
OD	mm	6"	
A - Length	mm	5760	
B - Depth	mm	2246	
C - Height	mm	2484	
C - Height with AXITOP	mm	2668	
W1 Supporting point	kg	1273	
W2 Supporting point	kg	1001	
W3 Supporting point	kg	551	
W4 Supporting point	kg	1276	
W5 Supporting point	kg	1004	
W6 Supporting point	kg	553	
Shipping weight	kg	5418	
Operating weight	kg	5658	

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 - Acoustic configuration: compressor soundproofing (SC)

DAA4Z320.2_PRM_SC_1_01
DATA/DATE 26/03/2018



- 1. Internal exchanger (evaporator)
- 2. External exchanger (condenser)
- 3. Unit fixing holes
- 4. Lifting brackets (removable, if required, after the unit positioning)
- 5. Electrical panel
- 6. Power input
- 7. Sound proof enclosure (only in the relevant versions)
- 8. Clearance access recommended

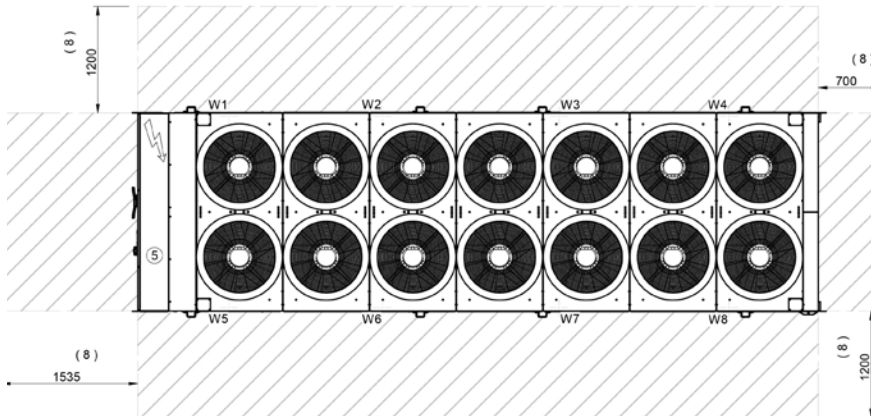
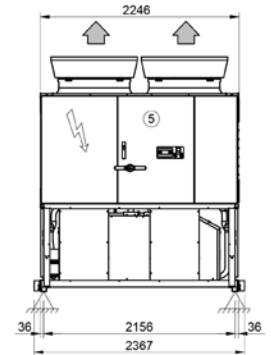
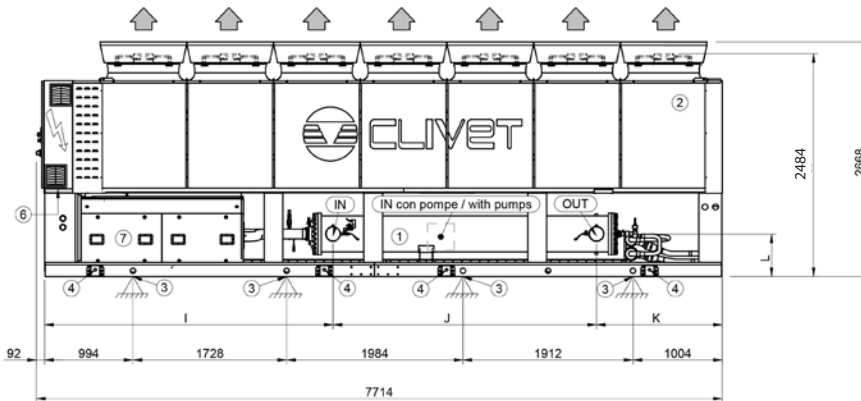
Size		SC-PRM	
		320.2	
I	mm	2900	
J	mm	2962	
K	mm	784	
L	mm	480	
OD	mm	6"	
A - Length	mm	6738	
B - Depth	mm	2246	
C - Height	mm	2484	
C - Height with AXITOP	mm	2668	
W1 Supporting point	kg	1570	
W2 Supporting point	kg	1108	
W3 Supporting point	kg	502	
W4 Supporting point	kg	1559	
W5 Supporting point	kg	1101	
W6 Supporting point	kg	499	
Shipping weight	kg	6031	
Operating weight	kg	6339	

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

Dimensional drawings

Size 360.2 - Acoustic configuration: compressor soundproofing (SC)

DAA4Z360.2_PRM_SC_1_01
DATA/DATE 26/03/2018



1. Internal exchanger (evaporator)
2. External exchanger (condenser)
3. Unit fixing holes
4. Lifting brackets (removable, if required, after the unit positioning)
5. Electrical panel
6. Power input
7. Sound proof enclosure (only in the relevant versions)
8. Clearance access recommended

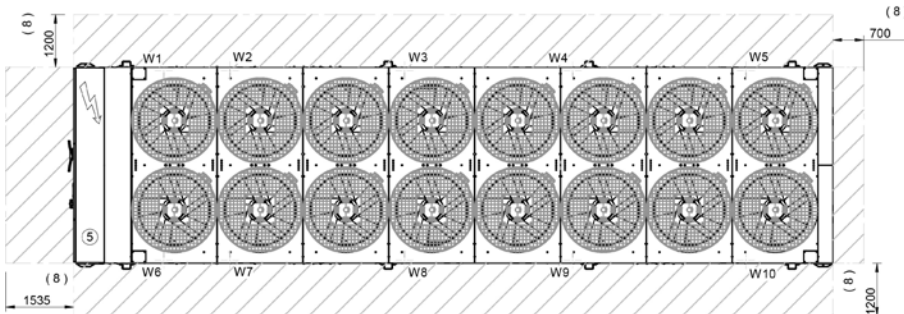
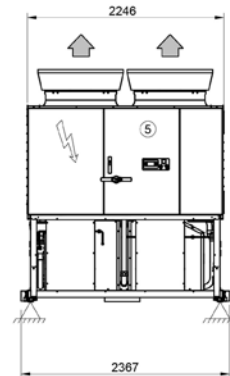
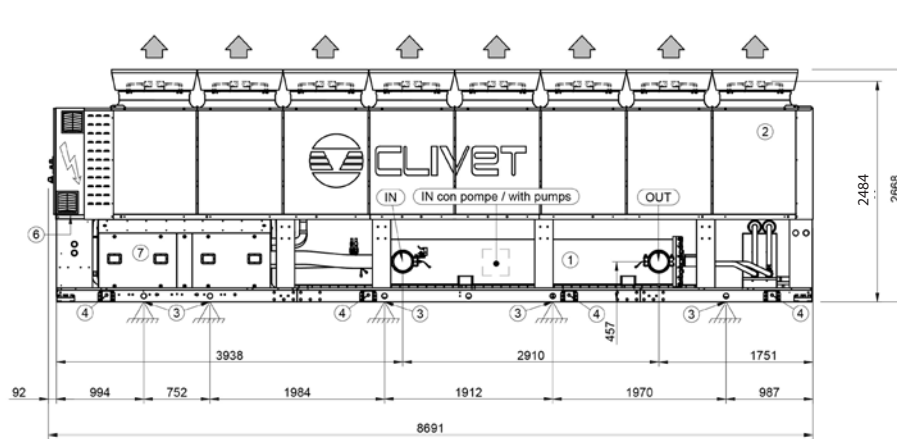
Size		SC-PRM	
		360.2	
I	mm	3245	
J	mm	2962	
K	mm	1415	
L	mm	480	
OD	mm	6"	
A - Length	mm	7714	
B - Depth	mm	2246	
C - Height	mm	2484	
C - Height with AXITOP	mm	2668	
W1 Supporting point	kg	1630	
W2 Supporting point	kg	540	
W3 Supporting point	kg	1007	
W4 Supporting point	kg	520	
W5 Supporting point	kg	1617	
W6 Supporting point	kg	536	
W7 Supporting point	kg	958	
W8 Supporting point	kg	495	
Shipping weight	kg	7024	
Operating weight	kg	7303	

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 - Acoustic configuration: compressor soundproofing (SC)

DAA4Z400.2_PRM_SC_1_01
DATA/DATE 26/03/2018



- 1. Internal exchanger (evaporator)
- 2. External exchanger (condenser)
- 3. Unit fixing holes
- 4. Lifting brackets (removable, if required, after the unit positioning)
- 5. Electrical panel
- 6. Power input
- 7. Sound proof enclosure (only in the relevant versions)
- 8. Clearance access recommended

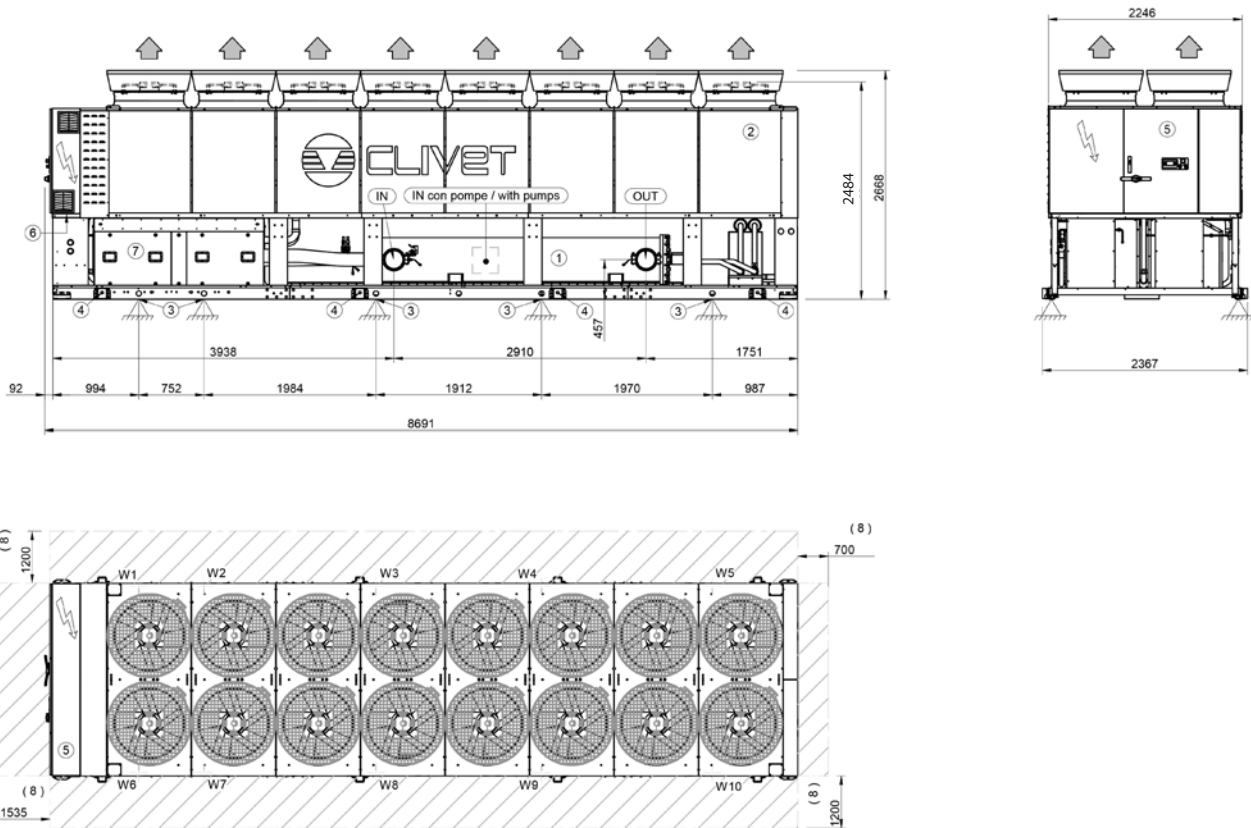
Size		SC-PRM	
		400.2	
I	mm	2980	
J	mm	2910	
K	mm	2709	
L	mm	480	
OD	mm	8"	
A - Length	mm	8691	
B - Depth	mm	2246	
C - Height	mm	2484	
C - Height with AXITOP	mm	2668	
W1 Supporting point	kg	1449	
W2 Supporting point	kg	943	
W3 Supporting point	kg	978	
W4 Supporting point	kg	555	
W5 Supporting point	kg	1423	
W6 Supporting point	kg	925	
W7 Supporting point	kg	935	
W8 Supporting point	kg	530	
Shipping weight	kg	7257	
Operating weight	kg	7738	

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 420.2 - 440.2 - Acoustic configuration: compressor soundproofing (SC)

DAA4Z420.2_440.2_PRM_SC_1_01
DATA/DATE 23/03/2018



- 1. Internal exchanger (evaporator)
- 2. External exchanger (condenser)
- 3. Unit fixing holes
- 4. Lifting brackets (removable, if required, after the unit positioning)
- 5. Electrical panel
- 6. Power input
- 7. Sound proof enclosure (only in the relevant versions)
- 8. Clearance access recommended

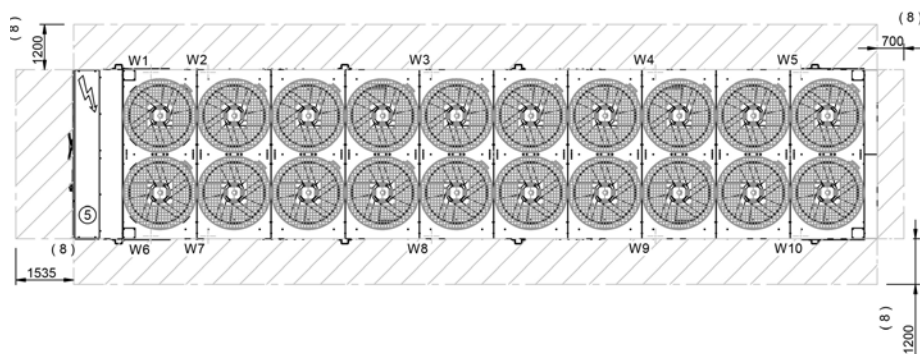
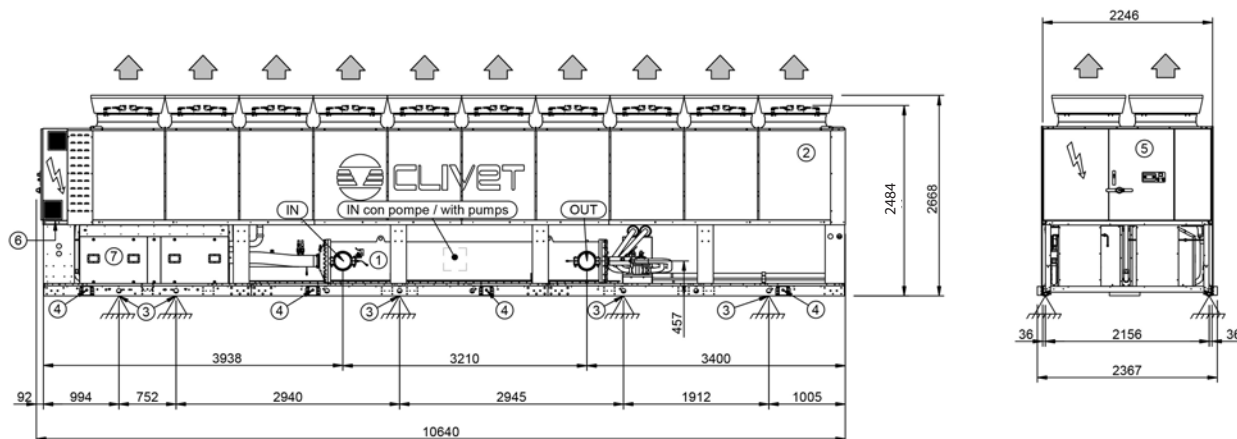
Size		SC-PRM	
		420.2	440.2
OD	mm	8"	8"
A - Length	mm	8691	8691
B - Depth	mm	2246	2246
C - Height	mm	2484	2484
C - Height with AXITOP	mm	2668	2668
W1 Supporting point	kg	1137	1361
W2 Supporting point	kg	706	548
W3 Supporting point	kg	742	758
W4 Supporting point	kg	856	851
W5 Supporting point	kg	615	628
W6 Supporting point	kg	1035	1516
W7 Supporting point	kg	997	854
W8 Supporting point	kg	777	795
W9 Supporting point	kg	809	805
W10 Supporting point	kg	577	582
Shipping weight	kg	7611	8057
Operating weight	kg	8251	8698

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

Dimensional drawings

Size 480.2 - 540.2 - 580.2 - Acoustic configuration: compressor soundproofing (SC)

DAA4Z480.2_540.2_580.2_PRM_SC_1_01
DATA/DATE 23/03/2018



- 1. Internal exchanger (evaporator)
- 2. External exchanger (condenser)
- 3. Unit fixing holes
- 4. Lifting brackets (removable, if required, after the unit positioning)
- 5. Electrical panel
- 6. Power input
- 7. Sound proof enclosure (only in the relevant versions)
- 8. Clearance access recommended

Size		SC-PRM		
		480.2	540.2	580.2
OD	mm	8"	8"	8"
A - Length	mm	10640	10640	10640
B - Depth	mm	2246	2246	2246
C - Height	mm	2484	2484	2484
C - Height with AXITOP	mm	2668	2668	2668
W1 Supporting point	kg	1322	1322	1322
W2 Supporting point	kg	725	725	725
W3 Supporting point	kg	1320	1320	1320
W4 Supporting point	kg	830	830	830
W5 Supporting point	kg	439	439	439
W6 Supporting point	kg	1554	1554	1554
W7 Supporting point	kg	939	939	939
W8 Supporting point	kg	1294	1294	1294
W9 Supporting point	kg	771	771	771
W10 Supporting point	kg	416	416	416
Shipping weight	kg	8896	8896	8896
Operating weight	kg	9610	9610	9610

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

**CLIVET SPA**

Via Camp Lonc 25, Z.I. Villapaiera - 32032 Feltre (BL) - Italy
Tel. + 39 0439 3131 - Fax + 39 0439 313300 - info@clivet.it

CLIVET GROUP UK Limited

4 Kingdom Close, Segensworth East - Fareham, Hampshire - PO15 5TJ - United Kingdom
Tel. + 44 (0) 1489 572238 - Fax + 44 (0) 1489 573033 - enquiries@clivetgroup.co.uk

CLIVET GROUP UK Limited (Operations)

Units F5&F6 Railway Triangle Ind Est, Walton Road - Portsmouth, Hampshire - PO6 1TG - United Kingdom
Tel. +44 (0) 2392 381235 - Fax. +44 (0) 2392 381243 - service@clivetgroup.co.uk

CLIVET ESPAÑA S.A.U.

C/ Bac de Roda, 36 - 08019 Barcelona - España
Tel: +34 93 8606248 - Fax +34 93 8855392 - info@clivet.es

Av.Manoterás Nº 38, Oficina C303 - 28050 Madrid - España
Tel. +34 91 6658280 - Fax +34 91 6657806 - info@clivet.es

CLIVET GmbH

Hummelsbütteler Steindamm 84, 22851 Norderstedt - Germany
Tel. + 49 (0) 40 32 59 57-0 - Fax + 49 (0) 40 32 59 57-194 - info.de@clivet.com

CLIVET RUSSIA

Elektrozavodskaya st. 24, office 509 - 107023, Moscow, Russia
Tel. + 74956462009 - Fax + 74956462009 - info.ru@clivet.com

CLIVET MIDEAST FZCO

Dubai Silicon Oasis (DSO), High Bay Complex, Office N. 20, PO BOX 342009, Dubai, UAE
Tel. + 9714 3208499 - Fax + 9714 3208216 - info@clivet.ae

CLIVET AIRCONDITIONING SYSTEMS PRIVATE LIMITED

501/502, Commercial-1, Kohinoor City, Old Premier Compound, Kirol Road, Off L B S Marg, Kurla West - Mumbai 400 070 - India
info.in@clivet.com

www.clivet.com
www.clivetlive.com

A Group Company of

