Technical Bulletin

BT14E008GB-03

ELFOEnergy Magnum - Heat pump

Air-cooled heat pump for outdoor installation

WSAN-XIN 18.2 - 30.2 RANGE

Nominal heating capacity **(A7/W45)** from 56 kW to 93 kW
Nominal cooling capacity **(A35/W7)** from 50 kW to 82 kW

- **ERP READY PRODUCT**
  A+ labelling
- **INVERTER DC COMPRESSORS**
  High seasonal efficiency
- **ECOBREEZE FANS**
  Silent operation and reduced fan consumptions
- **AXITOP FANS (OPTIONAL)**
  For a further increase in efficiency
- **VARY FLOW + (OPTIONAL)**
  Variable water flow-rate with inverter pumps
- **DOUBLE CIRCUIT**
  Service warranty

DC Inverter

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

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

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

Specialization

Every intended use has specific requirements. These requirements 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

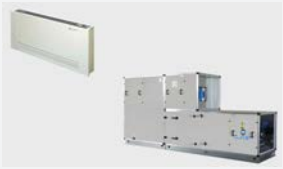
From the Air Renewal depends the comfort in the spaces. Since it often represents the main building energetic load, it also determines the running costs of the entire system.

ZEPHIR3
Packaged Primary Air supply system with thermodynamic energy recovery

- Simplifies the system, reduces the heating and cooling generators
- Purifies the air with the 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 the differents type 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

ELFOEnergy Magnum, four solutions to satisfy different installation requirements

MAGNUM HEAT PUMP

WSAN-XIN:

- Reverse cycle heat pump

MAGNUM MULTIFUNCTION

WSAN-XIN MF:

- Reverse cycle heat pump
- Simultaneous production of hot and chilled water

MAGNUM COOL ONLY

WSAT-XIN:

- Water chiller
- Hot water production with energy recovery option

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MAGNUM FREE-COOLING

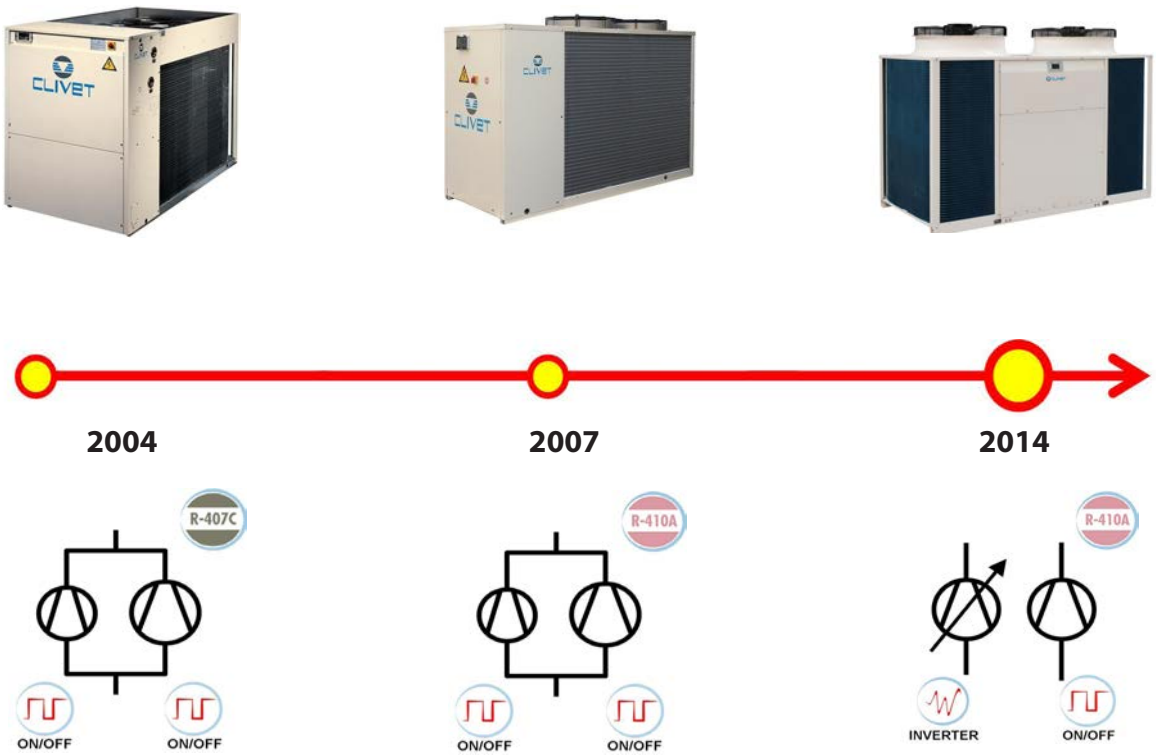
WSAT-XIN FC:

- Water chiller
- Direct or No-Glycol FREE-COOLING

Clivet. Change things.

For 25 years, we have been offering solutions to ensure sustainable comfort and the well-being of people and environment

Clivet, all along, has clearly defined its Business strategy in the **high Energy Efficiency systems** and has placed its Research and Development to full-service of this strategy, investing significant economic and human resources and identifying its Mission into **"Comfort & Energy Saving",** when topics as **energy saving** and **high seasonal efficiency** were not at the center of the public opinion as today.



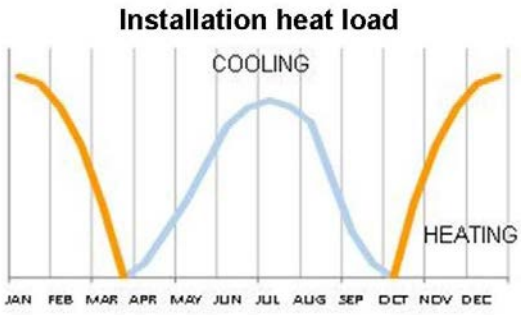
Maximum efficiency with partial loads

Load variability

Heating and **cooling** capacity required from the air conditioning system typically **varies over the year and often even in the course of the same day**.

Climatic conditions **vary depending on the place** consequently also the load 's trend.

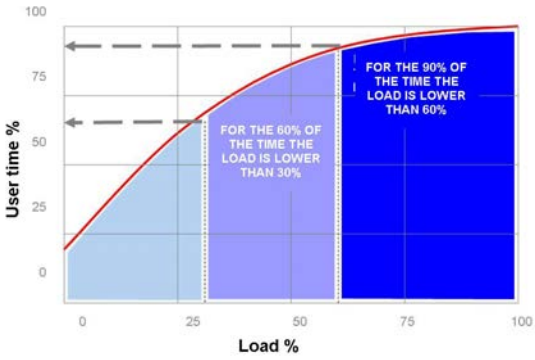
The **highest values appear for limited periods of time**, often coinciding with the most demanding weather conditions.



Maximum efficiency is necessary with a part load

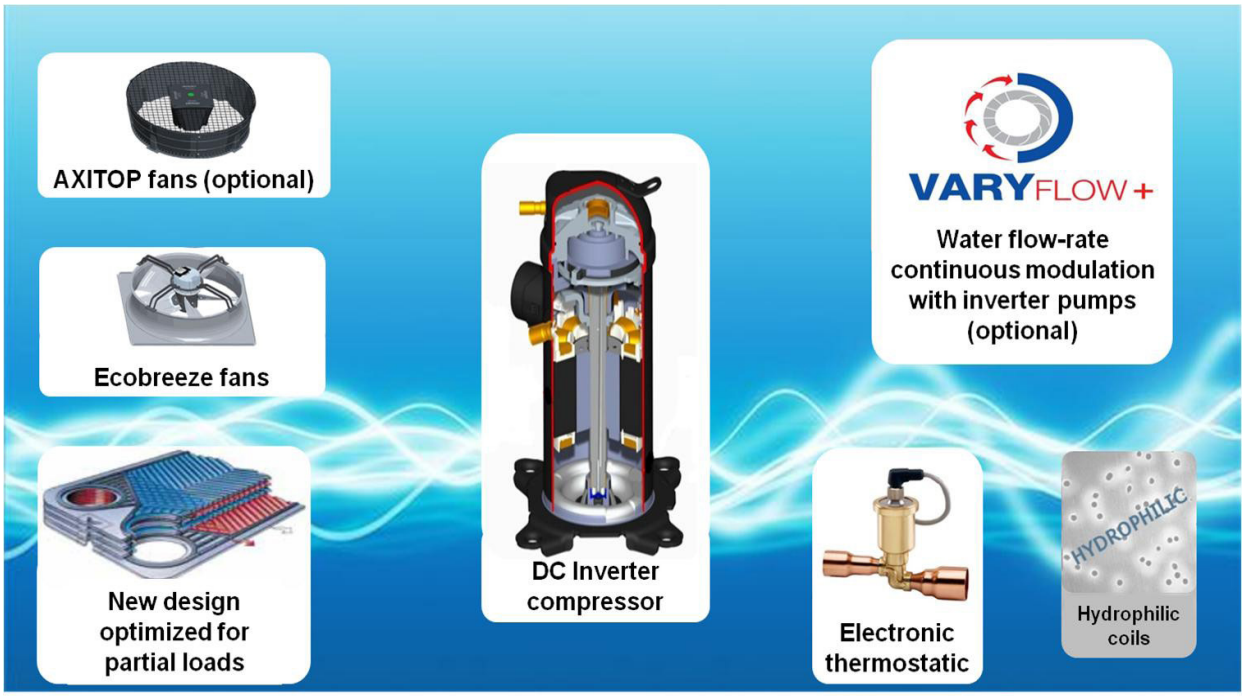
Since the system is required to generate maximum power **only for a short amount of time**, it is essential to have the **maximum efficiency under partialized load conditions.**

This is the only way to actually reduce overall yearly consumptions.



ELFOEnergy Magnum

The most advanced technologies, enclosed in a single compact unit, combined with the reliability advantages of the **double refrigeration circuit**, guarantee **the best seasonal efficiency**.



High seasonal efficiency thanks to the capacity continuous modulation

The progressive and sequential activation of the two refrigeration circuits, one controlled by inverter technology, guarantees the complete adjustment to the installation load.

The capacity modultation is necessary starting from minimum values which guarantee the continuous capacity supply depending on the requirements.

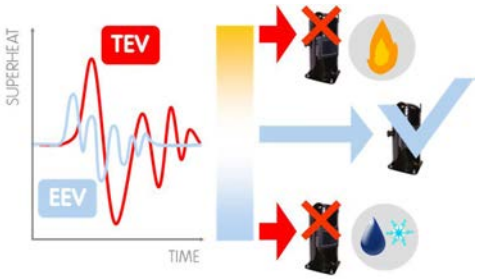
DC Inverter compressor

Control of the refrigerant flow

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.**

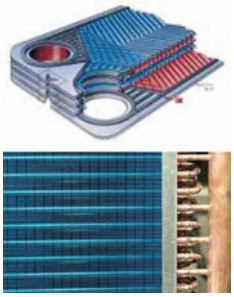
Through control of overheating, it also prevents hazardous phenomena for the compressors, such as overtemperature and return of fluids, thereby further increasing efficiency and durability.



Efficient heat exchange

The new plate exchanger design allows an higher evaporating temperature, guaranteeing a better exchange efficiency, above all in the part-load operating that coincides with the most of the unit operating time.

The coil **hydrophilic aluminium coating** allows a faster water drop elimination and consequently a better flow distribution, reducing the defrosting time and increasing the exchange efficiency.



Standard supplied ECOBREEZE fans, electronically controlled

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

Moreover all units are supplied with a **condensation electronic control.** It automatically reduces the fan speed when the heat load is reduced.

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.

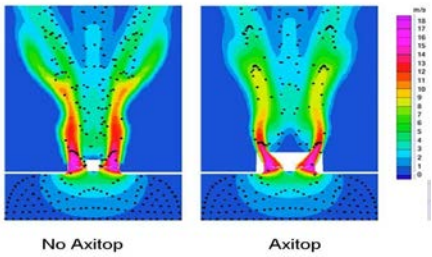
All this translates into a **sound pressure reduced down to 8 dB(A)** compared to full load operation.

Efficient and silent ventilation technology (optional)

It is possible to further increase the seasonal efficiency with the innovative air handling system on the external exchangers.

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. All AXITOP components are aerodinamically optimized enhancing significantly the efficiency and reducing the impeller speed and consequently the noise. Obtaining:

- down to –3 dB of silence
- reduction of 3% of the absorbed energy.



Water flow-rate continuous modulation (optional)

The energy used for the vector pumping is fundamental on the seasonal efficiency.

The **VARYFLOW + modulating pumping unit** made up of two pumps in parallel controlled by inverter, allows a precise water flow-rate modulation reducing notably the consumptions and at the same time it guarantees its functionality also in case of temporary unavailability of one of the two pumps, guaranteeing about the 80% of the nominal flow-rate.

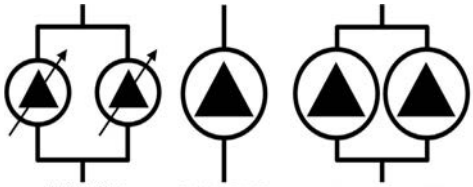
The water flow-rate modulation is managed keeping constant the supply/return temperature delta.

If the installation water temperature is in critical conditions, **VARYFLOW+** allows to extend the ELFOEnergy Magnum operating ranges guaranteeing the operating.

In case of particular installation needs, the hydronic assemblies are also available:

- **ON/OFF pump:** the traditional solution with high available pressure.
- **ON/OFF pump + ON/OFF pump in stand-by:** the solution that favours reliability. The built-in control balances the operating hours of the two pump and in case of any failure it signals the damage and automatically activates the stand-by pump.

VARYFLOW+



Advanced control

The control system combines in a single solution the operating efficiency and the user-friendliness. Continuously monitoring all of the unit operating parameters, it ensures the maintenance of an optimal energy efficiency. The control includes many safety functions and a complete alarm management.

It also includes advanced functions, such as daily and weekly programming and automatic maximum power consumption limitation (demand limit).

It allows the management of several units in cascade up to 1 master and 6 slave (Ecoshare)

The interface terminal has a backlit graphic display and a multifunction access keypad. The multilevel menu is protected by different passwords according to the type of user.

Remote control

The remote control allows accessing to the same functions that are accessible by the built-in unit user interface, and can be installed at a maximum distance of 350 meters.

System remote management

Thanks to the different available communication devices, the unit is able to exchange information with the main supervision systems by serial connections.

Modbus®

BACnet™

LonWorks

Defrosting smart management

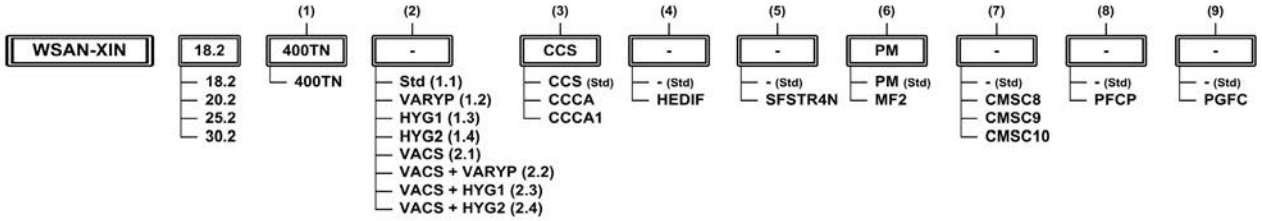
The automatic defrost cycles on the remaining external exchanger surface are managed in **ALTERNATED mode for each refrigeration circuit**, guaranteeing the 50% of the delivered capacity. The built-in electronic control analyzes not only the external conditions but also the evaporating pressure variations in the exchanger.

Compact unit

All these distinctive elements are included in only **one packaged solution**.

The new design reduces the **overall dimensions** and allows a **semplified access**, both front and rear, allowing a **quick maintenance.**

Unit configuration



(1) Supply voltage
Supply voltage 400/3/50 + N (standard)

(2) User side hydronic assembly
Refer to the diagrams of the hydronic assembly reported

(3) Condenser coil
CCS - Standard condenser coil (standard)
CCCA - Copper / aluminium condenser coil with acrylic lining
CCCA1 - Condenser coil with Energy Guard DCC Aluminium

(4) Fan type
(-) Fan (standard)
HEDIF - Diffuser for high efficiency axial fan

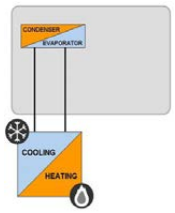
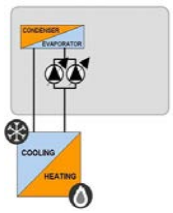
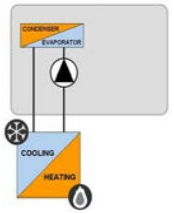
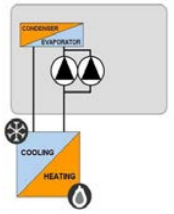
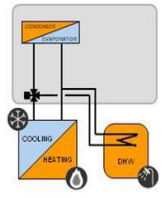
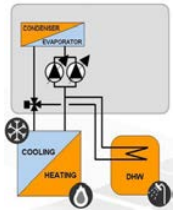
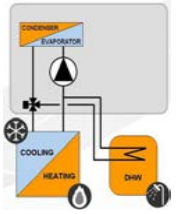
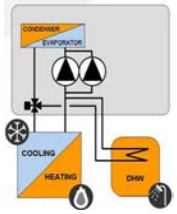
(5) Soft starter
(-) not required (standard)
SFSTR4N -Disposal for inrush current reduction, for unit 400/3/50

(6) Phase monitor
PM - Phase monitor (standard)
MF2 - Multi-function phase monitor

(7) Serial communication module
(-) not required (standard)
CMSC8 - Serial communication module to BACnet supervisor
CMSC9 - Serial communication module to Modbus supervisor
CMSC10 - Serial communication module to LonWorks supervisor

(8) Power factor correction capacitors
(-) not required (standard)
PFCP -Power factor correction capacitors (cosfi >0,9)

(9) Finned coil protection grill
(-) not required (standard)
PGFC - Finned coil protection grill

Functions	Diagram hydronic assemblies			
2-PIPE INSTALLATION Hot or chilled water production for installation	**1.1** Standard unit (Std) 	**1.2** Unit with VARYFLOW + (VARYP) 	**1.3** Unit with ON/OFF pump (HYG1) 	**1.4** Unit with two ON/OFF pumps (HYG2) 
2-PIPE INSTALLATION + 3-WAY VALVE Hot or chilled water production for installation - Priority hot water production with 3-way valve	**2.1** Unit with DHW switching valve (VACS) 	**2.2** Unit with DHW switching valve and VARYFLOW + (VACS+VARYP) 	**2.3** Unit with DHW switching valve and ON/OFF pump (VACS+HYG1) 	**2.4** Unit with DHW switching valve and two ON/OFF pumps (VACS+HYG2) 

Accessories separately supplied

• **RCTX** - Remote control	• **BACX** - BACnet serial communication module • **CMMBX** - Serial communication module to supervisor (Modbus) • **CMSLWX** - LonWorks serial communication module	• **PGFCX** - Finned coil protection grill • **IFWX** - Steel mesh strainer on the water side	• **AVIBX** - Anti-vibration mount support

General technical data

Size			18.2	20.2	25.2	30.2
Radiant panels						
Heating						
Heating capacity	1	kW	58,7	71,3	81,2	96,6
Total power input	2	kW	15,0	18,1	20,7	24,7
COP (EN 14511:2013)	3		3,92	3,94	3,92	3,91
Cooling						
Cooling capacity	6	kW	67,5	79,2	92,6	108,4
Total power input	2	kW	18,3	22,5	25,7	31,7
EER (EN 14511:2013)	7		3,69	3,53	3,61	3,42
Water flow-rate	6	l/s	3,23	3,78	4,42	5,18
Terminal units						
Heating						
Heating capacity	4	kW	56,1	68,5	78,4	93,3
Compressor power input	4	kW	15,5	18,7	20,9	25,4
Total power input	2	kW	17,5	21,4	24,4	29,1
COP (EN 14511:2013)	3		3,20	3,21	3,21	3,20
Water flow-rate	4	**l/s**	2,68	3,27	3,75	4,46
Pressure drop	4	kPa	19	27	18	25
Minimum cooling capacity	4	**kW**	15,4	15,4	15,4	20,8
Cooling						
Cooling capacity	8	kW	49,6	59,3	69,7	82,2
Compressor power input	8	kW	14,3	18,0	20,4	25,0
Total power input	2	kW	16,9	20,6	23,6	28,8
EER (EN 14511:2013)	7		2,93	2,87	2,95	2,85
ESEER	9		3,96	3,81	3,79	3,82
Water flow-rate	8	l/s	2,37	2,83	3,33	3,93
Pressure drop	8	kPa	15	21	14	20
Minimum cooling capacity	8	kw	14,0	14,0	14,4	19,1
Radiators						
Heating						
Heating capacity	5	kW	53,2	65,4	74,2	89,0
Total power input	2	kW	20,9	25,5	29,4	34,7
COP (EN 14511:2013)	3		2,55	2,57	2,53	2,56
Water flow-rate	5	l/s	1,27	1,56	1,77	2,13
Compressor						
Type compressors			SCROLL INVERTER + SCROLL ON/OFF			
Refrigerant			R-410A			
No. of compressors		Nr	2	2	2	2
Refrigeration circuits		Nr	2	2	2	2
Refrigerant charge (C1)		kg	8	8,5	9,5	10,5
Refrigerant charge (C2)		kg	8	8,5	9,5	10,5
User side exchanger						
Type of exchanger	10		PHE	PHE	PHE	PHE
No. of exchanger		Nr	1	1	1	1
Water content		l	9,2	9,2	11,8	11,8
External Section Fan						
Type of fan	11		EC	EC	EC	EC
No. of fan		Nr	2	2	2	2
Standard airflow		l/s	10556	10556	13056	13056
Power input		kW	1,1	1,1	1,4	1,4

Size		18.2	20.2	25.2	30.2
Water circuit					
Maximum water side pressure	kPa	1000	1000	1000	1000
Safety valve calibration	kPa	600	600	600	600
Min. installation water contents	l	49	49	48	66
Power supply					
Standard power supply		400/3/50 + N	400/3/50 + N	400/3/50 + N	400/3/50 + N

1. Entering/leaving water temperature user side 30/35°C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
2. The overall power absorbed is calculated by adding the power absorbed by the compressor + the power absorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump the percentage value of the pump to overcome pressure drop outside + the power absorbed by the auxiliary electrical circuit
3. COP (EN 14511:2013) heating performance coefficient. Ratio between delivered heating capacity and power input in compliance with EN 14511:2013
4. Entering/leaving water temperature user side 40/45°C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
5. Entering/leaving water temperature user side 45/55°C, Entering external exchanger air temperature 7°C (R.H. = 85%)
6. Entering/leaving water temperature user side 23/18°C, external exchanger entering air 35°C
7. EER (EN 14511:2013) cooling performance coefficient. Ratio between delivered cooling capacity and power input in compliance with EN 14511:2013
8. User side entering/leaving water temperature 12/7 °C, external exchanger entering air 35°C
9. ESEER calculated by EUROVENT, for systems featuring terminal units with water produced at 7°C
10. PHE = plate exchanger
11. EC = axial-flow fan + EC

Electrical data

Supply voltage: 400/3/50+N

Size			18.2	20.2	25.2	30.2
F.L.A. - Full load current at max admissible conditions						
F.L.A. - Compressor 1 (ON/OFF)		A	16,8	24,3	26,6	30,8
F.L.A. - Compressor 2 (INVERTER)		A	20,8	20,8	23,3	29,5
F.L.A. - Single External Fan		A	3,9	3,9	3,9	3,9
F.L.A. - Total		A	45,5	52,9	57,7	68,1
L.R.A. - Locked rotor amperes						
L.R.A. - Compressor 1 (ON/OFF)		A	98,0	147	158	197
L.R.A. - Compressor 2 (INVERTER)		A	20,8	20,8	23,3	29,5
F.L.I. - Full load power input at max admissible conditions						
F.L.I. - Compressor 1 (ON/OFF)		kW	9,7	14,6	16,5	18,5
F.L.I. - Compressor 2 (INVERTER)		kW	12,7	12,7	14,6	18,0
F.L.I. - Single External Fan		kW	2,56	2,56	2,56	2,56
F.L.I. - Total		kW	27,5	32,5	36,3	41,6
M.I.C. Maximum inrush current						
M.I.C - Value		A	126,6	175,6	189,1	234,3
M.I.C. with soft start accessory		A	77,6	102,1	110,1	135,8

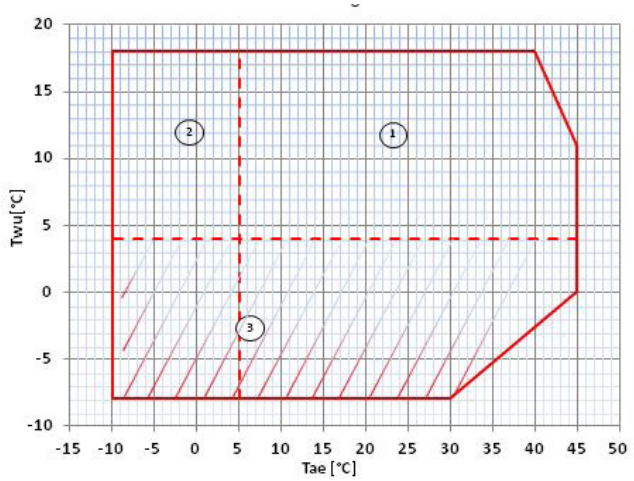
Power supply: 400/3/50 Hz. Voltage variation: max. +/-10%
Voltage unbalance between phases: max 2 %
For non standard voltage please contact Clivet technical office
Units are in compliance with the european law CEI EN 60204 and CEI EN 60335.

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)
18.2	90	83	78	80	78	72	67	61	82	65
20.2	89	82	80	81	77	72	64	59	82	65
25.2	90	83	80	81	79	74	68	60	83	66
30.2	91	84	82	83	78	75	66	59	84	66

Sound levels refer to units with full load under nominal test conditions.
The sound pressure level refers to a distance of 1 meter from the outer surface of the unit operating in open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2)
Data referred to the following conditions:
entering / leaving exchanger water temperature user side 12/7°C
entering / leaving exchanger water temperature source side 30/35°C

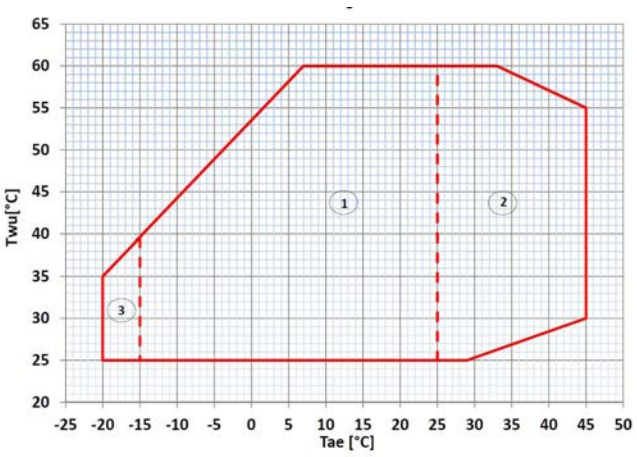
Operating range (Cooling)



Twu [°C] = exchanger water outlet temperature
Tae [°C]= external exchanger inlet air temperature

1. Normal operating range
2. Normal operating range, with modulating fans
3. Operating range where the use of ethylene glycol is mandatory in relation to the temperature of the water at the outlet of the user side exchanger

Operating range (Heating)



Twu [°C] = exchanger water outlet temperature
Tae [°C] = external exchanger inlet air temperature

1. Normal operating range
2. Operation with fans and compressors in modulation
3. Operating range with modulating compressor

Correction factors for glycol use

Internal exchanger (evaporator)

% 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	1	-1	-4	-6	-10	-14	-19
Internal exchanger cooling capacity factor		0,995	0,990	0,985	0,981	0,977	0,974	0,971	0,968
Internal exchanger compressor power input factor		0,997	0,993	0,990	0,988	0,986	0,984	0,982	0,981
Internal exchanger glycol solution flow factor		1,003	1,010	1,020	1,033	1,050	1,072	1,095	1,124
Internal exchanger pressure drop factor		1,029	1,060	1,090	1,118	1,149	1,182	1,211	1,243

Fouling Correction Factors

	Internal exchanger (evaporator)	
m2 °C / W	**F1**	**FK1**
0.44 x 10 (-4)	1,0	1,0
0.88 x 10 (-4)	0,97	0,99
1.76 x 10 (-4)	0,94	0,98

F1 = Cooling capacity correction factors

FK1 = Compressor power input correction factor

Overload and control device calibrations

		open	closed	Value
High pressure switch	[kPa]	4050	3300	-
Low pressure switch	[kPa]	450	600	-
Low pressure switch (Brine)	[kPa]	200	350	-
Antifreeze protection	[°C]	3	5,5	
High pressure safety valve	[kPa]	-	-	4500
Low pressure safety valve	[°C]	-	-	3000
Max no. of compressor starts per hour	[n°]	-	-	10
Discharge safety thermostat		-	-	120

Integrated heating capacities

Evaporator entering air temperature °C (B.S. / B.U)	-10 / -10,5	-5 / -5,4	0 / 0,6	5 / 3,9	Other
Heating capacity multiplication coefficient	0,90	0,89	0,88	0,91	1

Standard unit technical specifications

Compressor

First circuit: Scroll hermetic compressor controlled by inverter, complete with motor over-temperature and over-current devices and protection against excessive gas discharge temperature. Fitted on rubber antivibration mounts and complete with oil charge. The automatic oil heater prevents the oil from being diluted by the refrigerant when the compressor stops.

Second circuit: Hermetic orbiting scroll compressor, complete with motor over-temperature and over-current devices and protection against excessive gas discharge temperature. Fitted on rubber antivibration mounts and complete with oil charge. The automatic oil heater prevents the oil from being diluted by the refrigerant when the compressor stops.

Structure

Supporting structure made with zinc-magnesium sheet metal that ensures excellent mechanical features and high long-term resistance against corrosion.

Panelling

External pre-painted zinc-magnesium panelling that ensures superior resistance to corrosion for outdoor installation and eliminates the need for periodical painting. The panels can be easily removed to fully access internal components and are lined with sound-proof material on the inside to contain the unit's sound levels

Internal exchanger

Direct expansion heat exchanger, braze-welded AISI 316 stainless steel plates with large exchange surface and complete with external heat and anti-condensate insulation.

The exchanger is complete with:

- differential pressure switch, water side
- antifreeze heater to protect the water side exchanger, preventing the formation of frost if the water temperature falls below a set value.

External exchanger

Direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made from aluminium with a hydrophilic treatment, a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.

Fan

Axial fans with sickle profile blades terminating with "Winglets", directly coupled to the electronic controlled motor (IP54), driven by the magnetic switching of the stator. The brushless technology and the special supply increase both the life expectancy and the efficiency. As a result the electric consumption is reduced up to 50%. Fans are housed in aerodynamically shaped structures to increase efficiency and reduce noise level. The assembly is protected by accident prevention guards. Supplied with variable speed control.

Refrigeration circuit

Double refrigeration circuit complete, for each circuit, with:

- replaceable anti-acid solid cartridge dehydrator filter
- high pressure safety pressure switch
- low pressure transducer
- liquid receiver
- liquid separator
- refrigerant temperature probe
- electronic thermostatic expansion valve
- reverse valve of the 4-way cycle
- high pressure safety valve

Electrical panel

The capacity section includes:

- main door lock isolator switch
- isolating transformer for auxiliary circuit power supply
- on-off scroll compressor protection magnetothermic
- inverter scroll compressor protection fuses
- inverter, complete with thermal protection, for continuous control of the modulating scroll compressor revolutions
- fan protection fuses and thermal protection
- on-off scroll compressor control contactor

The control section includes:

- interface terminal with graphic display
- display of the set values, the error codes and the parameter index
- keys for ON/OFF control, cool and heat operating modes, alarm reset
- proportional-integral water temperature control
- daily, weekly programmer of temperature set-point and unit on/off
- set point compensation in function of the outdoor air temperature
- unit switching on management by local or remote (serial)
- antifreeze protection water side
- compressor overload protection and timer
- prealarm function for water antifreeze and high refrigerant gas pressure
- self-diagnosis system with immediate display of the error code
- automatic compressor start rotation control
- compressor operating hour display
- remote ON/OFF control
- relay for remote cumulative fault signal
- inlet for demand limit (power input limitation according to a 0÷10V external signal)
- digital input for double set-point enabling
- potential-free contacts for compressor status
- phase monitor

Electronic control

Description of step start-up control

The electronic control allows to manage the unit depending on the requested load.

The compressor step activation favours the maximum efficiency and manages at its best the inverter compressor.

The inverter compressor is activated first modulating the capacity in function of the installation return temperature and controlling the supply temperature with PID control.

Main controls

Leaving water temperature control with PID algorithm: it keeps the leaving mean temperatureto a set value.

- Auto-adaptive switching on differential: guarantees the compressors minimum operating time in systems with low water content.
- Set-point compensation with outdoor temperature
- Condensation control based on pressure
- Pre-alarms at automatic reset: in case of alarm it is allowed a certain number of restarts before the definitive lock.
- Compressor operating hour calculation
- Compressor start calculation
- Control and continuous management of the compressor operating conditions to guarantee the unit operating also in extreme conditions
- Water temperature check (when used) to avoid the pipe freezing
- "Anti-snow" function: in case of heavy snowfalls, it avoid the deposit of snow on fans
- Alarm log
- Autostart after voltage drop
- Local or remote control

Unit status display

By the user interface is possible to display:

- unit operating mode and status
- leaving/entering water temperature
- outdoor air temperature
- refrigeration circuit pressure and temperatures (circuit 1 and 2)
- signalling of alarms and anomalies in progress

Probe, transducer and parameter display

A user interface dedicated section allows the maintenance or technical assistance personnel to control the unit operating stata.

This section is accessible only by specialized personnel.

Management of more units in cascade (ECOSHARE)

It allows the management of several units hydraulically connected up to 1 master and 6 slave maximum.

Units must be of the same type: all reversible heat pumps, or all cool only, or all heat only. Sizes can be different.

The communication among the units is via a BUS serial cable allowing:

- supply water set-point setting of the slave units;
- setting of logics that increase the system energy efficiency
- unit operating hours balancing
- unit management in case of damage (only on slave unit)
- Hydronic assembly switch-off management of units not used

Remote control (RCTX)

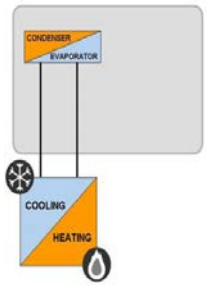
The remote control allows the full control of all unit functions from remote position.

Easy wall installation, it is similar in feature and functions to the built-in user interface

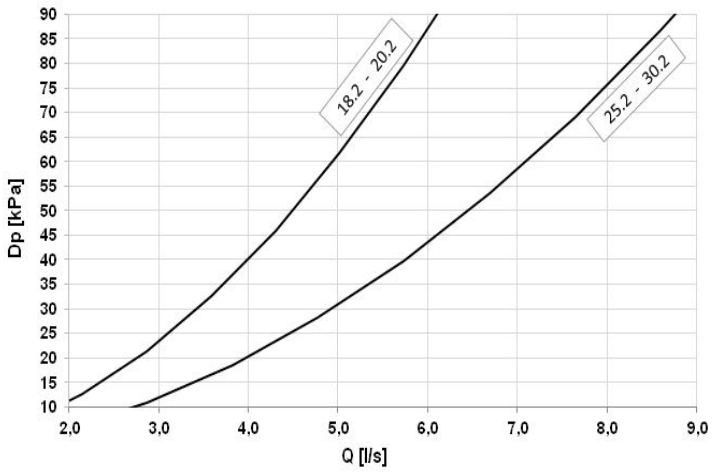
Hydronic assembly configuration - 1.1

Standard unit

Configuration without hydronic assembly, equipped with components as described on the water diagram key.
All water fittings are Victaulic type. It is possible to control an external pump by an on/off or 0-10V signal.



Internal exchanger pressure drop curves



Pressure drop water side are calculated considering a mean water temperature of 7°C

Q = Water flow-rate [l/s]
DP = Pressure drop [kPa]

The water flow-rate can be calculated with the following formula:

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

kWf = Cooling capacity [kW]
DT = Difference between leaving/entering water temperature.

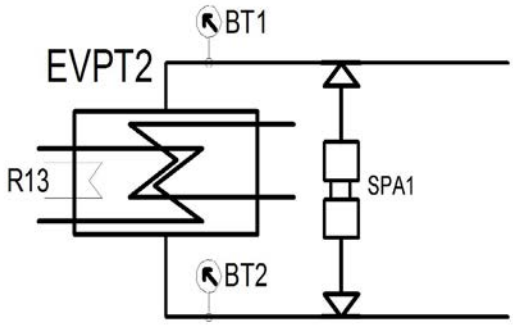
To the internal exchanger pressure drops must be added the pressure drops of the steel mesh mechanical strainer that must be placed on the water input line. It is a device compulsory for the correct unit operation, and it is available as IFWX accessory..

Admissible water flow-rates

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

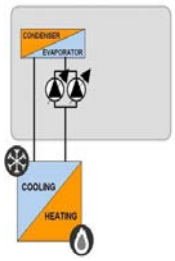
EXCELLENCE		18.2	20.2	25.2	30.2
Qmin	[l/s]	2,0	2,0	2,6	2,6
Qmax	[l/s]	6,0	6,0	8,6	8,6

Water diagram



EVPT2 = Plate evaporator 2 circuits
R13 = Evaporator gropu heater user side
BT1 = Probes of air return/entering water temperature
BT2 = Probes of air supply/leaving water temperature
SPA1 = Differential pressure switch user water side

Hydronic assembly configuration - 1.2
Unit with VARYFLOW + (VARYP)

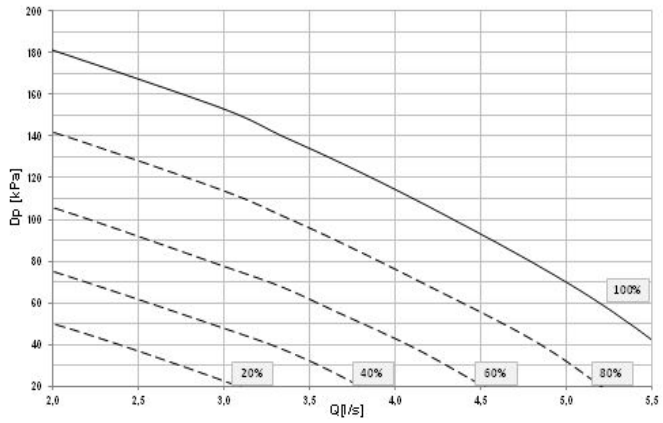


Configuration with 2 centrifugal electric pumps arranged in parallel and controlled by inverter, with housing and impeller made with AISI 304 stainless steel, and components as described on the water diagram key. All water fittings are Victaulic type.

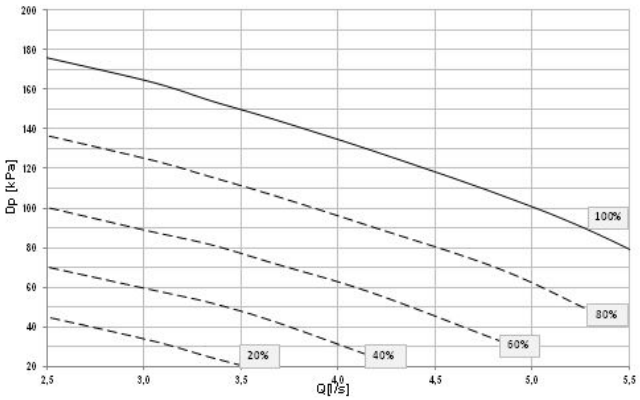
The electric pumps are equipped with three-phase electric motor with IP55-protection and complete with thermoformed insulated casing.

The control, modulates the water flow-rate keeping constant the delta T. If the water temperature is in critical conditions, it allows to extend the unit operating ranges guaranteeing its operating, automatically reducing the water flow-rate. In the event of one of the two pumps is temporarily unavailable, it guarantees about the 80% of the nominal flow-rate.

Available pressure VARYFLOW + (Size 18.2 - 20.2)

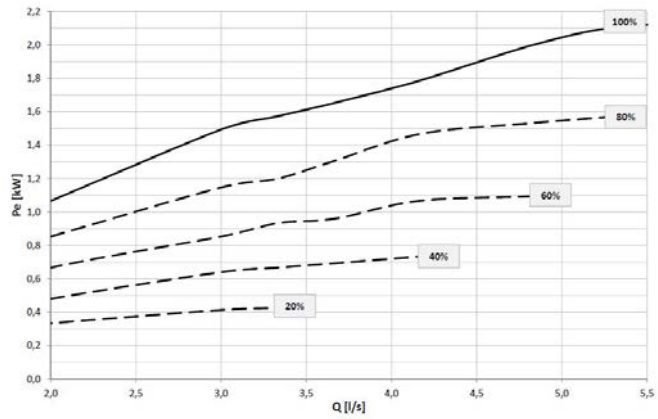


Available pressure VARYFLOW + (Size. 25.2 - 30.2)



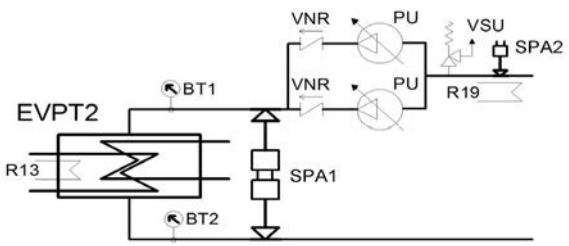
Q = Water flow-rate [l/s]
DP = Pressure head, available to the unit fittings [kPa]

Absorption curves VARYFLOW +



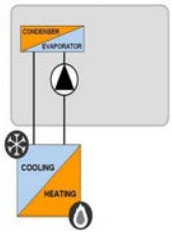
Q = Water flow-rate [l/s]
Pe = Electric power consumption [kW]

Water diagram



EVPT2 = Plate evaporator 2 circuits
R13 = Evaporator gropu heater user side
BT1 = Probes of air return/entering water temperature
BT2 = Probes of air supply/leaving water temperature
VNR = Non return valves
SPA1 = Differential pressure switch user water side
PU = Pump user side (VARYFLOW +)
VSU = Water safety valve
R19 = Hydronic assembly heaters
SPA2 = Installation load pressure switch user side

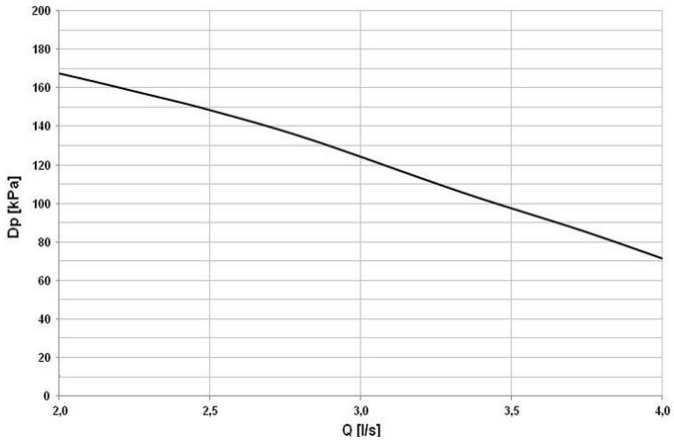
Hydronic assembly configuration - 1.3
Unit with ON/OFF pump (HYG1)



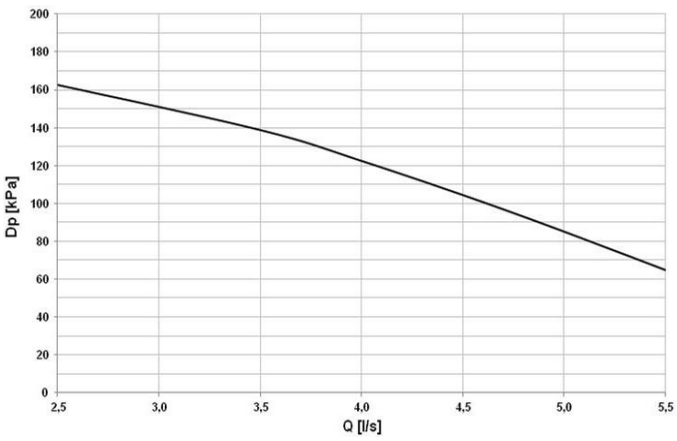
Configuration with 1 centrifugal electric pump, with housing and impeller made with AISI 304 stainless steel, and components as described on the water diagram key. All water fittings are Victaulic type.

The electric pump is equipped with three-phase electric motor with IP55-protection and complete with thermoformed insulated casing.

ON/OFF pump available pressure (Size 18.2-20.2)

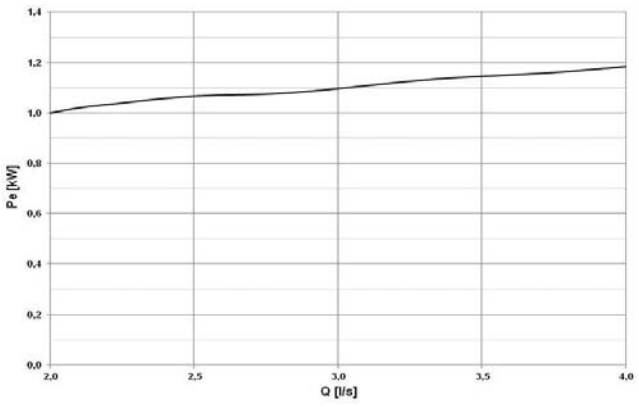


ON/OFF pump available pressure (Size 25.2-30.2)

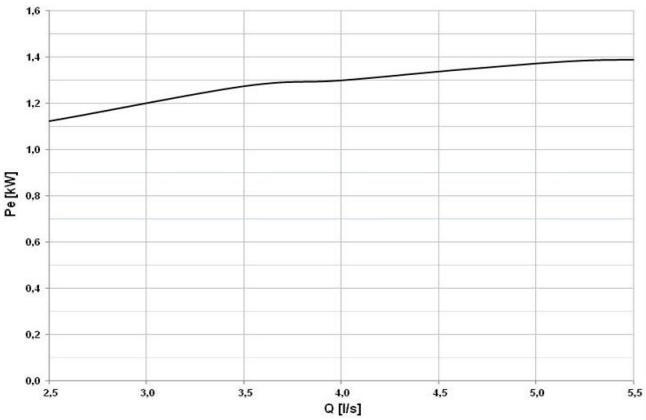


Q = Water flow-rate [l/s]
DP = Pressure head, available to the unit fittings [kPa]

ON/OFF pump absorption curves (Size 18.2-20.2)

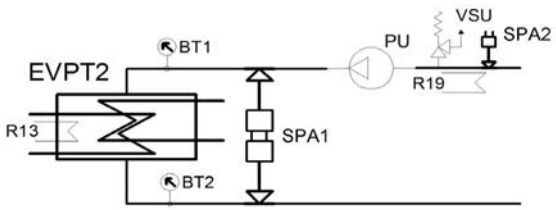


ON/OFF pump absorption curves (Size 25.2-30.2)



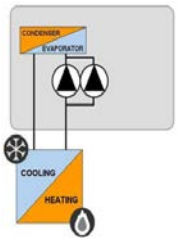
Q = Water flow-rate [l/s]
Pe = Electric power consumption [kW]

Water diagram



EVPT2 = Plate evaporator 2 circuits
R13 = Evaporator gropu heater user side
BT1 = Probes of air return/entering water temperature
BT2 = Probes of air supply/leaving water temperature
SPA1 = Differential pressure switch user water side
PU = Pump user side (VARYFLOW +)
VSU = Water safety valve
R19 = Hydronic assembly heaters
SPA2 = Installation load pressure switch user side

Hydronic assembly configuration - 1.4
Unit with two ON/OFF pumps (HYG2)

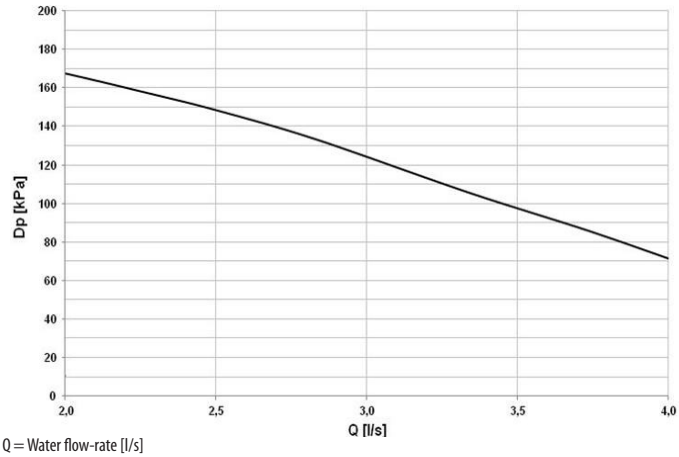


Configuration with 2 centrifugal electric pumps, 1 stand-by, with housing and impeller made with AISI 304 stainless steel, and components as described on the water diagram key. All water fittings are Victaulic type.

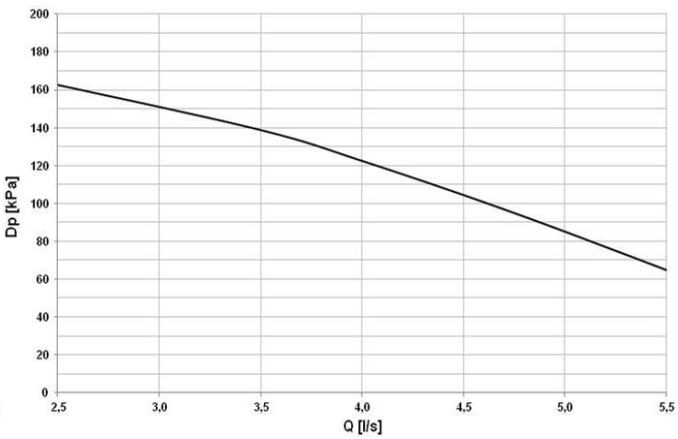
The electric pump is equipped with three-phase electric motor with IP55-protection and complete with thermoformed insulated casing.

The control balances the operating hours and in case of failure it is signaled and the stand-by pump is automatically activated.

ON/OFF pump available pressure (Size18.2-20.2)

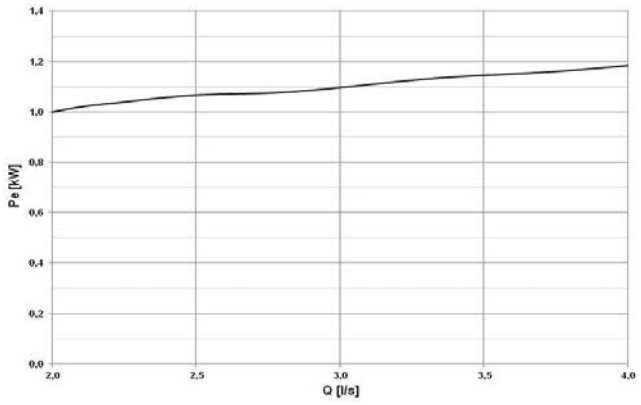


ON/OFF pump available pressure (Size 25.2-30.2)

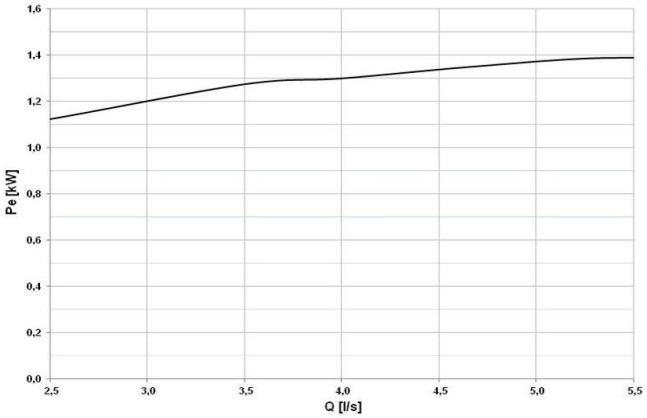


Q = Water flow-rate [l/s]
DP = Pressure head, available to the unit fittings [kPa]

ON/OFF pump absorption curves (Size 18.2-20.2)

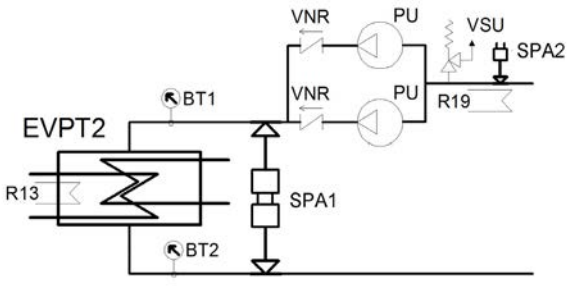


ON/OFF pump absorption curves (Size 25.2-30.2)



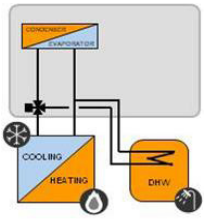
Q = Water flow-rate [l/s]
Pe = Electric power consumption [kW]

Water diagram



EVPT2 = Plate evaporator 2 circuits
R13 = Evaporator gropu heater user side
BT1 = Probes of air return/entering water temperature
BT2 = Probes of air supply/leaving water temperature
VNR = Non return valves
SPA1 = Differential pressure switch user water side
PU = Pump user side (VARYFLOW +)
VSU = Water safety valve
R19 = Hydronic assembly heaters
SPA2 = Installation load pressure switch user side

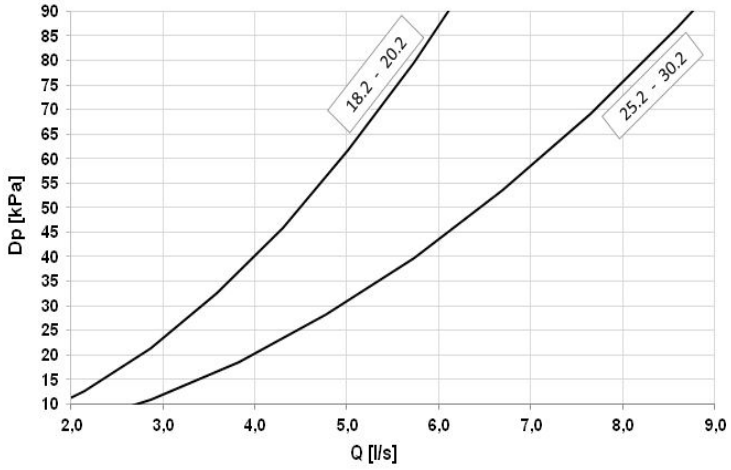
Hydronic assembly configuration - 2.1
Unit with DHW switching valve ACS (VACS)



Configuration with on/off 3-way valve for the water flow-rate diverting, and components as described on the water diagram key. All water fittings are Victaulic type.

The DHW is called by the closure of the potential-free contact present in the unit electric panel.In heating, the control regulates the 3-way valve commutation because it deviates the flow-rate from installation to DHW storage tank, changes the installation set into the DHW one, thermoregulates and activates or deactivates the compressors depending on the distance from the DHW set. In cooling, the control switches off the compressors due to the mode changing, regulates the 3-way valve commutation and starts the compressors after the safety time owed to on/off.

Internal exchanger pressure drop curves



Pressure drop water side are calculated considering a mean water temperature of 7°C

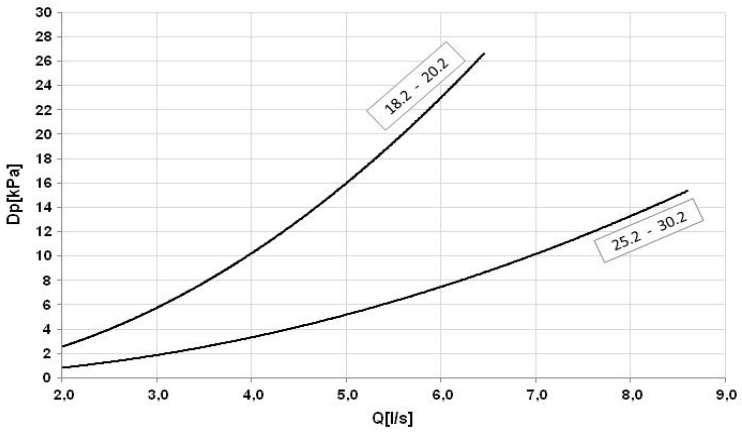
Q = Water flow-rate [l/s]
DP = Pressure drop [kPa]

The water flow-rate can be calculated with the following formula:

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

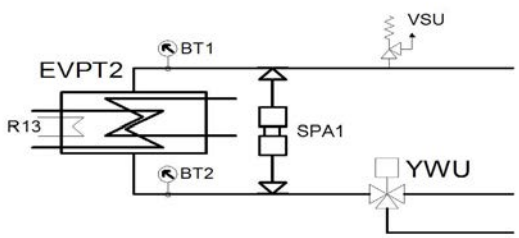
kWf = Cooling capacity [kW]
DT = Difference between leaving/entering water temperature.

3-way valve pressure drop curves



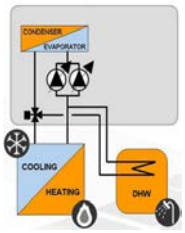
Q = Water flow-rate [l/s]
DP = Pressure drop [kPa]

Water diagram



EVPT2 = Plate evaporator 2 circuits
R13 = Evaporator gropu heater user side
BT1 = Probes of air return/entering water temperature
BT2 = Probes of air supply/leaving water temperature
SPA1 = Differential pressure switch user water side
VSU = Water safety valve
YWU = Motorized valve for DHW user side

Hydronic assembly configuration - 2.2
Unit with DHW switching valve and VARYFLOW + (VACS+VARYP)



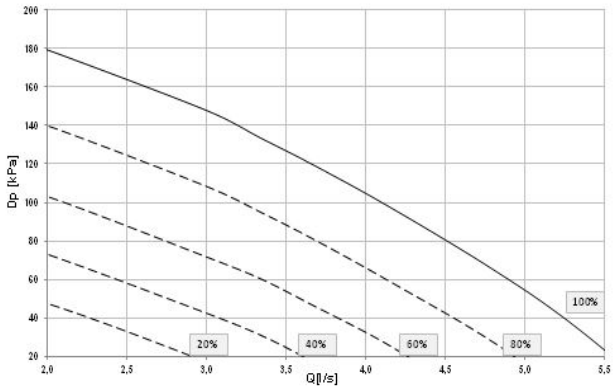
Configuration with 2 centrifugal electric pumps arranged in parallel and controlled by inverter, with housing andimpeller made with AISI 304 stainless steel, on/off 3-way valve for the water flow-rate diverting, and components as described on the water diagram key. All water fittings are Victaulic type.

The electric pump is equipped with three-phase electric motor with IP55-protection and complete with thermoformed insulated casing.

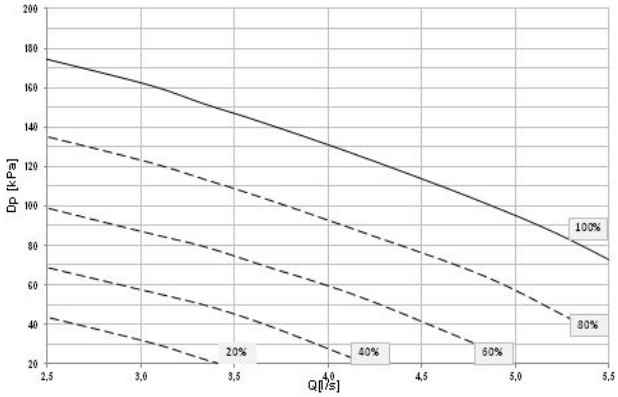
The control, modulates the water flow-rate keeping constant the delta T. If the water temperature is in critical conditions, it allows to extend the unit operating ranges guaranteeing its operating, automatically reducing the water flow-rate. In the event of one of the two pumps is temporarily unavailable, it guarantees about the 80% of the nominal flow-rate.

The DHW is called by the closure of the potential-free contact present in the unit electric panel.In heating, the control regulates the 3-way valve commutation because it deviates the flow-rate from installation to DHW storage tank, changes the installation set into the DHW one, thermoregulates and activates or deactivates the compressors depending on the distance from the DHW set. In cooling, the control switches off the compressors due to the mode changing, regulates the 3-way valve commutation and starts the compressors after the safety time owed to on/off.

Available pressure VARYFLOW + (Size 18.2 - 20.2)

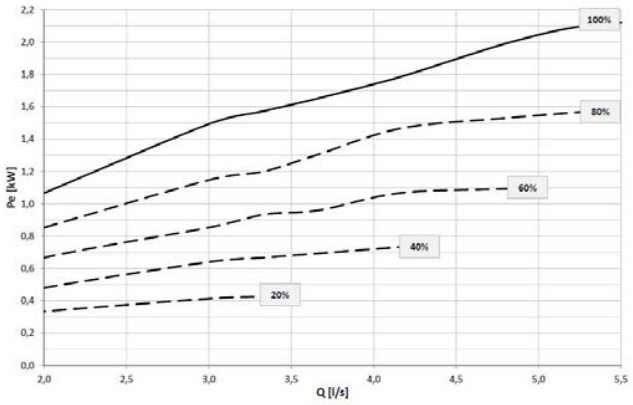


Available pressure VARYFLOW + (Size 25.2 - 30.2)



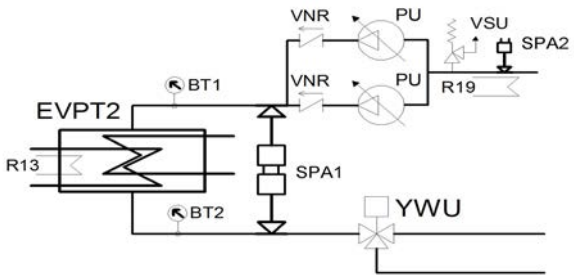
Q = Water flow-rate [l/s]
DP = Pressure head, available to the unit fittings [kPa]

Absorption curve WARYFLOW +



Q = Water flow-rate [l/s]
Pe = Electric power consumption [kW]

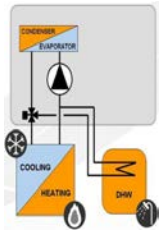
Water diagram



EVPT2 = Plate evaporator 2 circuits
R13 = Evaporator gropu heater user side
BT1 = Probes of air return/entering water temperature
BT2 = Probes of air supply/leaving water temperature
VNR = Non return valves
SPA1 = Differential pressure switch user water side
PU = Pump user side (VARYFLOW +)
VSU = Water safety valve
R19 = Hydronic assembly heaters
SPA2 = Installation load pressure switch user side
YWU = Motorized valve for DHW user side

Hydronic assembly configuration - 2.3

Unit with DHW switching valve and ON/OFF pump (VACS+HYG1)

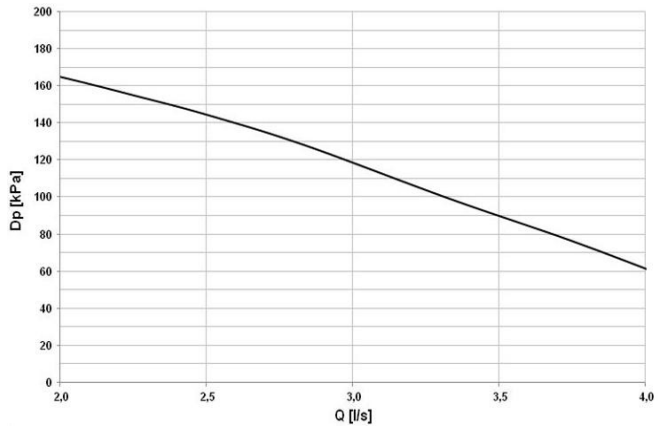


Configuration with 1 centrifugal electric pump, housing and impeller made with AISI 304 stainless steel, on/off 3-way valve for the water flow-rate diverting, and components as described on the water diagram key. All water fittings are Victaulic type.

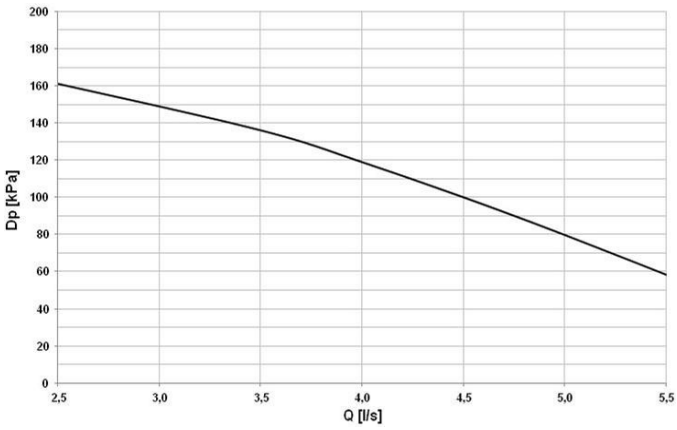
The electric pump is equipped with three-phase electric motor with IP55-protection and complete with thermoformed insulated casing.

The DHW is called by the closure of the potential-free contact present in the unit electric panel. In heating, the control regulates the 3-way valve commutation because it deviates the flow-rate from installation to DHW storage tank, changes the installation set into the DHW one, thermoregulates and activates or deactivates the compressors depending on the distance from the DHW set. In cooling, the control switches off the compressors due to the mode changing, regulates the 3-way valve commutation and starts the compressors after the safety time owed to on/off.

ON/OFF pump available pressure(Size18.2-20.2)

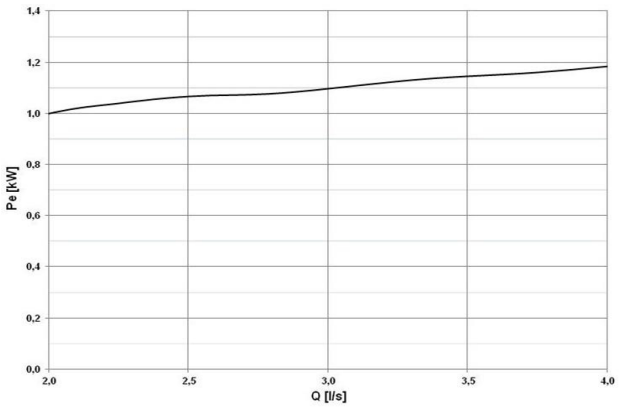


ON/OFF pump available pressure(Size 25.2 -30.2)

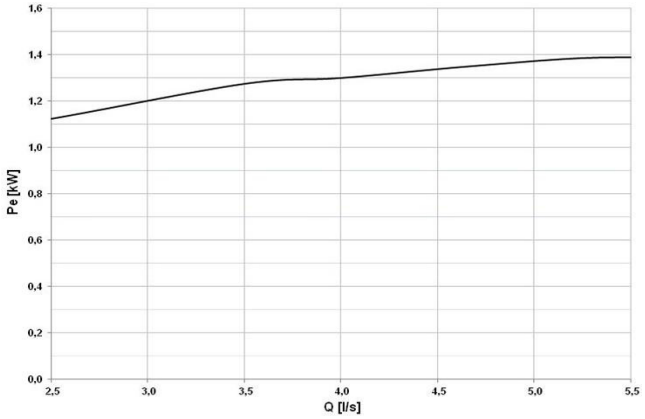


Q = Water flow-rate [l/s]
DP = Pressure head, available to the unit fittings [kPa]

ON/OFF pump absorption curves (Size 18.2-20.2)

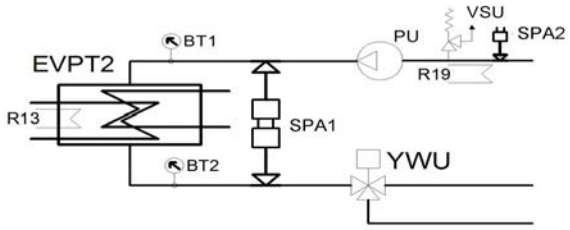


ON/OFF pump absorption curves (Size 25.2-30.2)



Q = Water flow-rate [l/s]
Pe = Electric power consumption [kW]

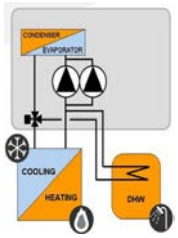
Water diagram



EVPT2 = Plate evaporator 2 circuits
R13 = Evaporator gropu heater user side
BT1 = Probes of air return/entering water temperature
BT2 = Probes of air supply/leaving water temperature
SPA1 = Differential pressure switch user water side
PU = Pump user side (VARYFLOW +)
VSU = Water safety valve
R19 = Hydronic assembly heaters
SPA2 = Installation load pressure switch user side
YWU = Motorized valve for DHW user side

Hydronic assembly configuration - 2.4

Unit with DHW switching valve and two ON/OFF pumps (VACS+HYG2)



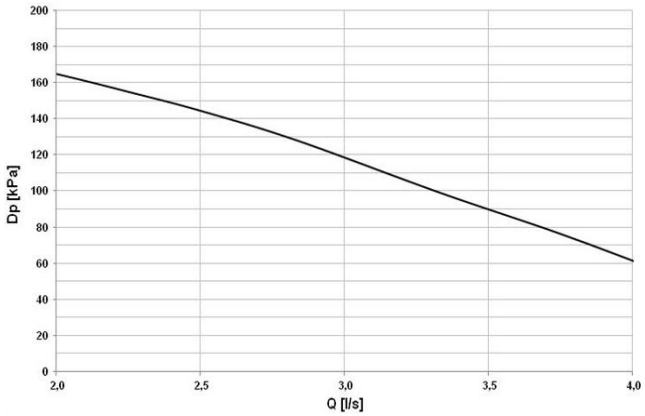
Configuration with 2 centrifugal electric pumps, 1 stand-by, with housing and impeller made with AISI 304 stainless steel, on/off 3-way valve for the water flow-rate diverting, and components as described on the water diagram key. All water fittings are Victaulic type.

The electric pumps are equipped with three-phase electric motor with IP55-protection and complete with thermoformed insulated casing.

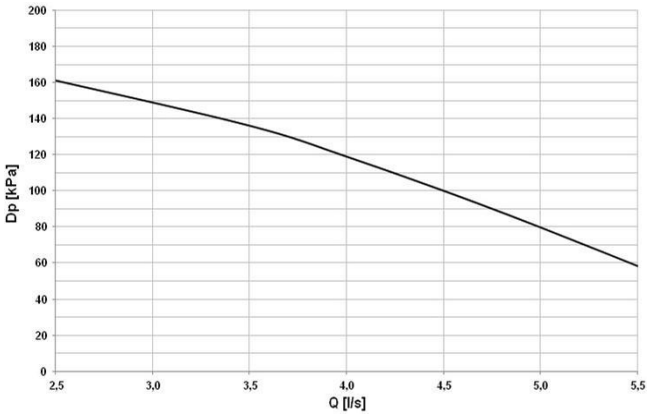
The control balances the operating hours and in case of failure it is signaled and the stand-by pump is automatically activated.

The DHW is called by the closure of the potential-free contact present in the unit electric panel.In heating, the control regulates the 3-way valve commutation because it deviates the flow-rate from installation to DHW storage tank, changes the installation set into the DHW one, thermoregulates and activates or deactivates the compressors depending on the distance from the DHW set. In cooling, the control switches off the compressors due to the mode changing, regulates the 3-way valve commutation and starts the compressors after the safety time owed to on/off.

ON/OFF pump available pressure(Size 18.2-20.2)

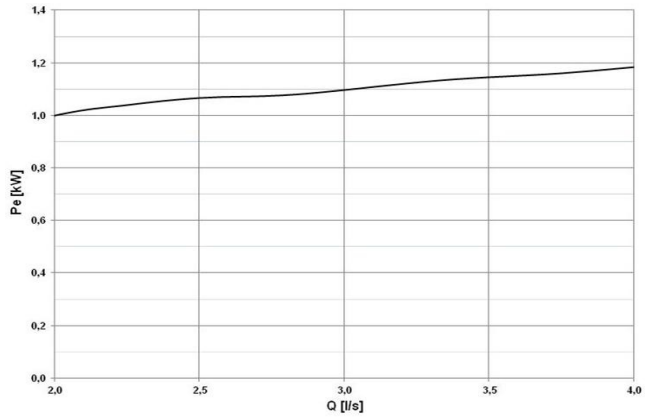


ON/OFF pump available pressure(Size 25.2-30.2)

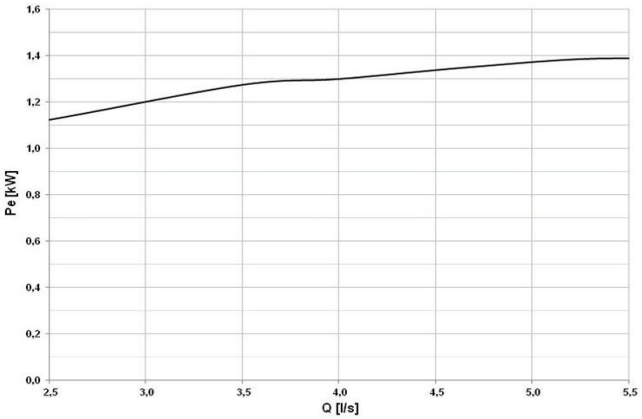


Q = Water flow-rate [l/s]
DP = Pressure head, available to the unit fittings [kPa]

ON/OFF pump absorption curves (Size 18.2-20.2)

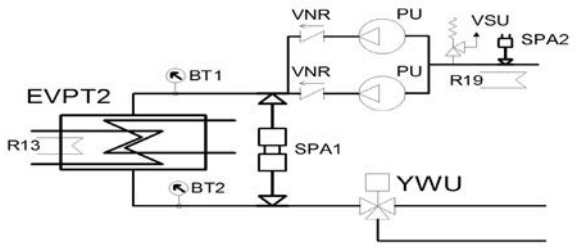


ON/OFF pump absorption curves (Size 25.2-30.2)



Q = Water flow-rate [l/s]
Pe = Electric power consumption [kW]

Water diagram



EVPT2 = Plate evaporator 2 circuits
R13 = Evaporator gropu heater user side
BT1 = Probes of air return/entering water temperature
BT2 = Probes of air supply/leaving water temperature
VNR = Non return valves
SPA1 = Differential pressure switch user water side
PU = Pump user side (VARYFLOW +)
VSU = Water safety valve
R19 = Hydronic assembly heaters
SPA2 = Installation load pressure switch user side
YWU = Motorized valve for DHW user side

Built-in configuration options

CCCA - Copper / aluminium condenser coil with acrylic lining

Coils with copper pipes and aluminium fins with acrylic lining. Resist bi-metallic corrosion and allow for application in coastal areas.

Attention!

- Cooling capacity variation -2.7%
- Variation in compressor power input +4.2%
- Operating range reduction -2.1°C

CCCA1 - Condenser coil with Energy Guard DCC Aluminum

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.

PFCP - Power factor correction capacitors (cosfi>0,9)

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

MF2 - Multi-function phase monitor

The multifunction phase monitor controls the presence and the correct phase sequence, checks any voltage anomalies (+/–10%), automatically reset the unit operating as the correct power supply is restored.

This control allows to:

- protect components inside the unit, as if they are powered by an anomalous voltage they may operate incorrectly or break;
- quickly identify, among the alarms of the unit's components, what really caused the malfunction due to the sudden change of voltage.

SFSTR4N - Disposal for inrush current reduction, for unit 400/3/50+N

Electronic device that automatically and gradually starts the compressors, thereby reducing the current peak generated in star-triangle start-ups and therefore reduces the mechanical stress on the motor and the electrodynamic stress on the power cables and on the mains.

PGFC – Finned coil protection grill

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.

HEDIF - Diffuser for high efficiency axial fan

The new AxiTop diffuser creates an ideal air distribution: aerodinamically decelerates the flow and transforms most of its kinetic energy in static pressure, obtaining:

- Down to –3 dB of silence
- 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.

CMSC8 - Serial communication module to BACnet supervisor

Allows the serial connection to supervision systems by using BACnet-IP as a communication protocol. It allows the access to the entire list of operating variables, controls and alarms. With this accessory every unit can communicate 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)

CMSC9 - Serial communication module to 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 to 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.

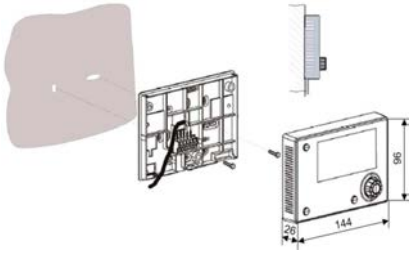
The device is installed and wired built-in the unit.

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.

Accessories separately supplied

RCTX - Remote 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 the features of the device can be replicated with a normal laptop connected to the unit with an Ethernet network cable and an internet browser.

The device should be installed on the wall using suitable plugs, electrically hooked up and connected to the unit (installation and wiring are the responsibility of the Customer). Max. remote distance 350 m without auxiliary supply.

Data and power supply serial connection cable no.1 shielded twisted pair. Conductor diameter 0.8 mm.

BACX - BACnet communication serial module

Allows the serial connection to supervision systems by using BACnet-IP as a communication protocol. It allows the access to the entire list of operating variables, controls and alarms. With this accessory every unit can communicate with the main supervision systems.

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)

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

CMSLWX - 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 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.

PGFCX - Finned coil protection grill

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.

This option is not suitable for application in sulphuric environments

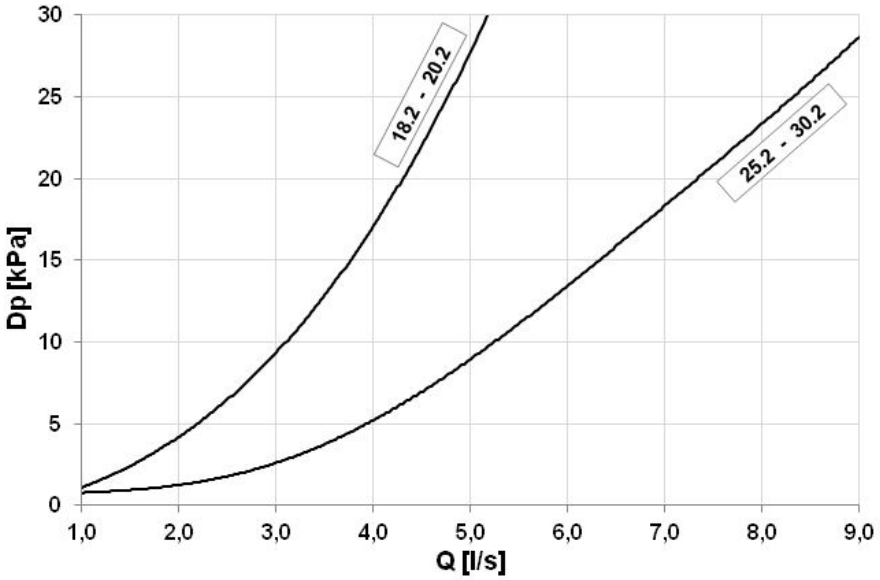
AVIBX - Anti-vibration mount support

The rubber 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.

IFWX - Steel mesh strainer 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 strainer pressure drops



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

Heating Perfornace

Size	Tae (°C) DB/WB	Internal exchanger leaving water temperature (°C)									
		25		35		45		55		60	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
18.2	-15 / -15.4	30.4	9.45	30.2	11.4	-	-	-	-	-	-
	-10 / -10.5	36.1	9.65	35.8	11.6	-	-	-	-	-	-
	-7 / -8	39.4	9.77	39.1	11.8	39.1	14.2	-	-	-	-
	0 / -0.6	48.6	10.1	47.9	12.2	47.0	14.6	-	-	-	-
	7 / 6	58.5	10.4	57.3	12.5	55.7	15.0	51.9	18.6	51.1	20.7
	15 / 13	71.5	10.8	69.4	12.9	67.1	15.4	62.0	19.0	61.3	21.0
	20 / 16	78.1	11.0	75.8	13.1	72.5	15.6	66.8	19.2	64.0	21.2
20.2	-15 / -15.4	38.5	11.8	38.5	14.3	-	-	-	-	-	-
	-10 / -10.5	45.3	12.1	44.9	14.6	-	-	-	-	-	-
	-7 / -8	49.3	12.2	48.7	14.7	48.2	17.8	-	-	-	-
	0 / -0.6	60.5	12.5	59.3	15.1	57.9	18.3	-	-	-	-
	7 / 6	72.4	12.9	70.3	15.5	68.0	18.7	64.2	23.2	62.9	25.7
	15 / 13	88.7	13.4	85.6	16.0	82.0	19.2	76.8	23.7	72.0	26.0
	20 / 16	95.8	13.6	92.3	16.2	88.2	19.4	82.1	23.9	79.0	26.3
25.2	-15 / -15.4	43.6	13.5	43.8	16.3	-	-	-	-	-	-
	-10 / -10.5	51.5	13.7	51.3	16.6	-	-	-	-	-	-
	-7 / -8	56.0	13.9	55.7	16.7	55.0	20.4	-	-	-	-
	0 / -0.6	69.2	14.2	68.0	17.2	66.1	20.8	-	-	-	-
	7 / 6	82.7	14.7	80.9	17.6	77.8	21.2	72.7	26.4	70.7	29.4
	15 / 13	101	15.3	98.1	18.2	93.1	21.7	86.0	26.7	84.2	29.7
	20 / 16	110	15.6	106	18.4	101	21.9	92.8	26.9	91.1	29.8
30.2	-15 / -15.4	52.1	16.2	52.7	19.6	-	-	-	-	-	-
	-10 / -10.5	61.3	16.6	61.4	20.0	-	-	-	-	-	-
	-7 / -8	66.4	16.8	66.3	20.3	65.8	24.5	-	-	-	-
	0 / -0.6	81.8	17.4	80.8	21.0	79.0	25.2	-	-	-	-
	7 / 6	98.2	18.1	96.0	21.6	92.6	25.8	86.4	31.7	85.4	35.3
	15 / 13	119	18.9	116	22.4	111	26.5	102	32.4	102	35.8
	20 / 16	130	19.3	126	22.8	120	26.9	111	32.8	110	36.2

kWt = Heating capacity to the internal exchanger (kW)
kWe = Compressor power input (kW)
Tae [°C]: external exchanger entering air temperature
Performance in function of the entering/leaving water temperature differential = 5°C

Cooling Performance

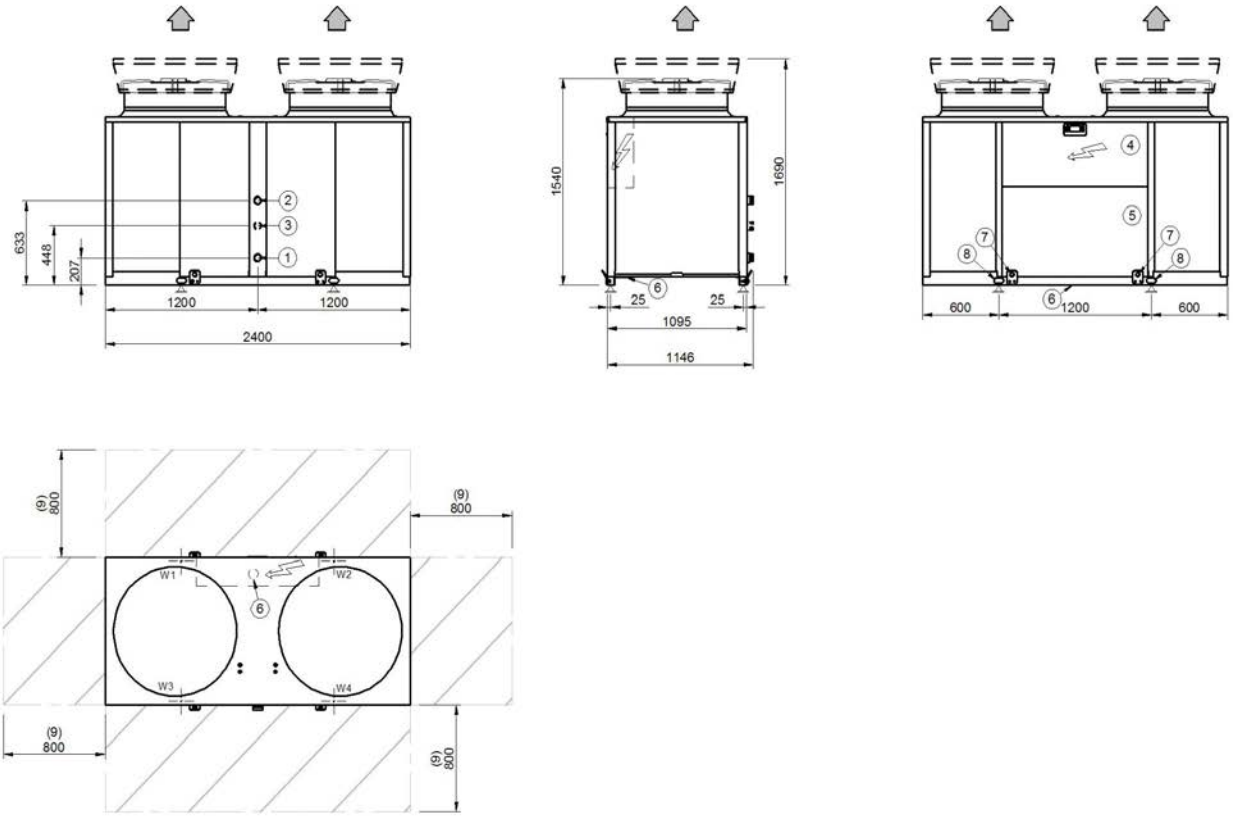
Size	To (°C)	Internal exchanger entering water temperature (°C)											
		20		25		30		35		40		45	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
18.2	5	52.6	10.9	50.5	12.0	48.3	13.1	46.4	14.3	42.1	15.8	38.1	17.7
	7	56.3	11.1	54.1	12.2	51.8	13.3	49.8	14.5	45.0	16.1	40.8	18.0
	10	62.1	11.4	59.8	12.5	56.9	13.6	54.7	14.9	49.5	16.4	44.9	18.3
	12	65.8	11.7	63.2	12.7	60.2	13.8	57.7	15.1	52.1	16.6	-	-
	15	71.6	12.0	68.9	13.0	65.4	14.2	62.7	15.4	56.7	16.9	-	-
	18	77.3	12.3	74.3	13.4	70.5	14.5	66.2	15.8	61.0	17.3	-	-
20.2	5	63.2	13.6	60.9	14.9	58.0	16.3	55.5	17.8	50.4	19.6	45.8	22.0
	7	67.4	13.9	64.9	15.2	62.0	16.6	59.6	18.1	53.9	20.0	49.0	22.4
	10	74.4	14.3	71.5	15.6	68.1	17.0	65.3	18.6	59.1	20.4	54.2	22.7
	12	78.9	14.6	75.5	15.9	71.8	17.4	68.6	18.9	62.0	20.7	-	-
	15	85.6	15.0	82.0	16.3	77.6	17.8	74.2	19.4	67.4	21.2	-	-
	18	91.7	15.5	87.9	16.8	83.1	18.3	77.7	19.8	71.7	21.8	-	-
25.2	5	75.4	15.5	72.6	16.8	69.4	18.4	66.0	20.1	60.3	22.1	55.1	24.6
	7	80.5	15.7	77.2	17.1	73.5	18.7	70.0	20.4	64.0	22.4	58.3	24.9
	10	88.1	16.2	84.5	17.6	80.6	19.1	76.4	20.9	69.9	22.9	64.0	25.3
	12	93.1	16.5	89.3	18.0	85.0	19.5	80.7	21.2	73.7	23.2	-	-
	15	101	17.1	97.3	18.5	92.3	20.0	87.1	21.8	79.7	23.7	-	-
	18	109	17.7	105	19.0	99.4	20.5	93.3	22.3	85.6	24.2	-	-
30.2	5	89.2	19.7	86.5	21.4	82.2	23.1	77.6	25.2	71.0	27.7	64.4	30.9
	7	94.9	20.1	91.8	21.8	87.2	23.6	82.5	25.6	75.2	28.1	68.5	31.2
	10	104	20.8	100	22.5	95.0	24.4	89.5	26.4	81.5	28.9	75.3	32.0
	12	110	21.3	106	23.0	100	24.8	94.0	26.9	86.3	29.2	-	-
	15	119	22.0	115	23.6	108	25.5	102	27.6	93.1	30.3	-	-
	18	128	22.8	123	24.4	116	26.2	109	28.4	99.9	31.0	-	-

kWf = Cooling capacity to the internal exchanger (kW)
kWe = Compressor power input (kW)
Tae [°C]: external exchanger entering air temperature
Performance in function of the entering/leaving water temperature differential = 5°C

Dimensional drawings

Size 18.2 - 20.2

DAAM118 2_20 2_0
08/04/2014



1. Return for the utility installation Ø 2"Victaulic
2. Supply to the utility installation Ø 2"Victaulic
3. DHW preparation water outlet Ø 2"Victaulic
4. Electrical panel
5. Compressor compartment
6. Power input
7. Lifting Brackets (Removable)
8. Unit fixing holes
9. Functional spaces

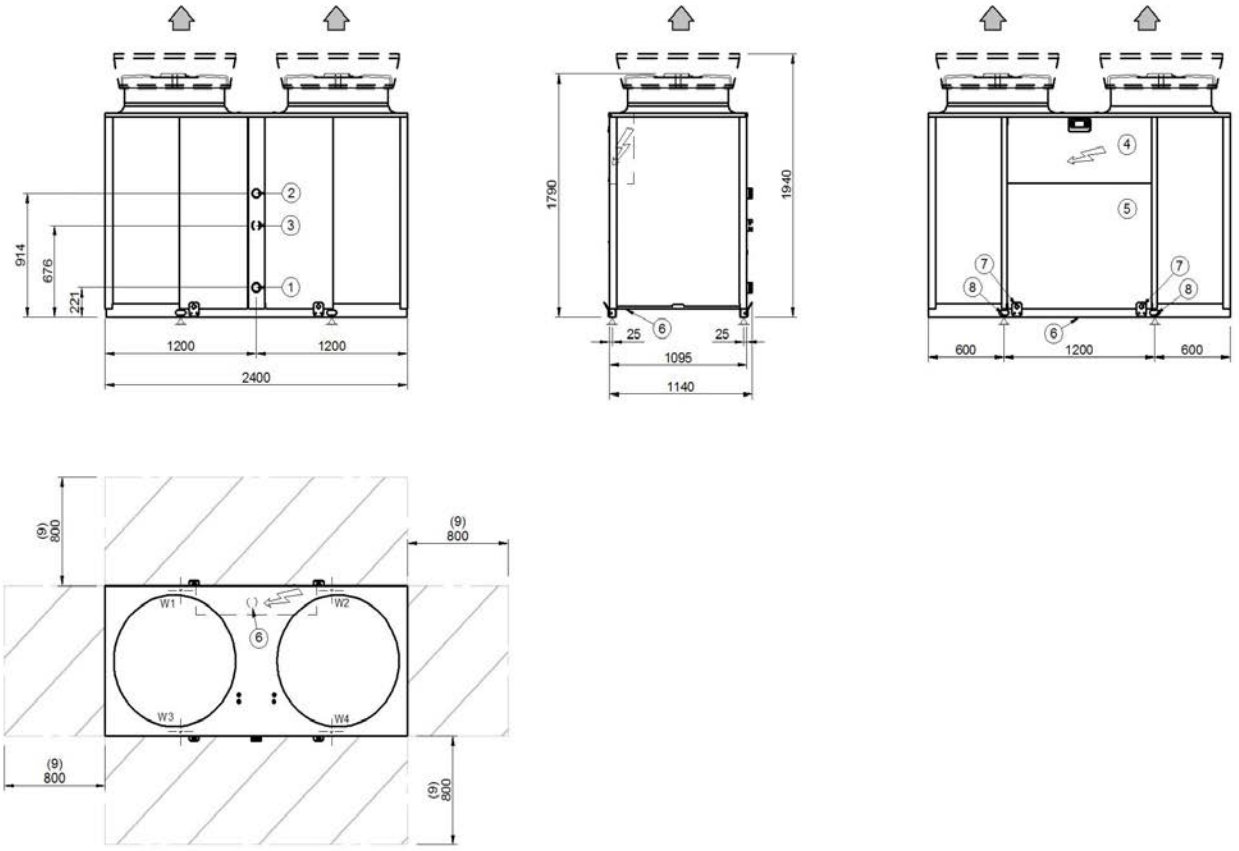
Size		18.2	20.2
A - Length	mm	2400	2400
B - Width	mm	1100	1100
C - Standard unit height	mm	1540	1540
C - Height with HEDIF option	mm	1690	1690
W1 Supporting Point	mm	174	179
W2 Supporting Point	kg	171	177
W3 Supporting Point	kg	131	133
W4 Supporting Point	kg	129	131
Shipping weight	kg	595	610
Operating weight	kg	605	620

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

Dimensional drawings

Size 25.2 - 30.2

DAAM125 2_30 2_0
08/04/2014



1. Return for the utility installation Ø 2"1/2 Victaulic
2. Supply to the utility installation Ø 2" 1/2 Victaulic
3. DHW preparation water outlet Ø 2"1/2 Victaulic
4. Electrical panel
5. Compressor compartment
6. Power input
7. Lifting Brackets (Removable)
8. Unit fixing holes
9. Functional spaces

Size		25.2	30.2
A - Length	mm	2400	2400
B - Width	mm	1100	1100
C - Standard unit height	mm	1790	1790
C - Height with HEDIF option	mm	1940	1940
W1 Supporting Point	kg	188	199
W2 Supporting Point	kg	190	198
W3 Supporting Point	kg	146	150
W4 Supporting Point	kg	146	148
Shipping weight	kg	655	675
Operating weight	kg	670	695

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

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