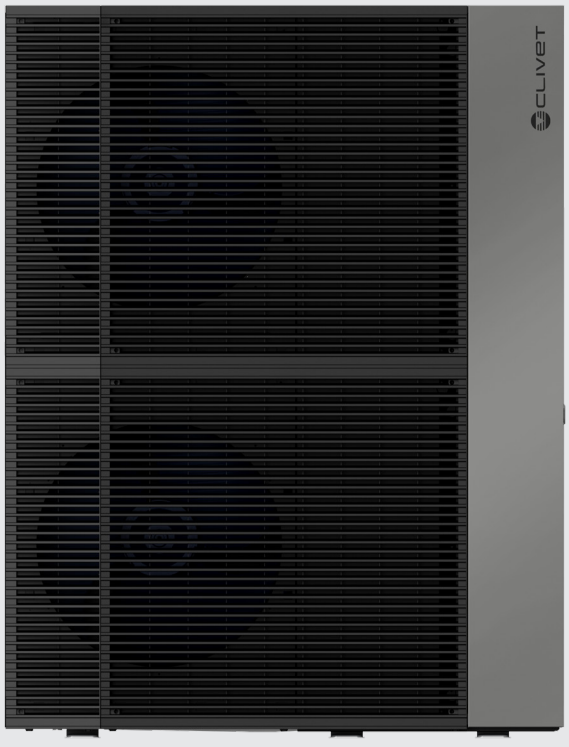
EDGE PRO L

WiSAN-PMP 1 S 12.1-14.1 RANGE

Air-to-water monobloc unit heat pump for heating, cooling and domestic hot water production



R-290

DESIGN AWARD 2025

TECHNICAL BULLETIN

SIZE	12.1	14.1
Nominal heating capacity [kW]	25.0	30.1
Nominal cooling capacity [kW]	26.0	30.1

Contents

General features

BIG EDGE PRO L:

BIG EDGE PRO L is a packaged reversible air/water heat pump for heating, cooling and domestic hot water production. The unit is designed and built to be installed outdoors, with only the power supply and water pipes needing to be connected.

WiSAN-PMP 1 S 12.1-14.1

Packaged reversible air/water heat pump

- Heating capacity 25 ÷ 30.1 kW
- Cooling capacity 26 ÷ 30.1 kW
- Seasonal efficiency class in heating mode (according to EU 811/2013):
  A+++ (water supply at 55 °C)
  A+++/A++ (water supply at 35°C)
- Produced water temperature up to 85°C
- Heating and DHW operation down to -25 °C outside air
- Low-GWP refrigerant

R-290

General features

Refrigeration circuit

The unit is equipped with a vapour compression refrigerant circuit, which includes the following main components:

- Brushless DC inverter scroll compressor with EVI technology, complete with suction and discharge gas temperature probes, and crankcase heater for preheating the oil.
- Source side (air) finned coil heat exchanger with "Blue Fin" protective treatment.
- User side (water) plate heat exchanger with additional electric antifreeze heater.
- Intermediate plate heat exchanger (economiser) for EVI technology.
- Electronic expansion valve (EEV) with PWM control logic.
- Intermediate electronic expansion valve for EVI technology.
- 4-way valve for reversing the refrigerating cycle (heat pump).
- Liquid separator and receiver.
- Filter drier.
- High and low pressure transducers.
- High pressure safety switch.
- Pressure relief valve.

Compressor

The unit uses a hermetic DC Inverter Scroll compressor with soft start. The inverter control constantly modulates the power output based on the actual thermal demand, ensuring maximum reliability, low consumption and high seasonal efficiency.
It is equipped with multiple protections (motor thermal, overcurrent, supply gas overheating) and comes complete with oil charge. An automatically activated crankcase heater prevents the refrigerant from diluting the oil when the compressor stops. To ensure silent operation, it is installed on rubber anti-vibration mounts and enclosed in a sound-absorbing casing that minimises noise emissions.

Refrigerant

The unit uses the natural refrigerant R-290 (Propane), which has a low environmental impact.

Fan

The unit is equipped with two axial fans with airfoil ("sickle") blades made of ABS resin. The fan is housed in an aerodynamic opening designed to maximise efficiency and reduce noise. The motor is a high-efficiency, directly coupled, variable speed, brushless DC motor. This allows continuous air flow adjustment based on operating conditions, optimising heat exchange.

User side (System) exchanger

Brazed plate heat exchanger in AISI 316 stainless steel, featuring low refrigerant content and a large exchange surface area. It has an external anti-condensation thermal insulation shell made of sintered expanded polypropylene (10 mm thick). Temperature probes on the water inlet and outlet constantly monitor operation and activate antifreeze protection (via the additional heater) if the water temperature falls below the safety thresholds. This protection function remains active even when the unit is in stand-by mode.

Source side (Air) exchanger

Direct expansion finned coil, consisting of copper tubes mechanically expanded to ensure a perfect fit with the aluminium fins. The spacing between the fins is optimised to maximise heat exchange efficiency and reduce the frequency of defrosting, improving seasonal efficiency.
The fins feature the special "Blue fin" hydrophilic treatment which facilitates the drainage of condensate and improves performance during defrosting. The circuit design ensures efficient distribution of the refrigerant during evaporation (heating mode) to prevent ice formation at the bottom of the coil. Two dedicated probes (outdoor air temperature and coil temperature) monitor operating conditions to optimise defrosting logic.

EVI economiser and expansion valve

The unit features EVI (Enhanced Vapor Injection) technology with an optimised refrigerant circuit.
This circuit includes an intermediate laminating valve (electronic) and an economiser (intermediate plate heat exchanger). The system works by leaking a fraction of the post-condensation liquid refrigerant, then expanding it through the intermediate valve and using it in the economiser to subcool the main refrigerant flow. The intermediate pressure vapour generated in this way is injected directly into the compressor port, ensuring increased heat capacity and efficiency (COP) at low outdoor temperatures.

Structure

Self-supporting structure designed for outdoor installation. The base and supporting frame are made of sheet metal (12/10 thick) with a hot-dip galvanising treatment and internal insulation in thermoformed material. The polyester powder coating (metallic grey) applied to visible parts ensures excellent and long-lasting resistance to corrosion and atmospheric agents.

Panelling

The cover panels are made of zinc-magnesium sheet metal, an alloy that offers superior corrosion resistance, eliminating the need for periodic repainting. The panels (metallic grey) are easily removable to allow full access to internal components during inspection and maintenance operations.

Grille

The fan protection grilles are made of ABS (ISO

14001/9001/50001 certified), a weather-resistant material. They are designed for easy maintenance: by unscrewing 4 corner screws, the grilles can slide on dedicated rails, facilitating access.

Base

Base equipped with a standard electric antifreeze heater. This heating element, automatically activated by the unit's control logic, will have the specific function of preventing the condensate produced during defrost cycles from freezing, ensuring proper water drainage and full operating efficiency even at the coldest outdoor temperatures.

Water circuit

The unit comes complete with an integrated hydronic unit, ready for connection to the system. It includes:
- High-efficiency modulating primary circulator
- Pressure relief valve (3 bar)
- Automatic air purge valve
- Compound flow meter
- Water side pressure transducer

Pump (Circulator)

The primary circulator is a modulating type, equipped with a brushless DC motor (IP44 protection rating). The rotation speed is managed by a self-regulating inverter control, which adapts the flow-rate to maintain the supply water flow temperature set-point.

Electrical panel (Power supply and Control)

The electrical panel, housed inside the unit and protected by a special panel, is divided into a power section and a control section.

Power Section:

- Inverter board for management of the compressor.
- Terminal block for main power supply

Control Section:

- Main control board (refrigerant circuit): manages all sensors (outdoor air temperature, evaporation, condensation, compressor) and implements the optimised defrosting algorithm.
- Hydronic control board: connected to the flow switch (water shortage protection) and water temperature probes (supply and return).
- Terminal blocks and I/O:
  - Connection terminals for unit functions.
  - Terminals for connecting the remote user interface.
  - Inputs for 1 or 2 zone thermostats.
  - Input for remote ON/OFF enabling.
  - Inputs for optional probes (e.g. auxiliary source, DHW tank, secondary circuit).
  - Digital outputs for alarm status and defrosting.
  - Outputs for controlling external pumps (e.g. secondary, DHW recirculation, solar thermal).
  - Output for enabling an auxiliary heat source.
  - Output for controlling the electric heater of a DHW tank (max 4 kW).
  - RS485 communication port (on user interface) with Modbus protocol.

User interface

The user interface (remote control) allows complete control of the unit's parameters and management of the main system components. It integrates an ambient temperature sensor, enabling it to function as a zone thermostat. It also includes a Wi-Fi module for management and monitoring via a dedicated App.

Main functions:

- Basic settings: ON/OFF, mode selection (Heating, Cooling, DHW), set-point setting (room, water, DHW).
- Time schedule: daily and weekly (time bands, set-points and modes).
- Climatic curve: automatic management of the set-point based on the outdoor temperature.
- Zone management: control of a second system zone (if configured).
- Source management: priority of auxiliary heat sources.
- Special functions: scheduling and activation of ECO mode, SILENT mode and Antilegionella cycle.
- Diagnostics: monitoring of all operating parameters.
- Alarms: display and alarm log.

Accessories supplied with the unit

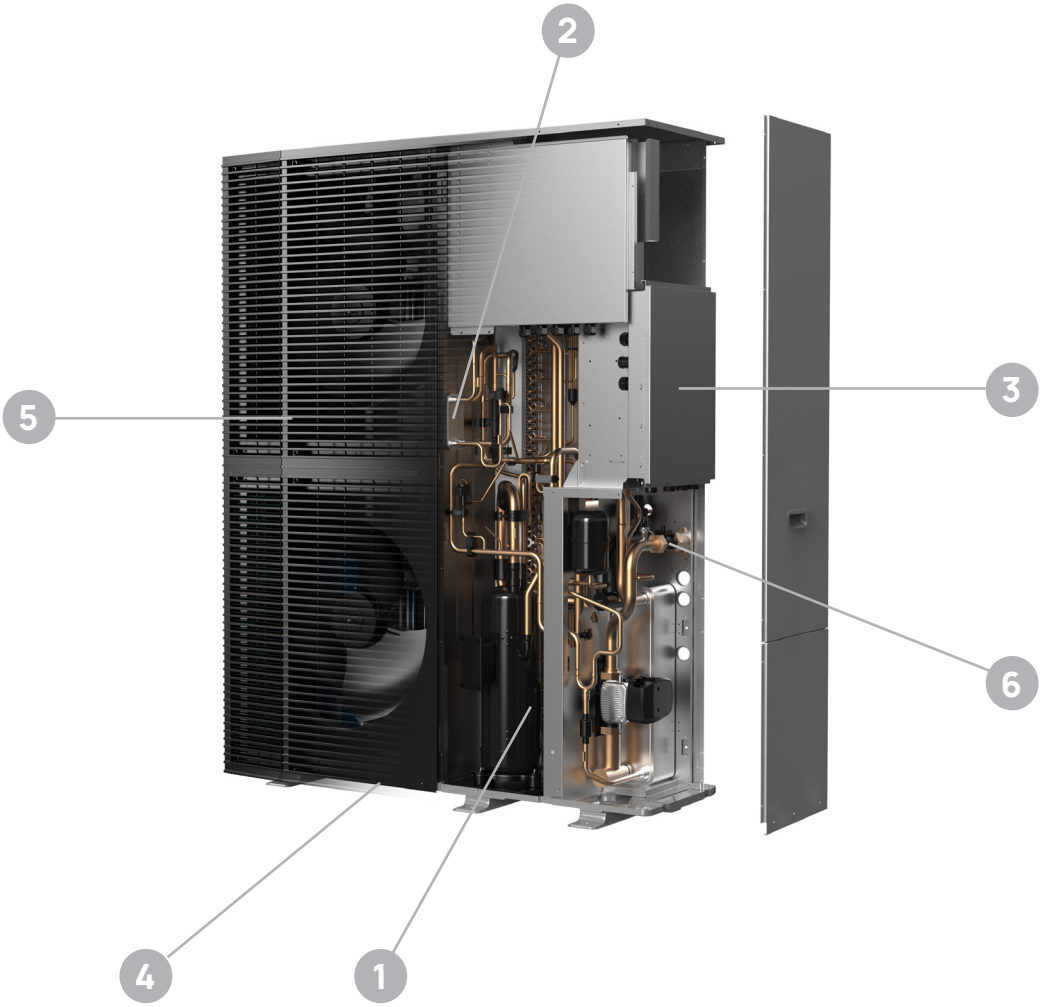
Accessories included in the package (for installation on site):
- NTC temperature probe (10 m long): for multiple uses (DHW tank control, auxiliary source management, mixed zone probe, solar circuit or hydraulic separator).
- Y filter (mesh) for the hydraulic circuit.
- Condensate drainage connection.

Mandatory accessories to be ordered separately

Accessories NOT included in the package (to be ordered separately):
- User interface (remote control)

General features

View and functional diagram

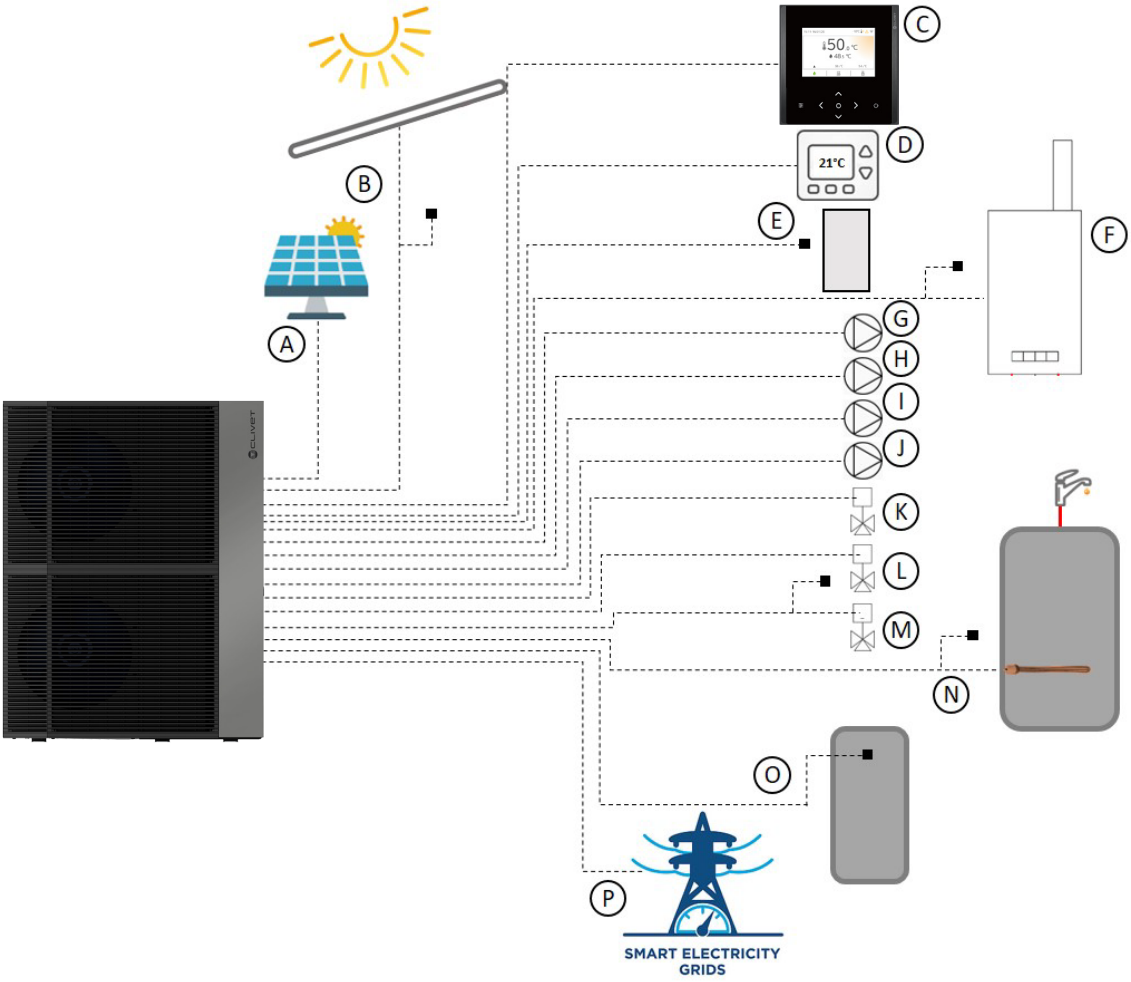


New components that ensure maximum performance and reliability:

1. **Injection scroll compressor,** thanks to EVI technology, the unit is capable of delivering hot water up to 85°C, maintaining high output even at very low temperatures
2. **Intermediate heat exchanger,** component that recovers energy that would otherwise be lost, reducing energy expenditure and increasing the useful effect of the system
3. **Hermetic control panel,** electronic components hermetically sealed from the refrigerant circuit to ensure maximum safety
4. **Electric crankcase heater,** ensures complete defrosting of the coil even under the most extreme conditions
5. **Grille design,** specially designed to further increase the silence level and ensure easy and safe maintenance
6. **Compound flow meter,** for accurate water flow rate measurement and improved reliability

Components that can be managed by the unit

The unit can communicate, receive information and manage a number of system and control components:



A. Solar photovoltaic
B. Pump and probe for solar thermal management
C. HMI user interface
D. Zone thermostat (up to 2)
E. probe and control signal for additional electric heater
F. AHS boiler: control signal and probe
G. secondary / zone 1 circuit pump
H. zone pump 2
I. DHW recirculation pump
J. Solar circuit pump
K. circuit / DHW switching 3-way valve
L. 2-way diverter valve for direct 2-zone systems
M. Zone 2 mixed management: SV3 3-way switching valve for mixed circuit and probe
N. DHW boiler: TBH heater and probe management signal
O. Hydraulic separator: probe
P. Smart Grid

General technical data

Heating

Size			12.1	14.1
Air 7°C - Water 35°C				
Rated heating capacity	1	kW	25.0	30.1
Total power input	1	kW	5.24	6.69
COP	1	-	4.77	4.50
Water flow rate	1	l/s	1.20	1.45
Maximum available pressure	1	kPa	92	66
Air 2°C - Water 35°C				
Rated heating capacity	2	kW	23.5	26.8
Total power input	2	kW	6.35	7.62
COP	2	-	3.70	3.52
Water flow rate	2	l/s	1.13	1.29
Maximum available pressure	2	kPa	98	83
Air -7°C - Water 35°C				
Rated heating capacity	3	kW	21.0	24.0
Total power input	3	kW	6.93	8.38
COP	3	-	3.03	2.86
Water flow rate	3	l/s	1.01	1.16
Maximum available pressure	3	kPa	108	96
Air 7°C - Water 45°C				
Rated heating capacity	4	kW	25.0	30.1
Total power input	4	kW	6.56	8.29
COP	4	-	3.81	3.63
Water flow rate	4	l/s	1.21	1.46
Maximum available pressure	4	kPa	92	66
Air 7°C - Water 55°C				
Rated heating capacity	5	kW	25.0	30.1
Total power input	5	kW	7.55	9.62
COP	5	-	3.31	3.13
Water flow rate	5	l/s	1.21	1.46
Maximum available pressure	5	kPa	92	66

Silent mode heating

Size			12.1	14.1
Air 7 °C - Water 35 °C				
Rated heating capacity	1	kW	22.6	25.2
Total power input	1	kW	4.86	5.51
COP	1	-	4.64	4.57
Water flow rate	1	l/s	1.08	1.21
Maximum available pressure	1	kPa	102	91

Supersilent mode heating

Size			12.1	14.1
Air 7 °C - Water 35 °C				
Rated heating capacity	2	kW	17.3	19.3
Total power input	2	kW	3.65	4.04
COP	2	-	4.75	4.78
Water flow rate	2	l/s	0.83	0.93
Maximum available pressure	2	kPa	121	114

Data according to EN 14511:2022.

1. inlet/outlet water temperature 30/35 °C, outdoor air temperature 7 °C dry bulb / 6 °C wet bulb
2. inlet/outlet water temperature 30/35 °C, outdoor air temperature 2 °C dry bulb / 1 °C wet bulb
3. inlet/outlet water temperature 30/35 °C, outdoor air temperature 7 °C dry bulb / 8 °C wet bulb
4. inlet/outlet water temperature 40/45 °C, outdoor air temperature 7 °C dry bulb / 6 °C wet bulb
5. inlet/outlet water temperature 47/55 °C, outdoor air temperature 7 °C dry bulb / 6 °C wet bulb

Cooling

Size			12.1	14.1
Air 35 °C - Water 18 °C				
Nominal cooling capacity	1	kW	26.0	30.1
Total power input	1	kW	5.60	6.82
EER	1	-	4.64	4.41
Water flow rate	1	l/s	1.25	1.44
Maximum available pressure	1	kPa	87	66
Air 35 °C - Water 7 °C				
Nominal cooling capacity	2	kW	26.0	30.1
Total power input	2	kW	8.39	10.7
EER	2	-	3.10	2.80
Water flow rate	2	l/s	1.25	1.44
Maximum available pressure	2	kPa	87	66

Silent mode cooling

Size			12.1	14.1
Air 7 °C - Water 35 °C				
Rated heating capacity	1	kW	20.1	22.3
Total power input	1	kW	6.41	7.18
COP	1	-	3.14	3.11
Water flow rate	1	l/s	0.97	1.07
Maximum available pressure	1	kPa	112	103

Supersilent mode cooling

Size			12.1	14.1
Air 7 °C - Water 35 °C				
Rated heating capacity	2	kW	15.5	17.2
Total power input	2	kW	4.94	5.27
COP	2	-	3.13	3.27
Water flow rate	2	l/s	0.74	0.83
Maximum available pressure	2	kPa	126	121

Data according to EN 14511:2022
1. inlet/outlet water temperature 23/18 °C, outdoor air temperature 35 °C dry bulb / 27 °C wet bulb
2. inlet/outlet water temperature 12/7 °C, outdoor air temperature 35 °C dry bulb / 27 °C wet bulb

ErP

Nominal capacity			12.1	14.1
Average climatic conditions - Heat pump for Average temperature application				
Nominal capacity	1	kW	25.0	30.1
SCOP	1	-	3.84	3.79
Generator energy class	1	-	A+++	A++
ns	1	%	151	149
Average climatic conditions - Heat pump for Low temperature application				
Nominal capacity	2	kW	25.0	30.1
SCOP	2	-	4.95	4.92
Generator energy class	2	-	A+++	A+++
ns	2	%	195	194
Average climatic conditions - Heat pump for application with Fan coil				
Nominal capacity	3	kW	26,0	30.1
SEER	3	-	5.21	5
ns	3	%	205	197

The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) no. 811/2018 and Commission Delegated Regulation no. 813/2018 of the Commission
Data according to EN 14825

1. Average climate, Medium temperature 47/55 °C
2. Average climate, Low temperature 30/35 °C
3. Average climate, Low temperature 12/7 °C

General technical data

Technical specifications

Size				12.1	14.1
Refrigeration circuit					
Compressor	n°/type	-	-	1	
	type	-	-	Scroll	
Oil	charge	-	ml	1100	
Refrigerant	type/GWP	-	-	0.02	
	charge	-	kg	2.9	
	CO_2 equiv.	-	tCO_2	0.000058	
Fan	number			2	
	load	-	m3/h	11000	
Water circuit					
Minimum system water content		-	l	100	
Admissible water flow rate	minimum	1	l/s	0,33	
	maximum	-	l/s	0,42	0,48
Maximum system pressure		-	bar	3	
System expansion vessel	volume	-	l	5	
	pre-charge		bar	8	
Hydraulic connections		-	inch	1'' 1/4	
Dimensions and weights					
Dimensions (Length x Height x Depth)	unit	-	mm	1388x1816x556	
	packaging	-	mm	1580x2093x695	
Weight	unit	-	kg	279	
	packaging	-	kg	323	

1. Consider the water content of the area with less volume

Electrical data

Size		12.1	14.1
Power supply	V/Hz/p	380-415V±6%/50/3N	
Standard unit			
F.L.I. - Power input at max admissible conditions	kW	14,5	16,4
F.L.A. - Absorbed current at maximum admissable conditions	A	28	30

Sound level

SIZE			12.1	14.1
Sound power	Partial-load C heating	dB(A)	55	56
	Nominal Heating capacity	dB(A)	68	74
	Max heating	dB(A)	75	75
	Silent mode heating	dB(A)	64	66
	Super silent mode heating	dB(A)	63	63
	Heating A2W55 (partial load B)	dB(A)	66	70
	Nominal cooling capacity	dB(A)	68	72
	Cooling max	dB(A)	70	74
	Silent mode cooling	dB(A)	62	64
	Super silent mode cooling	dB(A)	61	61
Sound pressure @1m	Nominal Heating capacity	dB(A)	55	61
	Max heating	dB(A)	61	61
	Silent mode heating	dB(A)	49	50
	Super silent mode heating	dB(A)	45	47
	Nominal cooling capacity	dB(A)	60	60
	Cooling max	dB(A)	61	61
	Silent mode cooling	dB(A)	50	54
	Super silent mode cooling	dB(A)	47	48

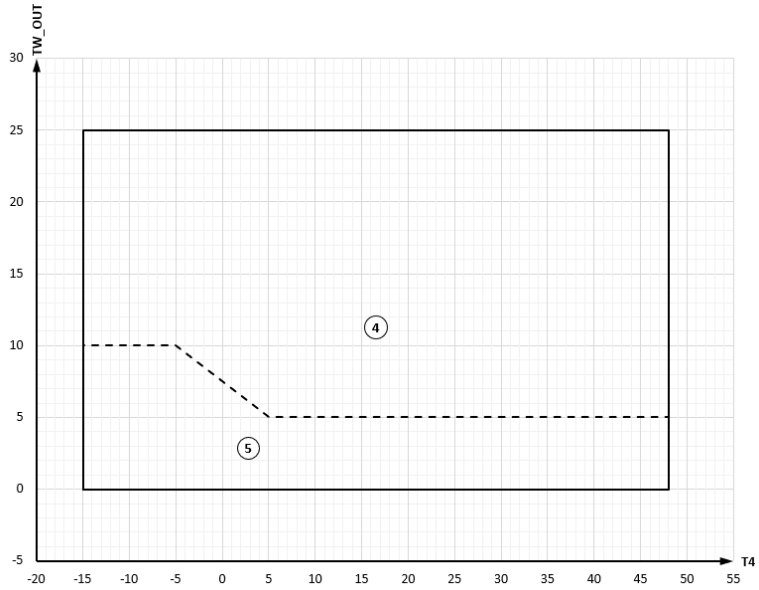
Reference legislation: EN12102-1
Reference conditions:
Heating: inlet/outlet water temperature 30/35 °C, outlet air temperature 7 °C dry bulb / 6 °C wet bulb
Cooling: inlet/outlet water temperature 23/18 °C, outlet air temperature 35 °C dry bulb / 27 °C wet bulb

General technical data

Field of operation

Cooling

12.1 - 14.1

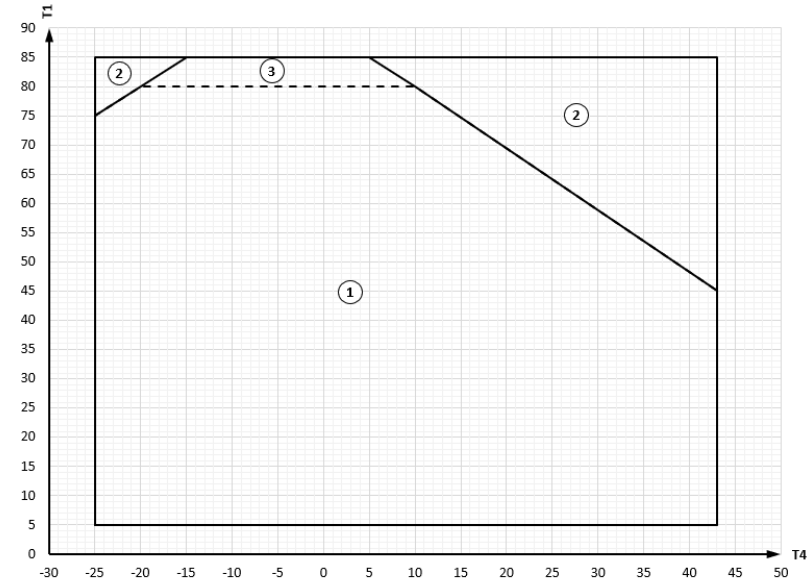


T1 Water supply temperature
T4 Ambient temperature
1. Cooling with only water in the hydraulic system
2. Cooling with water and glycol in the hydraulic system

If the water in the hydraulic circuit is mixed with glycol, ensure that the antifreeze valve is not installed in the system.

Heating

12.1 - 14.1

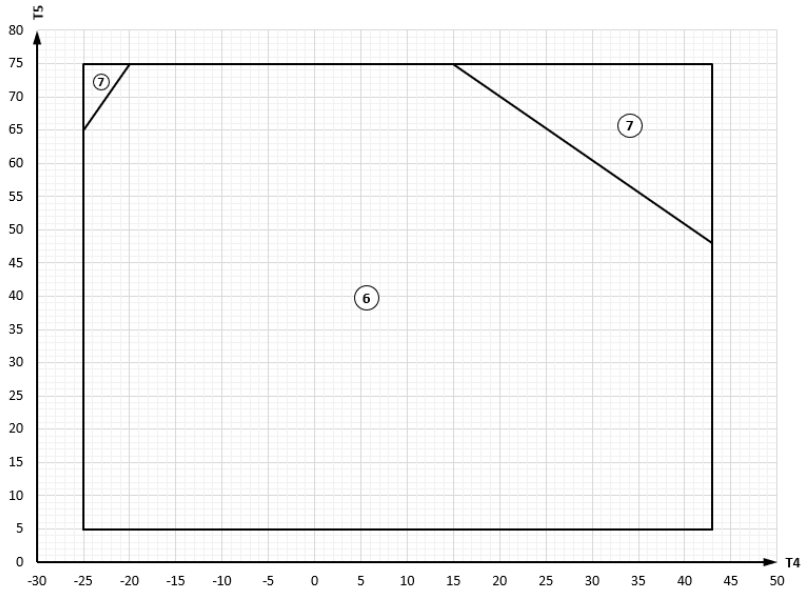


T1 Water supply temperature
T4 Ambient temperature
1. Heating with only heat pump
2. 2. Back-up / integration with electric heater
3. 3. The water flow-rate of the pump must be as close as possible to 1.2 m3

Field of operation

ACS

12.1 - 14.1



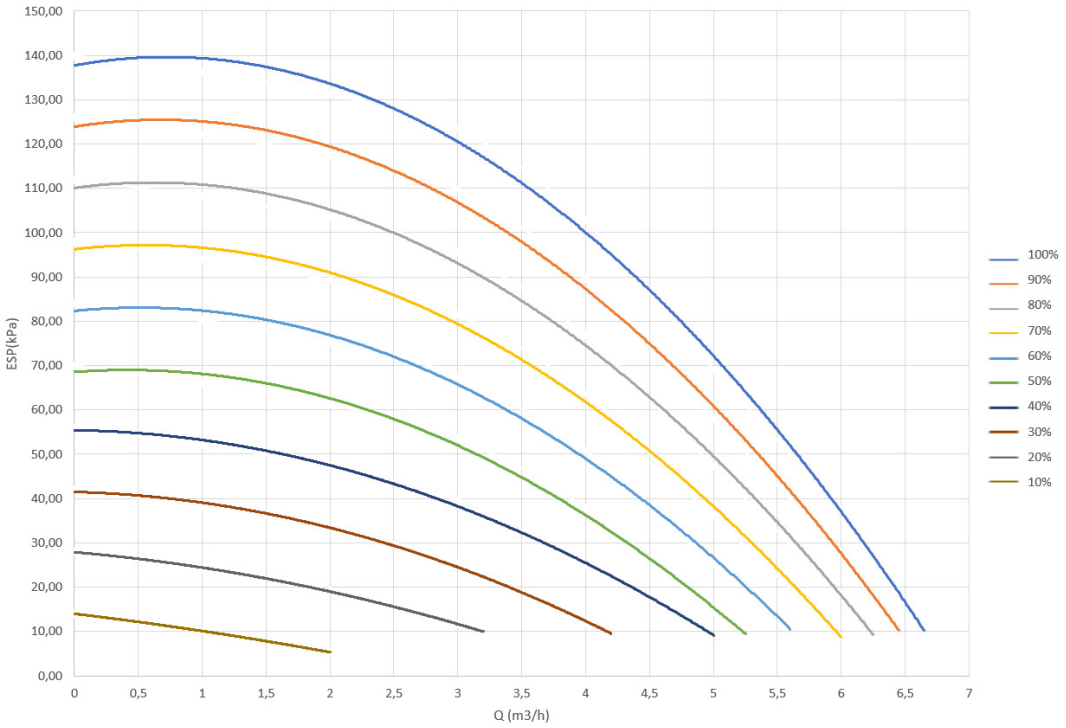
T5 Tank water temperature
T4 Ambient temperature
6. Heating / DHW in heat pump only
7. Back-up / additional with electric heater

General technical data

Hydraulic data

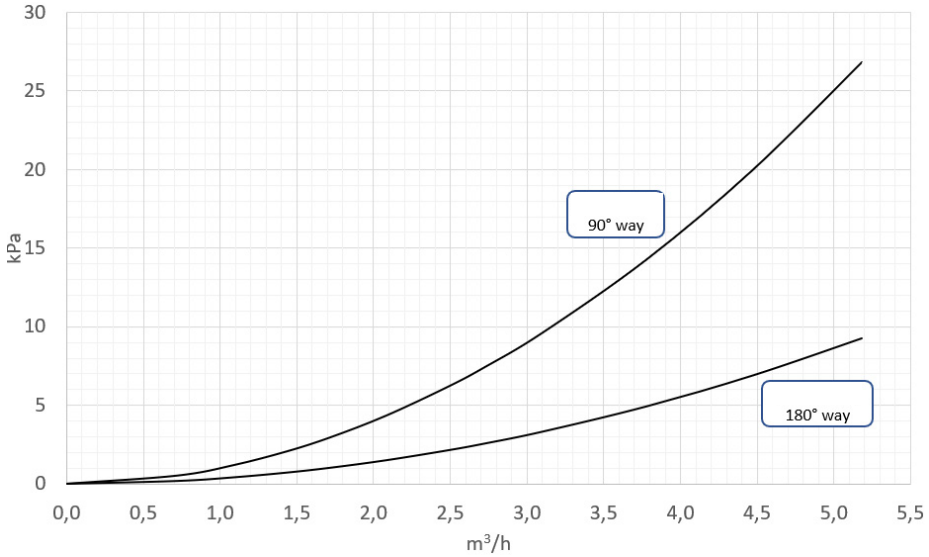
Available unit pressure (net of pressure drops of all components inside the unit)

12.1 - 14.1



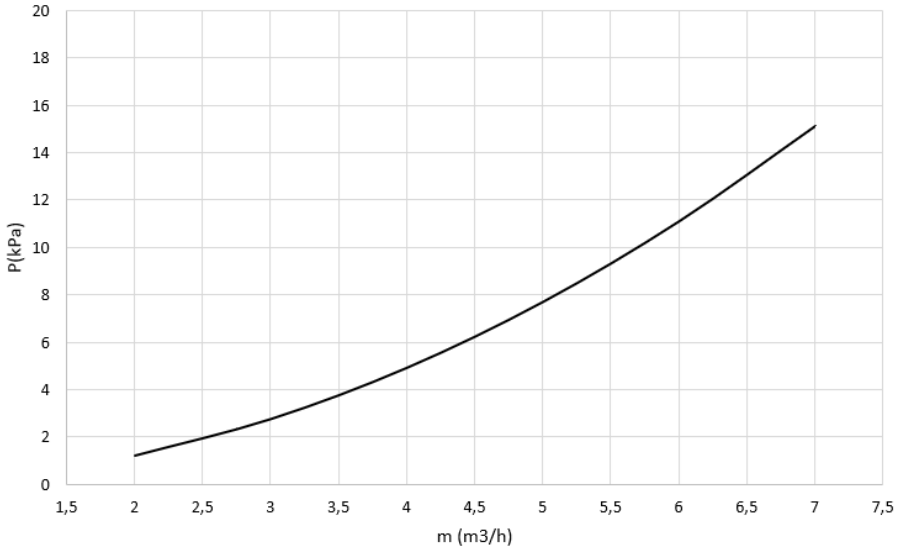
Available pressure of the accessories

3DHWX - 3-way switching valve



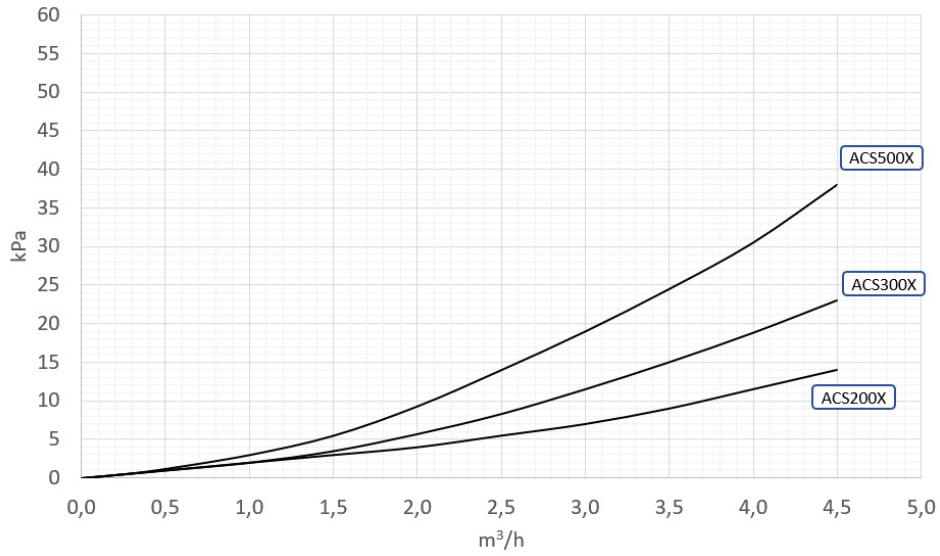
Note: pressure drops refer to the valve body only, without any fittings
The valve provides 90° way for DHW and 180° way for system

DEGAX - High-efficiency deaerator

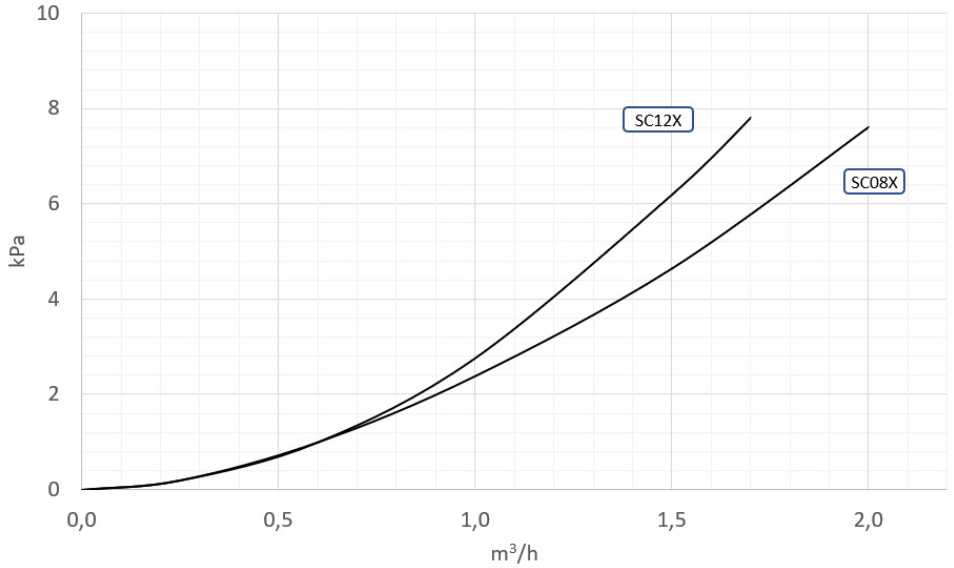


General technical data

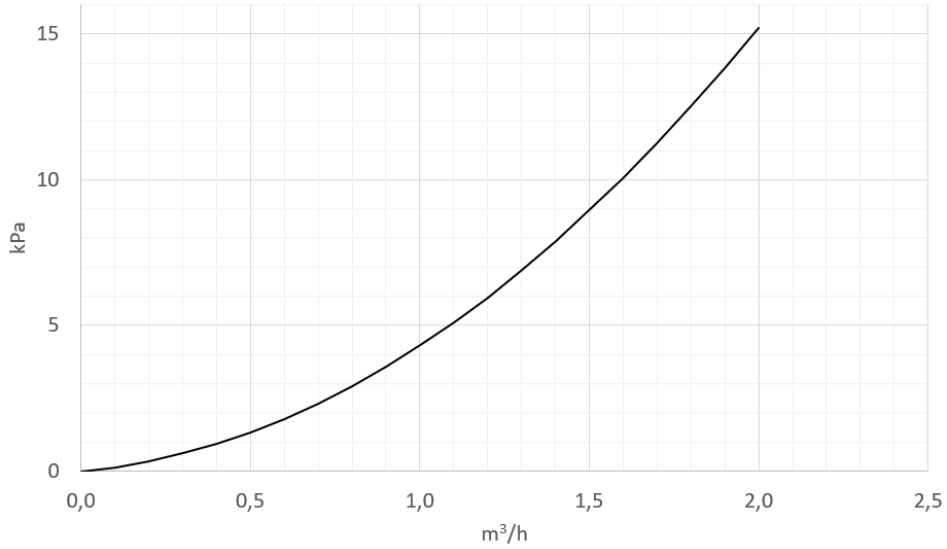
Boilers - standard



Boilers - with solar coil

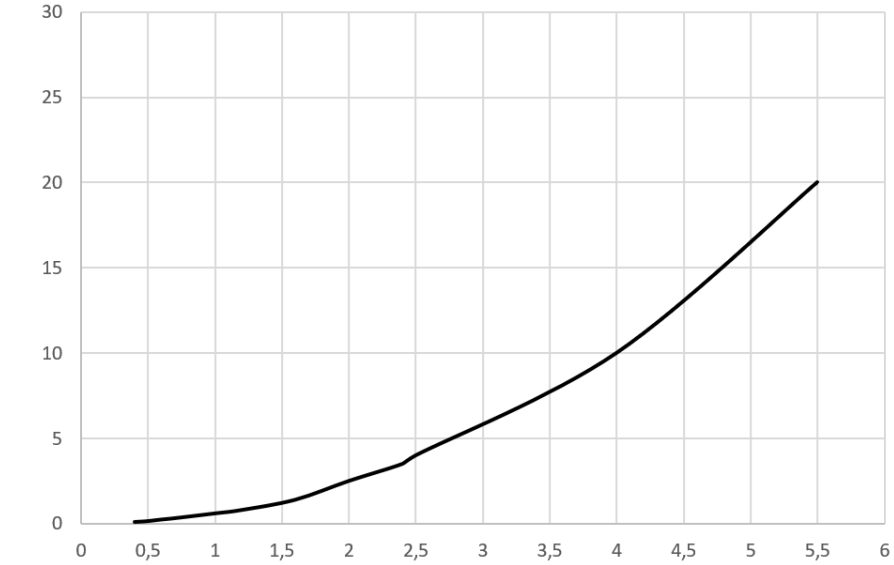


VDACSX



Note: pressure drops refer to the valve body only, without any fittings

FDMX



Note: pressure drops refer to the valve body only, without any fittings

Option compatibility

size	12.1	14.1
3DHWX	o	
QERAX	o (ACS200X / AC-S300X / ACS500X)	
ACS200X	o	
ACS300X	o	
ACS500X	o	
SCS08X	o (ACS200X / ACS300X)	
SCS12X	o (ACS500X)	
IBHX	o	
IBHTX	o	
TANKSX	o	
TANKMX	o	
TANKLX	o	
KTCAX	o	
DI50-2X	o	
DI100-2X	o	
VAGX	o	
VDACSX	o	
DTX	o	
AMRX	o	
ASTFX	o	
FDMX	o	
T1BX	o	
T1B30X	o	
HTC2WX	o	
SWCX	o	
DEGAX	o	

Rules of compatibility between accessories

Auxiliary heat sources	IBHX - IBHTX	ELFOSun	SCS08X - SCS12X	GAS BOILER
IBHX / IBHTX	-	o	o	NO
ELFOSun	o	-	o	o
GAS BOILER	NO	o	o	-

Accessories for installation	DTX	TANKX (S/M/L)	VAGX	ASTFX	AMRX
DTX	-	o	o	o	NO
TANKX (S/M/L)	o	-	NO	o	NO
VAGX	o	NO	-	o	o
ASTFX	o	o	o	-	NO
AMRX	NO	NO	o	NO	-

ACS	T1BX / T1B30X	SCS08X	SCS12X	QERAX
ACS200X	o	o	NO	o
ACS300X	o	o	NO	o
ACS500X	o	NO	o	o

Note: the accessories that are not mentioned can be freely selected without issues of compatibility

Mandatiry accessories

Mandatiry accessories

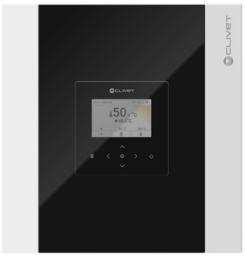
HMINX **KJRH-120L control black**

HMIX **KJRH-120L control withe**

The user interface (HMI) is supplied separately as an accessory.
In order to configure the unit correctly, it will be necessary when ordering to select the unit of the desired size and, among the accessories, the user interface in the desired colour.
The user interface is available in 2 colours:

- HMINX – KJRH-120L control black
- HMIX – KJRH-120L control withe

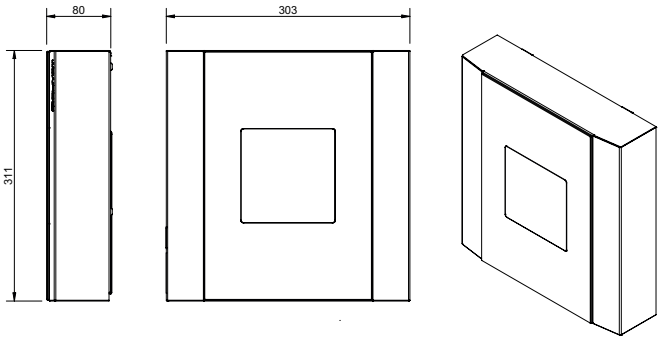
KITR290X **Simplified installation kit for R-290 units**



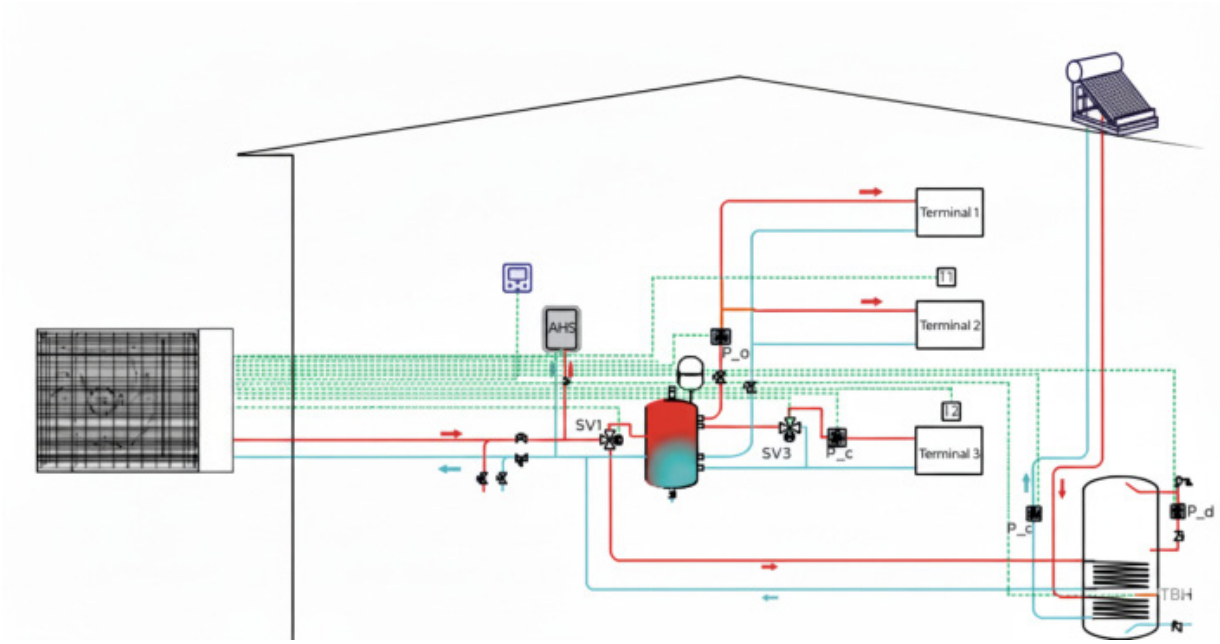
The simplified installation kit makes it possible to drastically reduce the connection cables between the electronic board of the hydraulic module and all system components (TBH, IBHX, AHS, SV1, SV2, SV3, PUMP_O, PUMP_D, PUMP_C, PUMP_S, DFT1/DFT2 and thermostats).
Inside the kit is an additional electronic board to which all hydraulic components can be connected, after which a single cable (2 for the R-32 version) can be used to connect the kit to the heat pump.
It can be easily installed on the wall thanks to a specially designed fixing bracket.
Cable routing can be provided from the bottom or the rear of the accessory.
The kit is supplied as standard with the controller mounted, but it is possible to install the controller and the rest of the kit in separate rooms (an aesthetic cap is supplied with the accessory to cover any missing controller).
To sum up, the kit consists of:

- Sheet metal case with holes for wall mounting
- Electronic board for connecting hydraulic circuit components
- 120L HMI control assembled as standard
- Aesthetic closing cap for controller compartment

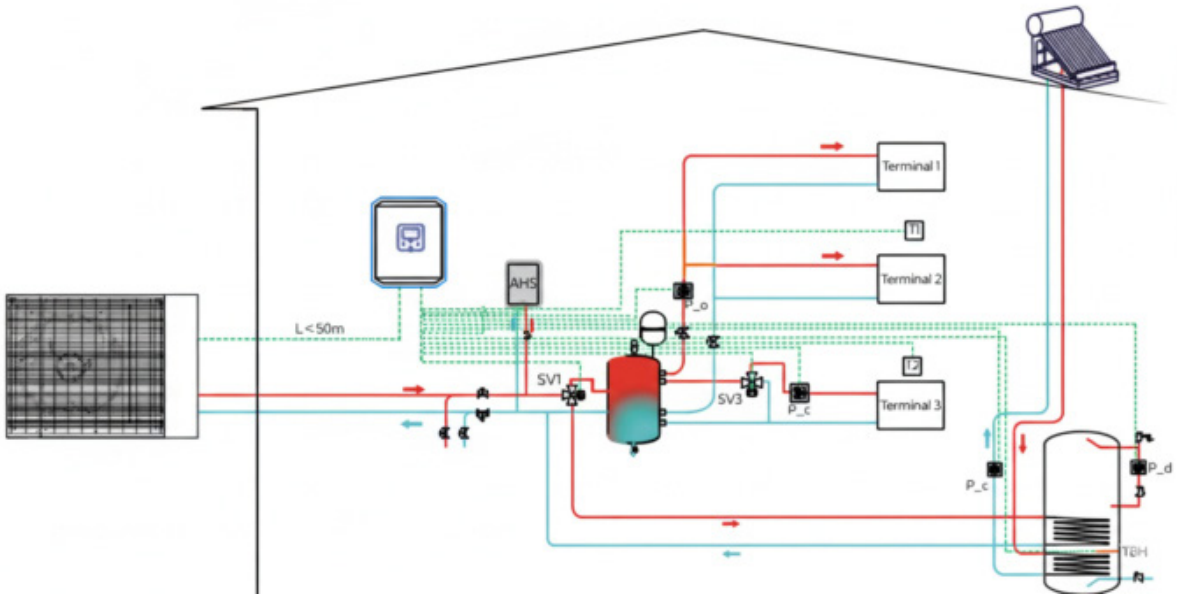
Dimensional



Traditional diagram



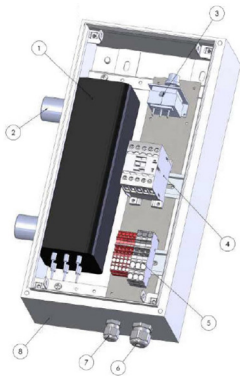
Installation with KITR290X



Optional accessories

IBHX **Electric back-up heater (single phase)**

IBHTX **Electric back-up heater (three-phase)**



During installation, it is possible to select a power by appropriately modifying the internal wiring and correctly selecting the protection fuses to be applied.
Note: the kit requires field connection of the T1 control probe supplied as standard with the accessory

The kit includes:
- TBH backup
- 1" 1/4 connections
- 85° C automatic reset safety thermostat
- 95° C non-automatic reset safety thermostat
- Safety contactor
- Painted steel casing
- water temperature NTC probe with 10 m cable, to be connected to the board of the unit in the field
- fuses (various power ratings to protect all available configurations)
- control contactor
- connection and control cable between unit and resistor

3DHWX **System/DHW 3-way switching valve (SV1)**

Motorised 3-way switching valve with actuator and 1"1/4 M connections, for diverting the flow of water from the system to the domestic hot water storage tank.
Kits available:
- valve, reduction 1"1/4 F - 1" F

Model		12.1-14.1
Power supply	V/Hz/p	230 / 50 / 1
Power input	W	5
Control	-	3-wire SPST
ΔP max	bar	2
Ps	bar	10
Temperature limits - water	°C	-10÷110
Temperature limits - air	°C	-5÷55
Hydraulic connection	-	1" 1/4 M
Cable length	mm	1.500
Switching time	s	30

* with reductions
n.s.: not provided

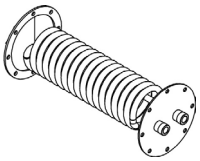
QERAX Connection kit for single-phase heater on DHW storage tank (for ACS200/300/500X)

Kit for managing the electric heater of a DHW storage tank, consisting of:
- Gewiss box to contain and protect the components
- back-up relay to transfer the incoming ON/OFF signal from the unit to the heater of the storage tank (230V voltage signal for QERAX, 400V for QERATX)
- protection fuse

⚠ The cable of the heater is 1.5m long, so the accessory must be installed close to the storage tank. For installations involving greater distances, replace the cable with one of suitable length

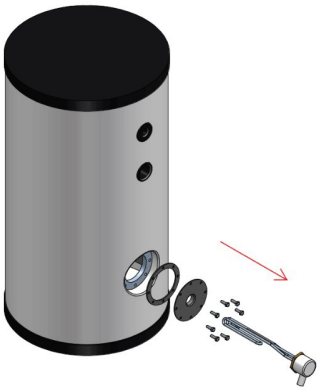
SCS08X Solar coil for ACS200X/ACS300X DHW boilers

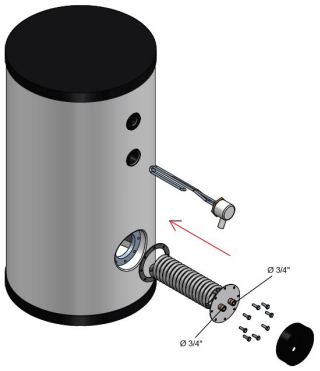
SCS12X Solar coil for ACS ACS500X DHW boilers



The boilers can be combined with solar thermal panels via an additional heat exchanger.
An additional exchanger is provided for 200, 300 or 500 litre models:
- accessory SCS08X for the exchanger to be combined with ACS200X or ACS300X
- accessory SCS12X for the exchanger to be combined with ACS500X.

The heater must be moved to the upper position and the solar exchanger must be installed in its place.





			SCS08X	SCS12X
Solar coil	Surface	m^2	0,8	1,2
	Internal volume	l	0,65	0,95
	Maximum operating pressure	bar	10	

Optional accessories

ACS200X **200-litre DHW boiler**

ACS300X **300-litre DHW boiler**

ACS500X **500-litre DHW boiler**

"Factory made" DHW boilers are optimised for domestic hot water production.
All boilers are made of carbon steel with internal vitrification treatment according to DIN 4753-3 and UNI 10025.
They are equipped with a water/water exchange coil with a surface area compatible with the power ratings of the heat pumps, an inspection flange in the lower part (ACS200/300/500X), a magnesium anode for corrosion protection, and an electric heater.
The boilers have an integrated electric heater and are equipped with removable 70 mm polyurethane (ACS200/300/500X) external insulation to minimise heat loss and ensure high efficiency

For connection to solar thermal circuit:
- the 200, 300 and 500-litre versions can be connected to a solar thermal circuit with a specific optional kit

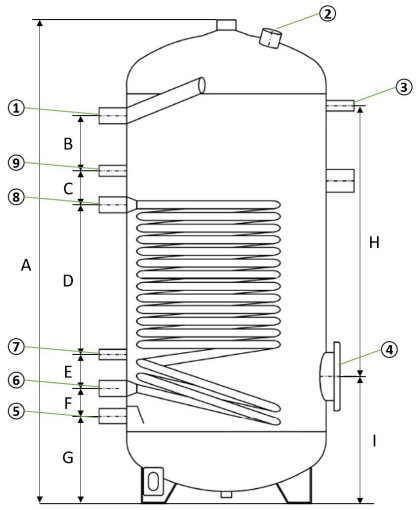
⚠ Electrical connection to the heat pump requires the optional QERAX kit (for ACS200X, ACS300X or ACS500X)

Clivet DHW boilers technical data

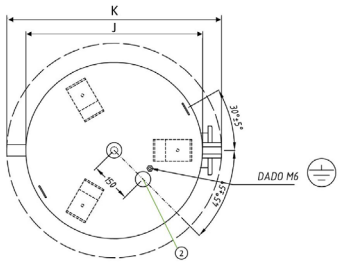
			ACS200X	ACS300X	ACS500X
Performance	Net water volume	l	196	273	475
	Energy efficiency class	-		B	
	Maximum water temperature	°C		95	
	Insulation: material / average thickness	-/mm		PU / 70	
	Heat loss	W/K	1,13	1,40	1,78
	TBH backup	kW		2 / 1-phase	
Coil	Surface	m^2	1,5	1,8	2,2
	Internal volume	l	8,6	10,4	12,7
Maximum operating pressure		bar		10	

Data according to DIN 4708 / EN 12897 / EN 15332
PU = polyurethane / PE = polyester fibre
The power transmitted from the coil to the boiler can be calculated using the formula:
PA = (TI - TA) x KS [W] where:

TI: heat exchanger inlet temperature
TA: average temperature of the boiler
KS: specific yield coefficient as a function of TI, obtainable from the diagrams:

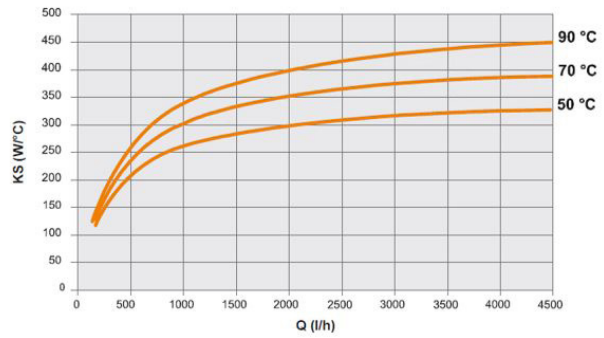


[MM]	ACS200X	ACS300X	ACS500X
A	1.215	1.615	1.705
B	140	225	245
C	85	275	290
C1		-	
C2		-	
D	375	515	440
E		85	95
F		70	80
G		220	265
H	680	1.070	1.060
I		320	365
J		500	650
K		640	790
Peso	77kg	98kg	128kg

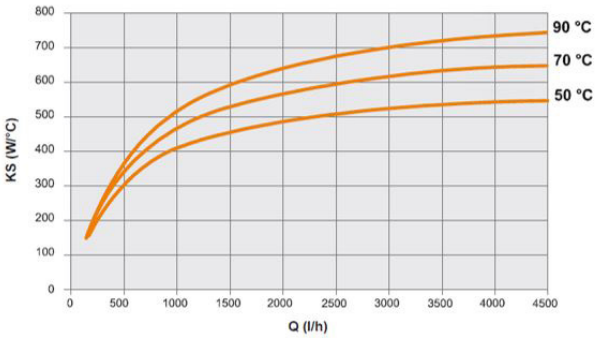


ACS200X/ACS300X/ACS500X

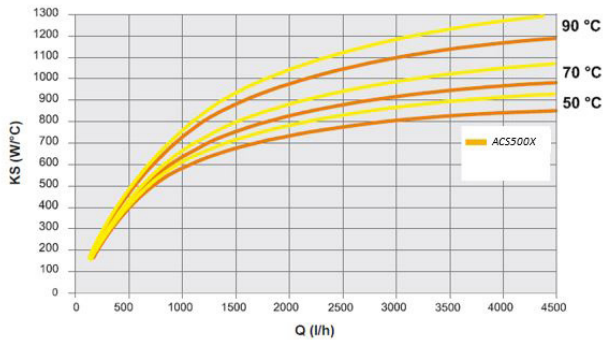
ACS200X



ACS300X



ACS500X

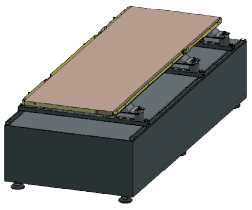


Optional accessories

FDMX **Magnetic dirt separator filter for water distribution systems**

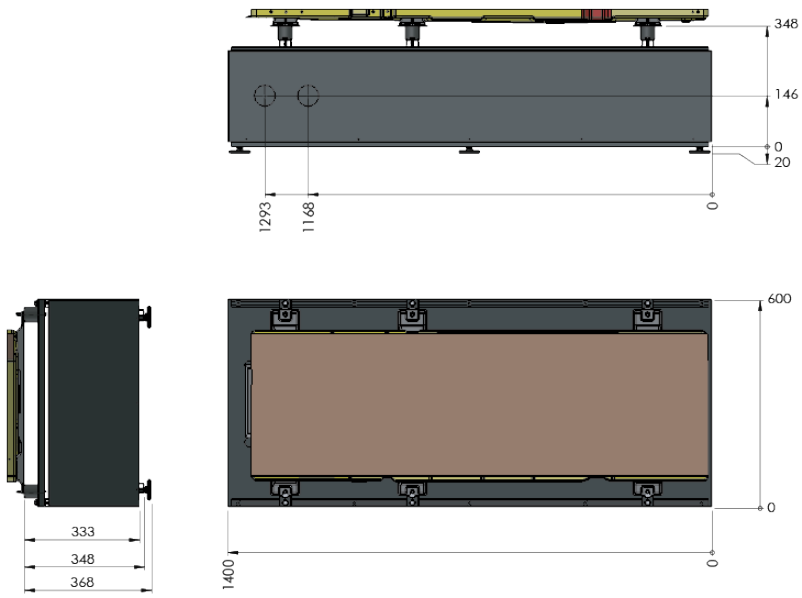
The filter supplied as standard with the unit is a mesh filter, but it is advisable to install a dirt separator filter (FDMX accessory) to trap not only general dirt, but also fine ferromagnetic particles dispersed during use that are not trapped by the mesh filter.

TANKSX **50L inertial storage tank for base installation**
TANKMX **75L inertial storage tank for base installation**
TANKLX **100L inertial storage tank for base installation**
KTCAX **Hose kit for connecting the unit to the inertial storage tank**



The TANKX series is designed to be installed under the unit's base, so as to occupy the least space. It is made of RAL 7046 painted sheet metal, thermally insulated with internal foaming and housed inside an enclosure also made of painted sheet metal.
It can be typically connected on the intake with the dedicated KTCAX hose kit.

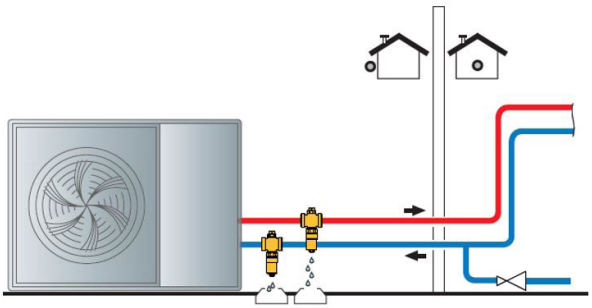
Model		TANKSX	TANKMX	TANKLX
Efficiency class	-		C	
Available volume	L	50	75	100
Maximum pressure	bar		3	
Material	-		Steel	
Hydraulic connection	-		1" 1/4 M	



VAGX

Safety antifreeze valve for system

The kit consists of antifreeze valves that allow the fluid to be discharged from the circuit when its temperature reaches a limit value, preventing the formation of ice in the system and consequent damage to the unit and pipes.



The valves must be installed outdoors, in a vertical position and on both the supply and return branches of the system

DEGAX

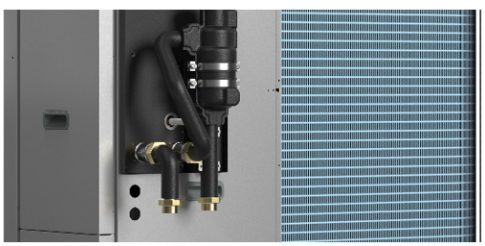
High efficiency deaerator

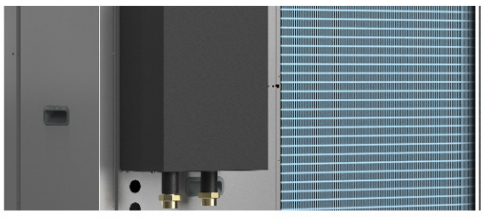
High efficiency deaerator designed to remove air bubbles from the heat transfer fluid.
This device is capable of removing up to 99% of the air in circulation on the first pass.
Removing air from water is essential because air can cause:

- Noise (bubbling and whistling).
- Corrosion of system components.
- Localised overheating due to stagnant air bubbles.
- Mechanical damage to components, such as pumps and valves.

A system with deaerated water operates under optimal conditions.
This configuration not only ensures maximum efficiency of the unit, but also offers maximum overall safety: the deaerator ensures that any propane leaks are released outside the building, thereby preventing build-up inside.
The deaerator is housed in a specially designed box that protects it and provides adequate insulation, while minimising the installation space required

Maximum operating pressure	3 bar
Maximum operating temperature	90 °C

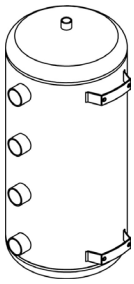




Optional accessories

DI50-2X **50-litre hydraulic circuit breaker**

DI100-2X **100 litre hydraulic circuit breaker**



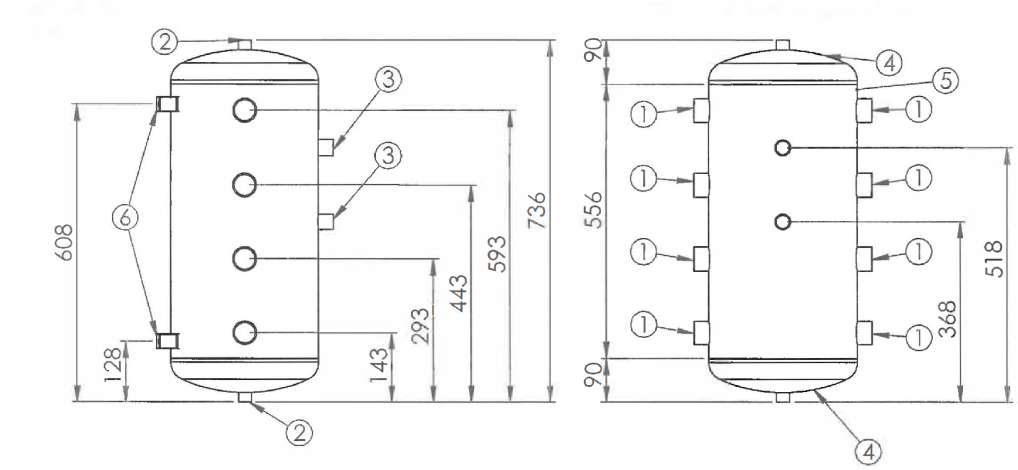
The 50-litre and 100-litre versions have 2 pairs of connections on the supply side and 2 pairs of connections on the return one.
The external insulation is made of polyurethane foam (30 mm for DI50-2X and DI100-2X) to minimise thermal leakage and ensure high efficiency.

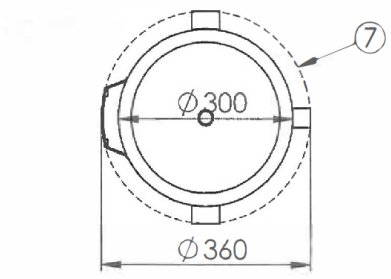
Note: DI50-2X and DI100-2X are supplied with wall mounting kits and four caps with gaskets for any unused connections. DI100-2X is also equipped with feet for floor mounting.

Model		DI50-2X	DI100-2X
Efficiency class	-	B	B
Maximum flow rate	l/s	-	-
Thermal dispersion	W/K	0,75	1,07
Available volume	l	45,3	45,3
Temperature limit	°C	80	80
Maximum pressure	bar	6	6
Material	-	Carbon steel	Carbon steel
Unladen weight	kg	20	24,5

Note: all versions can be wall mounted and DI100-2X can also be floor-standing with special feet

DI50-2X

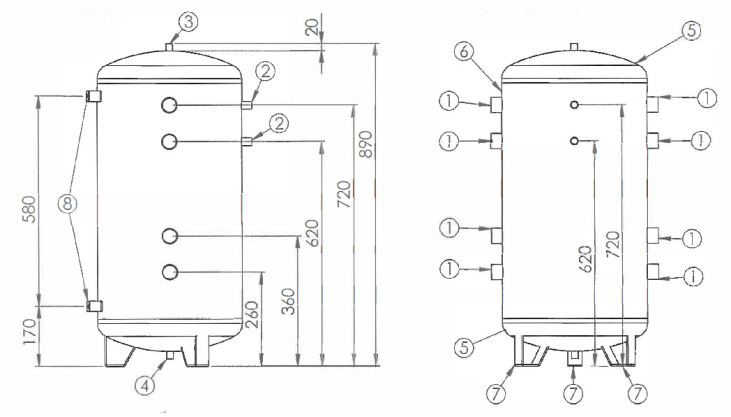


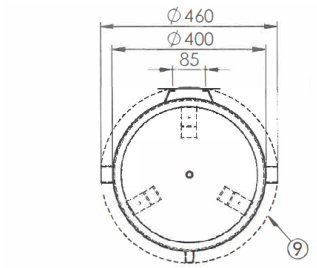


1. 1' 1/4 x 30 mm connection
2. 1/2" x 20 mm connection
3. 3/4" x 30 mm connection
4. Base diameter 300 thickness 20/10
5. Sheet metal 927 x 556 x 20/10
6. Internal shelf
7. Insulation

Note: 4 plugs and 4 gaskets are included for insertion on any unused connections

DI100-2X



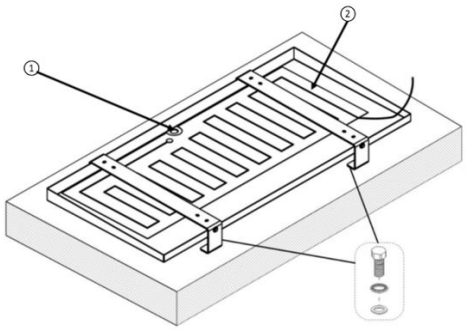


1. 1' 1/4 x 30 mm connection
2. 1/2' x 30 mm connection
3. 1/2' x 30 mm connection
4. 1/2' x 30 mm connection
5. Base diameter 400 thickness 20/10
6. Sheet metal 1245 x 650 x 20/10
7. Bracket 80 x 65 x 55 thickness 4 mm
8. Internal shelf
9. Insulation

Optional accessories

DTX **Drain pan with electric heater**

Drain pan to be fitted to the base of the unit for collecting condensate, with fitting for connection to the drain trap.
The drain pan has an automatically activated antifreeze heater that prevents the condensate from freezing.
The kit includes painted support brackets (with holes for installation of anti-vibration mounts and for fixing to base, inertial tank or wall brackets), screws and washers.



1. 1" drain hole
2. Heater

Note: the installation of vibration dampers is also mandatory with this accessory, to be applied between the unit and drain pan.

Product accessories

T1BX **DHW temperature probe and additional heating source at 10 m**

T1B30X **DHW temperature probe and additional heating source at 30 m**

NTC water temperature probe with 10 m or 30 m cable.
The probe can be used to detect temperatures:

- Tsolar: solar thermal circuit
- T1: boiler or external electric heater
- T5: DHW tank
- Tw2: mixed zone 2
- Tbt1/Tbt2: hydraulic separator

⚠ The unit is equipped with a T1BX probe as standard.

		T1BX	T1B30X
Length	m	10	30
Bulb dimensions (ϕxL)	mm	6x24	6x24
NTC sensor (50°C)	kΩ	17,6	17,6
Field of operation	°C	-3÷105	-3÷105
Insulation to resistance	MΩ	100	100
Voltage isolation	V	1.800	1.800
Protection rating	IP	67	67

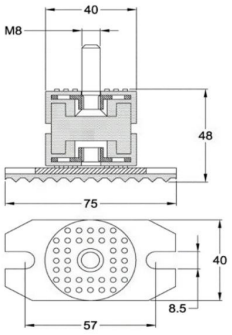
AMRX **Kit of antivibration mounts for floor installation**

ASTFX **Kit of antivibration mounts for installation on wall brackets, inertial storage tank or tray**

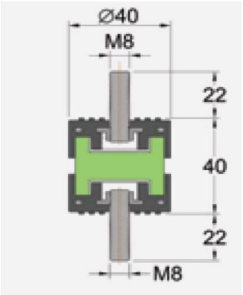
Anti-vibration mounts are an essential element for the correct installation of the unit as they are used to dampen noise and vibrations produced by components such as the compressor, circulators and pipes. Their installation is compulsory and their selection depends on the characteristics of the site: in the case of Edge F units, one element is required for each supporting point, for a total of 6 anti-vibration mounts.

Anti-vibration mount kits for installation on the floor (AMRX) or on brackets, inertial tank or drain pan (ASTFX): 6 rubber anti-vibration mounts with screws for attachment to the unit.
They consist of two plates made of galvanised steel discs, coated with recyclable thermoplastic elastomer material suitable for temperatures of -45 to 110 °C, with high resistance to ageing, pollutants, hydrocarbons, salt spray, UV radiation and detergents.
AMRX is also equipped with a steel base plate with holes for anchoring to the base.

AMRX



ASTFX

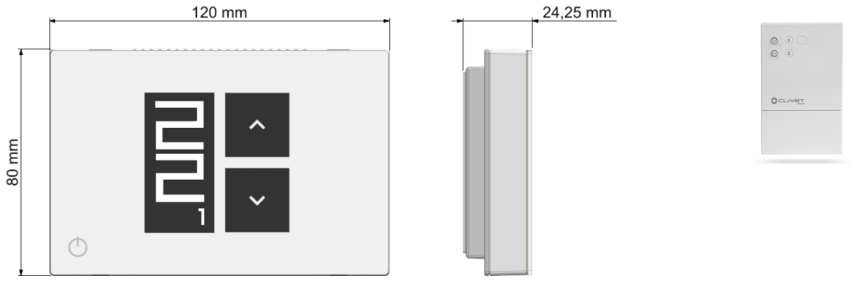


Product accessories

HTC2WX **HID-TConnect 2 white chronothermostat for temperature control**

SWCX **IoT SwitchConnect receiver / switch**

Chronothermostat for semi-recessed installation with temperature probe. The thermostat is able to manage the request for the heat pump and allows control of the system with the App (Clivet Home Connect) or voice assistant (Amazon Alexa or Google Home).
The thermostat can be combined with a radio receiver for managing the request of terminal units or radiant systems, the mode change of the heat pump, or the systems with double set-point.



See the specific documentation at Clivet.World for more details

CONTROL4 NRG **Clivet Smart Living comfort and energy assistant**

CONTROL4 NRG is a centralized control system for residential and commercial applications. Through an intuitive and easy to use interface panel, it effectively and efficiently manages all system elements to always achieve the best energy efficiency based on the required comfort.

CONTROL4 NRG acquires the data of the electric energy consumed by the air conditioning system and the electric energy produced by the photovoltaic system and displays charts of their trends both locally and remotely.
The entire system optimised by Control4 NRG can be managed remotely with Clivet Eye, Clivet's Cloud solution, available as an App for smartphones and tablets and on your PC from any browser.

CONTROL4 NRG is at the heart of Clivet Smart Living, the complete proposal to fulfil the following requirements:

- the PRODUCTION of water for heating, cooling and domestic use
- the VENTILATION and purification of room air through the management of Elfo Fresh EVO units
- the DISTRIBUTION of thermal/cooling energy in all the rooms of the building
- energy MANAGEMENT with power consumption and self-consumption data display
- the INTEGRATION with Clivet SINERGY storage system and photovoltaic system
- remote MONITORING and control of systems with Clivet Eye from the APP or PC
- optimisation of the hydronic system with produced water temperature compensation systems
- optimisation of the thermal energy distribution system thanks to climatic curves applied to indoor environment comfort management

See the specific documentation at Clivet.World for more details

ELFOSUN3

Flat-plate solar thermal collector for combination with heating and domestic hot water production systems

Flat-plate solar thermal manifold for empty or pressurised systems for connection to domestic hot water production system
with optional circulation kit consisting of pump unit, control unit and expansion tank. The panels can be combined in series (up to 5) and are suitable for horizontal or inclined installation with specific kits.
See the specific documentation for more details.

See the specific documentation at Clivet.World for more details

FE 24.4-33.4

4-pipe condensing boilers for stand-alone systems

Instantaneous gas boiler with condensation exchanger offering high efficiency in both heating and DHW production, with larger stainless steel single-pipe coils, to substantially reduce the possibility of clogging and facilitate maintenance.
Modulation ratio, for optimal performance in new, efficient systems at low temperatures, avoiding continuous switch-on and -off for higher energy saving and less consumption.

See the specific documentation at Clivet.World for more details

UC 70.2

Condensing boiler UC 70.2

Wall-mounted condensing boiler, natural gas / LPG / H2 20% (approved to operate with 20% hydrogen in methane), for heating. Energy efficiency class A, Low NOx class 6

See the specific documentation at Clivet.World for more details

UC 115.2

Condensing boiler UC 115.2

Modulating condensing floor-standing thermal generator, natural gas or LPG, with Low NOx premix burner, for indoor and outdoor (IPX5D), ErP A, Low NOx class

See the specific documentation at Clivet.World for more details

UC 200F.2

Condensing boiler UC 200F.2

Floor standing, condensing gas boiler, , Low NOx class 5, for Nat. Gas or LPG, for indoor /outdoor installation, isolation protection IPX5D

See the specific documentation at Clivet.World for more details

Performances

Performances in heating

The data in the following tables are considered under the unit's maximum operating conditions, i.e. at maximum frequency.
The figures in the "General technical data" are considered under the nominal operating conditions of the unit, i.e. at a partial frequency below the maximum frequency.
For this reason, nominal figures typically have lower powers but optimised efficiencies, unlike maximum figures where power is maximised.

Size	Tae (°C) DB/WB	Water supply temperature (°C)																		
		35			45			55			65			75			85		
		kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe
12.1	-25/-	16,52	2,01	8,22	17,85	1,62	11,02	18,67	1,41	13,24	19,68	1,30	15,14	17,55	1,20	14,63	-	-	-
	-20/-20,1	18,63	2,21	8,41	20,14	1,87	10,75	20,29	1,69	12,00	21,03	1,52	13,84	18,51	1,36	13,62	-	-	-
	-15/-15,3	20,47	2,41	8,50	21,10	2,19	9,62	21,24	1,88	11,28	22,20	1,72	12,89	20,85	1,61	12,99	18,03	1,33	13,59
	-10/-11	25,58	2,62	9,76	26,39	2,44	10,82	27,52	2,09	13,19	27,97	1,84	15,20	23,78	1,75	13,55	18,95	1,61	11,81
	-7/-8	26,06	2,45	10,62	26,37	2,28	11,59	27,43	2,05	13,35	27,96	1,83	15,32	26,26	1,73	15,18	19,45	1,54	12,64
	-5/-6	26,13	2,66	9,82	26,65	2,40	11,11	26,33	2,19	12,00	26,87	1,96	13,74	26,86	1,85	14,49	18,92	1,61	11,76
	0/-1	24,76	3,30	7,50	25,64	2,90	8,86	25,07	2,31	10,85	25,32	2,08	12,20	26,21	1,89	13,85	17,46	1,66	10,51
	2/1	26,41	3,52	7,50	26,70	3,07	8,70	26,10	2,45	10,65	26,51	2,18	12,14	27,60	2,00	13,83	17,78	1,78	10,00
	5/4	27,15	3,88	7,00	27,36	3,32	8,23	27,43	2,65	10,34	27,86	2,29	12,15	29,43	2,10	13,99	18,34	1,93	9,49
	7/6	28,73	4,33	6,63	29,07	3,58	8,11	29,75	3,05	9,76	30,14	2,47	12,20	31,66	2,30	13,76	-	-	-
	10/8	30,39	4,49	6,76	31,64	3,89	8,12	32,42	3,41	9,50	32,82	2,89	11,36	33,59	2,51	13,36	-	-	-
	15/12	34,32	4,99	6,88	34,61	4,28	8,09	35,25	3,79	9,31	35,62	3,16	11,29	36,59	2,69	13,62	-	-	-
	20/15	35,65	5,19	6,87	35,88	4,69	7,66	36,15	4,13	8,75	36,98	3,48	10,63	37,92	2,72	13,94	-	-	-
	25/17	36,75	5,93	6,20	37,37	5,36	6,97	37,73	4,62	8,16	38,15	3,80	10,04	-	-	-	-	-	-
	30/21	37,46	6,41	5,84	37,72	5,57	6,77	38,24	4,91	7,79	38,51	4,16	9,25	-	-	-	-	-	-
	35/24	32,22	6,87	4,69	32,42	5,83	5,56	31,64	5,34	5,93	-	-	-	-	-	-	-	-	-
	40	28,18	7,01	4,02	28,46	6,12	4,65	-	-	-	-	-	-	-	-	-	-	-	-
	43	25,93	7,33	3,54	26,45	7,01	3,77	-	-	-	-	-	-	-	-	-	-	-	-
14.1	-25/-	16,52	2,01	8,22	17,85	1,62	11,02	20,93	1,41	14,84	21,88	1,30	16,83	19,38	1,20	16,15	-	-	-
	-20/-20,1	20,52	2,21	9,27	22,19	1,82	12,19	22,36	1,64	13,61	23,17	1,48	15,69	20,39	1,32	15,44	-	-	-
	-15/-15,3	22,55	2,41	9,37	23,25	2,13	10,91	23,40	1,83	12,78	24,46	1,67	14,61	22,97	1,56	14,72	18,03	1,29	13,98
	-10/-11	28,18	2,62	10,75	29,08	2,37	12,26	30,05	2,03	14,82	30,81	1,79	17,23	26,20	1,71	15,36	18,95	1,56	12,15
	-7/-8	29,04	2,50	11,60	29,39	2,26	13,02	30,22	2,00	15,14	30,80	1,77	17,36	28,93	1,68	17,21	19,45	1,50	13,01
	-5/-6	28,07	2,68	10,47	28,62	2,35	12,18	29,01	2,13	13,61	29,61	1,90	15,58	29,59	1,80	16,43	18,92	1,56	12,10
	0/-1	26,51	3,34	7,93	27,45	2,85	9,64	27,63	2,25	12,30	28,40	2,02	14,08	29,09	1,84	15,82	17,46	1,62	10,81
	2/1	27,96	3,52	7,95	28,27	2,98	9,50	28,75	2,38	12,07	29,68	2,12	13,99	30,59	1,94	15,77	17,78	1,73	10,29
	5/4	29,30	3,86	7,60	29,77	3,21	9,27	30,22	2,58	11,72	31,76	2,23	14,25	32,42	2,04	15,86	18,34	1,88	9,77
	7/6	31,56	4,40	7,17	32,75	3,53	9,28	33,75	3,02	11,18	35,25	2,43	14,51	35,99	2,24	16,10	-	-	-
	10/8	33,48	4,66	7,18	34,86	3,79	9,21	35,72	3,32	10,77	36,65	2,81	13,05	37,56	2,44	15,37	-	-	-
	15/12	37,81	4,99	7,58	38,13	4,16	9,17	38,84	3,68	10,55	39,25	3,07	12,79	40,31	2,61	15,44	-	-	-
	20/15	39,27	5,19	7,57	39,53	4,56	8,68	39,83	4,01	9,92	40,75	3,38	12,05	41,78	2,65	15,76	-	-	-
	25/17	40,49	5,93	6,83	41,18	5,21	7,90	41,57	4,49	9,25	42,04	3,69	11,39	-	-	-	-	-	-
	30/21	41,27	6,41	6,44	41,56	5,42	7,67	42,13	4,77	8,83	43,25	4,05	10,69	-	-	-	-	-	-
	35/24	35,50	6,87	5,17	35,72	5,67	6,30	34,86	5,19	6,72	-	-	-	-	-	-	-	-	-
	40	31,05	7,01	4,43	31,36	5,95	5,27	-	-	-	-	-	-	-	-	-	-	-	-
	43	28,57	7,33	3,90	29,14	6,07	4,80	-	-	-	-	-	-	-	-	-	-	-	-

kWt: delivered heat capacity [kW]
kWe: electrical power input [kW]
Tae: outside air temperature [°C]
Performance in relation to the difference between inlet and outlet water temperature = 5 °C
Note: data are at maximum operation according to EN 14511:2018
Values indicate integrated heat capacity: the current heat capacity considering any defrost cycles

UNI/TS 11300 data – part 4

Data for Energy Certification

Data to be used for the calculation of the energy performance of the building, referring to the energy efficiency of heat pump generation.
The data provided can be used for calculation according to UNI/TS 11300 - part 4 and refer to the conditions defined in UNI EN 14825.
The data may be updated by the manufacturer in the event of updates to the range without obligation of prior notice.

Performance at full load in heating mode

Heating capacity and COP at full load, under the conditions defined in EN 14825.

Size	Heating						ACS		
	Tae	Supply water temperature					Tae	Supply water temperature	
		35 °C		45 °C		55 °C		55 °C	
		Heating capacity ΦH,HP out [kW]	COP	Heating capacity ΦH,HP out [kW]	COP	Heating capacity ΦH,HP out [kW]	COP	Heating capacity ΦH,HP out [kW]	COP
12.1	7- °C	21.00	3.03	20.10	2.67	18.80	2.30	25.00	3.31
	2 °C	23.50	3.70	22.60	3.15	21.95	2.71	26.02	4.21
	7 °C	25.00	4.77	25.00	3.81	25.00	3.31	26.02	4.75
	12 °C	26.01	5.20	26.02	4.77	26.02	3.95	26.01	5.95
14.1	-7 °C	24.00	2.86	23.10	2.41	21.30	2.22	30.10	3.13
	2 °C	26.80	3.52	26.10	3.11	25.35	2.63	30.02	3.75
	7 °C	30.10	4.50	30.10	3.63	30.10	3.13	30.01	4.15
	12 °C	30.02	4.87	30.02	4.02	30.02	3.55	30.01	5.29

Performance with partial loads in Heating mode

Standard UNI/TS 11300 - part 4, taking the Average climate according to UNI EN 14825 as reference, defines a design temperature of -10 °C and operating conditions A = -7 °C (bivalent temperature), B = 2°C, C = 7 °C and D = 12 °C.
The Load Factor (CR) is calculated for each condition; this is the ratio between the load required by the system and the maximum power that can be delivered by the unit. CR therefore represents the unit's capacity to partialise.
Similarly, the Correction Factor (fcop), is the ratio between the efficiency of partialisation and the efficiency at full load.

Size 12.1	$T_{designh}$	A	B	C	D
Outdoor temperature	-10°C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load		21.00	23.50	25.00	24.92
P - Load of the system	23.86	21.00	12.89	9.75	9.58
CR - Load factor of the heat pump		1.00	0.55	0.33	0.14
COP - Efficiency with partial load		3.03	3.90	4.33	3.13
COP› - Efficiency with full load		3.03	3.70	4.77	4.59
fCOP – Correction factor		1.00	1.05	0.91	0.68

Size 14.1	$T_{designh}$	A	B	C	D
Outdoor temperature	-10°C	-7 °C	2 °C	7 °C	12 °C
PLR - Climatic load factor	100%	88%	54%	35%	15%
DC - Power with full load		24.00	26.80	30.10	29.48
P - Load of the system	27.27	24.00	14.73	11.25	11.06
CR - Load factor of the heat pump		1.00	0.55	0.33	0.14
COP - Efficiency with partial load		2.86	3.89	4.02	3.02
COP› - Efficiency with full load		2.86	3.52	4.50	4.51
fCOP – Correction factor		1.00	1.11	0.89	0.67

Performances

Performances in cooling

The data in the following tables are considered under the unit's maximum operating conditions, i.e. at maximum frequency.
The figures in the "General technical data" are considered under the nominal operating conditions of the unit, i.e. at a partial frequency below the maximum frequency.
For this reason, nominal figures typically have lower powers but optimised efficiencies, unlike maximum figures where power is maximised.

GR	Tae (°C) DB/WB	Water supply temperature (°C)														
		0			5			7			12			18		
		kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe	kWt	COP	kWe
12.1	-15	12.17	4.10	2.97	14.35	4.62	3.11	14.93	4.72	3.16	17.14	5.00	3.43	18.65	5.29	3.52
	-10	12.58	4.07	3.09	14.83	4.58	3.24	15.42	4.69	3.29	17.95	4.93	3.64	19.95	5.24	3.81
	-5	12.76	4.06	3.14	15.04	4.57	3.29	15.65	4.68	3.35	18.52	4.97	3.72	21.35	5.36	3.98
	0	13.06	4.04	3.23	15.39	4.55	3.38	16.01	4.65	3.44	19.02	4.98	3.82	21.99	5.42	4.06
	5	13.71	4.00	3.42	16.16	4.52	3.58	16.81	4.62	3.64	19.26	5.01	3.84	22.62	5.47	4.13
	10	14.14	3.92	3.61	16.57	4.45	3.72	17.98	4.58	3.92	20.37	4.96	4.10	24.12	5.50	4.39
	15	18.14	3.56	5.09	20.74	4.11	5.04	21.66	4.22	5.13	23.90	4.63	5.16	27.15	5.24	5.18
	20	17.96	3.21	5.59	22.33	3.79	5.90	23.12	4.00	5.78	26.68	4.42	6.04	30.24	4.86	6.23
	25	20.42	3.23	6.33	24.45	3.66	6.68	25.83	3.79	6.83	29.08	4.11	7.08	33.61	4.40	7.63
	30	21.02	3.00	7.01	25.01	3.44	7.28	26.72	3.53	7.58	30.40	3.74	8.12	35.50	93.90	9.10
	35	21.22	2.38	8.91	25.57	2.82	9.08	27.01	3.01	8.98	31.22	3.32	9.40	38.29	3.66	10.46
	40	16.83	2.10	8.03	22.43	2.75	8.16	23.33	2.83	8.25	27.74	3.27	8.48	34.70	3.62	9.60
	45	6.75	1.82	3.70	12.48	2.65	4.71	13.44	2.88	4.66	18.31	3.35	5.46	26.85	3.74	7.18
	48	4.31	1.86	2.31	7.36	2.59	2.84	7.86	2.83	2.78	10.23	3.25	3.14	14.21	3.72	3.82
14.1	-15	12.81	3.71	3.46	15.35	4.24	3.62	15.96	4.33	3.68	18.55	4.59	4.04	21.23	4.87	4.36
	-10	13.24	3.69	3.59	15.86	4.22	3.76	16.50	4.31	3.82	19.40	4.54	4.27	22.50	4.82	4.67
	-5	13.43	3.68	3.65	16.10	4.21	3.82	16.74	4.31	3.89	19.80	4.57	4.33	22.82	4.93	4.63
	0	13.74	3.66	3.75	16.46	4.18	3.93	17.12	4.28	4.00	20.33	4.58	4.44	23.51	4.99	4.72
	5	14.42	3.63	3.97	17.28	4.16	4.16	17.97	4.25	4.23	20.52	4.61	4.45	24.18	5.04	4.80
	10	15.01	3.55	4.23	17.71	4.09	4.33	19.21	4.22	4.56	21.62	4.56	4.74	25.78	5.06	5.10
	15	19.17	3.20	5.99	22.12	3.78	5.85	23.10	3.88	5.95	25.49	4.25	5.99	28.96	4.82	6.01
	20	18.51	2.91	6.36	23.82	3.48	6.84	24.66	3.68	6.70	28.46	4.07	7.00	32.25	4.47	7.22
	25	20.95	2.91	7.20	26.08	3.37	7.74	27.56	3.48	7.91	31.09	3.78	8.21	35.85	4.05	8.85
	30	23.42	2.71	8.64	27.52	3.16	8.71	28.50	3.24	8.79	32.81	3.44	9.54	37.87	3.59	10.56
	35	27.23	2.25	12.12	29.72	2.59	11.47	31.58	2.77	11.41	34.73	3.03	11.45	40.84	3.37	12.13
	40	17.49	1.85	9.48	23.92	2.53	9.46	24.89	2.60	9.57	29.49	3.01	9.80	37.01	3.35	11.05
	45	8.49	1.85	4.58	13.31	2.44	5.47	14.34	2.65	5.40	18.57	3.06	6.07	25.24	3.44	7.33
	48	5.31	1.89	2.80	7.85	2.38	3.29	8.38	2.60	3.22	10.42	2.99	3.49	13.41	3.42	3.92

According to EN14511:2018
kWt: delivered cooling power [kW]
kWe: electrical power input [kW]
Tae: outside air temperature [°C]
Performance in relation to the difference between inlet and outlet water temperature = 5°C

Data for calculation UNI/TS 11300-3

Performance with partial loads in Cooling mode

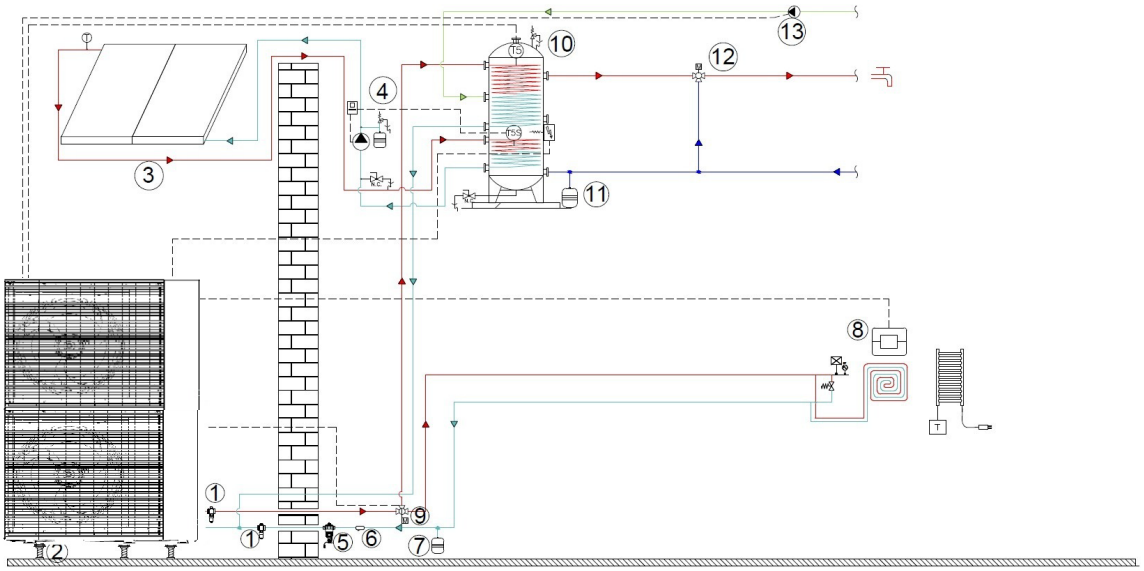
UNI/TS 11300 – part 3 is the reference standard to be considered for the evaluation of operation of the unit at partial loads in Cooling mode.
It indicates the operating temperatures and load factors (100 per cent, 75 per cent, 50 per cent and 25 per cent) to be used, based on the conditions of standard UNI EN 14825.
EER efficiency indices are calculated for each condition for assessing the actual performance of the unit.

	Cooling capacity [kW]				EER			
Condition	1	2	3	4	1	2	3	4
Load factor	100%	75%	50%	25%	100%	75%	50%	25%
12.1	26.00	19.56	13.33	8.16	3.10	3.79	4.02	3.82
14.1	30.00	21.49	13.99	8.16	2.80	3.35	3.68	3.82

Points calculated for fixed capacity systems according to prEN 14825:2018 referred to in UNI TS 11300-3
Reference conditions:
1. inlet/outlet water temperature 12/7 °C, outdoor air temperature 35 °C dry bulb
2. outlet water temperature 7 °C, outdoor air temperature 30 °C dry bulb
3. outlet water temperature 7 °C, outdoor air temperature 25 °C dry bulb
4. outlet water temperature 7 °C, outdoor air temperature 20 °C dry bulb

System diagrams

Heating / cooling / DHW with solar thermal circuit



1. VAGX: Antifreeze safety shut-off valve for water distribution system
2. AMRX: Antivibration mounts kit for floor installation
3. ELFOSUN Solar Thermal
4. Solar control box
5. FDMX: Magnetic dirt separator filter for water distribution system
6. Mesh filter (supplied as standard with the unit)
7. Additional expansion tank (externally supplied)
8. HTC2WX: white HID-TConnect 2 chronothermostat for temperature control
9. 3DHWX: Three-way deviating valve for system/DHW
10. ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Heater connection kit on DHW tank + SC08X solar coil for DHW boiler
11. DHW expansion tank (externally supplied)
12. Anti-scald valve (externally supplied)
13. DHW circulation pump (externally supplied)

There is an option for the unit to be connected to a DHW cylinder of suitable volume by equipping the system with a three-way diverter valve controlled by the unit itself (SV1, available as a 3DHWX accessory) and a dedicated temperature probe for measuring the temperature in the boiler (T5).
Three sizes of cylinders are available: 200, 300 and 500 L (ACS200X, ACS300X and ACS500X respectively). Each boiler is supplied with an auxiliary electrical heating element, which must be connected to the dedicated accessory (QERAX) to be powered.

Management and activation of DHW mode

Logic dictates that there is a demand for DHW when the difference between the DHW set-point T5S and the temperature of the storage tank T5 is greater than or equal to the value dT5_ON. Operation of the unit in DHW ends when T5 ≥ T5S.
You can also adjust the outside air temperature range T4 within which the heat pump can operate in DHW mode (by adjusting the range between parameters T4DHWMIN and T4DHWMAX).
If there is simultaneous demand from DHW and the system, the former has priority as standard, but this can be changed at the HMI. However, the unit's logic controls several parameters and alternates between DHW and system operation in order to preserve comfort.

Management and functions of the TBH electric heater

The electrical resistance on the TBH boiler is switched on below a certain outside air temperature level (settable via parameter T4_TBH_ON) or if it takes too long to reach the DHW set-point with heat pump operation only (parameter t_TBH_DELAY). Furthermore, outside the outdoor air operating range of the heat pump operation in DHW mode (defined by parameters T4DHWMIN and T4DHWMAX), but within the generic range of the heat pump, the unit can produce DHW by activating TBH.
The electric heater switches off when the water temperature in the tank reaches the maximum value above the set-point at which the heater can drive the boiler (can be set via parameter dT5_TBH_OFF).
Other functions related to the TBH heater are:

- RAPID DHW: forces DHW production with heat pump and TBH heater up to set-point
- TANK HEATING: the unit produces DHW with the TBH heater in the event of simultaneous demand for DHW and system (continuing to work as a heat pump in the system) and in the event of a failure.

Combination with thermal solar panelling

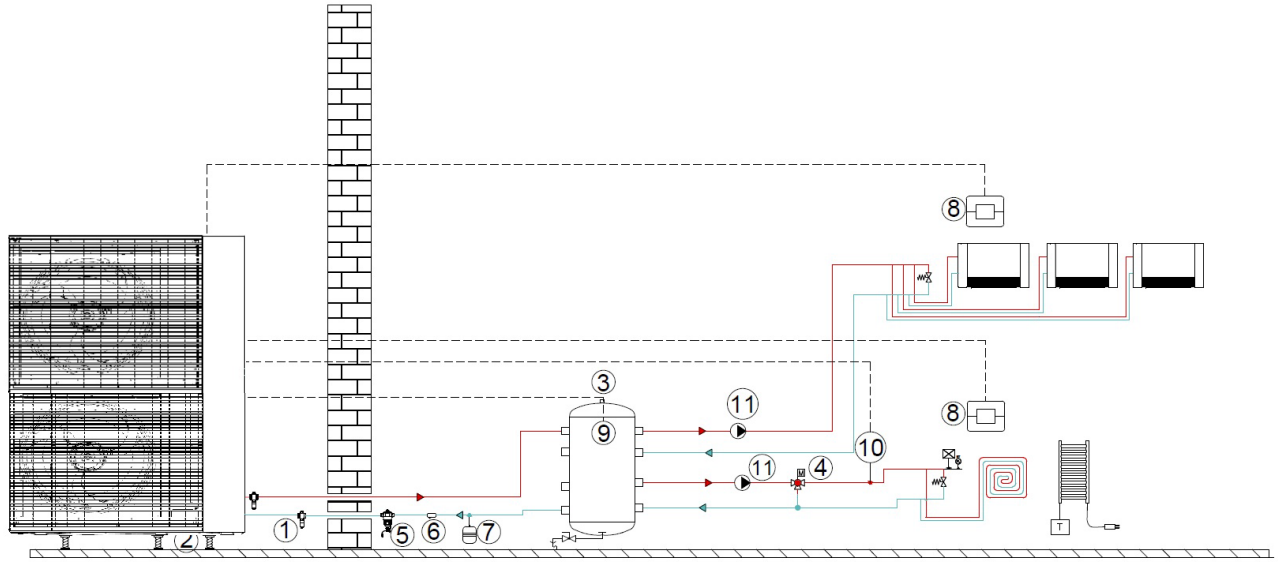
The boilers can be combined with solar thermal panelling via an additional heat exchanger. An additional heat exchanger is provided for the 200, 300 or 500 litre models:
- accessory SCS08X for the exchanger to be combined with ACS200X or ACS300X
- SCS12X accessory for heat exchanger to be combined with ACS500X

The solar thermal panels must be hydraulically connected to appropriate double-coil DHW boilers via a circuit with a dedicated P_s pump (from ELFOSun or other supply, with consent provided by the unit).
The solar system is set at the HMI, where it is possible to select between two types of control:
- DHW from both solar panels and heat pump: when there is a demand for DHW, the heat pump (and any other auxiliary sources) works normally, and the solar system can work alongside it, activating itself according to the unit's logic.
- DHW from solar panels only: heat pump and any other auxiliary sources cannot work in DHW mode, remaining available for the system. DHW is managed with only production from the solar system, which is activated according to the unit's logic.

The unit can control the P_S solar circuit pump in three different ways:
- The unit manages activation of the P_s pump based on the value detected by the Tsolar temperature probe and the setting of the DELTATSOL parameter (default 10°C, adjustable). DELTATSOL is the ΔT between the temperature of the water in the Tsolar solar circuit and the T5 temperature of the DHW boiler above which the P_s pump is activated.
- The unit manages activation of the P_s pump via an external signal from the solar control box (ON/OFF signal). The solar control box detects the conditions for which the solar circuit pump is to be activated.
- The solar circuit is fully managed by the ELFOSun external solar control box (see the specific Technical Bulletin for further details). In this case, it is not necessary to make any settings on the unit, as management is set directly on ELFOSun. Alternatively, a control box from an external supplier can also be used

System diagrams

Heating/cooling with 2-zone system (dual emitter)



1. VAGX: Antifreeze safety shut-off valve for water distribution system
2. AMRX: Antivibration mounts kit for floor installation
3. DI50-2X: 50-litre hydraulic circuit breaker
4. Three-way valve (external supply)
5. FDMX: Magnetic dirt separator filter for water distribution system
6. Mesh filter (supplied as standard with the unit)
7. Additional expansion tank (externally supplied)
8. HTC2WX: white HID-TConnect 2 chronothermostat for temperature control
9. Hydraulic separator temperature sensor Tbt1
10. Tw2 – Water supply temperature sensor for mixed zone
11. Circulation pumps for secondary circuit (externally supplied)

Up to two thermal zones can be managed, even at different temperatures. In this case, a primary and secondary circuit must be created.
There will be three circulators in the system:

- The primary circuit circulator (P_I), supplied as standard inside the unit
- The high temperature secondary circuit circulator (P_O)
- The high or low temperature secondary circuit circulator (P_C)

A three-way mixing valve (SV3) and downstream of it a mixed water temperature probe (Tw2) whose signal is used by the control logic to control the valve, if any, is required to manage the low temperature zone.
Alternatively, as in the diagram shown, a hydraulic separator of adequate volume **DI50-2X** or **DI100-2X**, 50 and 100 L respectively, can be provided and the circulation pumps can be selected separately.

Management and activation of thermal zone

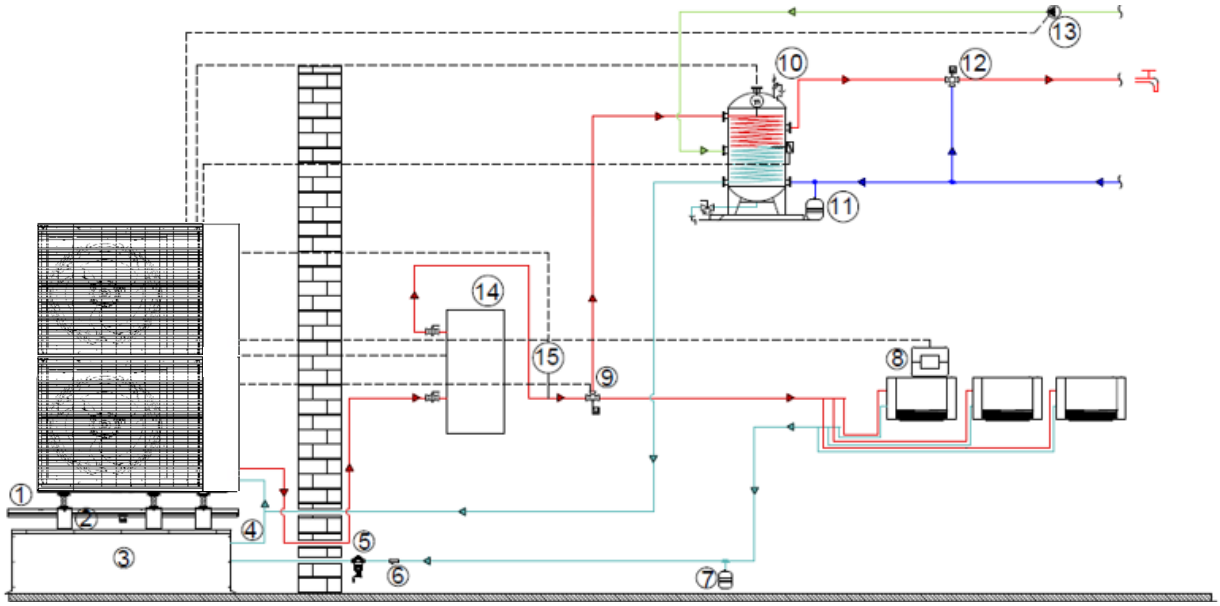
In the case of a two-zone system, two zone thermostats can be connected to manage the unit's ON/OFF function. Changing modes and setting the water set point are managed via the user interface.
Alternatively, it is possible to replace a zone thermostat with the user interface. In this case, the water set-point of zone 1 (where the zone thermostat is present) will always be set by the user interface while the set-point of zone 2 (where the user interface is present) will be adjusted automatically according to the temperature curve.

Operation of the circulation pumps

When zone 1 requires the unit to be switched on, the corresponding secondary circulator (P_O) is activated. When zone 1 no longer requires heat pump to operate, the circulator (P_O) stops.
When zone 2 requires the unit to be switched on, the corresponding secondary circulator (P_C) is activated and, if the zone is at low temperature, the mixing valve (SV3) is opened and adjusted according to the set-point of the mixed water probe (Tw2). When zone 2 no longer requires the heat pump to operate, the circulator (P_C) stops and the mixing valve (SV3), if present, is closed.

⚠ In systems where a mixing valve (SV3) is to be controlled, it is not possible to simultaneously control a diverter valve to manage two zones (SV2).

Heating / cooling / DHW with electric heater



1. DTX: Drain pan with electric heater
2. ASTFX: Antivibration mounts kit for installation on the brackets for wall installation, inertial storage tank or drain pan
3. TANKMX: 75 L system inertial tank
4. KTCAX: Hose kit for connecting the unit to the inertial storage tank
5. FDMX: Magnetic dirt separator filter for water distribution system
6. Mesh filter (supplied as standard with the unit)
7. Additional expansion tank (externally supplied)
8. HTC2WX: white HID-TConnect 2 chronothermostat for temperature control
9. 3DHWX: Three-way deviating valve for system/DHW
10. ACS300X: DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW storage tank
11. DHW expansion tank (externally supplied)
12. Anti-scalding valve
13. DHW circulation pump (externally supplied)
14. IBHX: electric heater
15. T1 – Supply temperature probe

The heating element should be positioned on the unit's water inlet.
In both cases, its operation is linked to a dedicated T1 temperature probe to be positioned downstream of the heater. (Note: the T1 probe is included in the Clivet configuration and accessories and does not need to be selected separately.)
The additional electric heater or the external generator can operate as:

- **Integration:** when it is not convenient/possible to work with the heat pump capacity alone
- **Replacement:** outside the work settings of the heat pump
- **Back-up:** in case of failure in the unit's refrigerant circuit (the unit keeps the pump running at maximum speed)

Activation of auxiliary source

Activation of the auxiliary source is linked to the simultaneous presence of 3 conditions, each of which is associated with a parameter that can be adjusted during initial start-up on the user interface:

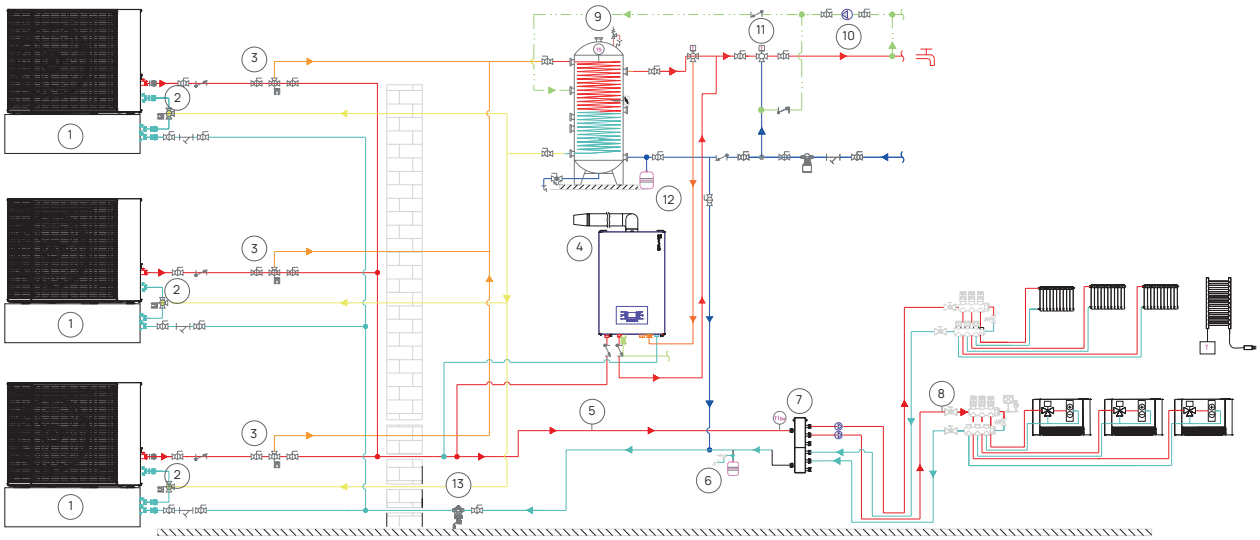
- Very low outdoor temperature, parameter (T4_IBH_ON): the minimum outdoor air temperature for heat pump operation only

⚠ to make the auxiliary source work only as a replacement for the unit, set the parameter to the same value as T4HMIN: the minimum outdoor air temperature at which the heat pump can operate.

- Supply temperature too far from the set-point (parameter dT1_IBH_ON): the minimum ΔT between water set-point (TS1) and unit supply (T1).
- Too long to reach the set-point (parameter t_IBH_DELAY): the maximum waiting time between compressor start-up and auxiliary source activation

System diagrams

Cascade x 3 Heating/cooling/DHW units with back-up boiler



1. TANKMX: 75 L system inertial tank
2. KTCAX: Hose kit for connecting the unit to the inertial storage tank
3. 3DHWX: Three-way deviating valve for system/DHW
4. GAS BOILER: boiler for centralised systems
5. T1 – Supply temperature probe
6. Additional expansion tank (externally supplied)
7. Hydraulic separation unit consisting of separator, booster pumps (externally supplied) and temperature sensor Tbt1
8. Tw2 – Water supply temperature sensor for mixed zone
9. ACS500X: 500 L DHW boiler / T5: DHW temperature probe / QERAX: Connection kit for heater on DHW tank
10. DHW circulation pump (externally supplied)
11. Anti-scalding valve
12. DHW expansion tank (externally supplied)
13. FDMX: Magnetic dirt separator filter for water distribution system

Many applications require drives to be installed as back-up to the main system or have loads that can change significantly during annual operation.
Cascade operation allows connection of up to 6 units in parallel, running a Master unit and activating the Slave units when its own capacity is not sufficient to meet the load of the system, ensuring maximum reliability and efficiency of the system.
The system rotates operation of all of the units by counting the compressor's operating hours, so as to use them evenly. In the event of failure of a unit, including the Master, the system ensures continuity of service.
Cascade management is provided as standard by the logic of the units; it must be set with the dip-switches (Master or Slave unit) on the board and all Slave units must be connected to the cascade H1H2 terminals.
Slave units are addressed via DIP switch S3 at start-up.
The Master unit is the only one that can:

- receive signals from the optionally installed temperature probes: T5 of the DHW tank, Tbt1 of the hydraulic separator, Tsolar of the solar system and Tw2 of the supply of the mixed circuit
- manage the components of the system: heater of the TBH DHW tank, SV2 three-way switching valve for direct two-zone systems or SV3 mixed circuit, P_o secondary circuit pump, P_c mixed circuit pump, P_s solar pump, P_d DHW recirculation pump and AHS auxiliary source
- receive external inputs: external ON/OFF signal via potential-free contact, signal from zone thermostat, Smart Grid signal and solar signal

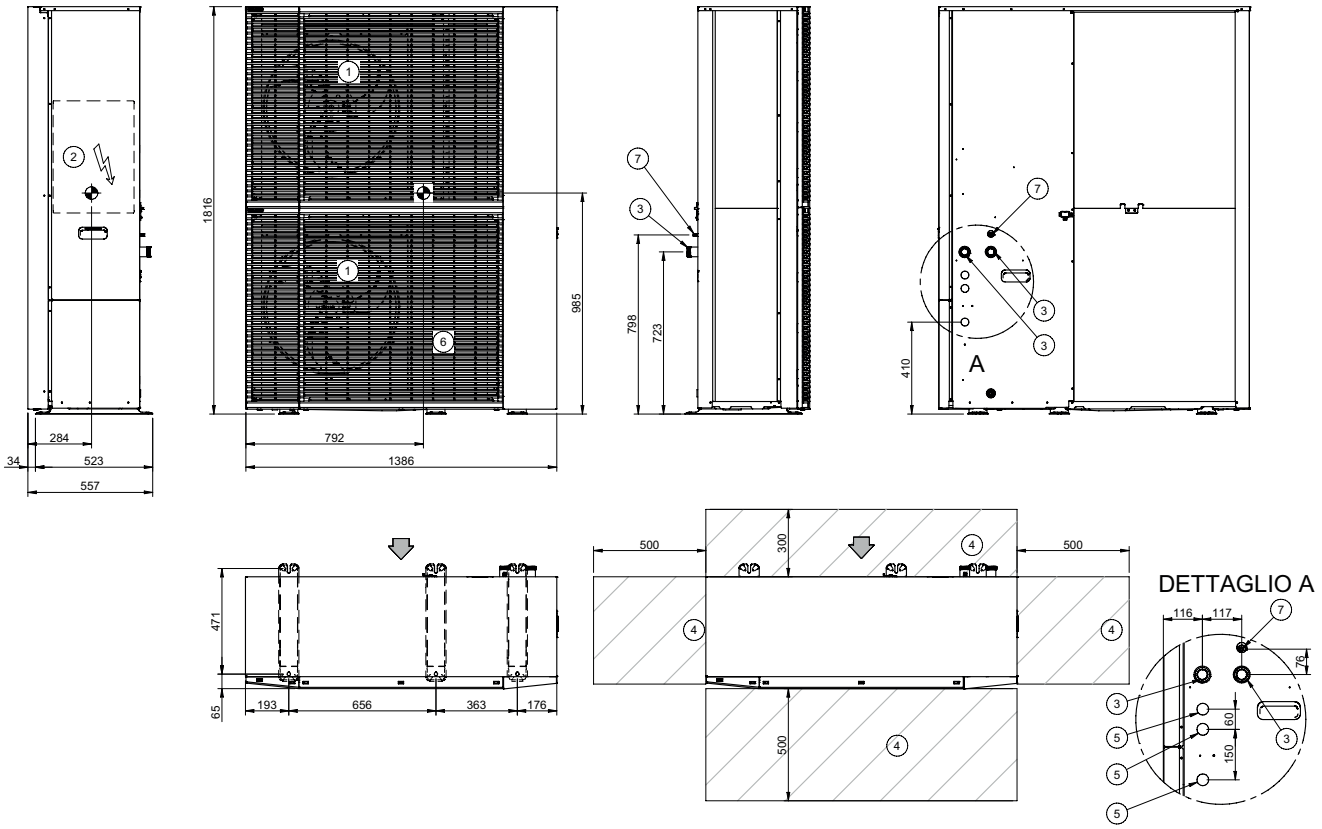
Note: each unit manages its own IBH additional electric heater, if present

When the Master is started up, it calculates the load to be supplied and activates the necessary Slave units when its own capacity is insufficient to meet the load of the system, providing them with mode and set-point settings. Should the Master start several Slaves, these are activated with a 10-second delay between each one.
If a Slave fails to start for 10 minutes, the unit is considered out of service and the Master will try to activate the next Slave. After 20 minutes, the unit considered to have failed is reset in the system management.
Note: In the event of failure of the Master's outdoor air probe, the Master will show the error on the display but will continue to operate using the average of the value detected in the Slave units.

When the system is switched off, the Slaves send the cumulative running time of their compressor to the Master, which prioritises the one with the lower value the next time it starts up.
Each unit normally manages its own defrosting cycles, but if the system is running with two or more units, the Master checks that the units defrosting at the same time are a maximum of 50 per cent (rounded down) of these.

Dimensional drawings

SIZE 2.1 ÷ 4.1



1. Fan
2. Electrical panel
3. Water connections
4. Functional spaces
5. Power input
6. Compressor enclosure
7. Water pressure relief valve drain

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

CLIVET LLC
Office 508-511, Elektozavodskaya st. 24,
Moscow, Russian Federation, 107023
Tel. +7495 6462009 - info.ru@clivet.com

CLIVET GROUP UK LTD
Units F5 & F6 Railway Triangle,
Portsmouth, Hampshire PO6 1TG
Tel. +44 02392 381235 - Enquiries@Clivetgroup.co.uk

CLIVET GMBH
Hummelsbütteler Steindamm 84,
22851 Norderstedt, Germany
Tel. +49 40 325957-0 - info.de@clivet.com

CLIVET MIDEAST FZCO
Dubai Silicon Oasis (DSO) Headquarter Building,
Office EG-05, P.O Box-342009, Dubai, UAE
Tel. +9714 3208499 - info@clivet.ae

CLIVET SOUTH EAST EUROPE
Jaruščica 9b 10000, Zagreb, Croatia
Tel. +3851 222 8784 - info.see@clivet.com

CLIVET FRANCE
6 Allée Kepler,
77420 Champs-sur-Marne - France
mail: info.fr@clivet.com
Tel: +33 01 88 60 99 40

CLIVET AIRCONDITIONING SYSTEMS PVT LTD
Office No.501 & 502,5th Floor, Commercial –I,
Kohinoor City, Old Premier Compound, Off LBS Marg, Kirol Road, Kurla West, Mumbai Maharashtra 400070, India
Tel. +91 22 30930200 - sales.india@clivet.com

clivet.com

Valid from: December 2025
Revision 00/2025 - BT25E042GB-00