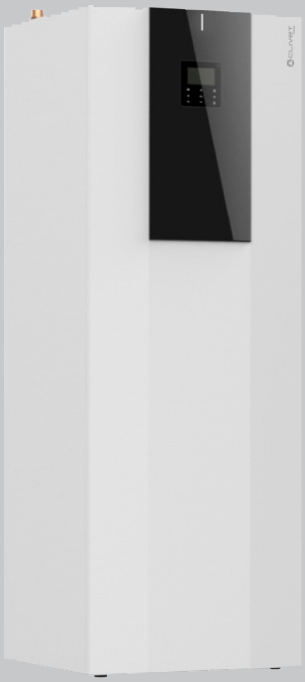
Two section air-water heat pump for heating, cooling and DHW production

SPHERA EVO 2.0 - Tower

SQKN-YEE 1 TC + MiSAN-YEE 1 S 2.1 ÷ 8.1 RANGE

TECHNICAL BULLETIN



SIZE	2.1	3.1	4.1	5.1	6.1	7.1	8.1
HEATING CAPACITY KW	4,32	6,18	8,30	10,9	12,13	14,51	16,01
COOLING CAPACITY KW	4,55	6,44	8,10	10,00	12,06	13,79	14,84

DHW STORAGE
190 L - A
250 L - A -B

Page

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

Features and benefits

SPHERA EVO 2.0 is a specialised autonomous heat pump system for single- and multi-family homes with medium/low and high power consumption.
Is an air-water heat pump system for cooling and producing/storing domestic hot water.
The SPHERA EVO 2.0 system is composed of a latest generation high efficiency outdoors moto-condensing unit connected via refrigerant connections to an indoors unit.
It is the second generation of heat pumps for residential use.

SPHERA EVO 2.0 Tower

- Tower Version
- Two volumes of DHW 190 and 250-litres
- Class A++ Average temperature
- Class A+ Domestic hot water production
- Built-in WiFi for connection to the dedicated APP
- Also available in the hybrid version with 24 kW or 34 kW gas boiler

R-32

SPHERA EVO 2.0 Box

- Box Version
- Integrated 3-way valve for DHW
- Compact dimensions
- Class A+++ Low temperature
- Built-in WiFi for connection to the dedicated APP
- Also available in the hybrid version with 24 kW or 34 kW gas boiler

R-32

SPHERA EVO 2.0 Invisible

- Version for built-in installation
- 150-litre DHW storage can be expanded up to 300-litres
- Compact dimensions for easy installation in walls
- Also available in the hybrid version with 24 kW or 34 kW gas boiler
- Built-in WiFi for connection to the dedicated APP
- Also available with outdoor aesthetic cabinet

R-32

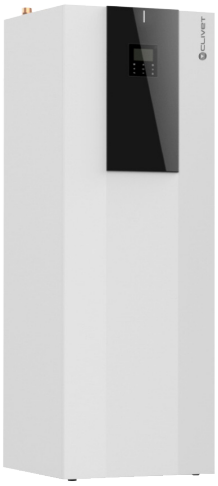
SPHERA EVO 2.0 - Tower - Indoor unit

Zinc-Magnesium frame

Supporting frame in Zinc-Magnesium panelling, excellent mechanical characteristics and high resistance to corrosion over time.

Panelling

External panelling in zinc-magnesium sheet, with white paint in RAL 9003 to ensure better resistance to corrosion. Panels that can be easily removed to allow full access to internal components.



Internal exchanger

Direct expansion heat exchanger with INOX AISI 316 stainless steel braze-welded plates. With low refrigerant content and high exchange surface, complete with external anti-condensation thermal insulation 10 mm thick in sintered expanded polypropylene.

Domestic hot water

- 190-litre or 250-litre DHW storage tank with vitrified internal surface and external polyurethane insulation (50mm thick)
- Magnesium anode
- 2 kW safety and anti-legionella heating element
- Internal exchanger in vitrified steel with an exchange surface of 2 m^2
- Set-up for domestic hot water recirculation circuit
- Storage discharge stop valve
- Probe sump for solar thermal system control
- Thermostatic valve.

Hydronics module

- Variable flow direct current primary circulator
- Safety flow switch for water flow
- 3-way switching valve for system or domestic hot water
- 3 bar system water side pressure relief valve
- Magnetic dirt separator
- System vent valve
- 12 litre system expansion tank, 1 bar pre-charge
- Drain pan in ABS
- 15 litre inertial storage tank

Electrical panel

The electrical panel is located inside the unit and is easily accessible thanks to removable panel. Moreover, a LED on the front panel is connected to check the operating status of the unit.
The capacity section includes:

- power input terminals.

Coloured keypad for:

- remote microprocessor control with single-area thermostat function;
- BMS management;
- daily, weekly temperature set point and start-up/shutdown scheduler;
- anti-legionella function scheduling;
- management busters two zones;
- solar thermal management;
- management for auxiliary heaters;
- antifreeze protection water side;
- no water flow-rate protection with flow switch;
- remote interface terminal with graphic display;
- cascade operation.

Inside the electrical panel there is a T1B temperature probe for low temperature area control in the 2-area kit (length 4.5 m and 6 mm bulb).

Standard unit kit:

- Mesh filter for system water
- Copper gas reduction for 4-6 kW outdoor unit connection
- Fittings for unit connection
- Ball shut-off valve for system isolation
- Torx key and insert for opening and closing the unit's panels
- Adjustable feet that can be screwed on the base of the unit
- Cover cap for remotely controlled keypad
- 1 x quick-action coupling spring
- 1 x expansion tank connection gasket
- 1 x O-ring
- 1x grease tube

SPHERA EVO 2.0 - Outdoor unit

Zinc-Magnesium frame
High strength frame for outstanding durability and excellent mechanical characteristics.

Panelling
Outer panelling made of Zinc-Magnesium sheet metal painted with pantone warm gray 2C to ensure superior corrosion resistance. Each panel can be easily removed to allow full access to internal components.

Rotary DC inverter compressor
Inverter controlled rotary hermetic compressor for constant modulation of the power supplied according to actual needs, ensuring high seasonal efficiency. With a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on anti-vibration mounts and it is equipped with oil charge. The compressor is wrapped by a sound-absorbing hood, that reduces its sound emissions. A guard heater with automatic insertion prevents the refrigerant from diluting the oil when the compressor stops.

EC inverter fan
Axial fan with variable speed control and sickle shaped blades in ABS resin. It is directly coupled to the electronically controlled motor (IP23), which, thanks to brushless technology and the particular power supply, increases its lifespan and reduces consumption. The fan is housed in an aerodynamically shaped nozzle to increase efficiency and minimise noise. It is also fitted with anti-intrusion grid.

External exchanger
Direct expansion finned coil exchanger made with copper pipes mechanically expanded to better adhere to the fin collar. It has a large surface area to improve heat exchange and reduce defrosting in the interest of seasonal efficiency. The fins are made of aluminium with hydrophilic treatment which facilitates the elimination of condensate, further improving defrosting.

Refrigerant circuit
The refrigeration circuit includes:
- Electronic expansion valve
- 4-way cycle inversion valve
- Liquid separator in extraction
- Mechanical filters
- Low pressure pressure switch
- High pressure pressure switch

EH024
EH6
EH9

Integration electric heater

The electric heater can operate both for the system and for the production of domestic hot water in two different modes:

- as an integration, when the heat pump capacity is not enough to fulfil the required set point;
- as a safety element if the heat pump fails.

⚠ The additional electric heater is not an accessory supplied separately, but a construction configuration.
⚠ Selection of the additional three-phase (6 e 9kW) electric heater changes the voltage of the indoor unit only. The outdoor unit remains with single phase power supply.
⚠ The configuration with additional electrical resistance excludes the external boiler connection kit and the hybrid solution.

Accessories separately supplied

KIRE2HX -
KIRE2HLX

2 zones: external kit, both at high temperature
2 zones: external kit, high temperature + low temperature (mixed)

Distribution module for 2-zone heating systems with compact design (402mm x 250mm x h525mm) and ample versatility for different types of installation.
Kit composed of:

- 1 collector / Black painted separator;
- 2 circulator;
- 1 sliding temperature mixing valve (only for the kit KIRE2HL);
- 1 EPP insulation (front and rear);
- 1 threaded disc with hermetic sealing cap;
- 1 lower anti-rotation jig;
- 1 support bracket module,
- 1 probe for mixed circuit temperature management

For the technical data of the hydraulic head of the pumps, please refer to the dedicated section in the HYDRAULIC DATA chapter.

KCSX

Secondary circuit kit (1-litre circuit breaker + pump)

The single-zone kit consists of one hydraulic separator combined with a high efficiency pump, all inside a box for easy installation. Allows interaction between the primary circuit circulator and the secondary circuit circulator. Furthermore, the separator also has the function of a deaerator. With the following benefits and advantages:

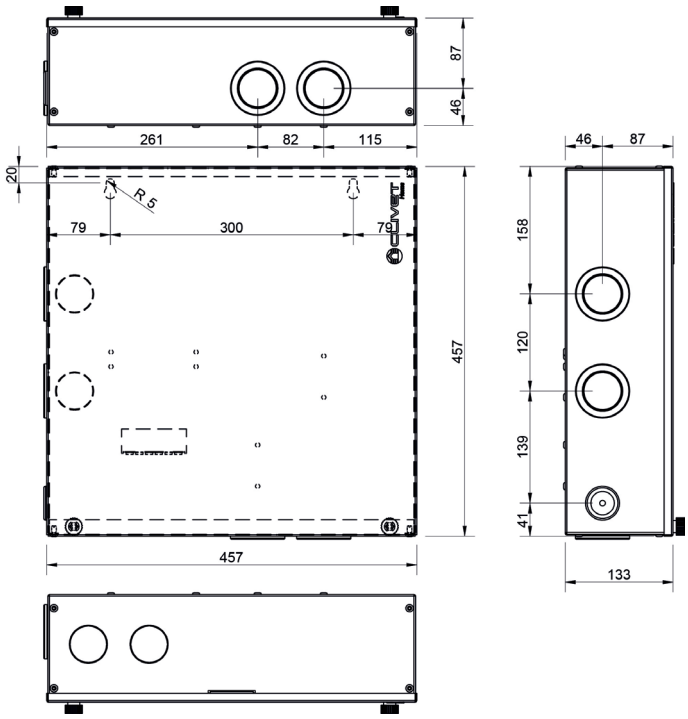
- makes the connected hydraulic circuits independent;
- ensures effective operation of the secondary circulator that provides the hydraulic demand of air conditioning systems
- air extraction system;
- thermally insulated black EPP
- zone manifold connection kit

The kit is comprised of:

- 1 1-litre circuit breaker;
- 2 copper pipes;
- 1 circulator;
- closing plates

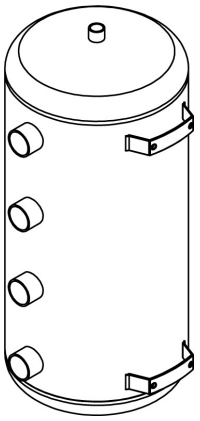
Dimensions:
Length 457 mm
Height 457 mm
Depth 133 mm

DIMENSIONAL



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

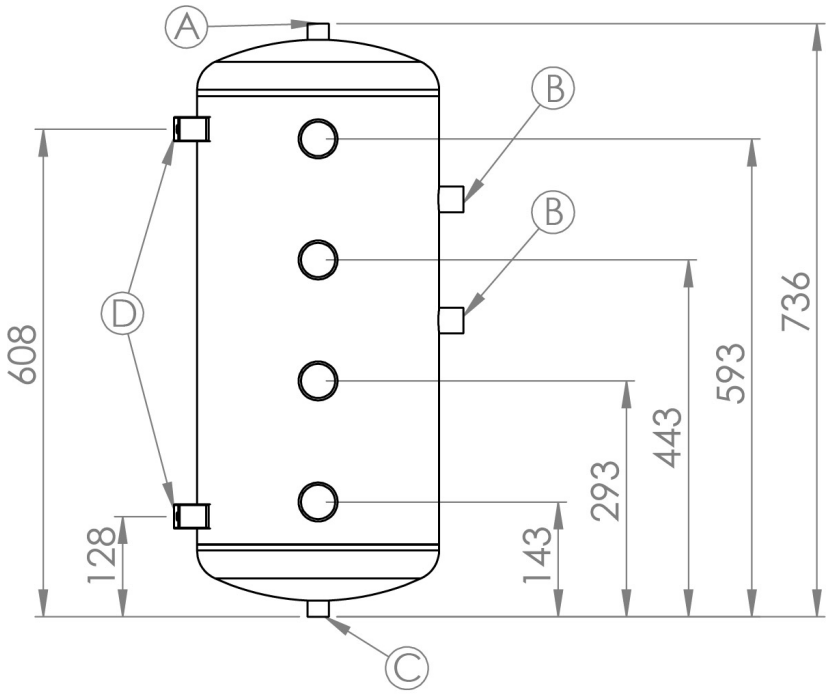
Technical 50-litre storage tank with the function of a hydraulic separator and inertial tank ensures effective operation of the secondary circulators that provide the hydraulic demand of air conditioning systems.
With the possibility of connecting two zones.

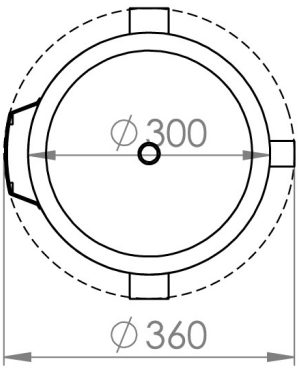


Technical data:
Circuit breaker diameter 380 mm
Circuit breaker height 933 mm
Connections 1"1/4 F
Max temperature 95°C
Max pressure 6 bar
Circuit breaker material S235JR steel
Circuit breaker capacity 57 litres
Circuit breaker weight 25 kg
Insulation material Polyurethane foam
Insulation thickness 40 mm
Energy class B
Specific heat loss 0.76 W/K

The kit is supplied with brackets for wall mounting.

DIMENSIONAL



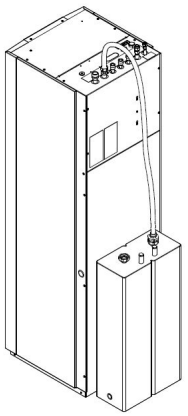


Accessories separately supplied

ACI40X **40L system inertial storage tank**

Inertial storage tank to be installed outside the unit. Extremely compact, supplied with air vents and support brackets for wall installation. Suitable for all SPHERA EVO 2.0 sizes, it facilitates operation and helps to fulfil the heat requirement, guaranteeing optimal modulation.
It can be installed next to or behind the unit, as shown in the figure.
Kit consisting of:

- 1 40-litre ST37.1 steel storage tank for ACI40X
- 1 2-metre flexible hose
- Extremely compact:
  LENGTH: 440 mm
  DEPTH: 220 mm
  HEIGHT: 887 mm
- Maximum working temperature: 100°C
- Maximum operating pressure: 6 bar
- Thermally-isolated with EPP 40 g/l
- Insulation thickness 30 mm
- Automatic air vent



ANEDX **Electronic anode to protect DHW boiler**

Electronic impressed current anode (supplied separately) to protect the internal surface of the DHW tank.
The kit contains:

- Electronic anode (15cm);
- Electric module + power supply (220-240V ~50Hz)
- Instruction manual

The device maintains its performance and reliability over time.
The power supply is separate from that of the unit and does not require any routine maintenance.

COFX **Casing sheets for the inertial storage cover**

Decorative metal sheets serving as a cover for the inertial storage tank, if installed at the back of the unit.

VEACSX **Vaso di espansione ACS**

Vaso di espansione per acqua calda sanitaria da 15 litri e una pressione massima di esercizio pari a 10 bar. Grazie al suo design fusiforme, rappresenta una soluzione ideale per l'ottimizzazione degli spazi, installabile dietro l'unità.
Le dimensioni del vaso di espansione sono le seguenti:
- Diametro 160 mm
- Altezza 750 mm

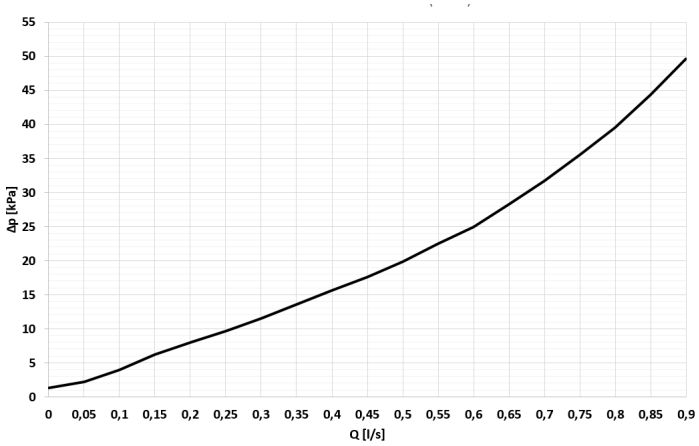
SOLX **Drain-back solar integration for domestic hot water**

The kit, which can be installed inside the unit, consists of:

- 1 Brazed plate heat exchanger in stainless steel (AISI 316) for domestic hot water production
- 1 Circulator
- 1 Exchanger support
- Copper connection pipes
- 2 plastic supports

Through the circulator, the domestic hot water is taken directly from the tank and heated, through the stainless steel plate exchanger with a heat exchange capacity of 2703 W/K, with the hot water coming from the solar collectors.
In this case, for operation, it is necessary to connect a solar circulation group, which can be installed outside the unit. For sizing of the solar collector system and of the components, see the ELFOSun technical documentation. For correct operation, the temperature probe of the solar panel regulation control unit must be positioned in the specific well of the SPHERA EVO 2.0 storage tank.

Solar heat exchanger pressure drop



⚠ The solar integration for DHW excludes the external boiler connection kit.

Accessories separately supplied

GAS BOILER FE 24.4 - e GAS BOILER FE 33.4

Caldaia a condensazione di integrazione

Caldaia a condensazione da 24kW che grazie alle logiche interne di SPHERA EVO 2.0 viene gestita sia in integrazione che in sostituzione alla pompa di calore in modo da ottenere un maggior comfort anche alle temperature più rigide.

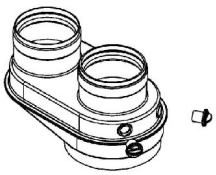
Il kit è composto da:

1. Caldaia a condensazione da 24 kW o 34 kW
   1a. pompa di circolazione
   1b. valvola d'intercettazione caldaia
   1c. vaso d'espansione da 8 litri FE 24.4 e 10 litri FE 33.4
2. 1 rubinetto gas a sfera;
3. tubi in rame e flessibili per il collegamento;
4. viti, guarnizioni e staffe per il fissaggio;
5. manuale installazione del kit.

⚠ L'opzione caldaia non è compatibile con opzione resistenze elettriche integrative

KSDFX

flue gas splitter kit



La caldaia è fornita di attacchi flangiati per lo scarico/aspirazione coassiale (Ø 60/100) STD.
Il kit KSDFX è composto da uno sdoppiatore (Ø 80/80) collegabile alla caldaia che permette l'aspirazione aria e l'espulsione fumi.
Il collegamento alla canna fumaria deve essere eseguito nel rispetto delle vigenti regolamentazioni tecniche.
L'unità è dotata di uno scarico dedicato per la condensa proveniente dalla caldaia; questa condensa con acidità elevata in utilizzo residenziale può essere immessa nello scarico acque reflue dell'abitazione (UNI 11071).

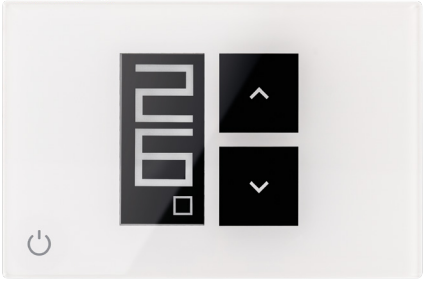
CCOAX

90° coaxial elbow for ø 60/100 mm horizontal outlet that can be adjusted at 360°

Elbow for the discharge of gas and intake of air, that can be combined with ø 60/100 coaxial pipe with terminal.
The internal section is used for the discharge of the combustion gas while the external section is used for the intake of combustion air.

HTC2WX **White HID-TConnect² chronothermostat for temperature control**

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.



SWCX **SwitchConnect radio receiver**

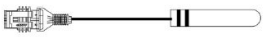
Radio receiver for HID-TConnect, for managing the request of terminal units or radiant systems, the heat pump mode change or the double set-point.

Technical specifications:

- functions: radio receiver for use with HID-TConnect
- combinable thermostats: max 6
- frequency: 2.4GHz
- transmission distance: max 30m (in buildings) / max 100m (in open range)
- contacts: 2 relays (voltage-free)
- power supply: 95÷290V / 47÷440Hz
- operation temperature: 0÷40°C
- operation humidity: 20÷80% RH
- dimensions: 125x78x30.5mm

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.*

Hybrid version

DTX **Auxiliary drain pan**

Outdoor unit

The base plate of the outdoor unit is fitted with a drain for the condensate produced during the winter phase in the defrosting period. This can help (not guarantee) condensate flow correctly into the relevant drains.

To ensure the condensate is drained correctly, in the various operating conditions it is mandatory to use the auxiliary condensate drain pan with drainage to be connected to the drain trap, according to the relevant technical standards and regulations in force.

An anti-freeze heater is also included in the drain pan. It prevents the condensate produced from freezing when the outdoor temperature drops below zero.

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

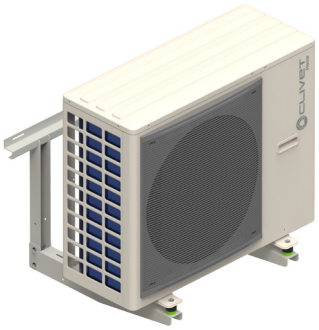
The antivibration mounts for floor installation reduce the vibrations of the compressor during its operation. They are secured to the feet of the base plate.

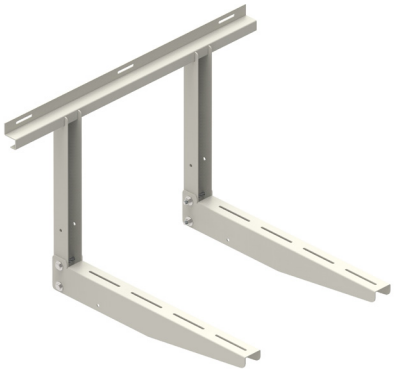
ASTFX **Kit of antivibration mounts for wall bracket installation**

The antivibration mounts reduce the vibrations of the compressor during its operation. They are secured to the wall support brackets

KSIPX **Kit with wall fixing brackets**

Wall fixing bracket for outdoor unit, adjustable, in galvanised steel painted with polyester powders for outdoor use..





VDACSX **Thermostatic switching valve for DHW**

The thermostatic switching valve is used in the DHW circuit.

It is designed to divert the water from the DHW storage tank directly to the utility as the water temperature is suitable for use. If the temperature is not adequate for direct use, the switching valve ensures the water passes inside the boiler which, thanks to instant production, guarantees continuous supply.

1 1/4 "M connections.
Body in anti-dezincification alloy. Chromium-plated.
PSU shutter.
Stainless steel springs.
EPDM sealing elements.
Maximum inlet temperature 100°C.
Adjustment range: 38÷52°C
Accuracy: ± 2°C
Max (static) working pressure: 10 bar
Max (dynamic) working pressure: 5 bar
Default calibration: 40°C
Minimum range for steady operation: 4 l/min

⚠ Reductions for connections of different diameters are the responsibility of the client

Prestazioni

SIZE			2.1		3.1		4.1		5.1		6.1*	7.1*	8.1*
STORAGE TANK CAPACITY			190 L	250 L	190 L	250 L	190 L	250 L	190 L	250 L	250 L	250 L	250 L
Heating													
Air 7 °C - Water 35 °C													
Nominal heating capacity / Max	1	kW	4,32 / 6,26		6,18 / 7,41		8,30 / 9,11		10,09 / 10,3		12,13 / 14,60	14,51 / 15,5	16,01 / 16,80
Total power input	1	kW	0,80		1,19		1,56		2,01		2,42	3,09	3,52
COP	1	-	5,42		5,21		5,31		5,01		5,00	4,70	4,55
Water flow-rate	1	l/s	0,21		0,30		0,41		0,49		0,57	0,67	0,75
Nominal available pressure	1	kPa	31,2		36,5		33,1		31,0		25,7	31,7	22,6
Maximum available pressure	1	kPa	69	95	62	90	47	83	31	76	70	55	39
Air -7 °C - Water 35 °C													
Nominal heating capacity / Max	2	kW	4,17 / 6,25		6,05 / 6,97		7,33 / 8,35		8,20 / 9,30		10,49 / 13,85	12,23 / 14,09	13,43 / 14,33
Total power input	2	kW	1,32		2,01		2,27		2,67		3,36	4,33	4,90
COP	2	-	3,16		3,00		3,23		3,07		3,13	2,82	2,74
Water flow-rate	2	l/s	0,22		0,29		0,34		0,40		0,56	0,62	0,70
Nominal available pressure	2	kPa	35,0		39,8		34,0		31,7		65,8	63,1	47,7
Maximum available pressure	2	kPa	69	94	64	91	58	88	49	84	71	63	49
Air 7 °C - Water 45 °C													
Nominal heating capacity / Max	3	kW	4,16 / 5,96		6,03 / 7,13		8,22 / 8,98		10,01 / 10,30		12,30 / 14,50	14,00 / 15,70	16,01 / 16,60
Total power input	3	kW	1,06		1,57		2,08		2,59		3,24	3,84	4,45
COP	3	-	3,93		3,83		3,95		3,86		3,80	3,65	3,60
Water flow-rate	3	l/s	0,19		0,30		0,39		0,49		0,60	0,67	0,76
Nominal available pressure	3	kPa	32,3		36,4		34,9		31,0		51,6	41,8	21,7
Maximum available pressure	3	kPa	70	95	63	90	51	85	31	76	65	55	38
Air 7 °C - Water 55 °C													
Nominal heating capacity / Max	4	kW	4,08 / 5,74		5,94 / 6,90		7,50 / 7,80		9,60 / 9,72		12,07 / 13,90	13,85 / 14,50	16,00 / 16,20
Total power input	4	kW	1,36		1,93		2,35		3,10		3,89	4,53	5,52
COP	4	-	3,00		3,07		3,19		3,10		3,10	3,05	2,90
Water flow-rate	4	l/s	0,12		0,18		0,23		0,29		0,36	0,41	0,48
Nominal available pressure	4	kPa	35,6		33,4		31,2		33,6		14,1	16,5	17,4
Maximum available pressure	4	kPa	70	98	70	96	69	94	63	91	90	105	80
Cooling													
Air 35 °C - Water 18 °C													
Nominal cooling capacity / max	5	kW	4,55 / 6,88		6,44 / 7,65		8,10 / 11,13		10,00 / 12,03		12,06 / 15,02	13,79 / 15,30	14,84 / 16,38
Total power input	5	kW	0,75		1,23		1,58		2,10		3,00	3,73	4,07
EER	5	-	6,08		5,24		5,12		4,77		4,02	3,70	3,65
Water flow-rate	5	l/s	0,22		0,32		0,38		0,48		0,60	0,63	0,71
Nominal available pressure	5	kPa	34,9		34,8		34,6		10,6		13,1	16,3	15,1
Maximum available pressure	5	kPa	69	94	61	89	51	85	32	76	65	61	48
Air 35 °C - Water 7 °C													
Nominal cooling capacity / max	6	kW	4,26 / 6,14		6,25 / 6,39		7,46 / 7,94		9,10 / 9,10		11,80 / 11,80	12,86 / 12,86	14,2 / 14,2
Total power input	6	kW	1,22		2,02		2,24		2,94		4,29	5,04	5,80
EER	6	-	3,50		3,09		3,33		3,09		2,75	2,55	2,45
Water flow-rate	6	l/s	0,20		0,29		0,36		0,43		0,54	0,59	0,64
Nominal available pressure	6	kPa	5,8		36,1		34,3		36,8		18,1	20,3	25,1
Maximum available pressure	6	kPa	70	95	64	91	56	87	43	82	74	67	60

1. User side entering/leaving water temperature 30/35 °C, source side air 7 °C (U.R. = 85% Heat power data, Total power input and COP in accordance with EN 14511:2022.
2. User side entering/leaving water temperature 30/35 °C, source side air -7 °C Heat power data, Total power input and COP in accordance with EN 14511:2022.
3. User side entering/leaving water temperature 40/45 °C, source side air 7 °C (U.R. = 85% Heat power data, Total power input and COP in accordance with EN 14511:2022.
4. User side entering/leaving water temperature 47/55 °C, source side air 7 °C U.R.= 85% Heat power data, Total power input and COP in accordance with EN 14511:2022.
5. User side entering/leaving water temperature 18/23 °C, source side air 35 °C Heat power data, Total power input and COP in accordance with EN 14511:2022.
6. User side entering/leaving water temperature 7/12 °C, source side air 35 °C Heat power data, Total power input and COP in accordance with EN 14511:2022.

The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) N. 811/2018 and Commission Delegated Regulation N. 813/2013, Clima Average, High Temperature 47/55°C.

All data calculated with zero elevation gain and equivalent length of 7m.

General technical data

SIZE			2.1		3.1		4.1		5.1		6.1*	7.1*	8.1*
STORAGE TANK CAPACITY			190 L	250 L	190 L	250 L	190 L	250 L	190 L	250 L	250 L	250 L	250 L
ERP													
Clima Average High temperature Heat pumps													
Nominal power	7	kW	4		6		7		9		12	13	13
SCOP	7	-	3.32		3.54		3.72		3.73		3.56	3.52	3.48
Generator energy class	7	-	A++		A++		A++		A++		A++	A++	A++
ηs	7	%	130		138		146		146		139	138	136
System energy class	7	-	A++		A++		A++		A++		A++	A++	A++
ηs	7	%	135		143		151		151		144	143	141
Clima Average Low temperature Heat pumps													
Nominal power	8	kW	5		6		8		10		12	14	16
SCOP	8	-	5,13		5,15		5.32		5.27		5.00	4.91	4.89
Generator energy class	8	-	A+++		A+++		A+++		A+++		A+++	A+++	A+++
ηs	8	%	202		203		210		208		196	193	193
System energy class	8	-	A+++		A+++		A+++		A+++		A+++	A+++	A+++
ηs	8	%	207		208		215		213		201	198	198
Average climatic conditions - Heat pump for application with Fan coil													
Nominal power	9	kW	4		6		7		9		12	13	14
SEER	9	-	5,09		5,42		5.95		6.01		5.16	5.10	4.87
Generator energy class	9	-	A+++		A+++		A+++		A+++		A+++	A+++	A+++
ηs	9	%	201		214		235		238		203	201	192
Heat pump for Domestic Hot Water application													
Load profile declared	10	-	L	XL	L	XL	L	XL	L	XL	XL	XL	XL
ηwh	10	%	120	123	120	123	116	125	116	125	124	124	124
Sanitary water energy class	10	-	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+

7. The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) N. 811/2018 and Commission Delegated Regulation N. 813/2013. Clima Average, Medium temperature 47/55 °C
8. The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) N. 811/2018 and Commission Delegated Regulation N. 813/2013. Clima Average, Low temperature 30/35 °C
9. The product is conforming with the European ErP Directives, which includes Commission Delegated Regulation (EU) N. 811/2018 and Commission Delegated Regulation N. 813/2013. Clima Average, Low temperature 12/7°C
10. Data according to EN 16147: 2017

All data calculated with zero elevation gain and equivalent length of 7m.

Construction - Outdoor unit

SIZE			2.1	3.1	4.1	5.1	6.1	7.1	8.1
Characteristics									
Compressor			Twin Rotary						
Refrigerant			R32						
Refrigerant charge		kg	1.50	1.50	1.65	1.65	1.84	1.84	1.84
GWP		t_{CO2}	675	675	675	675	675	675	675
Equivalent tons of CO2 (*)		t_t	1.02	1.02	1.11	1,11	1.24	1.24	1.24
Oil charge		l	0,46	0,46	0,46	0,46	1,10	1,10	1,10
Type of fan			Axial						
Nominal air flow rate		m^3/h	2770	2770	4030	4030	4060	4060	4060
Outdoors unit sound pressure at 1 metre	1	dB(A)	42	44	45	47	50	51	53
Sound power	1	dB(A)	55	57	58	60	63	64	66
Dimensions									
Operation (L x P x A)		mm	986x426x712	986x426x712	1140x523x866	1140x523x866	1140x523x866	1140x523x866	1140x523x866
Packing (L x P x A)		mm	1065x485x800	1065x485x800	1180x560x890	1180x560x890	1180x560x890	1180x560x890	1180x560x890
Operation weight 230M / 400TN	2	kg	58	58	77	77	96/112	96/112	96/112
Shipping weight 230M / 400TN	2	kg	64	64	88	88	110/125	110/125	110/125

1. Sound pressure level determined using the intense metric method (UNI EN ISO 9614-2). The sound levels are referred to a unit at full load, under nominal test conditions. Data referred to the following conditions: service side exchanger inlet/outlet water 47/55 °C source side exchanger inlet air 7 °C. The sound pressure level refers to a distance of 1 m from the external surface of the unit operating in the free field.
2. Power supply 220-240V ~ 50Hz / Power supply 380-415V 3N~ 50Hz

(*) It contains fluorinated greenhouse gases.

Construction - Indoor unit

SIZE			A - 190 L	A - 250 L	B - 250 L
System characteristics					
Maximum circuit pressure		bar	3,0	3,0	3,0
System expansion tank	1	l	12	12	12
Preload expansion tank		bar	1,0	1,0	1,0
System water connections		inch	1''	1''	1''
DHW characteristics					
Type Storage tank			Enameled steel	Enameled steel	Enameled steel
Volume of DHW tank		l	190	250	250
Internal pipe coil exchange surface		m^2	2,0	2,0	2,0
Storage dipersion		W/K (kWh/24h)	1.81 (1.95)	2.04 (2.20)	2.04 (2.20)
DHW safety heating element		kW	2,0	2,0	2,0
Maximum DHW circuit pressure	2	bar	10,0	10,0	10,0
Recommended sanitary expansion tank	3	l	12,0	16,0	16,0
DHW water connections		inch	3/4''	3/4''	3/4''
Dimensions					
Operation (L x P x A)		mm	600 x 615 x 1774	600 x 615 x 2084	600 x 615 x 2084
Packing (L x P x A)		mm	660 x 690 x 1890	660 x 690 x 2190	660 x 690 x 2190
Operation weight		kg	359	419	421
Shipping weight		kg	187	192	194

1. Sufficient volume up to a maximum of 60 litres of system water content.
2. The installation of the sanitary side safety valve is mandatory and left to the installer.
3. The installation of the fixture's expansion tank is mandatory and is to be completed by the installer. The indicated volumes are for reference purposes only..

Configuration compatibility table SPHERA EVO 2.0 Tower

INDOOR UNIT		SQKN-YEE 1 TC A	SQKN-YEE 1 TC A	SQKN-YEE 1 TC B	INTEGRATION ELECTRIC HEATER		
	Storage	190L	250L	250L	EH024	EH6	EH9
OUTDOOR UNIT							
MiSAN-YEE 1 S 2.1		✓	✓	-	✓	✓	✓
MiSAN-YEE 1 S 3.1		✓	✓	-	✓	✓	✓
MiSAN-YEE 1 S 4.1		✓	✓	-	✓	✓	✓
MiSAN-YEE 1 S 5.1		✓	✓	-	✓	✓	✓
MiSAN-YEE 1 S 6.1		-	-	✓	✓	✓	✓
MiSAN-YEE 1 S 7.1		-	-	✓	✓	✓	✓
MiSAN-YEE 1 S 8.1		-	-	✓	✓	✓	✓

Condensing boiler technical data

MODEL				FE 24.4	FE 33.4
Heating capacity					
Nominal heating capacity (Qn)	-	Maximum	[kW]	24,5	34,8
		Minimum	[kW]	4,8	5,0
Heating capacity (Pn)	60/80 °C	Maximum	[kW]	24,0	34,0
		Minimum	[kW]	4,7	4,9
	30/50 °C	Maximum	[kW]	26,0	37,0
		Minimum	[kW]	5,2	5,4
Performance	60/80 °C	Maximum	%	97,8	97,7
		Minimum	%	97,6	97,2
	30/50 °C	Maximum	%	106,1	106,2
		Minimum	%	107,3	107,1
	30% di Pn	-	%	109,7	109,7
Boiler water content	-	-	[l]	3,4	4,3
Operating pressure	PMS	Maximum	[bar]	3	3
	-	Minimum	[bar]	0,8	0,8
Expansion tank	Volume	-	[l]	8	10
	Preload	-	[bar]	0,8	0,8
ACS performances					
Nominal heating capacity (Qnw)	-	Maximum	[kW]	28,5	34,8
		Minimum	[kW]	4,7	5,0
Heating capacity	-	Maximum	[kW]	28,0	34,0
		Minimum	[kW]	4,7	4,8
Specific flow rate	ΔT=25°C	-	[l/min]	16,1	19,5
	ΔT=30°C	-	[l/min]	13,4	16,2
DHW production in continuous operation	ΔT=45 K	-	[l/min]	8,9	10,8
	ΔT=40 K	-	[l/min]	10,0	12,1
	ΔT=35 K	-	[l/min]	11,5	13,9
	ΔT=30 K	-	[l/min]	13,4	16,2
	ΔT=25 K	-	[l/min]	16,1	19,5
Water temperature		Maximum	[°C]	65	65
		Minimum	[°C]	40	40
Operating pressure	PMW	Maximum	[bar]	9	9
	-	Minimum	[bar]	0,3	0,3
ErP data					
Seasonal efficiency *Medium climate*	Heating	ηs	%	94	94
		Energy class	-	A	A
	DHW	ηwh	%	85	85
		Energy class	-	A	A
		DHW profile	-	XL	XXL
Sound power level		Lwa	[dB(A)]	49	52
Thermal losses and smoke discharge					
Chimney losses	burner ON 80/60 °C	Pmax	%	2,00	2,10
		Pmin	%	2,00	2,90
	burner ON 50/30°C	Pmax	%	1,40	1,40
		Pmin	%	1,00	1,00
Smoke temperature	80/60 °C	Pmax	[°C]	66	67
		Pmin	[°C]	64	62
	50/30 °C	Pmax	[°C]	52	53
		Pmin	[°C]	44	45
Smoke flow rate	-	Pmax	[g/s]	11,2	16
	-	Pmin	[g/s]	2,3	2,4
Nitrogen oxide (NOX) emissions		Class	-	6	6
		-	[mg/kWh]	35	33

Boilers for centralised systems

MODEL				UC 70.2	UC 115.2	UC 200F.2
Heating Performance						
Modulation ratio	-	-	-	1: 7	1: 5.75	1: 10
Nominal heat capacity (Qn)	-	Maximum	[kW]	67.5	115.0	199.0
		Minimum	[kW]	9.6	20.0	20.0
Heating capacity (Pn)	60/80 °C	Maximum	[kW]	65.7	111.5	194.8
		Minimum	[kW]	9.1	19.2	19.1
	30/50 °C	Maximum	[kW]	68.7	120.0	205.2
		Minimum	[kW]	10.3	21.8	21.1
Efficiency	60/80 °C	Maximum	%	97.3	97.1	97.9
		Minimum	%	94.9	95.9	95.6
	30/50 °C	Maximum	%	101.7	104.6	103.1
		Minimum	%	107.6	108.8	105.4
	30% of Pn	-	%	107.3	107.3	108.9
Combustion efficiency	Reduced load		%	98.3	98.3	98.2
	Nominal load		%	97.4	97.7	98.0
Water content			[l]	3.9	9.0	22.0
Operating pressure	PMS	Maximum	[bar]	6	6	6
	-	Minimum	[bar]	0.5	0.5	0.5
ErP data						
Seasonal eff.	Heating	ηs	%	93	92	93
Average climate		Energy class	-	A	A	A
Sound power level		Lwa	[dB(A)]	63	-	-
Thermal losses and discharge of flue gas						
Casing losses	burner ON	Qn	%	0.09	0.7	0.14
		Qmin	%	3.44	2.69	2.60
Flue loss	burner ON	Pmax	%	2.62	2.29	2.00
		Pmin	%	1.66	1.87	1.80
Flue gas temperature (T_F-T_A)		Pmax	[°C]	51.3	46.6	40
		Pmin	[°C]	34	36	34
Flue gas flow rate	-	Pmax	[g/s]	111.4	184.6	319.57
	-	Pmin	[g/s]	15.9	34.3	34.3
Nitrogen oxide (NOX) emissions		Class	-	6	6	6
		-	[mg/kWh]	59	47	68

Hydraulic data - Indoor unit + Outdoor unit

SIZE			2.1		3.1		4.1		5.1		6.1	7.1	8.1
Characteristics			190 L	250 L	190 L	250 L	190 L	250 L	190 L	250 L	250 L	250 L	250 L
Minimum system water content	1	l	40		40		40		40		40	40	40
Minimum admitted water flow rate		l/s	0,16		0,16		0,16		0,16		0,16	0,16	0,16
Maximum admitted water flow rate		l/s	0,61	0,86	0,61	0,86	0,61	0,86	0,61	0,86	0,92	0,92	0,92
Net boiler capacity		l	182	240	182	240	182	240	182	240	240	240	240
DHW tank setpoint		°C	50	50	50	50	50	50	50	50	50	50	50
Water mixed at 40°C (V40)		l	204	269	204	269	204	269	204	269	269	269	269
Warm-up time	2	h:min	02:30	02:25	02:30	02:25	02:08	02:05	02:08	02:05	01:46	01:46	01:46
Energy consumption during heating	3	kWh	2,20	2,70	2,20	2,70	2,30	2,85	2,30	2,85	3,01	3,01	3,01

1. Consider the water content of the area with less volume
2. Time required to bring the water volume of the tank from a temperature of 10 °C to a temperature of 50 °C
3. Energy consumption to bring the water volume of the tank from a temperature of 10 °C to a temperature of 50 °C

Electrical data

Outdoor unit

SIZE			2.1	3.1	4.1	5.1	6.1	7.1	8.1
Power supply 220-240V ~ 50Hz									
F.L.A. - Full load current at max admissible conditions		A	10.0	11.8	15.0	16.4	24.5	25.9	27.7
F.L.I. - Full load power input at max admissible conditions		kW	2.20	2.60	3.30	3.60	5.40	5.70	6.10
M.I.C - Maximum inrush current		A	10.0	11.8	16,7	16.4	24.5	25.9	27.7
Power supply 380-415V 3N~ 50Hz									
F.L.A. - Full load current at max admissible conditions		A	-	-	-	-	8.20	8.70	9.30
F.L.I. - Full load power input at max admissible conditions		kW	-	-	-	-	5.40	5.70	6.10
M.I.C - Maximum inrush current		A	-	-	-	-	8.20	8.70	9.30

Indoor unit

SIZE			A - 190 L	A - 250 L	B - 250 L
Power supply 220-240V ~ 50Hz					
F.L.A. - Current draw without DHW heating element		A	0,50	0,90	0,90
F.L.A. - Current draw of DHW heating element		A	8,70	8,70	8,70
F.L.A. - TOTAL current draw under maximum conditions		A	9,20	9,60	9,60
F.L.I. - Power draw without DHW heating element		kW	0,10	0,20	0,20
F.L.I. - Power draw of DHW heating element		kW	2,00	2,00	2,00
F.L.I. - Total power draw under full load		kW	2,10	2,20	2,20
M.I.C. - Maximum inrush current of unit		A	9,20	9,60	9,60

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335
(*) All data calculated with zero height difference and a length of 7m.

⚠ Important: when rating the unit, check that the absorptions are conforming to the utility contract in the country of installation

Additional electric heater - EH024/EH6/EH9

SIZE		2 kW	3 kW	4 KW
Power supply 220-240V ~50Hz				
F.L.A. - Full load current at max admissible conditions	A	10,1	15,2	20,2
F.L.I. - Full load power input at max admissible conditions	kW	2	3	4

Power supply 220-240V ~50Hz +/- 10%
Size 2kW and 4kW available only for indoor unit A, size 3kW available only for indoor unit B

SIZE		6 kW	9 kW
Power supply 380-415V 3N ~50Hz			
F.L.A. - Full load current at max admissible conditions	A	10,1	15,2
F.L.I. - Full load power input at max admissible conditions	kW	6	9

Power supply 380-415V 3N ~50Hz +/- 6%.
Data to be added to the values of the standard unit without DHW electric heater.

⚠ The additional electric heater is not an accessory supplied separately, but a construction configuration.

2 zones: both high temperature - 2 zones: high + low temperature (mixed)

SIZE		KIRE2HX - KIRE2HLX
Power supply 220-240V ~50Hz		
F.L.A. - Full load current at max admissible conditions	A	0,6
F.L.I. - Full load power input at max admissible conditions	W	120

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335.
Data to be added to standard indoor unit values.

Single zone kit

SIZE		KCSX
Power supply 220-240V ~50Hz		
F.L.A. - Full load current at max admissible conditions	A	0,3
F.L.I. - Full load power input at max admissible conditions	W	60

Power supply 220-240V ~ 50Hz +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335.
Data to be added to standard indoor unit values.

Integration condensing boiler

SIZE		FE 24.4	FE 33.4
Power supply 220-240V ~50Hz			
F.L.A. - Full load current at max admissible conditions	A	0,4	0,5
F.L.I. - Full load power input at max admissible conditions	W	82	99
Fusibile sull'alimentazione	-	3,15	3,15
Grado di protezione IP	-	X4D	X4D

Power supply : +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335.
Data to be added to standard indoor unit values.

Solar option kit

SIZE		SOLX
Power supply 220-240V ~50Hz		
F.L.A. - Full load current at max admissible conditions	A	0,4
F.L.I. - Full load power input at max admissible conditions	W	75

Power supply +/-10%
The units are conforming with the prescriptions of European Standards CEI EN 60335.
Data to be added to standard indoor unit values.

Sound levels outdoor unit

Standard mode

SIZE	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
2.1	46	49	49	52	52	46	37	27	42	55
3.1	49	48	50	55	53	48	39	30	44	57
4.1	36	51	53	56	55	49	44	30	45	58
5.1	37	56	53	57	57	51	47	36	47	60
6.1	44	53	54	60	58	55	52	51	50	63
7.1	44	54	55	60	59	57	56	54	51	64
8.1	46	58	57	60	61	59	54	51	53	66

Sound levels refer to units with full load under nominal test conditions. Data referred to the following conditions:
entering / leaving exchanger water temperature user side 47/55 °C source side exchanger air inlet 7 °C.
The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2).

Silenced mode

SIZE	Sound pressure level	Sound power level
	dB(A)	dB(A)
2.1	40	53
3.1	40	53
4.1	42	55
5.1	42	55
6.1	46	59
7.1	47	60
8.1	48	61

Sound levels refer to units with full load under nominal test conditions.
For maximum capacity delivered in silent mode use a correction factor of 0.8.
Data referred to the following conditions: entering / leaving exchanger water temperature user side 47/55 °C source side exchanger air inlet 7 °C.
The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2).

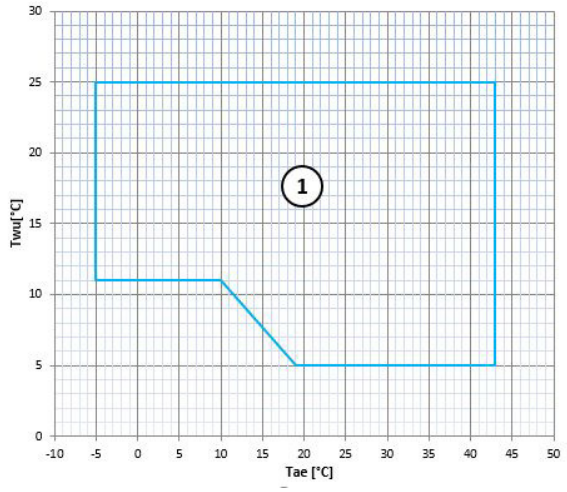
Super-silenced mode

SIZE	Sound pressure level	Sound power level
	dB(A)	dB(A)
2.1	37	50
3.1	38	51
4.1	39	52
5.1	39	52
6.1	41	54
7.1	41	54
8.1	41	54

Sound levels refer to units with full load under nominal test conditions.
For maximum capacity delivered in silent mode use a correction factor of 0,6
Data referred to the following conditions: entering / leaving exchanger water temperature user side 47/55 °C source side exchanger air inlet 7 °C.
The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2).

Operating limits

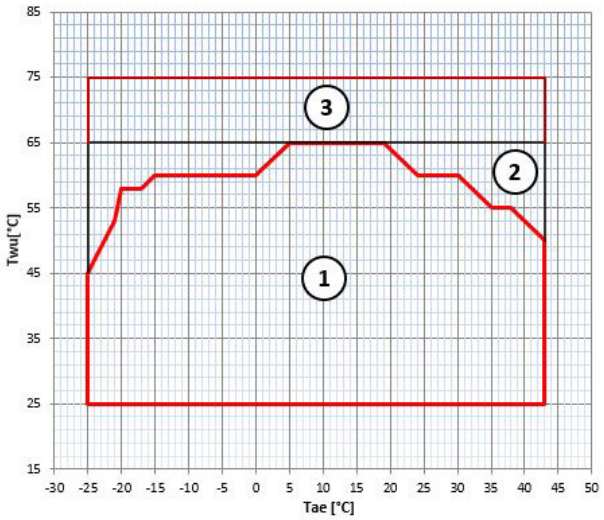
Cooling



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

1. Normal operating range

Heating



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

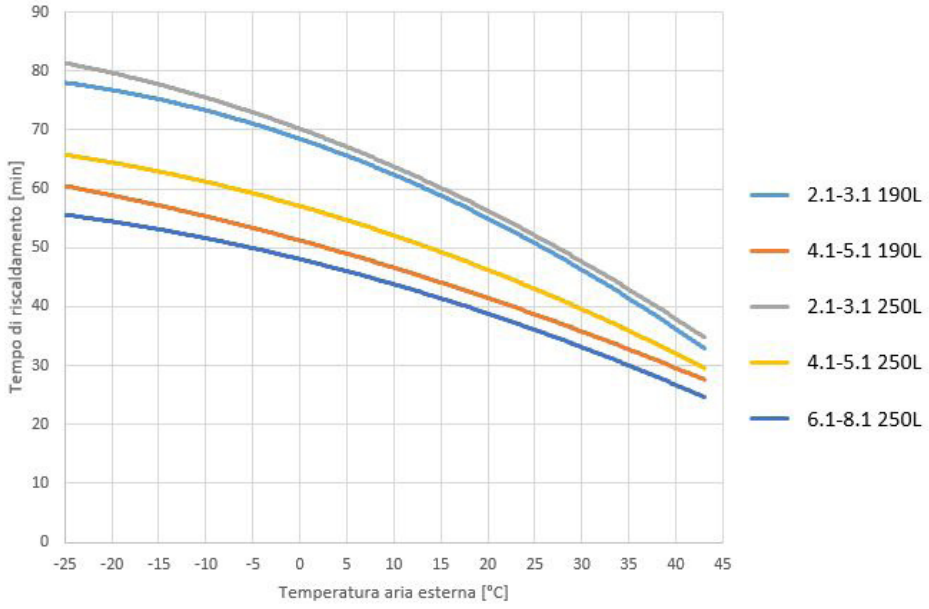
1. Normal operating range
2. Operating range with additional electric heater option
3. Hybrid system operating range

In the configuration with the integration electric heater, the extension of the limits varies according to the electrical capacity of the electric heater chosen.

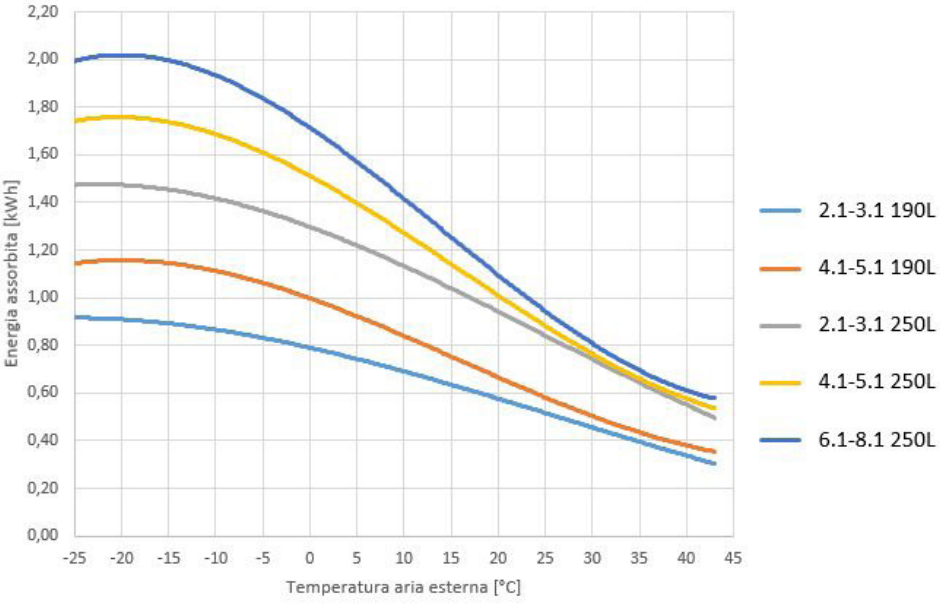
Performance curves in domestic hot water production

Curves referring to the switch-on of the unit from which 90 litres of water were taken out of a total of about 190 available (at an equivalent temperature of 40 °C).

Heating time

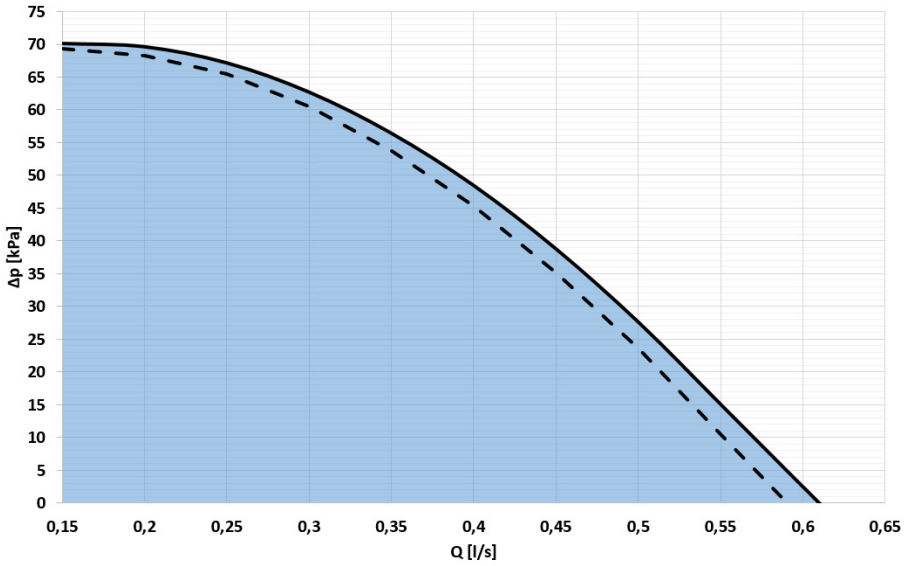


Energy consumption



Nominal test conditions:
- Storage temperature (T5) at power-off = 50 °C
- Storage temperature (T5) at switch-on = 40 °C
- Amount drawn = 3 l/min

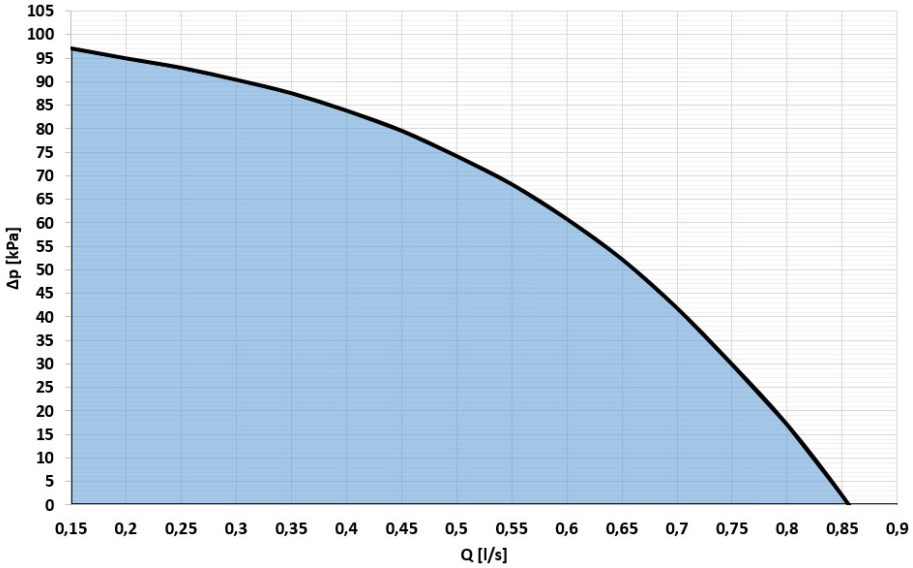
Available pressure of the standard circulator at the unit A connections



ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

-------- Maximum head of the circulator with configuration of integration electric heater
Circulator operating field

Head of the circulator with increased pump at the unit A connections

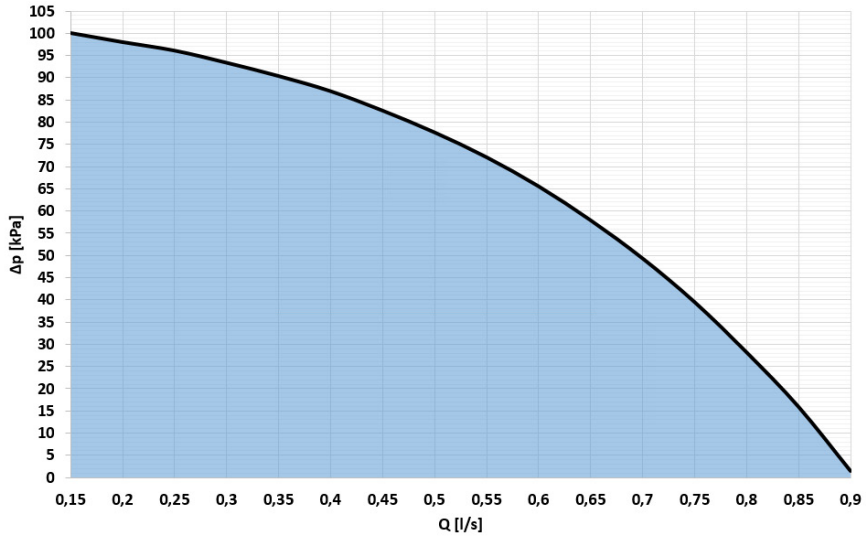


Pel [W] = Electrical power input
Q [l/s] = Water flow-rate

Circulator operating field

General technical data

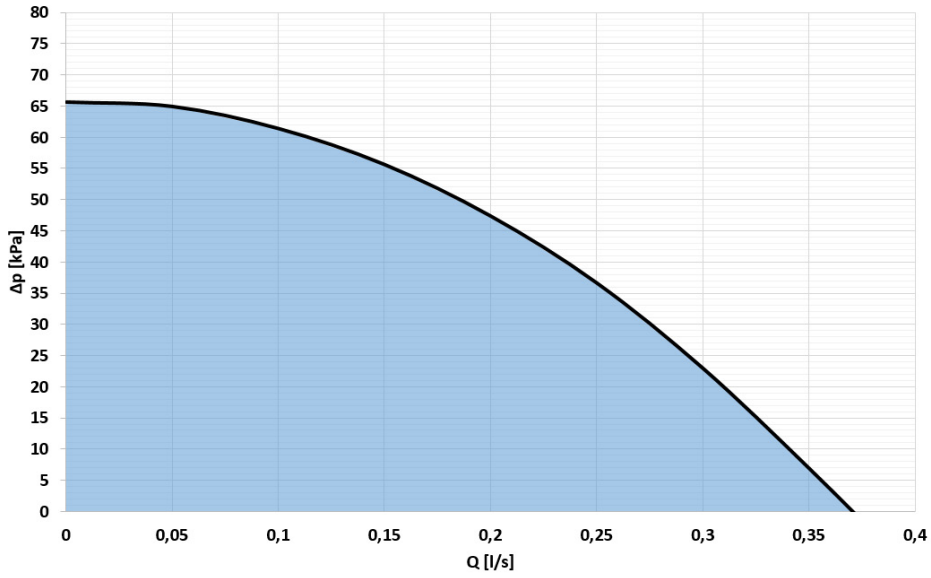
Available pressure of the standard circulator at the unit B connections



ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

-------- Maximum head of the circulator with configuration of integration electric heater.
Circulator operating field

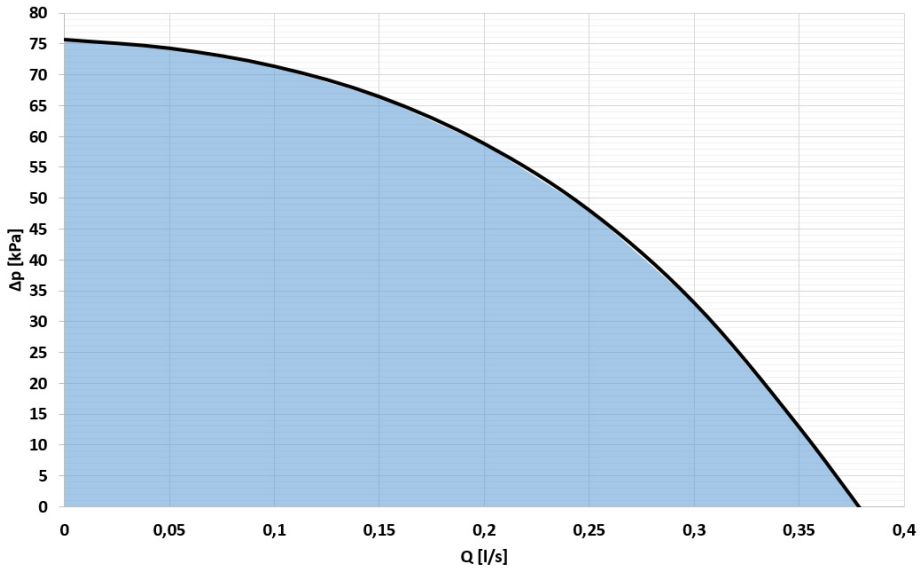
Available pressure of the circulator - GAS BOILER FE 24.4



ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

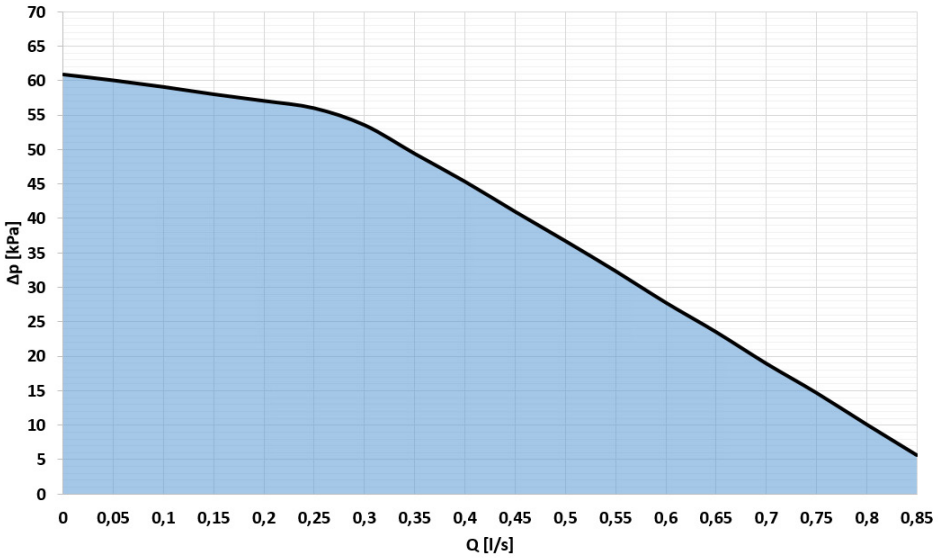
Circulator operating field

Available pressure of the circulator - GAS BOILER FE 33.4



ΔP [kPa] = Available pressure
Q [l/s] = Water flow-rate

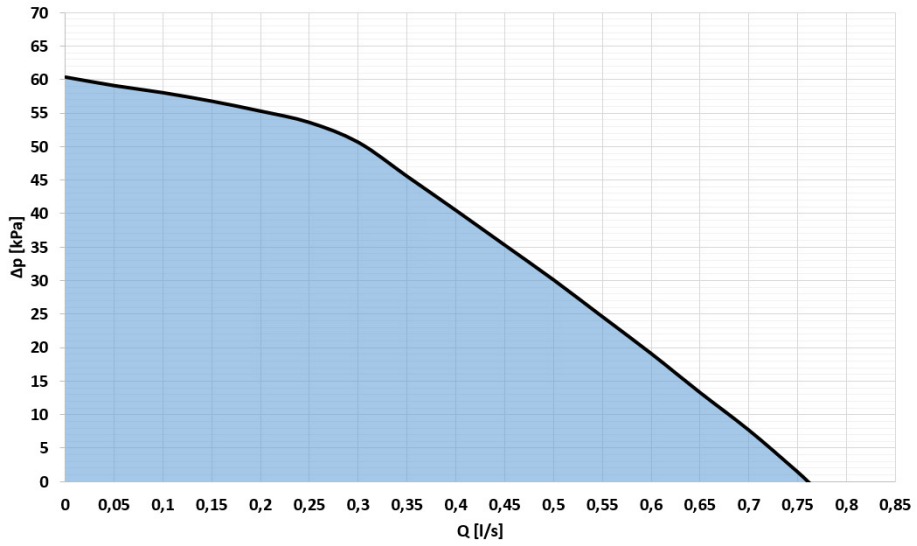
Pressure drop for direct booster system circulator



Pel [W] = Electrical power input
Q [l/s] = Water flow-rate

General technical data

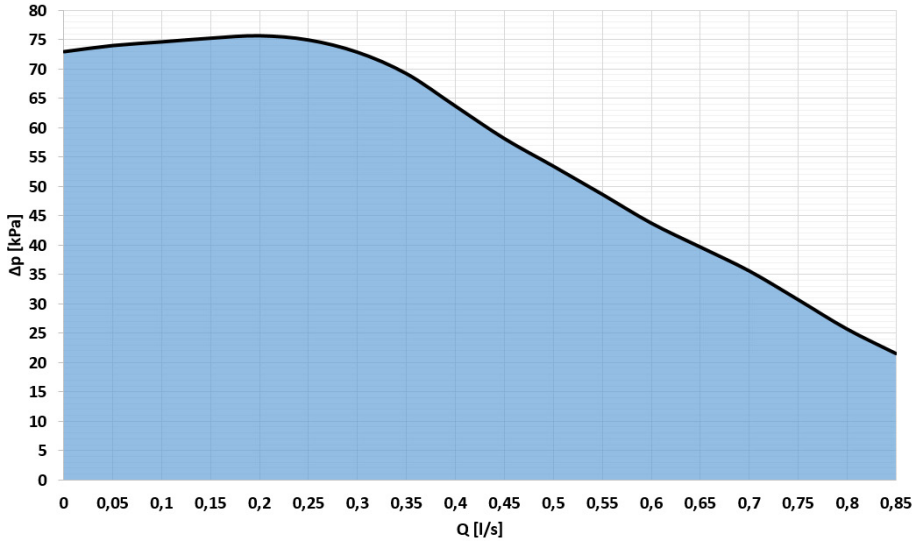
Available pressure for mixed booster system circulator



Pel [W] = Electrical power input
Q [l/s] = Water flow-rate

Circulator operating field

KCSX secondary circuit kit available pressure



Pel [W] = Electrical power input
Q [l/s] = Water flow-rate

Circulator operating field

Performance in heating

Sizes	Tae (°C) DB/WB	Water supply temperature (°C)														
		35			45			55			60			65		
	°C	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
2.1	-25	3,68	2,92	1,26	3,38	2,54	1,33	\	\	\	\	\	\	\	\	\
	-20	4,38	2,81	1,56	4,02	2,56	1,57	3,80	2,61	1,46	\	\	\	\	\	\
	-15	5,04	2,53	1,99	4,76	2,57	1,85	4,50	2,62	1,72	3,40	2,47	1,38	\	\	\
	-10	5,65	2,40	2,36	5,41	2,55	2,12	5,06	2,63	1,93	3,94	2,49	1,58	\	\	\
	-7	6,25	2,30	2,72	6,06	2,54	2,39	5,62	2,64	2,13	4,22	2,47	1,71	\	\	\
	-5	6,25	2,15	2,91	6,05	2,41	2,51	5,64	2,53	2,23	4,38	2,42	1,81	\	\	\
	-2	6,25	1,93	3,25	6,02	2,21	2,72	5,66	2,37	2,38	4,62	2,34	1,98	\	\	\
	0	6,26	1,78	3,52	6,01	2,08	2,89	5,68	2,27	2,50	4,78	2,28	2,09	\	\	\
	2	6,26	1,63	3,84	6,00	1,95	3,07	5,70	2,16	2,63	4,93	2,23	2,21	\	\	\
	7	6,26	1,26	4,96	5,96	1,63	3,67	5,74	1,90	3,03	5,41	2,08	2,61	4,27	2,09	2,04
	15	5,75	1,25	4,59	6,20	1,47	4,21	5,63	1,65	3,41	5,04	1,76	2,87	4,87	1,90	2,56
	20	5,67	1,11	5,13	6,12	1,31	4,66	5,52	1,50	3,68	4,77	1,56	3,06	\	\	\
	35	5,97	0,82	7,27	5,99	0,99	6,05	5,61	1,22	4,62	\	\	\	\	\	\
3.1	-25	4,09	3,25	1,26	3,75	2,82	1,33	\	\	\	\	\	\	\	\	\
	-20	4,87	3,12	1,56	4,47	2,85	1,57	4,15	2,88	1,44	\	\	\	\	\	\
	-15	5,60	2,81	1,99	5,28	2,86	1,85	5,00	2,91	1,72	4,10	2,97	1,38	\	\	\
	-10	6,28	2,66	2,36	6,01	2,83	2,12	5,62	2,92	1,93	4,75	3,00	1,58	\	\	\
	-7	6,97	2,55	2,73	6,73	2,82	2,39	6,25	2,93	2,13	5,09	2,98	1,71	\	\	\
	-5	7,03	2,41	2,92	6,79	2,70	2,51	6,34	2,85	2,22	5,28	2,91	1,81	\	\	\
	-2	7,12	2,20	3,24	6,88	2,53	2,72	6,48	2,73	2,37	5,57	2,82	1,98	\	\	\
	0	7,19	2,06	3,50	6,93	2,41	2,88	6,57	2,65	2,48	5,76	2,75	2,09	\	\	\
	2	7,25	1,91	3,79	6,99	2,29	3,05	6,67	2,57	2,59	5,95	2,68	2,21	\	\	\
	7	7,41	1,56	4,76	7,13	2,00	3,58	6,90	2,37	2,91	6,42	2,52	2,55	5,25	2,60	2,02
	15	7,26	1,38	5,28	7,63	1,83	4,16	6,98	2,12	3,30	6,01	2,23	2,70	6,10	2,39	2,56
	20	6,98	1,18	5,91	7,42	1,68	4,42	6,81	1,89	3,60	5,98	1,95	3,06	\	\	\
	35	6,96	0,85	8,17	6,89	1,27	5,42	6,57	1,48	4,45	\	\	\	\	\	\
4.1	-25	5,33	2,68	1,99	5,21	2,65	1,97	\	\	\	\	\	\	\	\	\
	-20	6,15	2,83	2,17	5,68	2,97	1,91	4,50	2,90	1,55	\	\	\	\	\	\
	-15	6,90	2,98	2,32	5,93	2,97	2,00	4,94	2,92	1,69	3,99	2,84	1,41	\	\	\
	-10	7,64	2,99	2,56	6,45	2,97	2,17	6,07	3,05	1,99	5,19	2,86	1,81	\	\	\
	-7	8,35	3,00	2,78	6,97	2,98	2,34	6,22	3,07	2,03	5,32	2,88	1,85	\	\	\
	-5	8,46	2,83	2,99	7,26	2,89	2,51	6,45	2,94	2,19	6,04	3,00	2,02	\	\	\
	-2	8,62	2,57	3,35	7,69	2,75	2,79	6,78	2,97	2,28	6,45	3,08	2,09	\	\	\
	0	8,73	2,40	3,64	7,98	2,66	2,99	7,10	2,99	2,38	6,85	3,16	2,17	\	\	\
	2	8,84	2,23	3,97	8,26	2,57	3,21	7,33	2,87	2,56	6,98	3,03	2,31	\	\	\
	7	9,11	1,80	5,07	8,98	2,35	3,82	7,80	2,50	3,12	7,24	2,66	2,72	4,08	3,00	1,36
	15	9,09	1,51	6,04	8,91	2,03	4,38	8,32	2,34	3,55	7,68	2,49	3,09	5,71	2,39	2,39
	20	9,33	1,32	7,09	9,08	1,81	5,02	8,43	2,12	3,97	7,86	2,27	3,46	\	\	\
	35	8,50	1,06	8,05	9,29	1,46	6,34	8,16	1,80	4,72	\	\	\	\	\	\
5.1	-25	5,92	2,98	1,99	5,79	2,94	1,97	\	\	\	\	\	\	\	\	\
	-20	6,83	3,15	2,17	6,31	3,30	1,91	5,10	3,27	1,56	\	\	\	\	\	\
	-15	7,67	3,31	2,32	6,59	3,30	2,00	5,79	3,29	1,76	4,20	2,96	1,42	\	\	\
	-10	8,48	3,32	2,56	7,17	3,30	2,17	6,12	3,34	1,83	5,38	3,15	1,71	\	\	\
	-7	9,30	3,33	2,79	7,75	3,31	2,34	6,44	3,39	1,90	5,61	3,10	1,81	\	\	\
	-5	9,38	3,07	3,05	8,18	3,09	2,65	7,53	3,32	2,27	6,13	3,10	1,98	\	\	\
	-2	9,47	2,82	3,36	8,54	3,10	2,76	7,86	3,32	2,37	6,56	3,20	2,05	\	\	\
	0	9,56	2,55	3,76	8,89	3,10	2,87	8,18	3,31	2,47	6,99	3,30	2,12	\	\	\
	2	9,83	2,40	4,10	9,34	2,99	3,12	8,63	3,29	2,62	7,42	3,25	2,28	\	\	\
	7	10,30	2,09	4,93	10,30	2,73	3,77	9,72	3,20	3,04	8,23	2,96	2,78	4,85	3,11	1,56
	15	10,20	1,73	5,90	10,10	2,39	4,22	9,76	2,76	3,54	8,43	2,70	3,13	6,56	2,71	2,43
	20	10,70	1,59	6,72	10,30	2,12	4,86	9,85	2,54	3,88	8,90	2,56	3,48	\	\	\
	35	9,25	1,11	8,30	10,30	1,61	6,40	9,42	1,90	4,96	\	\	\	\	\	\

kWt: delivered heat capacity [kW].
kWe: electrical power absorbed [kW].
Tae: outdoor air temperature [°C].
Performance in relation to the difference between inlet and outlet water temperature = 5 °C
The values indicate the integrated heat capacity: the current heat capacity considering any defrosting cycles
Note: the data are at maximum operation

General technical data

Performance in heating

Sizes	Tae (°C) DB/WB	Water supply temperature (°C)														
		35			45			55			60			65		
	°C	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
6.1	-25	9,40	5,66	1,66	8,74	5,53	1,58	\	\	\	\	\	\	\	\	\
	-20	10,43	5,64	1,85	9,40	5,63	1,67	7,62	5,69	1,34	\	\	\	\	\	\
	-15	11,63	5,73	2,03	9,97	5,60	1,78	8,34	5,63	1,48	5,87	4,69	1,25	\	\	\
	-10	12,74	5,69	2,24	10,93	5,62	1,95	9,10	5,69	1,60	6,70	5,13	1,30	\	\	\
	-7	13,85	5,65	2,45	11,88	5,63	2,11	9,86	5,73	1,72	8,05	5,06	1,59	\	\	\
	-5	13,96	5,29	2,64	12,25	5,40	2,27	10,44	5,58	1,87	8,21	5,14	1,60	\	\	\
	-2	14,12	4,75	2,98	12,81	5,05	2,54	11,30	5,35	2,11	8,37	5,09	1,65	\	\	\
	0	14,23	4,38	3,25	13,19	4,81	2,74	11,88	5,20	2,29	8,52	5,03	1,69	\	\	\
	2	14,33	4,02	3,57	13,56	4,58	2,96	12,46	5,04	2,47	10,06	5,05	1,99	\	\	\
	7	14,60	3,11	4,69	14,50	4,00	3,63	13,90	4,66	2,97	13,00	5,07	2,56	11,50	5,17	2,23
	15	14,40	2,65	5,43	14,60	3,53	4,14	12,10	3,97	3,03	12,30	4,32	2,85	11,70	4,42	2,65
	20	14,20	2,20	6,47	14,80	3,15	4,69	12,00	3,55	3,39	10,80	3,71	2,90	\	\	\
	35	14,70	1,80	8,16	14,60	2,50	5,83	12,90	2,79	4,62	\	\	\	\	\	\
7.1	-25	9,45	5,69	1,66	8,86	5,68	1,56	\	\	\	\	\	\	\	\	\
	-20	10,49	5,78	1,81	9,54	5,77	1,65	7,80	5,84	1,34	\	\	\	\	\	\
	-15	11,70	5,76	2,03	10,14	5,73	1,77	8,47	5,79	1,46	6,15	5,14	1,20	\	\	\
	-10	12,89	5,78	2,23	11,11	5,74	1,93	9,19	5,77	1,59	6,87	5,36	1,28	\	\	\
	-7	14,09	5,79	2,43	12,09	5,76	2,10	9,91	5,76	1,72	8,15	5,62	1,45	\	\	\
	-5	14,29	5,44	2,63	12,60	5,56	2,27	10,56	5,64	1,87	8,49	5,58	1,52	\	\	\
	-2	14,59	4,92	2,96	13,38	5,25	2,55	11,55	5,46	2,11	9,00	5,52	1,63	\	\	\
	0	14,80	4,58	3,23	13,89	5,05	2,75	12,20	5,34	2,29	9,34	5,48	1,70	\	\	\
	2	15,00	4,23	3,54	14,41	4,85	2,97	12,86	5,22	2,46	10,52	5,43	1,94	\	\	\
	7	15,50	3,37	4,59	15,70	4,35	3,60	14,50	4,92	2,95	13,20	5,20	2,54	10,40	4,95	2,10
	15	15,20	2,94	5,16	15,50	3,98	3,89	13,00	4,02	3,24	12,70	4,48	2,84	11,90	4,97	2,41
	20	14,60	2,59	5,65	15,10	3,42	4,42	12,70	3,62	3,52	11,00	3,77	2,92	\	\	\
	35	15,00	1,87	8,02	15,30	2,65	5,77	13,00	2,77	4,69	\	\	\	\	\	\
8.1	-25	9,50	5,72	1,66	8,98	5,83	1,54	\	\	\	\	\	\	\	\	\
	-20	10,55	5,93	1,78	9,68	5,90	1,64	7,98	5,99	1,33	\	\	\	\	\	\
	-15	11,76	5,79	2,03	10,30	5,85	1,76	8,61	5,94	1,45	6,42	5,59	1,15	\	\	\
	-10	13,05	5,86	2,23	11,30	5,87	1,93	9,29	5,86	1,59	7,04	5,59	1,26	\	\	\
	-7	14,33	5,92	2,42	12,30	5,89	2,09	9,96	5,79	1,72	8,25	6,18	1,33	\	\	\
	-5	14,68	5,62	2,61	13,40	5,88	2,28	12,60	5,92	2,13	8,62	5,97	1,45	\	\	\
	-2	15,21	5,16	2,95	13,75	5,61	2,45	12,70	5,67	2,24	9,09	5,76	1,58	\	\	\
	0	15,57	4,86	3,21	14,10	5,33	2,64	12,80	5,42	2,37	9,56	5,54	1,72	\	\	\
	2	15,92	4,55	3,50	15,00	5,15	2,92	13,65	5,32	2,57	11,13	5,45	2,04	\	\	\
	7	16,80	3,79	4,43	16,60	4,71	3,53	16,20	5,53	2,89	14,10	5,34	2,63	11,30	5,13	2,20
	15	18,90	3,48	5,43	18,50	4,53	4,09	17,50	5,11	3,42	14,70	4,83	3,06	12,50	4,80	2,60
	20	16,70	2,69	6,21	16,10	3,77	4,28	15,00	4,32	3,46	13,10	4,39	3,00	\	\	\
	35	16,30	1,94	8,42	15,90	2,79	5,68	13,40	3,07	4,35	\	\	\	\	\	\

kWt: delivered heat capacity [kW].
kWe: electrical power absorbed [kW].
Tae: outdoor air temperature [°C].
Performance in relation to the difference between inlet and outlet water temperature = 5 °C
The values indicate the integrated heat capacity: the current heat capacity considering any defrosting cycles
Note: the data are at maximum operation

Performance in cooling

Sizes	Tae	Water supply temperature (°C)																		
		5			7			10			12			15			18		
	°C	kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER	kWf	kWe	EER
2.1	20	4,72	1,04	4,54	5,24	1,16	4,50	6,01	1,35	4,47	6,37	1,32	4,82	6,90	1,28	5,39	7,44	1,24	6,00
	25	5,87	1,30	4,51	6,31	1,52	4,16	6,97	1,84	3,80	7,12	1,70	4,19	7,34	1,48	4,95	7,56	1,27	5,96
	30	5,84	1,55	3,78	6,22	1,67	3,73	6,80	1,85	3,67	6,90	1,73	3,98	7,06	1,56	4,53	7,22	1,38	5,22
	35	5,80	1,79	3,24	6,14	1,82	3,37	6,64	1,87	3,55	6,70	1,77	3,78	6,79	1,63	4,16	6,88	1,49	4,63
	40	3,80	1,51	2,52	4,31	1,63	2,65	5,08	1,81	2,81	5,24	1,74	3,01	5,47	1,64	3,35	5,71	1,53	3,73
	43	2,58	1,15	2,24	3,07	1,30	2,36	3,80	1,52	2,51	4,10	1,49	2,75	4,55	1,45	3,14	5,00	1,41	3,55
3.1	20	5,41	1,38	3,93	5,90	1,40	4,21	6,63	1,43	4,62	7,24	1,45	4,98	8,16	1,49	5,47	8,26	1,38	6,00
	25	7,16	1,80	3,98	7,24	1,79	4,05	7,37	1,77	4,17	7,71	1,67	4,61	8,23	1,53	5,39	8,40	1,41	5,96
	30	6,50	1,85	3,51	6,82	1,87	3,64	7,29	1,90	3,84	7,48	1,80	4,16	7,77	1,65	4,72	8,02	1,54	5,22
	35	5,84	1,90	3,07	6,39	1,95	3,27	7,22	2,03	3,55	7,26	1,92	3,78	7,31	1,76	4,15	7,65	1,65	4,63
	40	3,80	1,51	2,52	4,31	1,63	2,65	5,08	1,81	2,81	5,41	1,78	3,04	5,91	1,73	3,41	6,34	1,70	3,73
	43	2,58	1,15	2,24	3,07	1,30	2,36	3,80	1,52	2,51	4,31	1,54	2,81	5,08	1,56	3,26	5,56	1,57	3,55
4.1	20	5,68	1,15	4,96	6,23	1,21	5,17	7,06	1,29	5,46	7,59	1,31	5,77	8,38	1,35	6,22	9,54	1,50	6,36
	25	6,47	1,48	4,36	7,01	1,54	4,55	7,82	1,63	4,81	8,40	1,65	5,09	9,26	1,68	5,52	10,45	1,81	5,77
	30	7,27	1,89	3,85	7,79	1,94	4,02	8,57	2,01	4,25	9,20	2,03	4,53	10,15	2,06	4,93	11,38	2,14	5,31
	35	7,39	2,25	3,28	7,94	2,27	3,49	8,77	2,31	3,80	9,35	2,31	4,05	10,21	2,31	4,43	11,13	2,36	4,71
	40	6,61	2,52	2,62	6,93	2,46	2,82	7,42	2,37	3,14	8,00	2,43	3,29	8,88	2,53	3,51	9,69	2,52	3,85
	43	5,09	2,28	2,23	5,31	2,24	2,37	5,64	2,19	2,58	6,08	2,17	2,81	6,73	2,13	3,16	7,58	2,15	3,52
5.1	20	6,20	1,28	4,86	6,93	1,35	5,13	7,19	1,39	5,17	7,78	1,41	5,50	8,67	1,45	5,97	9,94	1,56	6,36
	25	7,13	1,68	4,24	7,96	1,77	4,51	8,26	1,81	4,56	8,90	1,84	4,84	9,87	1,88	5,24	11,15	1,99	5,59
	30	8,06	2,17	3,71	9,00	2,27	3,96	9,34	2,31	4,05	10,04	2,35	4,28	11,08	2,40	4,62	12,36	2,50	4,94
	35	8,13	2,48	3,12	9,10	2,51	3,63	9,48	2,43	3,72	10,10	2,51	4,03	11,03	2,62	4,21	12,03	2,66	4,53
	40	6,61	2,52	2,62	7,28	2,51	2,90	7,42	2,37	3,14	8,00	2,43	3,29	8,88	2,53	3,51	9,69	2,52	3,85
	43	5,09	2,28	2,23	5,58	2,29	2,44	5,64	2,19	2,58	6,08	2,17	2,81	6,73	2,13	3,16	7,58	2,15	3,52
6.1	20	7,78	2,03	3,83	10,07	2,47	4,07	12,15	2,96	4,10	12,95	3,02	4,28	14,16	3,12	4,54	15,22	3,13	4,86
	25	10,10	3,00	3,37	12,24	3,34	3,66	13,80	3,61	3,82	14,61	3,73	3,92	15,82	3,91	4,04	16,53	3,97	4,16
	30	9,99	3,58	2,79	12,01	3,91	3,07	13,43	4,13	3,25	14,13	4,15	3,41	15,18	4,17	3,64	15,77	4,16	3,79
	35	9,89	4,52	2,19	11,80	4,81	2,45	13,07	4,90	2,67	13,65	4,76	2,87	14,53	4,56	3,19	15,02	4,45	3,37
	40	8,11	4,53	1,79	9,32	4,58	2,03	9,87	4,33	2,28	10,19	4,17	2,45	10,67	3,92	2,72	11,58	4,00	2,90
	43	5,20	3,72	1,40	5,88	3,64	1,61	6,11	3,26	1,87	6,60	3,16	2,09	7,33	3,02	2,43	8,05	3,12	2,58
7.1	20	8,17	2,17	3,77	11,02	2,75	4,02	12,80	3,16	4,04	13,64	3,23	4,23	14,90	3,33	4,47	15,50	3,22	4,82
	25	10,60	3,19	3,32	13,38	3,69	3,62	14,50	3,84	3,77	15,34	3,97	3,87	16,60	4,16	3,99	16,84	4,07	4,14
	30	10,50	3,96	2,65	13,13	4,48	2,93	14,10	4,53	3,11	14,82	4,54	3,26	15,90	4,56	3,49	16,08	4,33	3,71
	35	10,40	4,81	2,16	12,86	5,36	2,40	13,70	5,32	2,58	14,34	5,14	2,79	15,30	4,88	3,13	15,30	4,62	3,31
	40	8,11	4,53	1,79	9,70	4,76	2,04	9,87	4,33	2,28	10,20	4,17	2,45	10,70	3,92	2,72	11,60	4,00	2,90
	43	5,20	3,72	1,40	6,12	3,78	1,62	6,11	3,26	1,87	6,60	3,16	2,09	7,33	3,02	2,43	8,05	3,12	2,58
8.1	20	8,99	2,43	3,70	12,09	3,08	3,93	14,00	3,55	3,96	14,72	3,55	4,14	15,80	3,56	4,42	16,46	3,44	4,78
	25	11,70	3,59	3,25	14,72	4,15	3,54	15,90	4,32	3,69	16,50	4,38	3,77	17,40	4,47	3,90	17,70	4,37	4,05
	30	11,50	4,46	2,59	14,41	5,05	2,85	15,50	5,11	3,04	16,18	5,09	3,18	17,20	5,05	3,41	17,14	4,82	3,56
	35	11,40	5,42	2,11	14,20	6,05	2,35	15,10	6,00	2,52	15,66	5,84	2,68	16,50	5,60	2,94	16,38	5,22	3,14
	40	8,92	5,11	1,75	10,68	5,37	1,99	10,90	4,89	2,22	11,22	4,70	2,39	11,70	4,42	2,65	12,72	4,58	2,78
	43	5,98	4,50	1,33	7,17	4,65	1,54	7,33	4,12	1,78	8,00	4,04	1,98	9,01	3,91	2,31	9,90	4,04	2,45

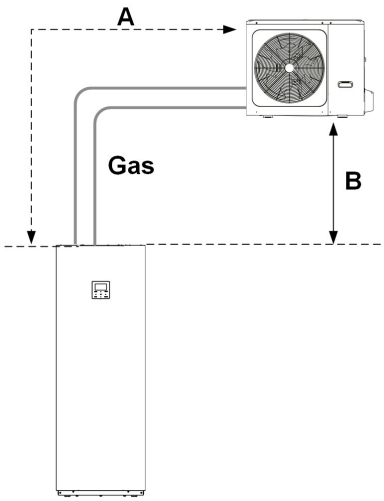
kWf: delivered cooling capacity [kW].
kWe: electrical power absorbed [kW].
Tae: outdoor air temperature [°C].
Performance in relation to the difference between inlet and outlet water temperature = 5 °C
Note: the data are at maximum operation

Refrigerant connections

Sizing the refrigerant pipes

Equivalent length of pipes (metres) = Effective length (metres) + Number of bends x K
Consider K= 0.3 m per wide radius elbow bend.
Consider K= 0.5 m per standard 90° elbow bend.

⚠ to correctly install the refrigerant pipes and charge the refrigerant gas, refer to the SPHERA MANUAL

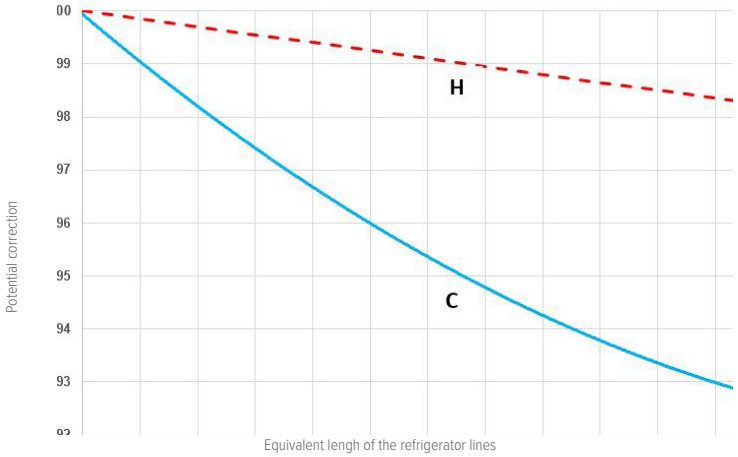


SIZE		2.1	3.1	4.1	5.1	6.1	7.1	8.1
Length and height difference of refrigerant pipes								
A - Refrigerant pipe min/max equivalent length	m	2 - 30	2 - 30	2 - 30	2 - 30	2 - 30	2 - 30	2 - 30
B - Maximum refrigerant pipe height difference with outdoor unit higher than indoors unit	m	25	25	25	25	25	25	25
B - Maximum refrigerant pipe height difference with outdoor unit underthan indoor unit	m	25	25	25	25	25	25	25
Diameters of refrigerant pipes								
Gas pipe diameter	inch	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"
Fluid line diameter	inch	1/4"	1/4"	3/8''	3/8''	3/8''	3/8''	3/8''
Additional charge per meter	kg/m	0,020	0,020	0,038	0,038	0,038	0,038	0,038

The refrigerant pre-charge in the outdoor units is sufficient for connection up to 15 m.

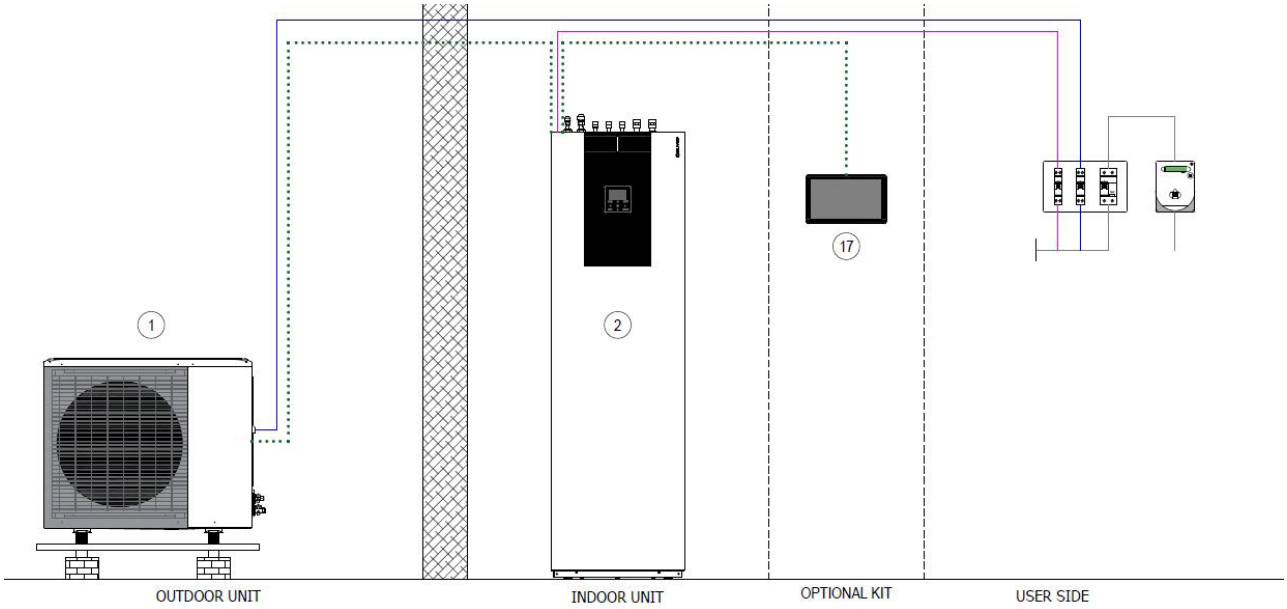
Determination of cooling and heating power loss

The equivalent length of the cooling lines results in a loss of cooling and heating power supplied to the circuit and DHW system.
The graph shows the amount of this loss of powergh



C = Cooling power efficiency curve
H = Heating power efficiency curve

The electrical hookup must be conforming with the local regulations. The hookup must be done by a specialised technician, qualified to work on live equipment.
SPHERA EVO 2.0 can be controlled with the on-board controller. To operate the unit, you may use: the CONTROL4 NRG supervision system or normal electromechanical thermostats.
For more information on connections, consult the installation manual.



1. Outdoor unit
2. Indoor unit
3. CONTROL4 NRG

220-240V~50Hz
BUS RS 485

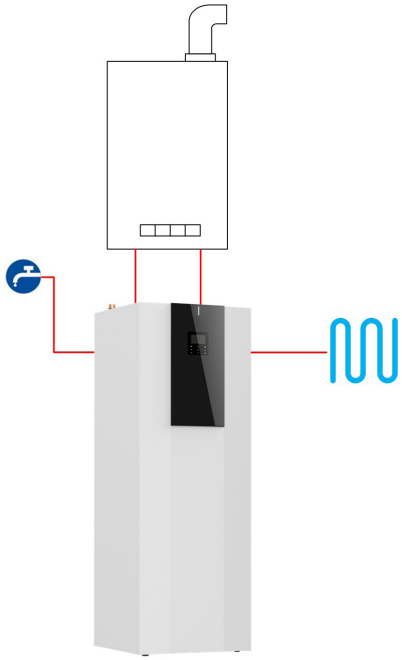
Auxiliary and hybrid version heat sources

The electrical connection must be carried out in accordance with national regulations in force. The connection must be carried out by specialised personnel who are qualified to work with live voltage.
SPHERA EVO 2.0 can be controlled with the built-in control panel. The unit can be called using: the CONTROL4 NRG supervisory system or common electromechanical thermostats.
Refer to the installation manual for more information on the connections.

⚠ only one of IBH or AHS can be managed

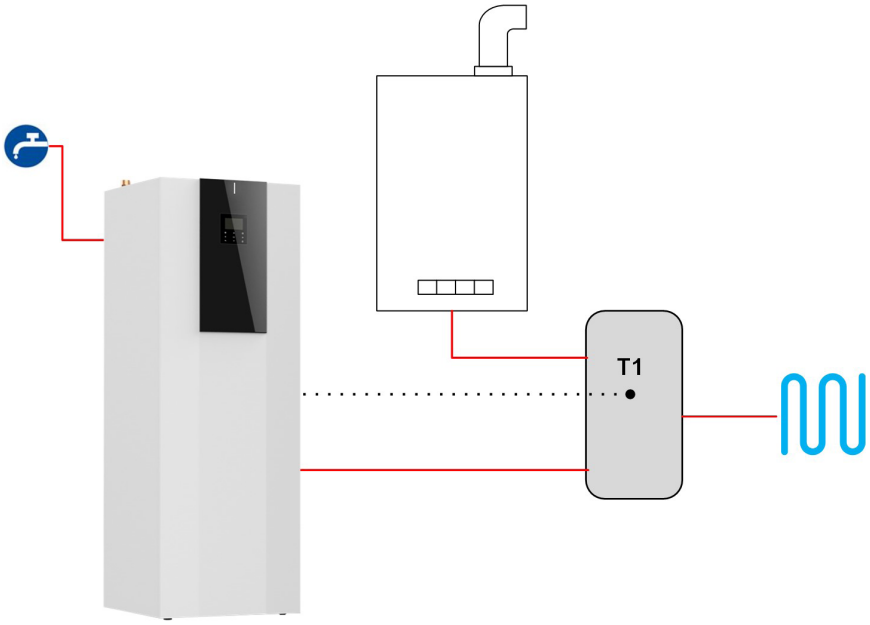
The additional electric heater or boiler can operate as::
- Integration: when it is not convenient/possible to work with the heat pump capacity alone
- Replacement: outside the work settings of the heat pump
- Back-up: in case of unit failure (the unit keeps the pump running at maximum speed)

A third-party supplier's boiler, if any, must be installed in parallel with the heat pump and can act:
- on the system and DHW: installed directly on the system, in this case its operation will require a dedicated T1 temperature probe (to be selected separately) to be installed downstream



⚠ Requires installation of the KCCEX kit, the T1 probe is included and must be fitted inside the indoor unit downstream of the boiler

- only on the system: installed on a hydraulic separator, where the T1 probe (to be selected separately) must also be fitted

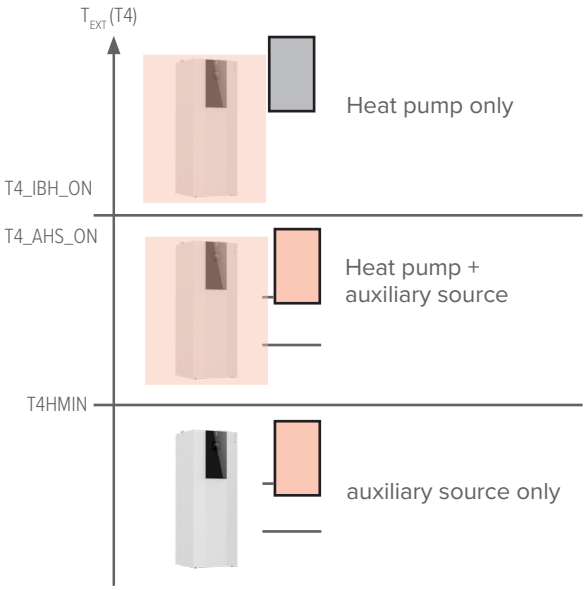


The activation operating mode (in Heating, DHW production or both) must be selected with the dip-switches on the board during installation.
Activation of the auxiliary source is linked to the simultaneous presence of 3 conditions, each of which is associated with a parameter that can be adjusted during initial start-up on the user interface:

- very low outdoor temperature

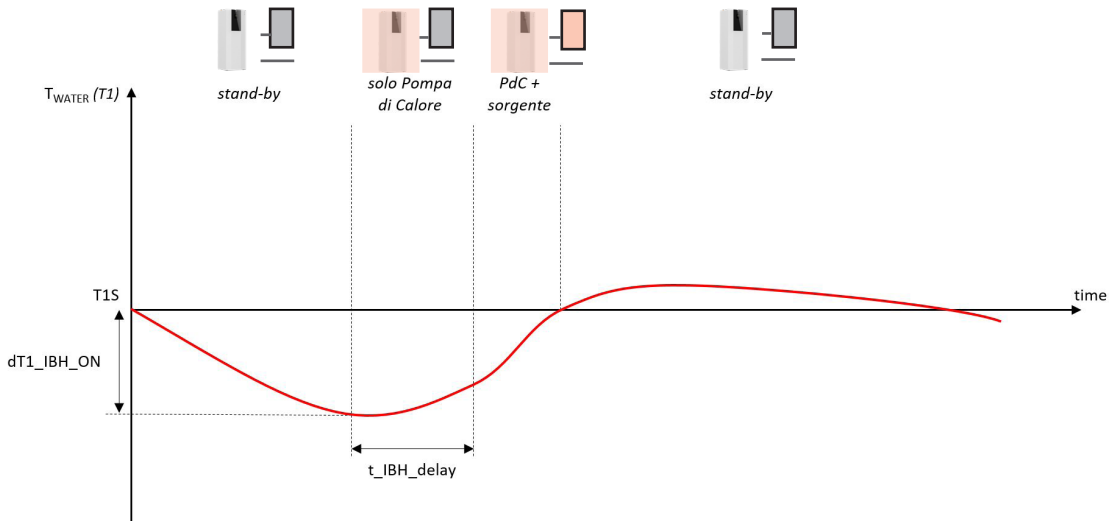
parameter T4_IBH_ON or T4_AHS_ON: the minimum outdoor air temperature for heat pump operation only

⚠ To make the auxiliary source work only as a replacement for the unit, set the parameter to the same value as T4HMIN (default -15°C, adjustable -25÷15): the minimum outdoor air temperature at which the heat pump can operate.



- supply temperature too far from the set-point
  parameter dT1_IBH_ON or dt1_AHS_ON: the minimum ΔT between the water set-point TS1 and unit supply set-point T1
- too long to reach the set-point
  parameter t_IBH_DELAY or t_AHS_DELAY: the maximum waiting time between compressor start-up and auxiliary source activation

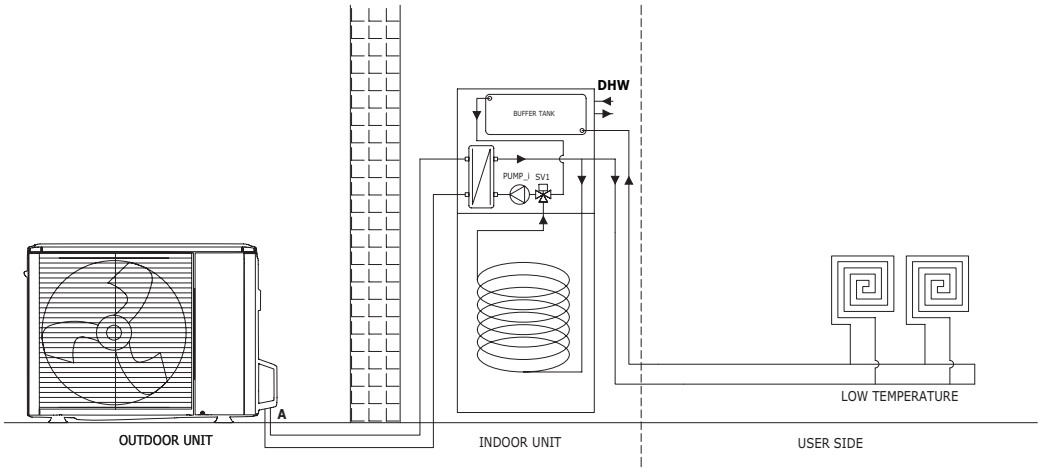
⚠ The BACKUP HEATER function on the HMI allows activation of the IBH or AHS auxiliary source to be forced



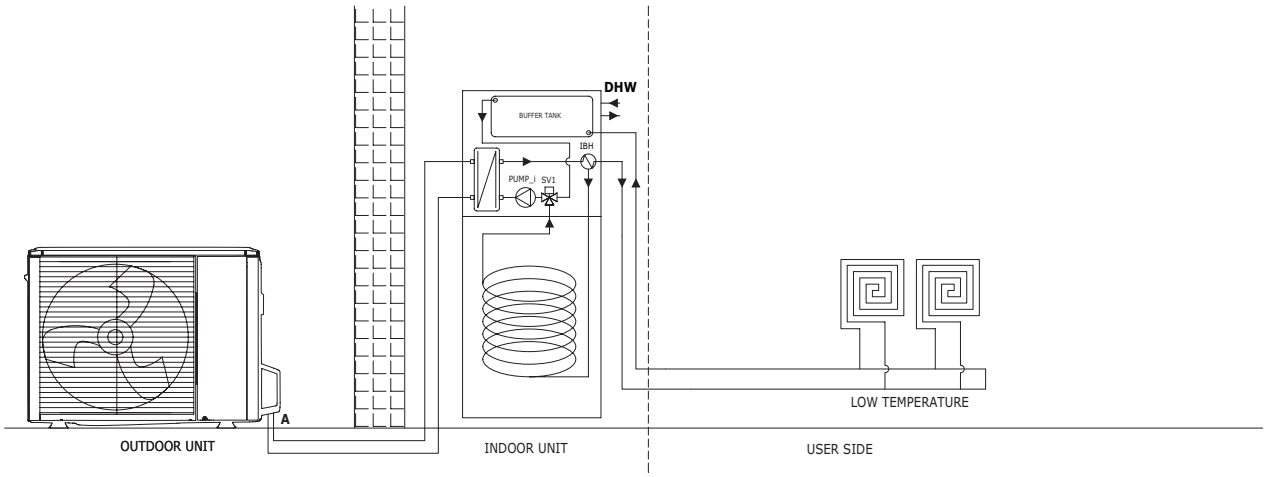
The unit can manage the AHS set-point dynamically with a 0-10V signal, with parameters:

- MAX_SETHEATER and MIN_SETHEATER: the minimum and maximum set-points that can be set in the boiler
- MAX_SIGHEATER and MIN_SIGHEATER: the 0-10V signals linked to the minimum and maximum set-points that can be set in the boiler

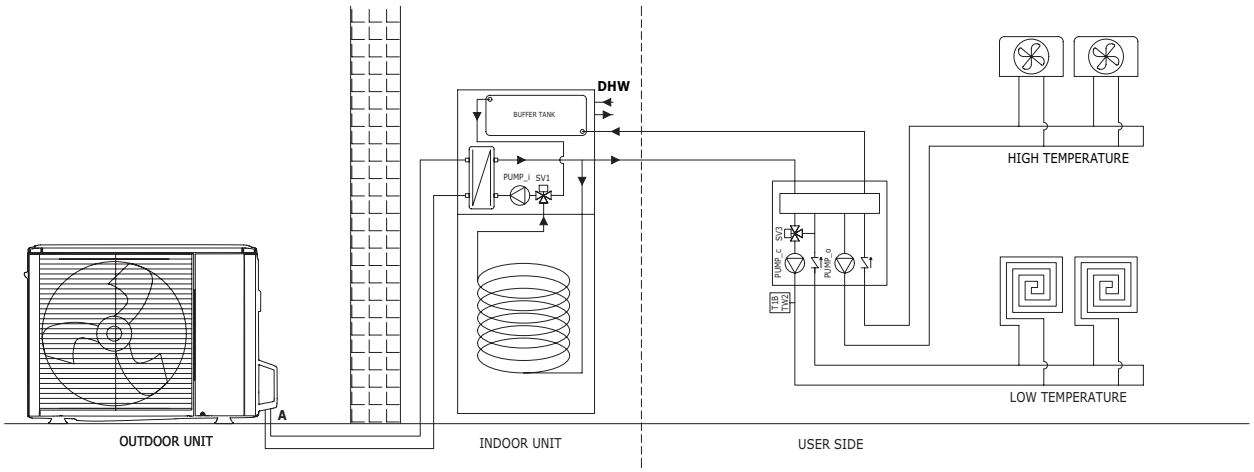
General description of the system and possible connections



Standard

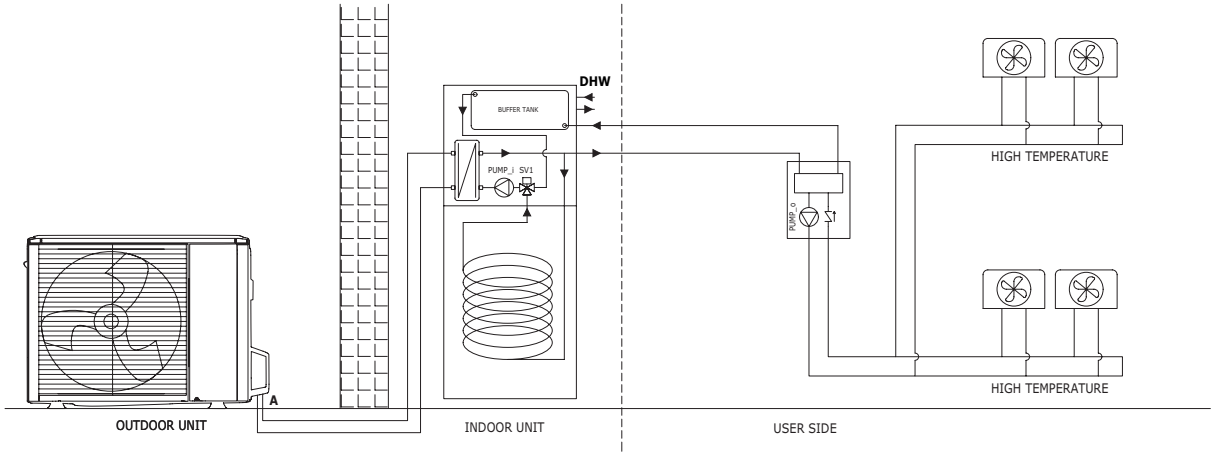


Electric heater

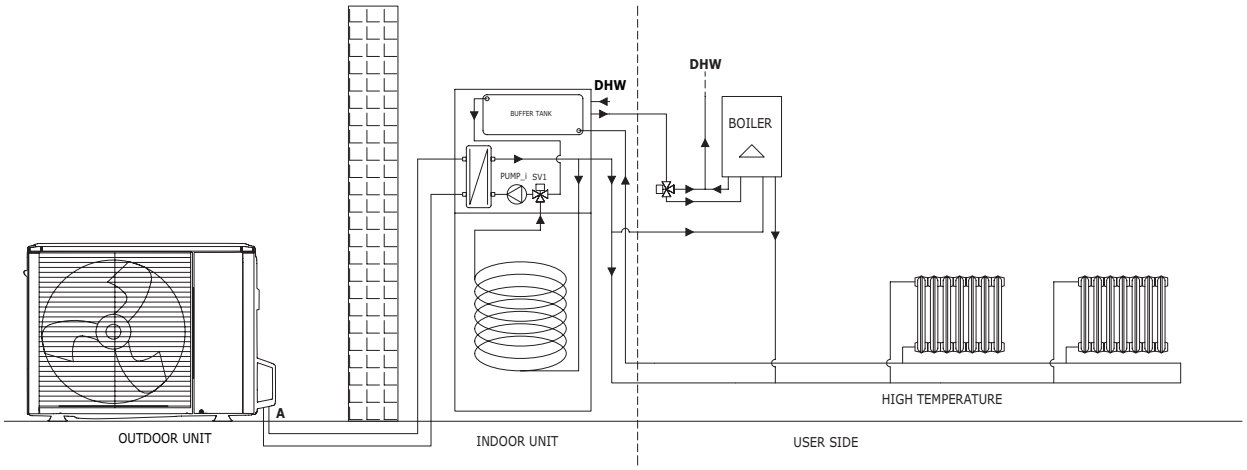


2 zone kit

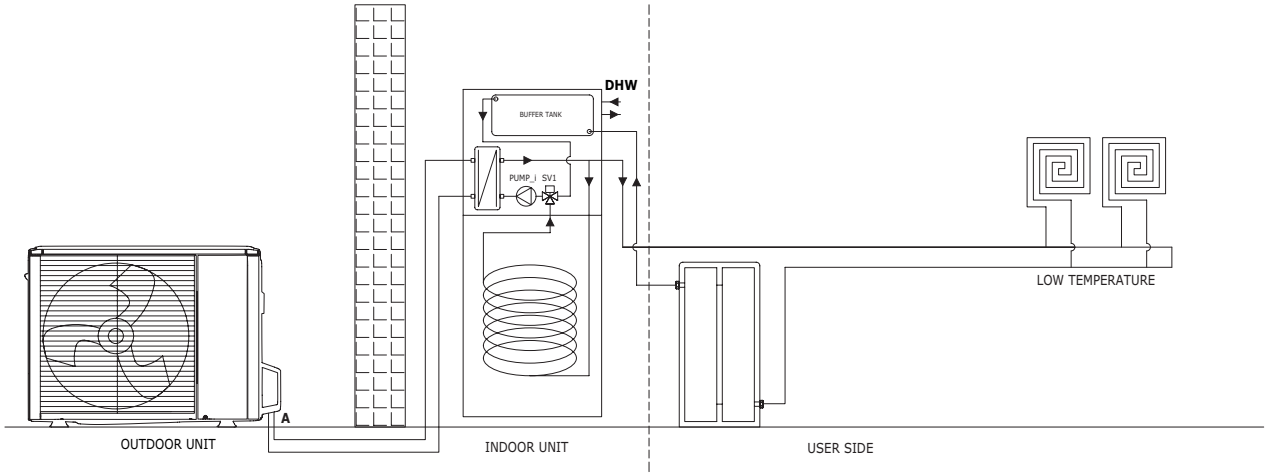
General description of the system and possible connections



Single zone kit

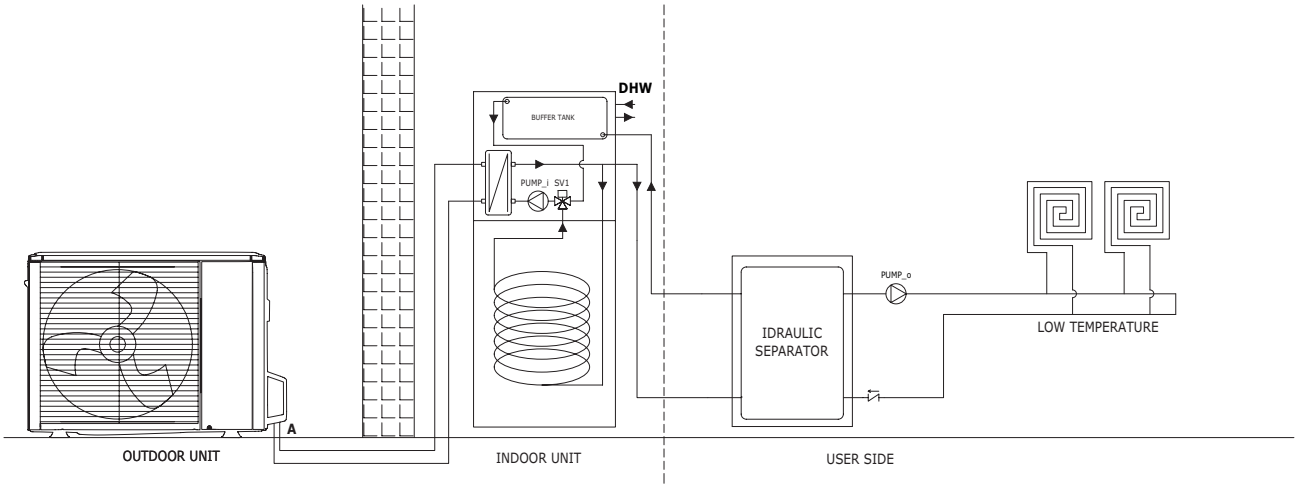


Boiler

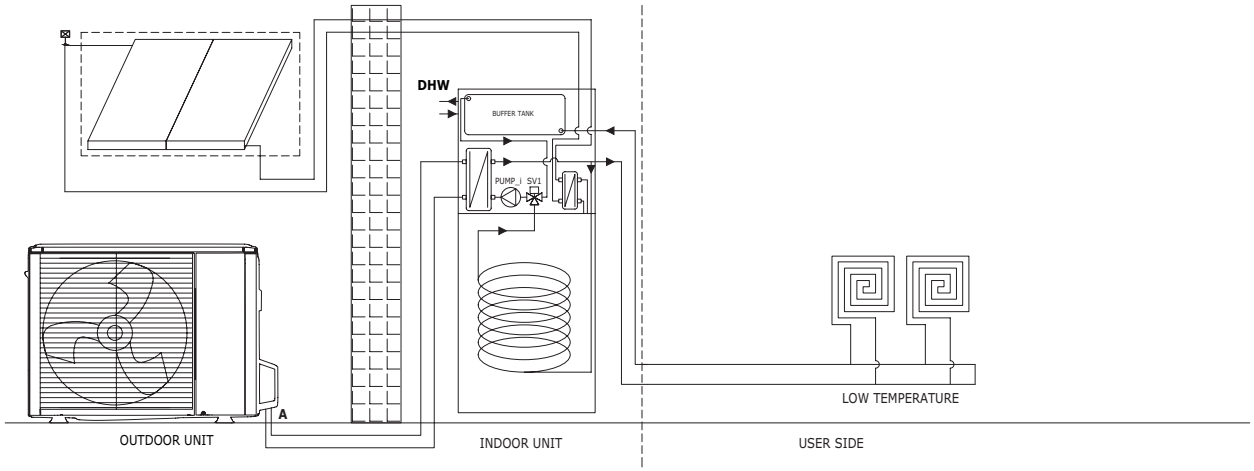


40L inertial storage

General description of the system and possible connections



50L hydraulic circuit breaker



Solar kit

Clivet S.p.A. declares that the data to be used for the calculation pursuant to UNI/TS 11300 part 4 of the efficiency of their heat pump are given in the following tables.
The data given in this document may be updated without advance notice by the manufacturer when upgrading his product range..

UNI/TS 11300 Part 4

SPHERA EVO 2.0 - Size 2.1

Data for determination of COPPL T delivery 20 °C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
2.1	PLR	100%	88%	54%	35%	15%
	DC		4,74	4,50	4,32	4,33
	CR		1,00	0,65	0,44	0,19
	P	5,39	4,74	3,05	1,99	1,45
	COP (part load)		3,15	4,96	6,81	6,23
	COP (full load)		3,15	4,46	5,42	6,37
	Fcop		1,00	1,11	1,26	0,98
Data to be provided for power and COP under full load cold source air						
	Te	Tm	-7	2	7	12
2.1	Heating capacity ΦH,HP out (kW)	35 °C	4,74	4,50	4,32	4,33
		45 °C	4,31	4,35	4,16	4,16
		55 °C	4,40	4,40	4,08	4,50
	COP	35 °C	3,15	4,46	5,42	6,37
		45 °C	2,51	3,27	3,93	4,52
		55 °C	1,99	2,56	3,00	3,44
DHW Power and COP data under full load			Te			
	Te	Tm	7	15	20	35
2.1	Heating capacity ΦH,HP out (kW)	55 °C	4,08	5,11	5,71	6,85
	COP	55 °C	3,00	3,84	4,23	3,90

SPHERA EVO 2.0 - Size 3.1

Data for determination of COPPL T delivery 20 °C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
3.1	PLR	100%	88%	54%	35%	15%
	DC		5,51	5,89	6,18	6,28
	CR		1,00	0,57	0,35	0,15
	P	6,26	5,51	3,30	2,24	1,45
	COP (part load)		3,13	4,91	7,11	5,70
	COP (full load)		3,13	4,15	5,21	6,10
	Fcop		1,00	1,18	1,36	0,93
Data to be provided for power and COP under full load cold source air			Te			
	Te	Tm	-7	2	7	12
3.1	Heating capacity ΦH,HP out (kW)	35 °C	5,51	5,89	6,18	6,28
		45 °C	5,22	6,42	6,03	6,53
		55 °C	5,15	5,46	5,94	6,64
	COP	35 °C	3,13	4,15	5,21	6,10
		45 °C	2,41	3,07	3,83	4,41
		55 °C	2,03	2,56	3,07	3,55
DHW Power and COP data under full load			Te			
	Te	Tm	7	15	20	35
3.1	Heating capacity ΦH,HP out (kW)	55 °C	5,94	6,99	7,33	8,80
	COP	55 °C	3,07	3,97	4,44	4,10

Data for the UNI/TS 11300 calculation

SPHERA EVO 2.0 - Size 4.1

Data for determination of COPPL T delivery 20 °C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
4.1	PLR	100%	88%	54%	35%	15%
	DC		7,15	5,64	8,30	8,21
	CR		1,00	0,78	0,34	0,15
	P	8,13	7,15	4,65	2,91	1,85
	COP (part load)		3,30	5,17	7,08	6,01
	COP (full load)		3,30	3,69	5,31	6,41
	Fcop		1,00	1,40	1,33	0,94
Data to be provided for power and COP under full load cold source air				Te		
	Te	Tm	-7	2	7	12
4.1	Heating capacity ΦH,HP out (kW)	35 °C	7,15	5,64	8,30	8,21
		45°C	6,34	6,59	8,22	8,07
		55 °C	6,08	6,27	7,50	7,55
	COP	35 °C	3,30	3,69	5,31	6,41
		45 °C	2,56	3,26	3,95	4,69
		55 °C	2,17	2,69	3,19	3,72
DHW Power and COP data under full load				Te		
	Te	Tm	7	15	20	35
4.1	Heating capacity ΦH,HP out (kW)	55 °C	7,50	8,37	9,18	11,02
	COP	55 °C	3,19	4,11	4,50	4,15

SPHERA EVO 2.0 - Size 5.1

Data for determination of COPPL T delivery 20 °C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
5.1	PLR	100%	88%	54%	35%	15%
	DC		8,45	9,30	10,09	10,26
	CR		1,00	0,56	0,33	0,14
	P	9,60	8,45	5,23	3,47	1,96
	COP (part load)		3,18	5,03	7,33	6,16
	COP (full load)		3,18	4,12	5,01	5,97
	Fcop		1,00	1,22	1,46	1,03
Data to be provided for power and COP under full load cold source air				Te		
	Te	Tm	-7	2	7	12
5.1	Heating capacity ΦH,HP out (kW)	35 °C	8,45	9,30	10,09	10,26
		45 °C	7,71	9,16	10,01	10,06
		55 °C	7,08	8,49	9,60	9,19
	COP	35 °C	3,18	4,12	5,01	5,97
		45 °C	2,59	3,11	3,86	4,32
		55 °C	2,11	2,66	3,10	3,65
DHW Power and COP data under full load				Te		
	Te	Tm	7	15	20	35
5.1	Heating capacity ΦH,HP out (kW)	55 °C	9,60	8,99	8,78	10,54
	COP	55 °C	3,10	4,03	4,53	4,18

Terms and definitions
Tm = Delivery temperature
Tdesignh = A - Average design climate temperature (pursuant to UNI EN 14825)
A, B, C, D = names of the four conditions with which different outdoors air temperatures are associated (Te)
Te = Outdoors air temperature
PLR = part load ratio
DC = power under full load referred to the specified temperatures
CR = heat pump load factor
P = system power demand
COP' (full load) = COP under full load referred to the indicated outdoors air temperatures
COP' (partial load) = COP under partial load referred to the indicated outdoors air temperatures
fCOP = COP correction factor, as follows: COP' (full load) / COP (partial load)HP= heat pump
DHW = domestic hot water

SPHERA EVO 2.0 - Size 6.1

Data for determination of COPPL T delivery 20 °C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
6.1	PLR	100%	88%	54%	35%	15%
	DC		10,69	13,01	12,13	12,26
	CR		1,00	0,50	0,35	0,15
	P	12,14	10,69	6,57	4,48	3,67
	COP (part load)		3,07	4,68	6,90	6,33
	COP (full load)		3,07	3,93	5,00	5,68
	Fcop		1,00	1,19	1,38	1,12
Data to be provided for power and COP under full load cold source air			Te			
	Te	Tm	-7	2	7	12
6.1	Heating capacity ΦH,HP out (kW)	35 °C	10,69	13,01	12,13	12,26
		45 °C	11,21	12,52	12,30	11,56
		55 °C	10,10	12,05	12,07	10,89
	COP	35 °C	3,07	3,93	5,00	5,68
		45 °C	3,14	3,34	3,80	4,59
		55 °C	1,76	2,88	3,10	3,78
DHW Power and COP data under full load			Te			
	Te	Tm	7	15	20	35
6.1	Heating capacity ΦH,HP out (kW)	55 °C	12,07	12,30	13,71	16,45
	COP	55 °C	3,10	4,19	4,59	4,23

SPHERA EVO 2.0 - Size 7.1

Data for determination of COPPL T delivery 20°C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
7.1	PLR	100%	88%	54%	35%	15%
	DC		12,33	12,71	14,51	12,31
	CR		1,00	0,60	0,34	0,17
	P	14,01	12,33	7,97	5,21	3,67
	COP (part load)		2,87	4,62	7,07	6,70
	COP (full load)		2,87	4,00	4,70	5,70
	Fcop		1,00	1,16	1,50	1,18
Data to be provided for power and COP under full load cold source air			Te			
	Te	Tm	-7	2	7	12
7.1	Heating capacity ΦH,HP out (kW)	35 °C	12,33	12,71	14,51	12,31
		45 °C	11,27	11,21	14,00	11,61
		55 °C	10,35	11,71	13,85	10,94
	COP	35 °C	2,87	4,00	4,70	5,70
		45 °C	2,61	3,11	3,65	4,61
		55 °C	2,18	2,91	3,05	3,80
DHW Power and COP data under full load			Te			
	Te	Tm	7	15	20	35
7.1	Heating capacity ΦH,HP out (kW)	55 °C	13,85	12,35	13,76	16,51
	COP	55 °C	3,05	4,21	4,60	4,25

Terms and definitions
Tm = Delivery temperature
Tdesignh = A - Average design climate temperature (pursuant to UNI EN 14825)
A, B, C, D = names of the four conditions with which different outdoors air temperatures are associated (Te)
Te = Outdoors air temperature
PLR = part load ratio
DC = power under full load referred to the specified temperatures
CR = heat pump load factor
P = system power demand
COP' (full load) = COP under full load referred to the indicated outdoors air temperatures
COP' (partial load) = COP under partial load referred to the indicated outdoors air temperatures
fCOP = COP correction factor, as follows: COP' (full load) / COP (partial load)HP= heat pump
DHW = domestic hot water

Data for the UNI/TS 11300 calculation

SPHERA EVO 2.0 - Size 8.1

Data for determination of COPPL T delivery 20 °C		Tdesignh	A	B	C	D
	Te	-10	-7	2	7	12
8.1	PLR	100%	88%	54%	35%	15%
	DC		13,82	14,30	16,01	15,20
	CR		1,00	0,59	0,34	0,16
	P	15,71	13,82	8,55	5,88	3,67
	COP (part load)		2,86	4,59	7,13	6,44
	COP (full load)		2,86	3,85	4,55	5,43
	Fcop		1,00	1,19	1,57	1,19
Data to be provided for power and COP under full load cold source air			Te			
	Te	Tm	-7	2	7	12
8.1	Heating capacity ΦH,HP out (kW)	35 °C	13,82	14,30	16,01	15,20
		45 °C	12,35	13,79	16,01	14,55
		55 °C	11,23	13,32	16,00	13,91
	COP	35 °C	2,86	3,85	4,55	5,43
		45 °C	2,58	3,28	3,60	4,49
		55 °C	2,13	2,80	2,90	4,00
DHW Power and COP data under full load			Te			
	Te	Tm	7	15	20	35
8.1	Heating capacity ΦH,HP out (kW)	55 °C	16,00	13,91	13,90	16,68
	COP	55 °C	2,90	4,39	4,86	4,49

Terms and definitions
Tm = Delivery temperature
Tdesignh = A - Average design climate temperature (pursuant to UNI EN 14825)
A, B, C, D = names of the four conditions with which different outdoors air temperatures are associated (Te)
Te = Outdoors air temperature
PLR = part load ratio
DC = power under full load referred to the specified temperatures
CR = heat pump load factor
P = system power demand
COP' (full load) = COP under full load referred to the indicated outdoors air temperatures
COP' (partial load) = COP under partial load referred to the indicated outdoors air temperatures
fCOP = COP correction factor, as follows: COP' (full load) / COP (partial load)HP= heat pump
DHW = domestic hot water

The specified data refer to the nominal power values under the declared conditions

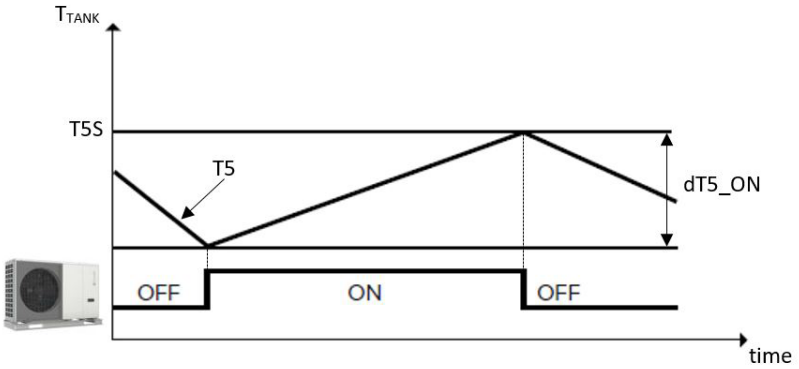
UNI/TS 11300 Part 3

SIZE	Cooling capacity kW				EER			
Test	1	2	3	4	1	2	3	4
	100%	75%	50%	25%	100%	75%	50%	25%
220-240V N 50Hz								
2.1	4,26	3,20	2,05	0,90	3,50	4,71	5,84	5,81
3.1	6,25	4,59	2,96	1,35	3,09	4,43	6,17	7,40
4.1	7,46	5,20	3,51	1,63	3,33	4,48	6,67	9,30
5.1	9,10	6,43	4,25	1,94	3,09	4,26	6,73	10,48
6.1	11,80	8,89	6,01	2,91	2,75	3,89	5,73	7,88
7.1	12,86	9,40	6,29	2,91	2,55	3,78	5,71	7,88
8.1	14,20	10,53	7,12	2,91	2,45	3,54	5,38	7,88

Reference conditions prescribed by UNI/TS 11300-3:
1. External air temperature B.S. 35 °C Refrigerated water temperature at the fancoil inlet/outlet 12/7 °C
2. External air temperature B.S. 30 °C Refrigerated water temperature at the fancoil outlet /7 °C
3. External air temperature B.S. 25 °C Refrigerated water temperature at the fancoil outlet /7 °C
4. External air temperature B.S. 20 °C Refrigerated water temperature at the fancoil outlet /7 °C

DHW (Domestic Hot Water) settings and management

The unit is designed to be coupled to DHW storage boilers connected with the heater management kit and T5 probe.



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 *(default 10 °C, can be adjusted to 1-30)*
Operation of the unit in DHW mode ends when T5 ≥ T5S or when T5 reaches the maximum temperature for DHW in the heat pump T5stop, which is parameterised according to the outdoor temperature T4:

T4 [°C]	43÷40	40÷35	35÷30	30÷25	25÷20	20÷15	15÷10
2.1÷8.1	45	48	50	52	55	56	57

T4 [°C]	10÷5	5÷0	0÷-5	-5÷-10	-10÷-15	-15÷-20	<-20
2.1÷8.1	56	55	52	48	45	40	35

If there is a further demand for DHW beyond T5stop, the unit can activate the TBH boiler heater until setpoint T5S is reached.

In DHW mode, the heat pump delivers water at Twout = T5 + dT1S5, where the parameter dT1S5 *(default 10 °C, can be adjusted to 5-40)* can be set from the HMI. Irrespective of how the parameter is set, the heat pump in Full Electric mode can deliver water up to 65 °C (60 °C for sizes 9.1-14.1), and up to 75 °C (70 °C for sizes 9.1-14.1) in hybrid systems in which there is an additional boiler driven by the unit itself.

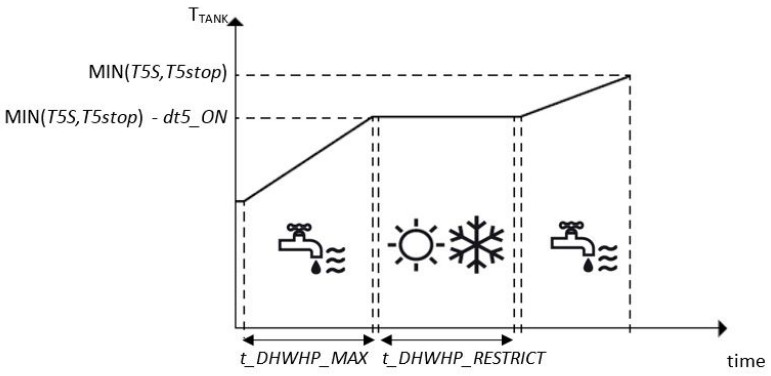
The outdoor air temperature range T4 within which the heat pump can operate in DHW mode adjusting it between T4DHWMIN *(default -10 °C, can be adjusted to between -25 and 30) and* T4DHWMAX *(default 43 °C, can be adjusted to 35-43)*. Outside the operating range set in this way, but within the generic operating range of the heat pump, the unit can produce DHW with the heater of the TBH DHW storage tank.

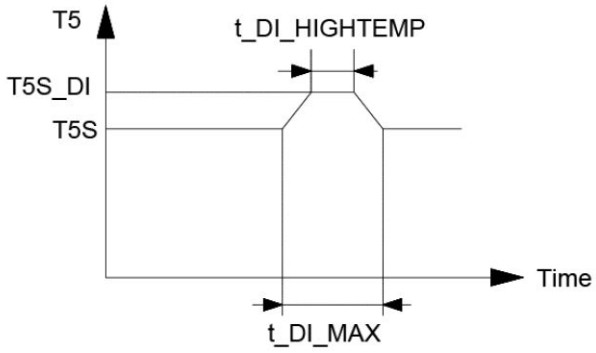
If there is simultaneous demand from DHW and the system, the former has priority as standard, but this can be changed at the HMI. However, the unit's logic controls several parameters and alternates between DHW and system operation in order to preserve comfort.

In particular, two controls can be activated, which process the maximum operating time of the unit in the system before switching to DHW t_DHWHP_RESTRICT *(default 30min, can be adjusted to 10-600)* and the maximum operating time of the unit in DHW mode before switching to system t_DHWHP_MAX *(default 90min, can be adjusted to 10-600)*.

By default, when the compressor of the unit is stopped, the heat pump waits a minimum of 5 minutes for it to be reactivated.

Other functions related to the production of DHW are:
- DISINFECT: management of periodic antilegionella cycles *(to be enabled, with logic as per the diagram)*





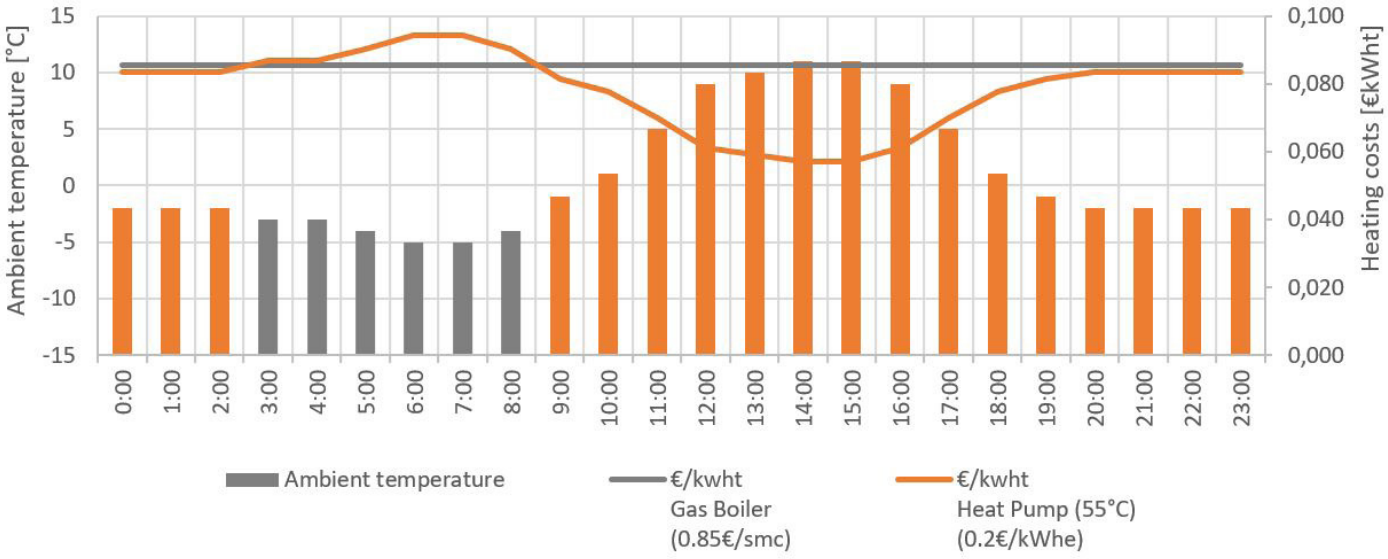
Parameters that can set on the HMI:
T5S_DI *(standard: 65 - can be set from: 60-70)*
temperature to which the unit must bring the DHW tank in anti-legionella mode
t_DI_HIGHTEMP *(standard: 15 - can be set from: 5-60)*
minutes during which the temperature T5S_DI must be kept in anti-legionella mode
t_DI_MAX *(standard: 210 - can be set from: 90-300)*
maximum minutes during which the unit can remain in anti-legionella mode

Note: it is important to set the heater safety thermostat above the anti-legionella cycle temperature set point T5S_DI, so that the cycle can be completed.

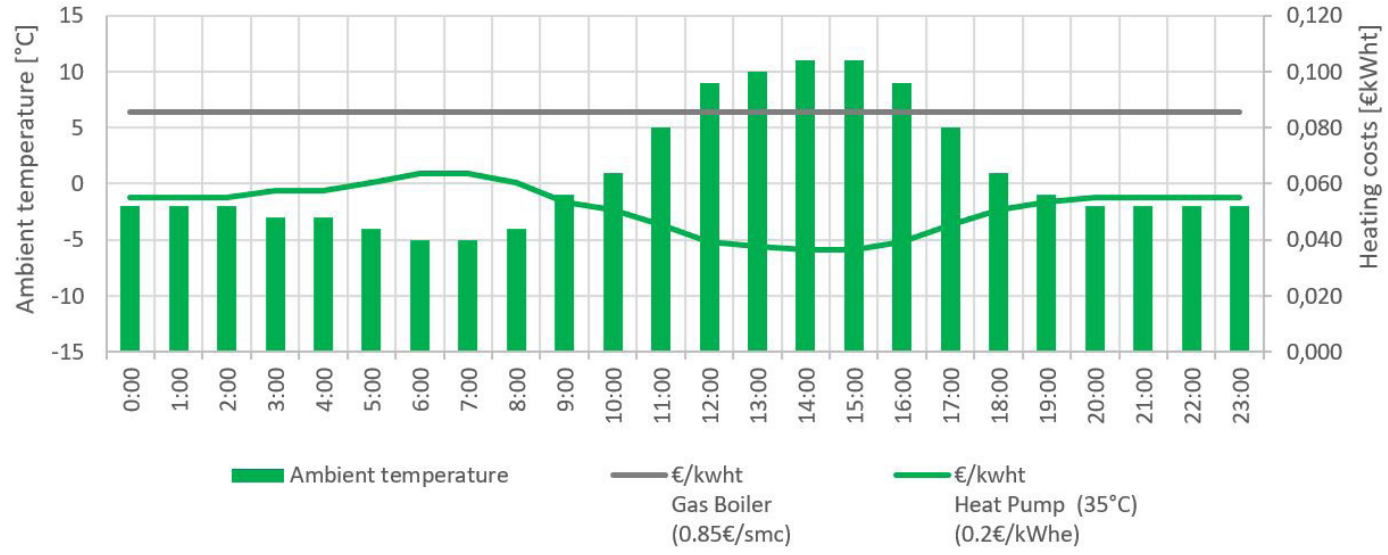
- FAST DHW: forces the unit and the heater of the TBH boiler to run in DHW mode up to the set-point
- TANK WATER: forces the heater of the TBH boiler to run in DHW mode, letting the unit of the system to work or act as a back-up in case of failure
- DHW PUMP: cycle programme for the DHW recirculation pump. The recirculation pump must be enabled at the HMI (parameter PUMP_D TIMER), selecting whether it should also work during anti-legionella cycles (parameter PUMP_D DISINFECT RUN), and setting the time of operation in minutes when activated in PUMP_D RUNNING TIME (standard: 5 - can be set from: 5-120)

SPHERA EVO 2.0 provides a useful instrument for maximising savings, for hybrid systems with a gas boiler, through the EuroSwitch function. Based on the set price of natural gas and electricity, the heat pump will assign priority to its own operation rather than that of the boiler depending on its efficiency. The aim is to always use the most cost-effective heat source.

Case 1 - Typical day in January - Radiators (supply temperature = 55°C)



From 03:00am to 08:00am, heat will be produced by the boiler, while during other time slots, it will be produced by the heat pump.



Case 2 - Typical day in January - Radiant floor (supply temperature = 35°C)

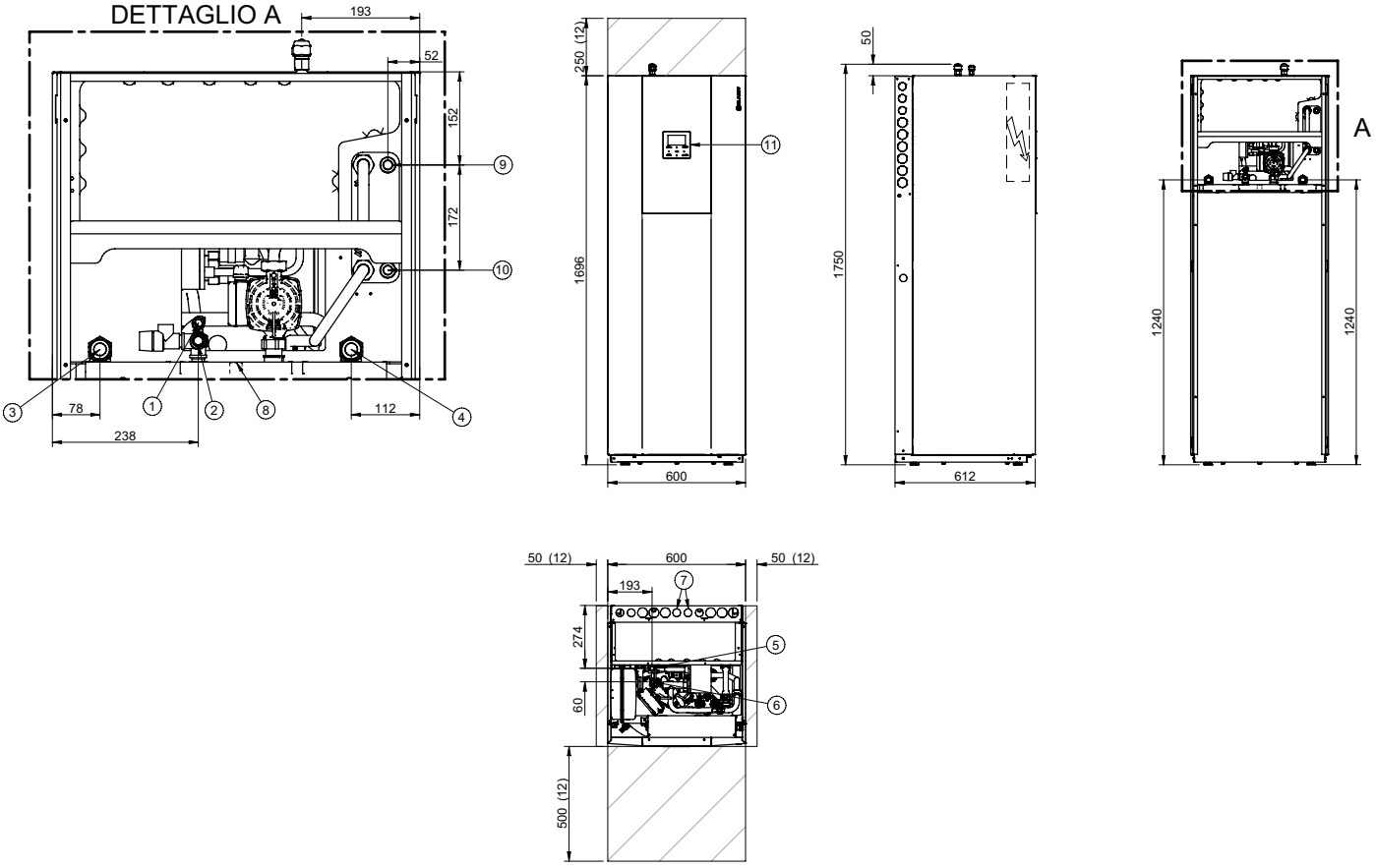
Heat will be produced by the heat pump during the whole day.
The graphs show the trend of the daily temperature and of the cost for thermal energy. The heat pump's efficiency varies according to the outdoor temperature and the water temperature, while the boiler has a fixed efficiency. The calculations consider an average cost of natural gas equal to 0.85 €/SCM and of electricity equal to 0.2 €/SCM.

Management of units in cascade

Many applications require units to be installed as back-up for 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 with a serial to the HMI of the Master. The slave units are automatically addressed by the Master at start-up.

SPHERA EVO 2.0 - SQKN-YEE 1 TC A TOWER 190 L

DABGL0000 REV01
DATA/DATE 14/02/2025



1. Uscita acqua calda sanitaria M 1/2"
2. Ingresso acquedotto F 1/2"
3. Ritorno dall'impianto utilizzo M 1"
4. Mandata all'impianto utilizzo M 1"
5. Connessione aspirazione, 5/8"SAE
6. Connessione linea del liquido, 3/8" SAE
7. Ingresso linea elettrica
8. Ingresso circuito ricircolo sanitario M 3/4"
9. Ritorno dall'impianto solare M 3/4" (accessorio opzionale)
10. Mandata all'impianto solare M 3/4" (accessorio opzionale)
11. Tastiera controllo unita'
12. Spazi funzionali unita' standard

(*) vedi istruzioni in kit RGGL00009

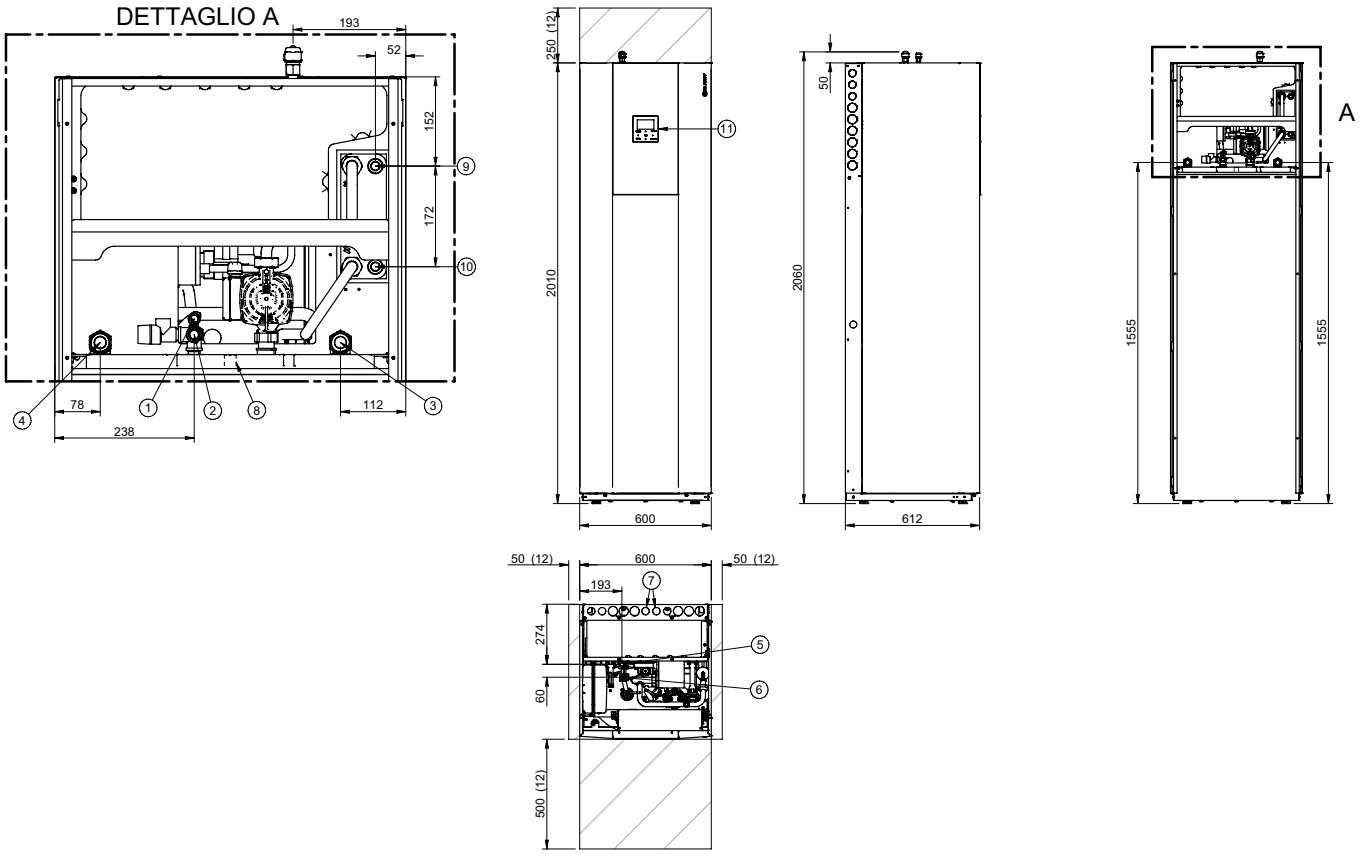
SIZE		190 L
Operation weight	kg	359
Shipping weight	kg	187

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

Dimensional drawings

SPHERA EVO 2.0 - SQNK-YEE 1 TC A-B TOWER 250 L

DABGL0001 REV01
DATA/DATE 14/02/2025



1. Domestic hot water outlet M 3/4"
2. Mains inlet M 3/4"
3. Return for the utility installation M 1"
4. Supply to the utility installation M 1"
5. Return connection 5/8" SAE (*)
6. Liquid connection 3/8" SAE (*)
7. Electrical line inlet
8. DHW recirculation circuit M 3/4"
9. Solar system outlet M 3/4" (optional accessory)
10. Solar system inlet M 3/4" (optional accessory)
11. Gas boiler outlet M 1" (optional accessory)
12. Gas boile inlet M 1" (optional accessory)
13. Control keypad
14. Functional spaces for standard unit

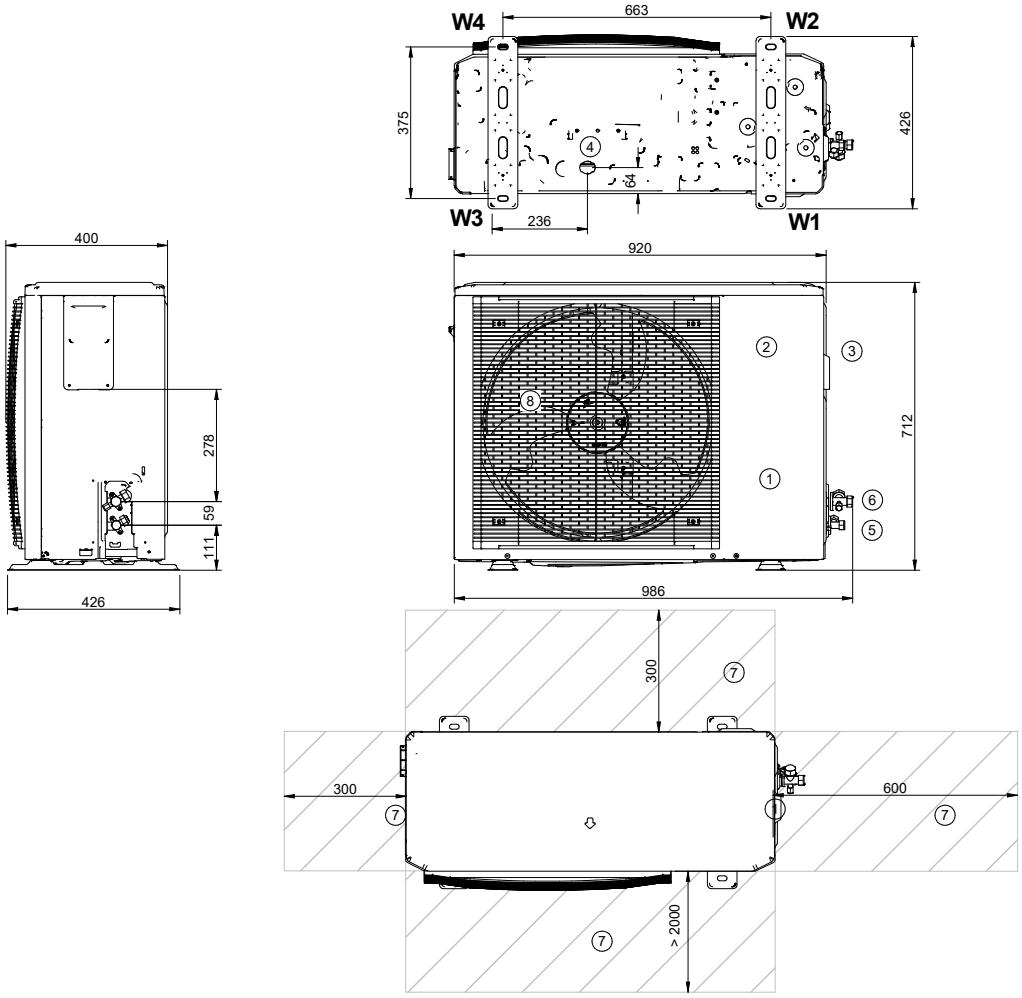
(*) see instructions in kit RGGL00001

RANGE		GABC	GBBC
SIZE		250 L	250 L
Operation weight	kg	419	421
Shipping weight	kg	192	194

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

SPHERA EVO 2.0 (outdoor unit) - 2.1 - 3.1

DAAQ80002_REV03
DATA/DATE 05/06/2023



1. Compressor enclosure
2. Electrical panel
3. Power input
4. Condensate drain
5. Gas connections (1/4")
6. Gas connections (5/8")
7. Functional spaces
8. Electrical fan

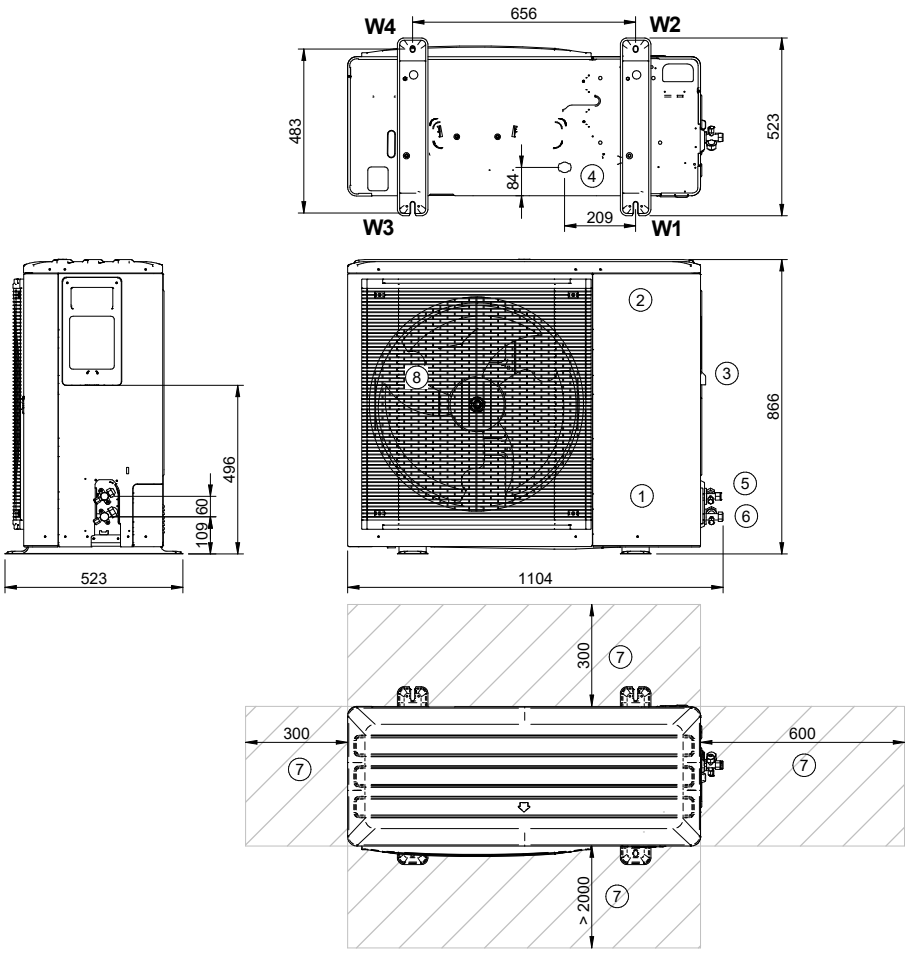
SIZE			2.1	3.1
W1 Supporting Point		kg	23,9	23,9
W2 Supporting Point		kg	13,8	13,8
W3 Supporting Point		kg	12,9	12,9
W4 Supporting Point		kg	7,4	7,4
Operation weight		kg	58	58
Shipping weight		kg	64	64

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

Dimensional drawings

SPHERA EVO 2.0 (outdoor unit) - 4.1 - 8.1

DAAQ80001_REV03
DATA/DATE 05/06/2023



1. Compressor enclosure
2. Electrical panel
3. Power input
4. Condensate drain
5. Gas connections (3/8")
6. Gas connections (5/8")
7. Functional spaces
8. Electrical fan

SIZE			4.1 / 1Ph	5.1 / 1Ph	6.1 / 1Ph	6.1 / 3Ph	7.1 / 1Ph	7.1 / 3Ph	8.1 / 1Ph	8.1 / 3Ph
W1 Supporting Point			30	30	30,4	40,3	30,4	40,3	30,4	40,3
W2 Supporting Point			17,8	17,8	29,1	34,8	29,1	34,8	29,1	34,8
W3 Supporting Point			18,4	18,4	18,6	19,8	18,6	19,8	18,6	19,8
W4 Supporting Point			10,9	10,9	17,9	17,1	17,9	17,1	17,9	17,1
Operation weight		kg	77	77	96	112	96	112	96	112
Shipping weight		kg	88	88	110	125	110	125	110	125

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

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