STØNE T1

TECHNICAL BULLETIN

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STØNE T1

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GENERAL

Pictograms relating to figures

1 The numbers indicate the individual components.
A The capital letters indicate component assemblies.

(1) The white numbers in black marks indicate a series of actions to be carried out in sequence.

(A) The black letter in white identifies an image when there are several images in the same figure.

CONFIGURATIONS AND CODES

Description

Indoor unit

The indoor units in the **STØNE** range, **T1** version, are designed for indoor installation, on the floor and work in combination with the **STØNE Split** outdoor units.
The units are complete with 200 L tank for DHW instantaneous exchanger, 24 L expansion tank, diverter valve for DHW, connection for auxiliary boiler, safety valves.

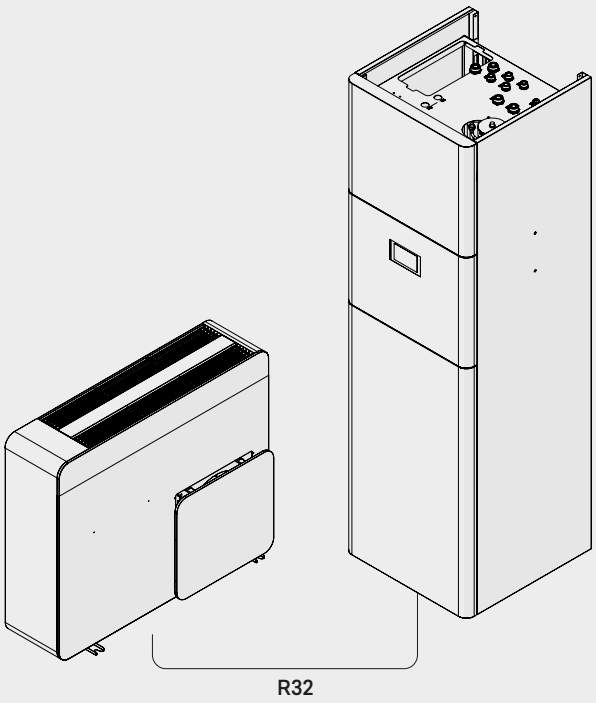
The units are manufactured in different sizes, distinguished by performance and type of power supply:
Single-phase models 5M - 7M - 9M - 11M - 13M - 15M
Three-phase 11T - 13T - 15T models

Outdoor unit

The outdoor units **STØNE** are designed for vertical outdoor, floor or wall installation and work paired with indoor units **STØNE B1 T1 C1.**
The range consists of four versions, depending on the type of installation:
STØNE-V exposed with vertical delivery
STØNE-H exposed with horizontal delivery
STØNE-IN built-in
STØNE-PI partially built-in

The units are manufactured in different sizes, distinguished by performance and type of power supply:
Single-phase models 5M - 7M - 9M - 11M - 13M - 15M
Three-phase 11T - 13T - 15T models

The **STØNE Split** outdoor units are paired with refrigerant connections to the indoor units. The refrigerant used is R32.



CONFIGURATIONS AND CODES

Coding

A key is used to correctly identify the specific properties and functions of the various models for classification purposes.

STØNE T1 5 M V

Unità esterna

Tipologia di installazione

V = a vista con mandata verticale
H = a vista mandata orizzontale
IN = ad incasso
PI = semi incasso

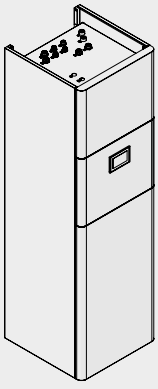
Tensione di alimentazione

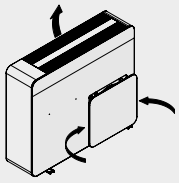
M = monofase 230/1/50
T = trifase 400/3/50

Grandezza

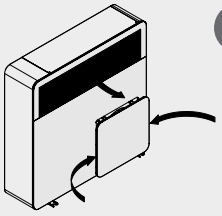
5
7
...
...
15

Unità interna

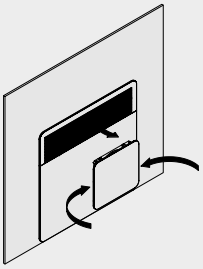




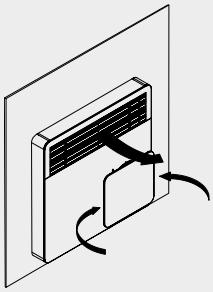
V — A vista con mandata verticale.



H — A vista con mandata orizzontale.



IN — Ad incasso.



PI — Semi incasso.

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INDOOR UNIT

Indoor unit features

Structure

Supporting structure made of zinc-magnesium sheet providing excellent mechanical characteristics and long-lasting corrosion resistance. External zinc-magnesium sheet metal panelling painted RAL 9003.

Water-side heat exchanger

Brazed corrugated plate gas/water heat exchanger made of stainless steel (AISI 316). The particular design of the surfaces contribute to significantly increasing exchange efficiency and reducing pressure drops.

Hydraulic circuit

- variable-speed primary circulator
- water-side differential pressure switch
- expansion vessel 24L
- 3-bar safety valve
- filling cock
- drain cock
- net filter
- 3-way on/off valve
- 200 litre tank for DHW
- automatic relief valve
- auxiliary boiler connector

Electrical panel

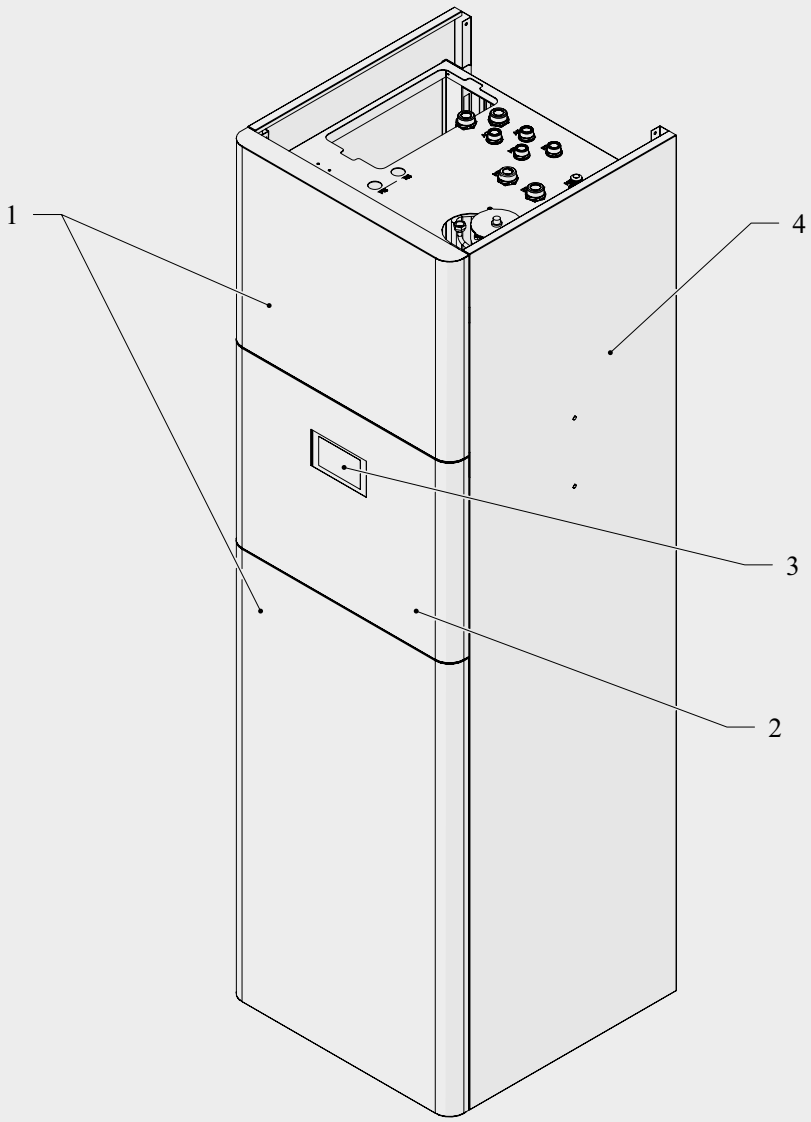
- terminal block for wiring
- PCB
- line disconnector

Control Panel

- AUX power supply terminal block
- external unit BUS connection terminal block (power supply and communication)
- terminal block for connecting external devices (secondary pumps, etc.)
- control touchscreen for adjusting the following functions:
  1. cooling/heating selection
  2. domestic hot water production
  3. heat adjustment
  4. control of all main functions of the device
  5. display of alarms

INDOOR UNIT

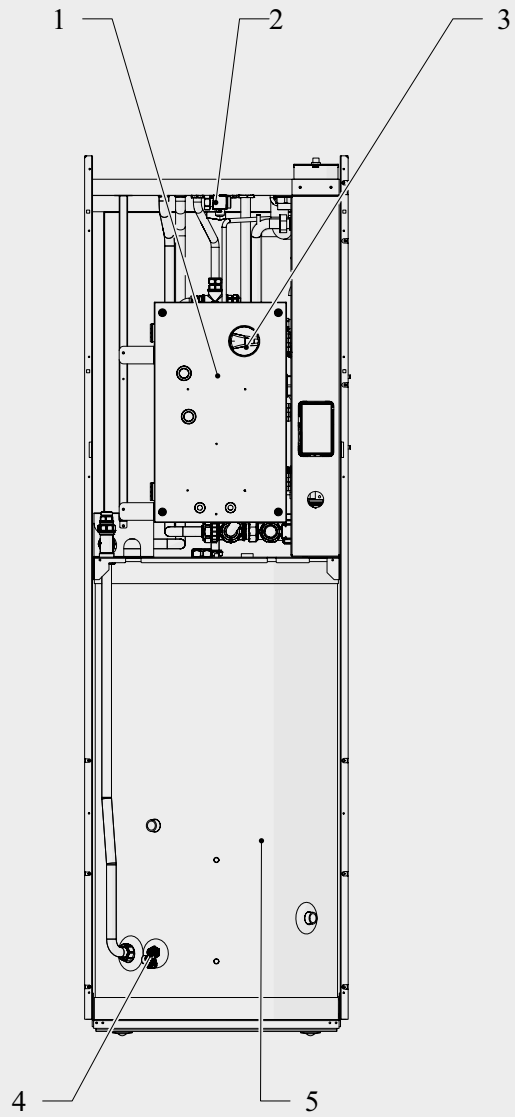
External components

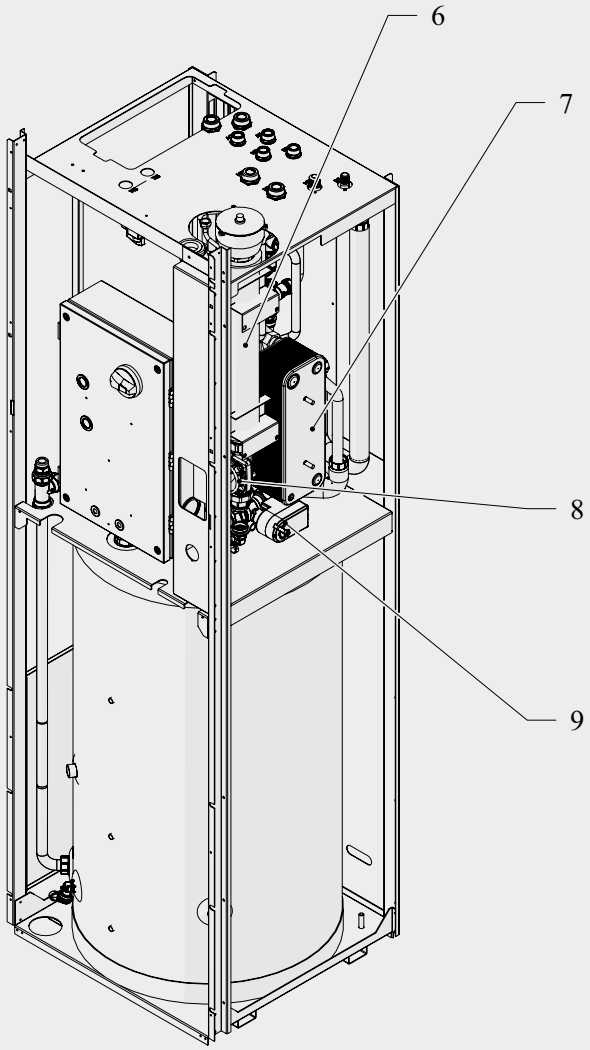


1. Cosmetic front panel
2. Access panel
3. Control Panel
4. Cosmetic side panel

INDOOR UNIT

Internal components





1. Electrical panel
2. Filling cock
3. Disconnect switch
4. Drain cock
5. tank
6. Manifold for heating element
7. Plate heat exchanger
8. PP1 primary circulation pump
9. System/sanitary deviator valve

INDOOR UNIT

Accessory

	Accessory description	Combinable products	Code
Network controls			
Butler			
	BUTLER: codes, accessories and price list in relevant section	All	
Configuration accessories			
Heater kit			
	Heating elements maximum 6 kW (3 steps of 2 kW). Limitation to 4 kW for single-phase heat pumps	All	GB0684II (1)
tank			
	Integrated inertial tank 20 L	All	GB1016II (1) (2)
Secondary separator kit			
	Secondary separator kit - Secondary hydraulic unit: hydraulic separator, system pump (DC Inverter class A) and fittings	5M 7M	GB0683II (1) (3)
	Oversized secondary separator kit - Secondary hydraulic unit: hydraulic separator, system pump (DC Inverter class A) and fittings	All	GB1020II (1) (3)
Heated towel rail kit			
	Hydraulic unit and circulation pump for high temperature Heated towel rail feeding	All	GB0736II (1)
Solar heating kit			
	Solar unit: control unit, pump, safety valve, 24 litre expansion tank, loading unit	All	GB0685II (1)

1. Accessories can be installed and tested at the factory
2. The 20 litre inertial tank kit can be supplied if the solar kit is not present / installed on the system flow
3. The separator kit is mandatory unless it is already present in the system.

Installation site

The location of the appliance must be determined by the plant engineer or a competent person and must take into account both purely technical requirements and any national/local legislation in force.
The appliance is intended to be installed indoors.

Warnings

Avoid installing the unit near:
- narrow places where the sound level of the appliance can be enhanced by reverberations or resonances
- environments with the presence of flammable or explosive gases
- very humid environments (laundries, greenhouses, etc.)
- environments with aggressive atmospheres
- solar radiation and proximity to heat sources
- radio and video equipment

Make sure that:
- the installation site of the unit must be chosen with the utmost care to guarantee adequate protection from shocks and consequent damage
- the floor is able to support the weight of the appliance.
- the floor is not crossed by pipelines, load-bearing construction elements or power lines
- the appliance must be installed in a position where it can be easily serviced

Provide the following:
- a drain and a water supply nearby
- a compliant power supply nearby

Warnings referring to refrigerant R32

The appliance must be installed in well-ventilated rooms with a minimum floor area as indicated in the Minimum floor area table according to the total refrigerant charge in the circuit. If the appliance is located in a poorly ventilated place, precautions must be taken to prevent stagnation in the event of leakage of refrigerant to avoid creating a risk of fire or explosion. Any ventilation openings must be kept free of obstacles.

The appliance must be placed in room where there are no open flames continuously in operation (e.g. a gas appliance in operation) and no sources of ignition (e.g. an electric heater in operation).
The refrigerant charge means the total charge of the circuit given by the sum of the factory charge and any additional charge.

Refer to the rating plate on the paired outdoor unit for the amount of refrigerant gas loaded in the unit.

Minimum floor area

m (kg)	Amin (m^2)
1,8	Without limitations
2,0	3,81
2,2	4,61
2,4	5,49
2,6	6,44
2,8	7,47
3,0	8,58
3,2	9,76
3,4	11,02
3,6	12,36
3,8	13,77
4,0	15,26
4,2	16,82
4,4	18,46
4,6	20,18
4,8	21,97
5,0	23,84
5,2	25,79
5,4	27,81
5,6	29,91
5,8	32,09
6,0	34,34
6,2	36,67

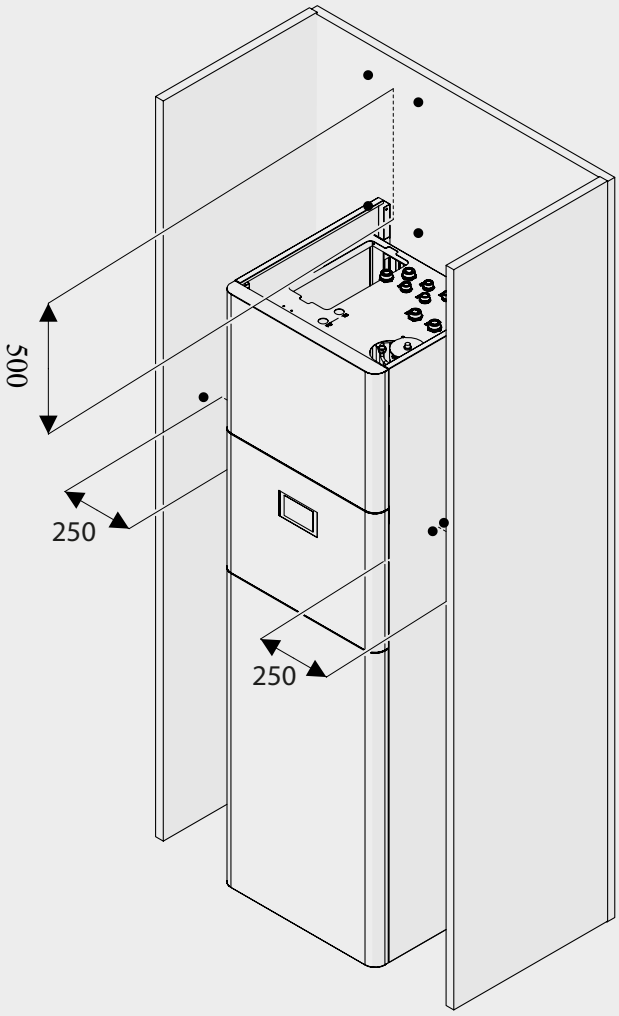
10. **m** Refrigerant charge
11. **Amin** Minimum floor area

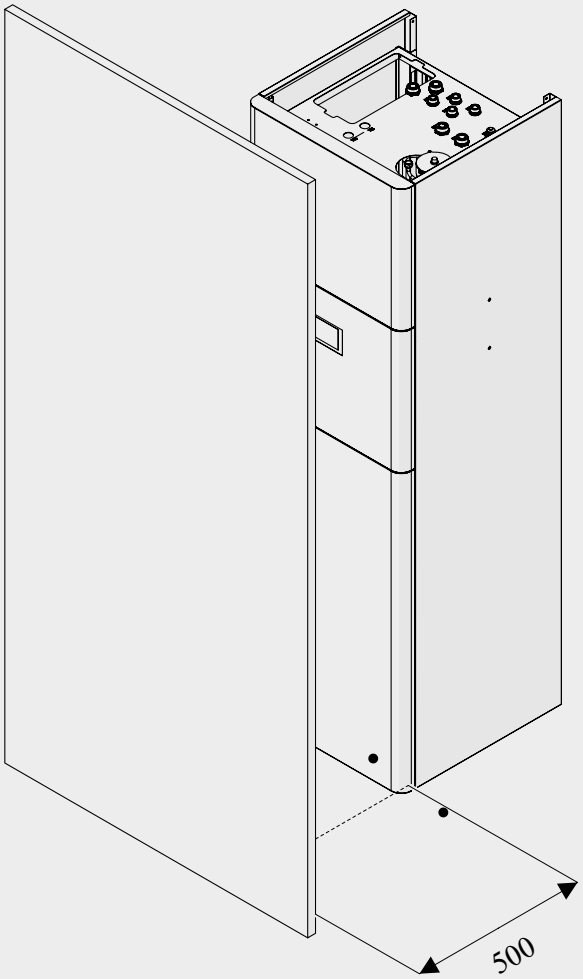
INDOOR UNIT

Installation minimum distances

The clearance zones for the installation and maintenance of the appliance are shown in the figure. Established spaces are necessary to allow for normal cleaning and maintenance.

Make sure that there is sufficient space to allow the panels to be removed for routine and supplementary maintenance operations.





INDOOR UNIT

Positioning

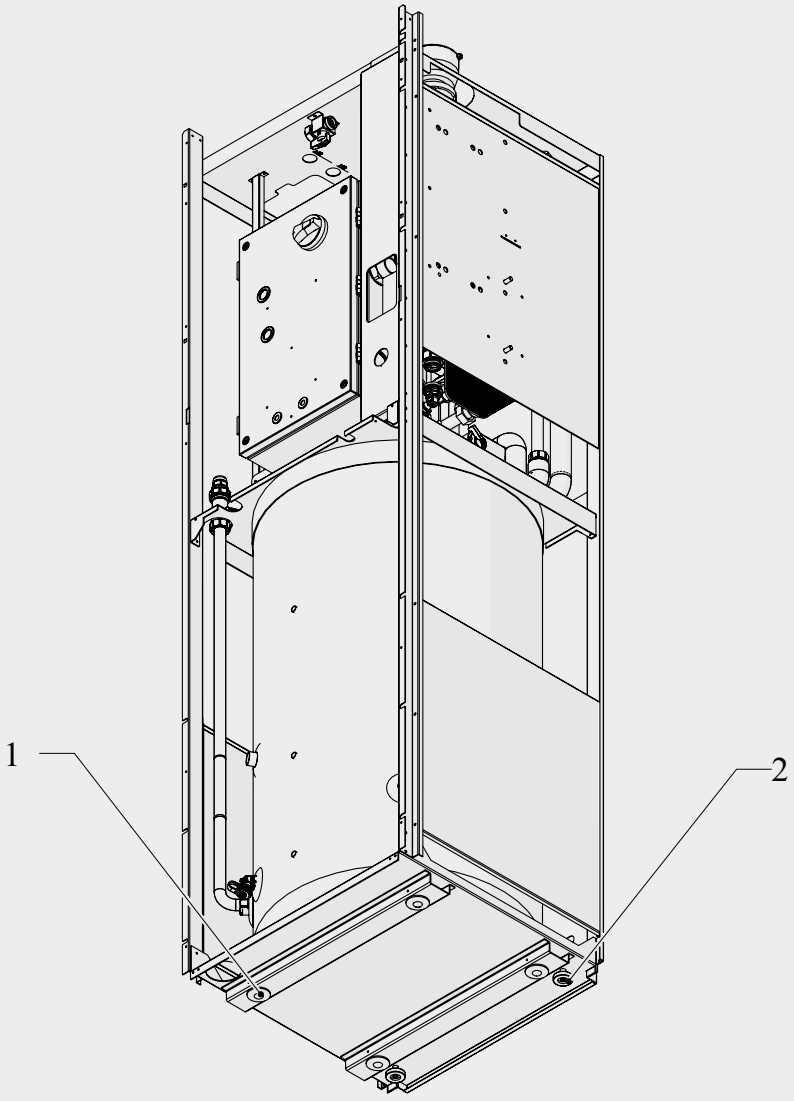
Exposed units can be positioned on the floor.
Before installation, check that:

- the floor supports the weight of the appliance
- the floor is not crossed by pipelines, load-bearing construction elements or power lines

The unit is provided with:

- four ball wheels to facilitating handling
- two locking and adjustment feet

1. Ball wheels for movement
2. Locking feet



INDOOR UNIT

Hydraulic connections

Heat pumps require plants that guarantee a constant flow of fluid to the appliance, within the minimum and maximum values and with sufficient volumes to avoid imbalances in the refrigeration circuits and to guarantee the correct level of comfort.

System water content

A minimum volume of water in the primary circuit of the plant must be guaranteed for the correct operation of the appliance. The volume is necessary to prevent risks of ice formation during defrosting operations or continuous modulation of the compressor frequency.

The minimum volume of water also allows the following advantages:

- less wear and tear on the appliance
- increased system performance
- improved temperature stability and accuracy

The minimum volume must be guaranteed in all operating modes and under all conditions. If the minimum volume is not reached, a suitably sized storage tank must be provided.

The minimum volume is indicated in the table below.

Models	m.u.	5-M	7-M	9-M	11-M	11-T	13-M	13-T	15-M	15-T
Minimum system water content	L	20	25	30	35	35	40	40	50	50

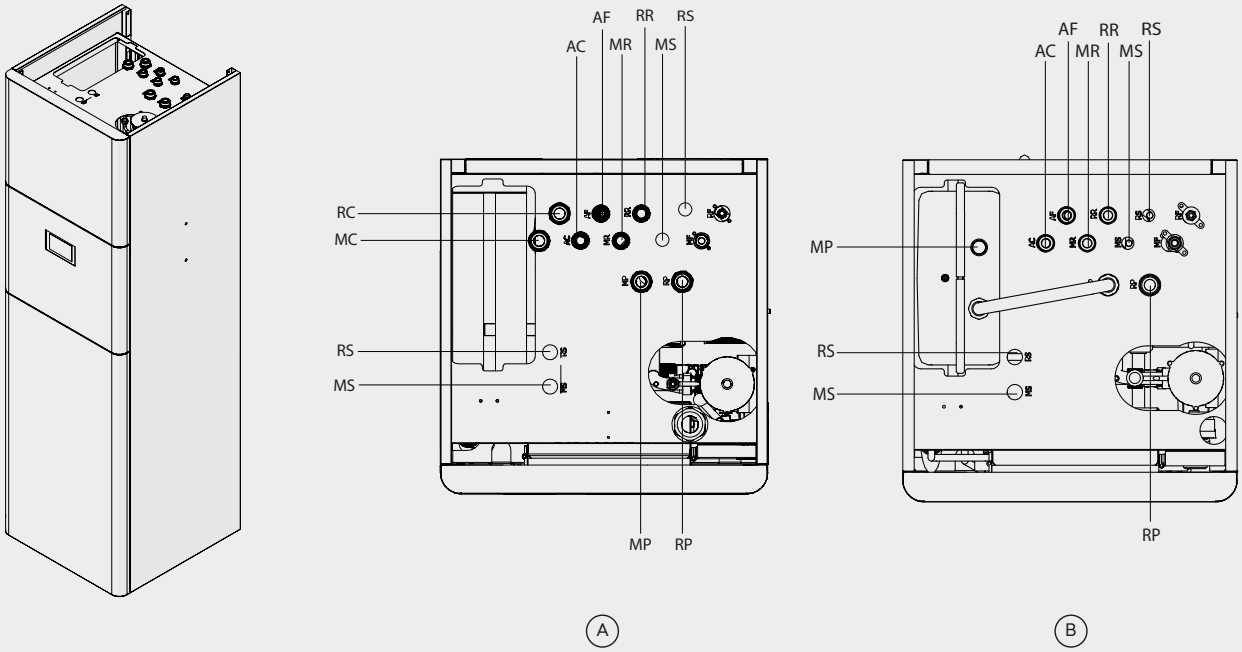
Minimum flow rate

A minimum water flow rate must be guaranteed to the device to prevent the pressure switch from tripping for the plant to operate correctly. The minimum flow rate must be guaranteed in all operating modes and under all conditions, if necessary by adding a by-pass valve. A hydraulic separator must be provided if the plant requires a higher head than that available from the pump of the unit.
The minimum flow rate is indicated in the table below.

Models	m.u.	5-M	7-M	9-M	11-M	11-T	13-M	13-T	15-M	15-T
Minimum water flow rate	m^3/h	0,6	0,9	1,1	1,2	1,2	1,4	1,4	1,7	1,7

INDOOR UNIT

Position and dimensions



A	Standard units	AC	Domestic hot water	MS	Solar flow
B	Unit with integrated inertial tank 20 L	AF	Domestic hot water supply	RS	Solar return
MC	Boiler flow	MR	High temperature utilities flow (radiator)	MP	Plant delivery
RC	Boiler return	RR	High temperature utilities (radiator) return	RP	System return

Models	m.u.	05-M	07-M	09-M	11-M	11-T	13-M	13-T	15-M	15-T
Hydraulic connections										
Boiler flow	" GAS	1	1	1	1	1	1	1	1	1
Boiler return	" GAS	1	1	1	1	1	1	1	1	1
Domestic hot water	" GAS	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Hot water feed	" GAS	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
High temperature utilities flow	" GAS	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
High temperature utilities return	" GAS	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Solar flow	mm	12	12	12	12	12	12	12	12	12
Solar return	mm	12	12	12	12	12	12	12	12	12
Plant return	" GAS	1	1	1	1	1	1	1	1	1
Plant delivery	" GAS	1	1	1	1	1	1	1	1	1

INDOOR UNIT

Connection to the system

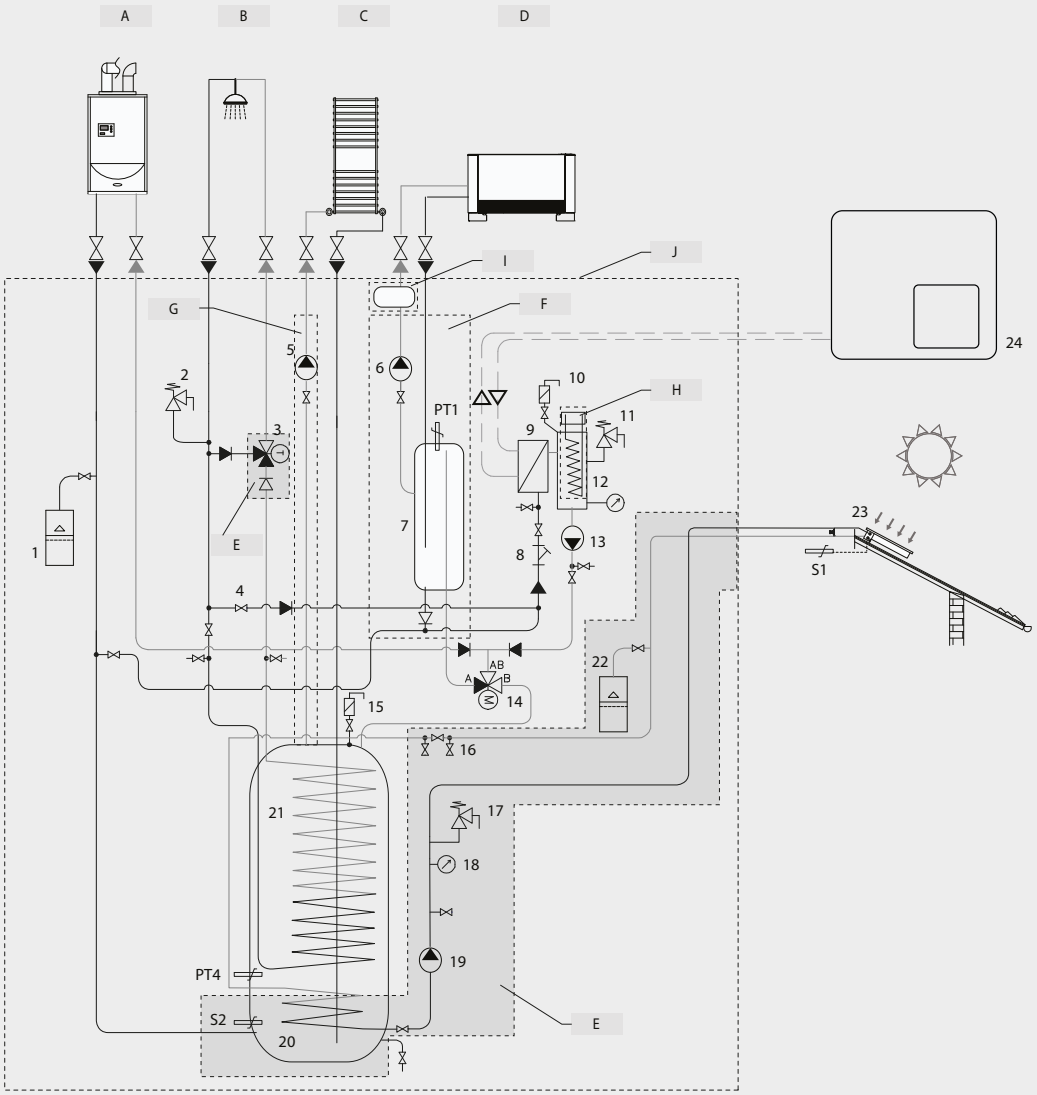
The minimum nominal diameter of the connecting pipes must be as shown in the table. Keep in mind that undersized piping determines malfunctions and/or loss of heating and cooling performance. Hydraulic lines, joints, shut-off valves, bends and fittings must be thermally insulated with polyethylene foam or similar materials with a minimum thickness of 13 mm.
For the correct operation of the appliance, the connection piping must be supported so as not to bear on the internal components with its weight. Furthermore, installing a mains water filter and a sludge remover at the inlet of the appliance, possibly in an area accessible for maintenance is compulsory to safeguard the appliance from impurities in the water. Operating the unit without the water filter installed and clean is forbidden.
To allow maintenance or repair operations, each hydraulic connection must be equipped with the respective manual shut-off valves. Furthermore, it is advisable to create a by-pass in the plant to be able to wash the plate exchanger without having to disconnect the appliance.
Plants filled with antifreeze or special legal provisions require the use of hydraulic disconnectors.
The hydraulic connections must be completed by installing:

- air release valves at the highest points of the piping
- flexible elastic joints
- shut-off valves
- a suitably sized storage tank for plant water
- the secondary separator kit is available as accessory

The separator kit is compulsory unless it is already present in the system.

INDOOR UNIT

Basic hydraulic scheme



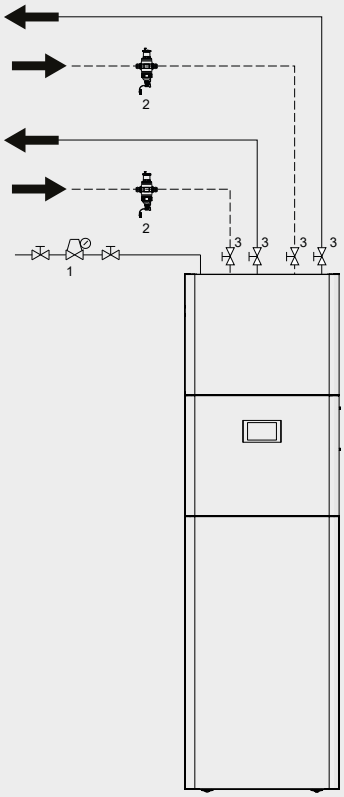
A Boiler
B Domestic hot water consumers
C High temperature (radiator) utilities
D System utilities
E Solar heating kit (optional)
F Secondary separator kit (optional)
G Heated towel rail kit (optional)
H Heater kit (optional)
I tank (optional)
J Indoor unit

1. 24 litre system expansion vessel
2. 7-bar safety valve
3. Thermostatic mixing valve (supplied with the solar kit)
4. Filling cock
5. High-temperature circulation pump
6. Secondary circulation pump PP3
7. Hydraulic separator
8. Net filter
9. Plate exchanger
10. Automatic relief valve
11. 3-bar safety valve
12. Collector with heating element
13. PP1 primary circulation pump
14. 3-way on/off valve PV1
15. Boiler relief valve
16. Solar filling cock
17. 4 bar solar safety valve (optional)
18. Pressure gauge
19. Solar circuit pump
20. Solar serpentine
21. 200 litre tank for domestic hot water
22. 24 L solar expansion vessel
23. Solar panel
24. Outdoor unit

INDOOR UNIT

Connection diagram

1. Automatic plant filling assembly
2. Dirt separator
3. Shut-off valves



Filtration system

It is necessary to install a filtration system at the inlet of the appliance in an area accessible for maintenance, in order to protect the appliance from impurities in the water.

The recommended filtration system is through a dirt separator. Alternatively, a net filter can be used.

Safety valve

The outlet of the installed safety valve must be connected to a suitable collection and evacuation system to prevent any water spillage from coming into contact with the electrical parts of the appliance. A pressure reducer must be provided if the mains pressure exceeds 3 bar.

Coil vent

To avoid air pockets inside the circuit, place automatic or manual venting devices at all points (higher piping, siphons, etc.) where air can accumulate.

INDOOR UNIT

Plant water reference values

The quality of the water used must comply with the requirements set out in the following table; otherwise, a treatment system must be provided.

Well or groundwater not coming from an aqueduct should always be carefully analysed and, if necessary, conditioned with appropriate treatment systems.

A water softening plant must be used if the initial water hardness exceeds the value indicated in the table. Be careful because excessive water softening (total hardness < 1.5 mmol/l) could generate corrosive phenomena in contact with metallic elements (piping or parts of the boiler). Also keep the conductivity value within 600 µS/cm.

A filling system external to the unit must be provided.

The operating pressure of the plant must not exceed 1.5 bar with the pump off. To check for leaks in the plant during testing, it is advisable to raise the test pressure and then discharge it later to reach the correct working pressure. If the pressure exceeds 3 bar, the safety valve opens and discharges the excess water outside.

Check the chloride concentration at the outlet after resin regeneration.

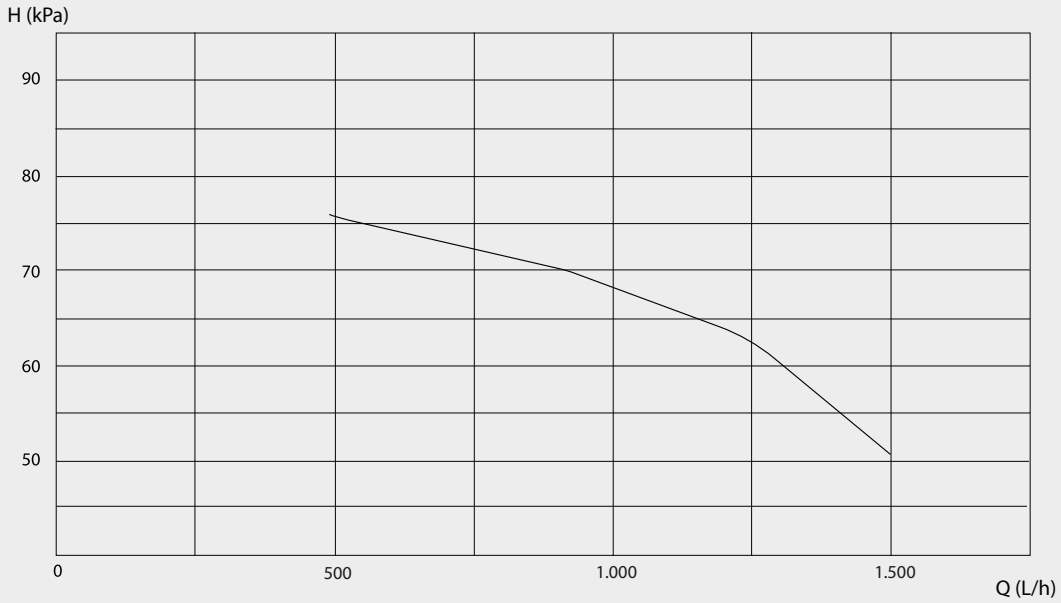
It is forbidden to introduce acids into the flushing circuit and constantly or frequently top up the plant because this operation can damage the heat exchanger of the appliance.

Plant water reference values		
pH		6,5 ÷ 7,8
Electrical conductivity	µS/cm	250 ÷ 800
Total hardness	°F	5 ÷ 15
Total Iron	ppm	0,2
Manganese	ppm	< 0,05
Chlorides	ppm	< 250
Sulphur ions		none
Ammonia ions		none

INDOOR UNIT

PP1 circulation pump graphs

Model 5 - 7

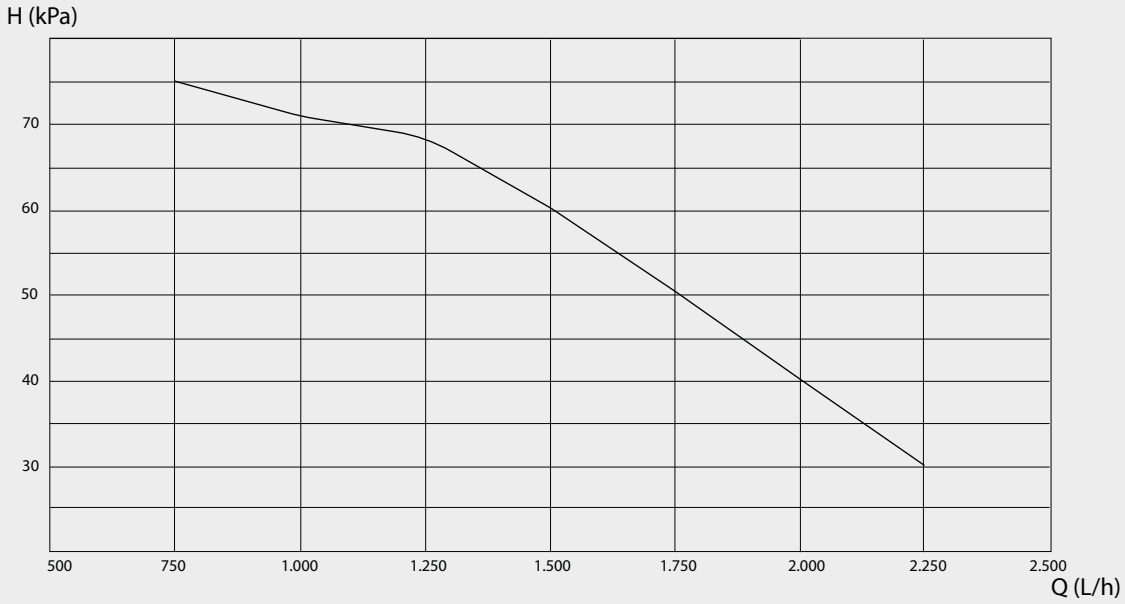


H Available pressure

Q Water flow rate

Curves refer to fixed maximum speed

Model 9 - 11 - 13 - 15



H Available pressure

Q Water flow rate

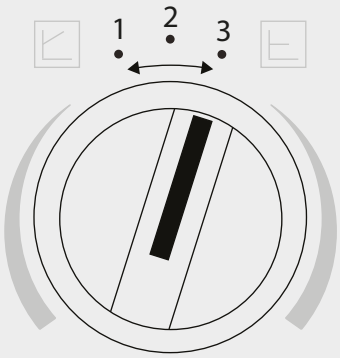
Curves refer to fixed maximum speed

PP1 primary circulation pump

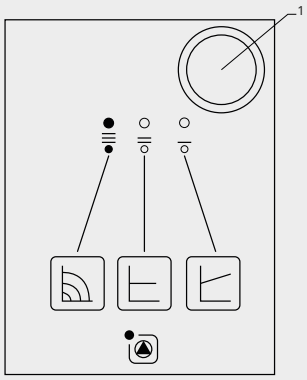
Settings

The appliance uses a high-efficiency wet circulation pump, suitable for all heating and air-conditioning plants.
On the front of the pump body there is a regulator for select operating mode at fixed or variable speed: Top fixed speed mode must be used for the primary pump unless indicated otherwise. In this mode, the circulation pump operates at fixed speeds that are not subject to regulation. For operating curves (available at maximum speed) see specific chapter.

There are two different control modes according to the installed pump model:



1. Minimum speed
2. Medium speed
3. Maximum speed



1. Selection button

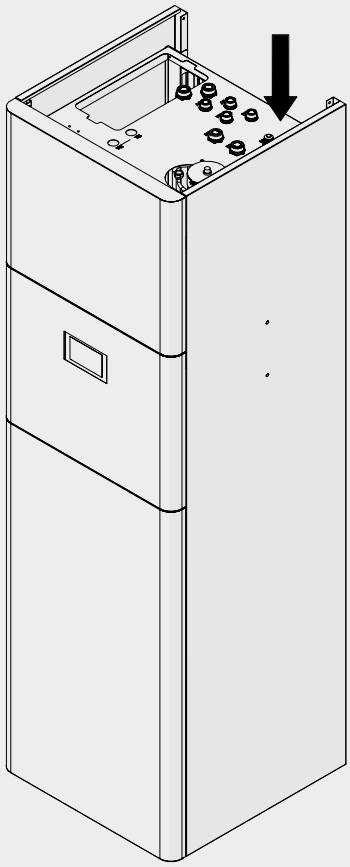
Fixed speed selection

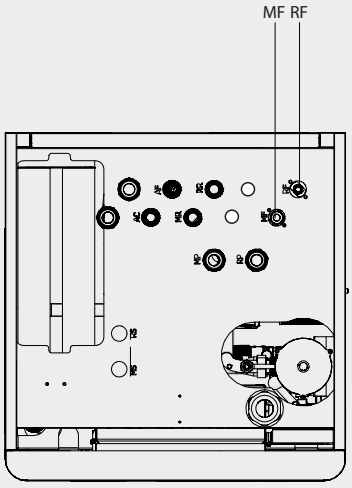
Maximum speed

INDOOR UNIT

Refrigeration connections

Position and dimensions





MF Refrigerant gas line (5/8")
RF Liquid refrigerant line (3/8")

For refrigeration connections, refer to chapter "Refrigeration connections" 50 of the outdoor unit.

INDOOR UNIT

Electric connections

The appliance leaves the factory fully wired and only needs to be connected to the power supply, external unit and any accessories.

Power supply line dimensions

It must be possible to disconnect the power supply line from the rest of the electrical network of the building using an omnipolar magneto-thermal circuit breaker complying with EN 60335 part 1 (contact opening of at least 3 mm), suitable for the draw of the appliance, with differential relay with the maximum setting as prescribed by the individual electrical regulations.

Use the tables below for the sizing of the power supply line and its protection device.
The data shown do not refer to average draw or transient peaks, but are instead values to be considered for the correct sizing of the plant and the request of the contractual capacity (excluding loads due to the normal operation of the building).

Maximum capacity is reached only in exceptional cases. Therefore, the indicated trip current is suggested to guarantee a balance between machine absorption and incidence in the general plant. The indicated minimum cable cross-section area must be verified according to the actual conditions of the installation: length of the cable, characteristics of the electrical supply, etc.

Models	m.u.	5-M	7-M	9-M	11-M	11-T	13-M	13-T	15-M	15-T
Electrical data										
Power Supply	V/ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	400/3/50	230/1/50	400/3/50	230/1/50	400/3/50
Maximum power consumption	kW	2,90	3,80	4,50	5,30	5,30	5,90	5,90	7,30	7,30
Maximum current consumption	A	14,00	18,00	21,30	25,00	8,50	28,00	9,30	34,50	11,50
Protection tripping current	A	16	16	16	16	16	16	16	16	16
Minimum wire cross-section area	mm^2	4,0	4,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0

Heating elements

For units equipped with electrical heating elements, the draw values of the units must be added to those of the heating elements shown in the following tables.

Single-phase power supply

Connection		Stage 1	Stage 2
Power draw	kW	2,00	4,00
Current draw	A	8,70	17,39

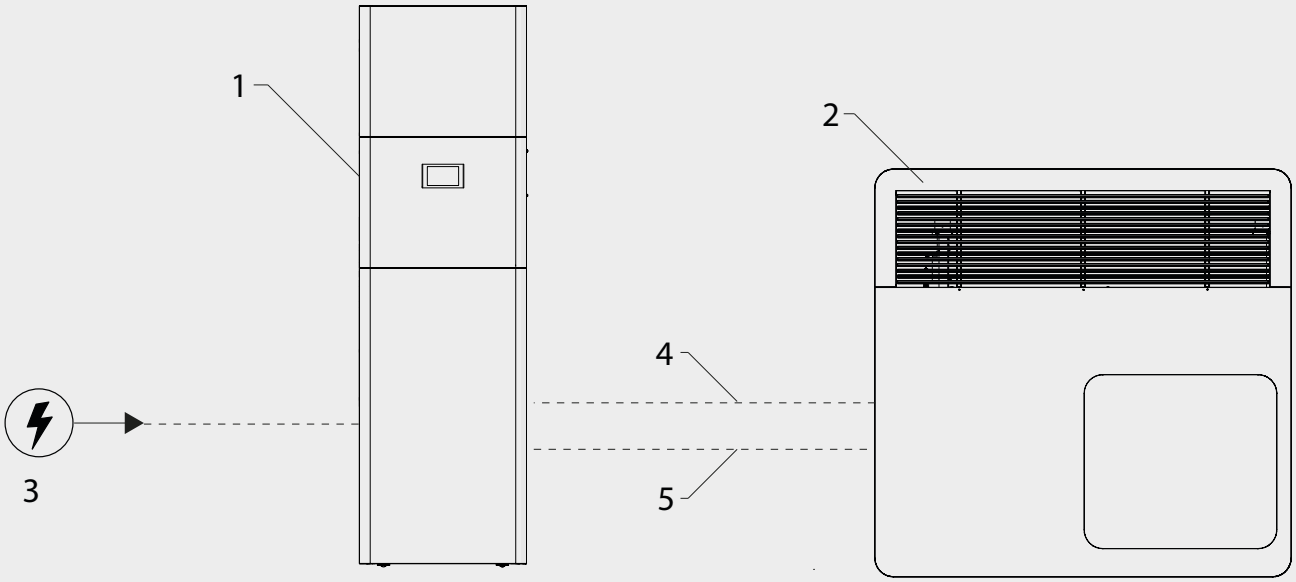
INDOOR UNIT

Three-phase power supply

Connection		Stage 1	Stage 2	Stage 3
Power draw	kW	2,00	4,00	6,00
Current draw	A	8,70	8,70	8,70

Models	m.u.	05-M	07-M	09-M	11-M	11-T	13-M	13-T	15-M	15-T
Electrical data										
Protection tripping current with electrical heating elements	A	50	50	50	50	50	50	50	50	50
Minimum wire cross-section area with electrical heating elements	mm²	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0

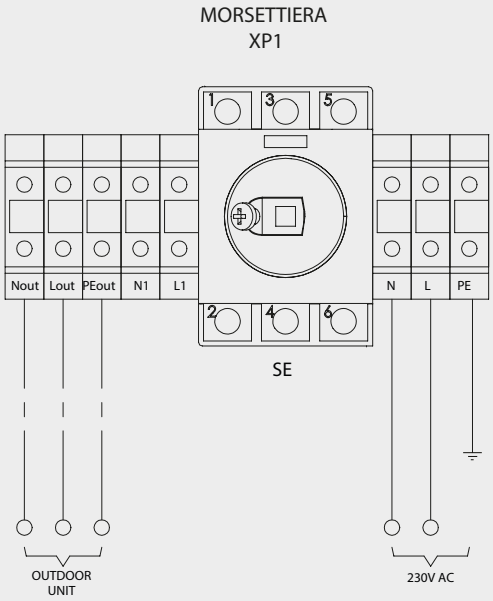
Connection diagram



1. Indoor unit
2. Outdoor unit
3. Unit power supply 230/1/50 0 400/3/50 depending on model
4. Communication cable - two-core cable for RS485 serial connection, minimum cross section 0.35 mm², maximum length 100 m
5. Power cable

INDOOR UNIT

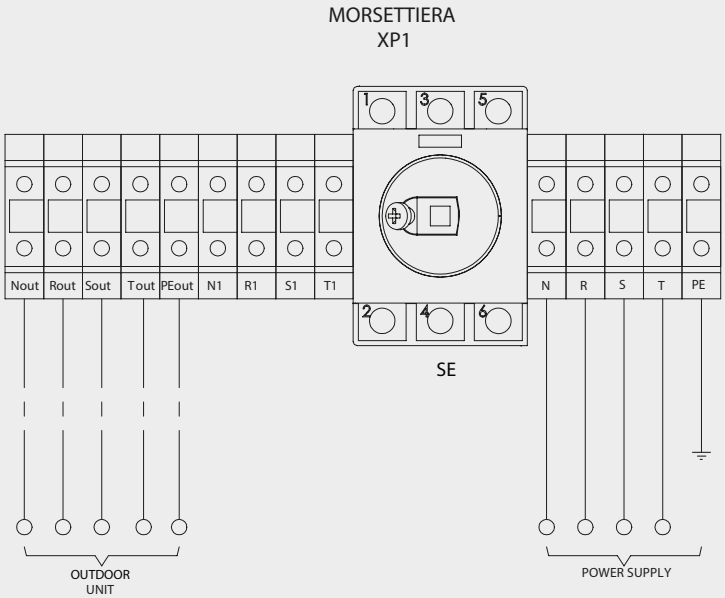
Power connection terminal blocks



230V AC Unit power supply

SE Disconnect switch

OUTDOOR UNIT External unit connection



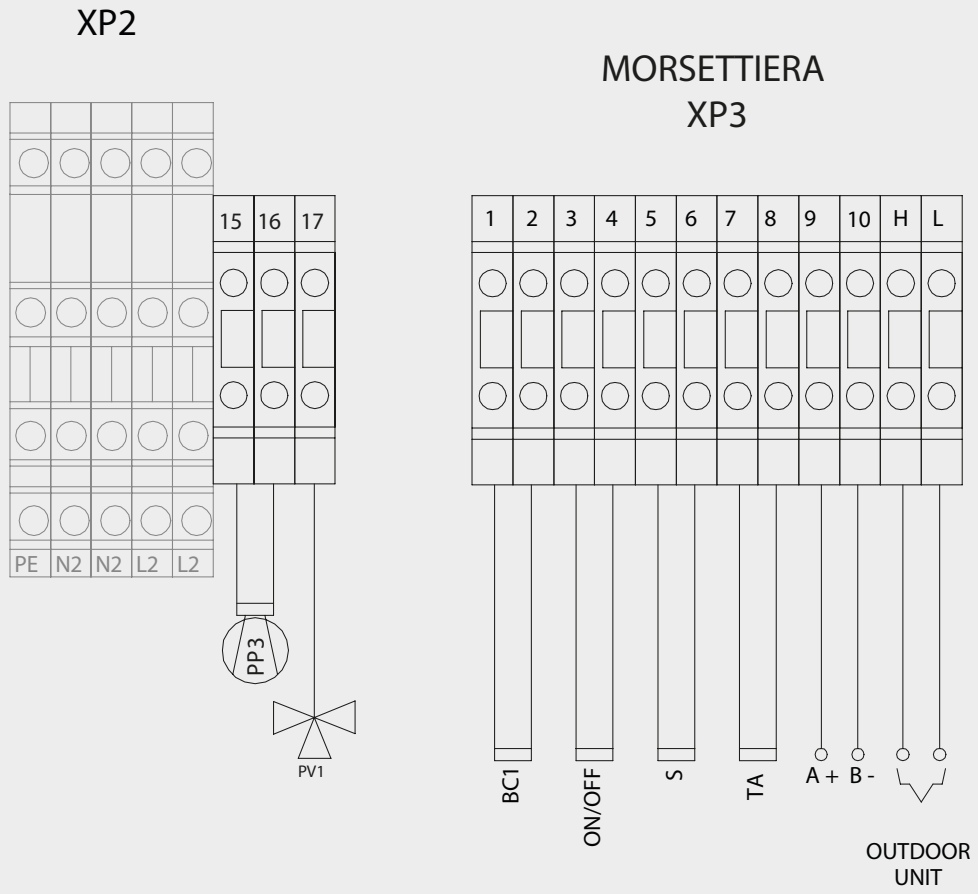
400V AC Unit power supply

SE Disconnect switch

OUTDOOR UNIT External unit connection

INDOOR UNIT

Auxiliary contact connection terminal block



Auxiliary generator

BC1 Backup heat generator

Digital inputs

ON/OFF Remote On/Off

S Silent or Heating/Cooling switching

TA Consent from room thermostat or generic voltage-free contact

Power supply and communications

A+ B- Modbus connection

H+ L- Serial connection for communication with the outdoor unit (CAN Bus)

Outputs

PP3 Secondary circulation pump

PV1 Plant/domestic hot water diverter valve

Support generator terminals

1 - 2: BC1 normally open potential-free contact for backup heat generator. Maximum contact rating 2 A.

Digital input terminals

3 - 4: ON/OFF contact for remote activation/deactivation of the appliance.

- Operation must be activated by parameter **PF4**.

5 - 6: S configurable input for activating/deactivating the Silent function or for switching the Cooling/Heating operating mode. The Silent function reduces the noise level of the appliance by lowering the working frequency of the compressor and the fan.

- Operation must be activated by parameter **PF5**.

7 - 8: TA consent from room thermostat or general voltage-free contact

- Closed contact: the unit is switched on for heating or cooling the plant water.

INDOOR UNIT

- Open contact: the unit is switched off for heating or cooling the plant water

If the domestic hot water function is active, this function has priority even when the contact is open.
The terminals are supplied jumped (contact closed). Remove the jumper to connect the TA consent.

Power and communication terminals

9 - 10: A+ B- Modbus connection for control with external supervisor.

H - L: serial connection with the panel in the outdoor unit. The connection is polarised. Use two-core shielded cable with a minimum cross-section area of 0.35 mm^2 separated from the power supply cables.

Output terminals

15 - 16: PP3 secondary pump connection secondary separator kit accessory.

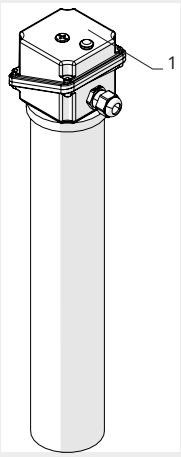
17: PV1 plant/domestic hot water diverter valve connection.

CONFIGURATION ACCESSORIES

Heater kit

GB0684II - Heating elements 6 kW (3 steps of 2 kW). Limitation to 4 kW for single-phase heat pumps
Accessories can be installed and tested at the factory.

1. Heating element



Electric connections

The accessory is supplied installed and tested at the factory. No electrical connections are required.

Single-phase power supply

Connection		Stage 1	Stage 2
Power draw	kW	2,00	4,00
Current draw	A	8,70	17,39
Minimum wire cross-section area	mm²	4,00	4,00

Three-phase power supply

Connection		Stage 1+2+3
Power draw	kW	6,00
Current draw	A	8,70
Minimum wire cross-section area	mm²	2,50

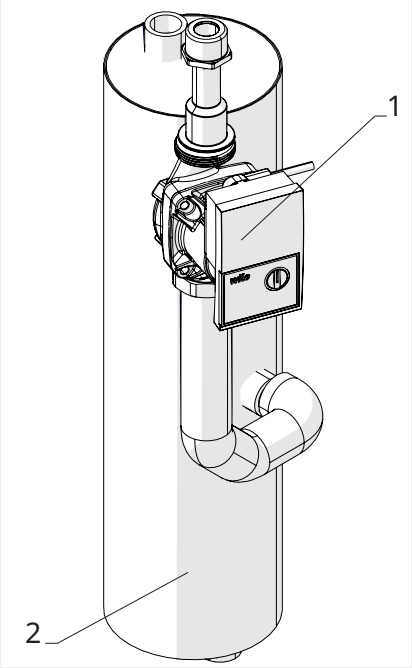
CONFIGURATION ACCESSORIES

Secondary separator kit

GB0683II - Secondary separator kit - Secondary hydraulic unit: hydraulic separator, system pump (DC Inverter class A) and fittings
GB1020II - Oversized secondary separator kit - Secondary hydraulic unit: hydraulic separator, system pump (DC Inverter class A) and fittings

The separator kit is mandatory unless it is already present in the system.
Accessories can be installed and tested at the factory.

1. Circulation pump
2. Separator



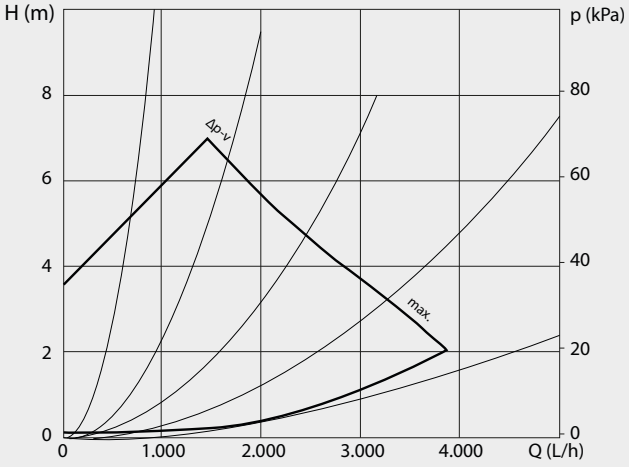
Pump flow rate/head graph secondary separator kit

Proportional control

H Available pressure

Q Water flow rate

Δp-v (variable)

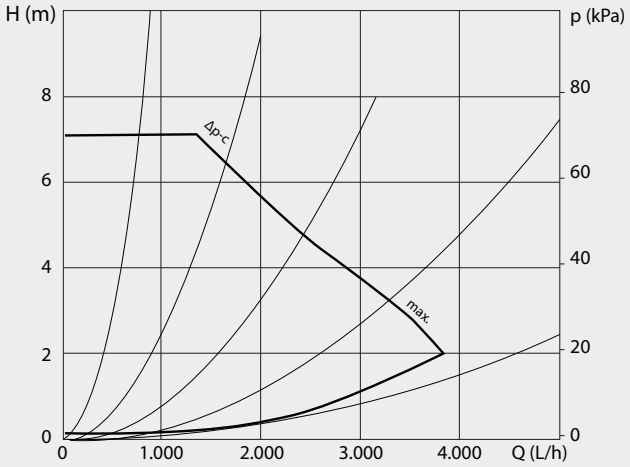


CONFIGURATION ACCESSORIES

Constant pressure

H Available pressure

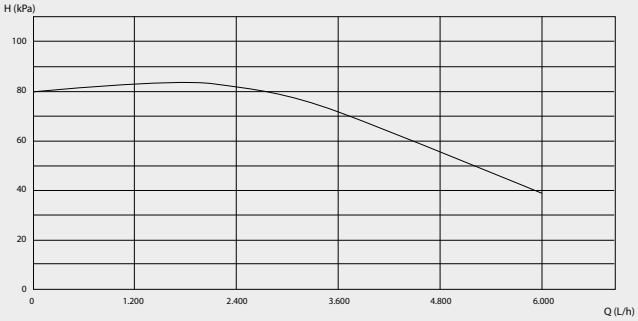
Q Water flow rate



Pump flow rate/head graph Oversized secondary separator kit

H Available pressure

Q Water flow rate

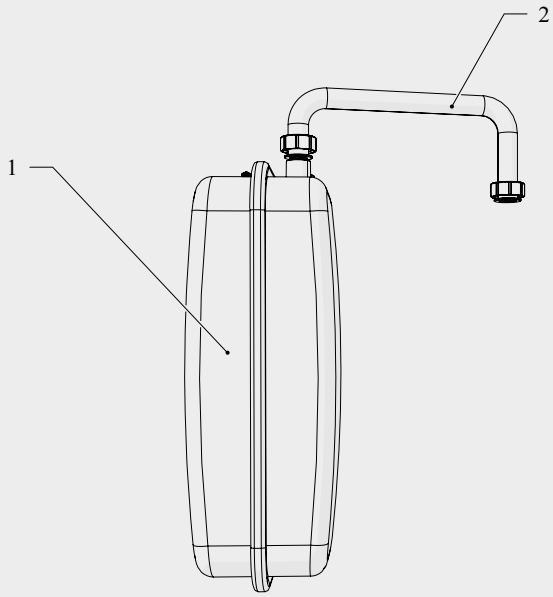


CONFIGURATION ACCESSORIES

Buffer vessel kit

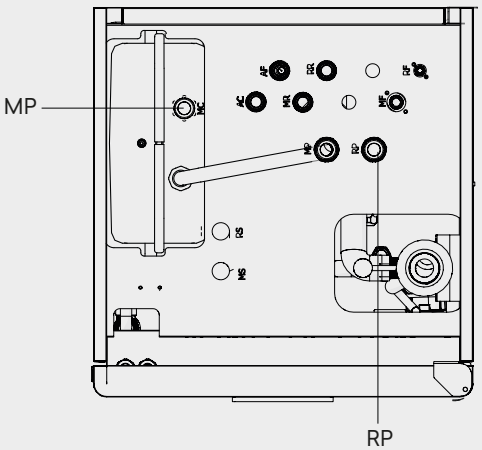
GB1016II - Integrated inertial tank 20 L

1. Buffer tank
2. System flow connection pipe



Hydraulic connections

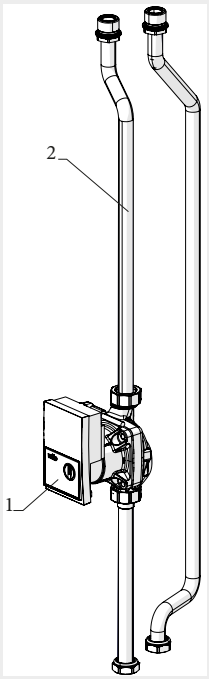
MP Plant delivery
RP Plant return



Heated towel rail kit

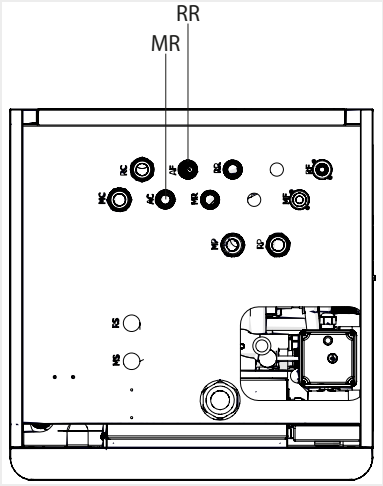
GB0736II - Hydraulic unit and circulation pump for high temperature Heated towel rail feeding

1. Circulation pump for water heater supply
2. Pipe N600032A



Hydraulic connections

MR High-temperature utility flow (radiator)
RR High-temperature utility return (radiator)

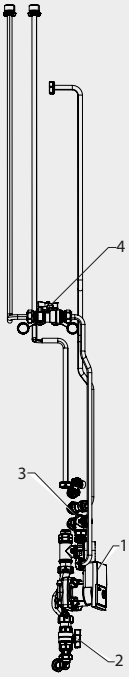


Solar heating kit

GB0685II - Solar unit: control unit, pump, safety valve, 24 litre expansion tank, loading unit

CONFIGURATION ACCESSORIES

1. Circulation pump
2. Solar kit cock
3. 3-bar safety valve
4. Charge/drain valve



In order to prevent the occurrence of undesirable natural circulation, install a check valve at the outlet to the collector (MS connection), or preferably make a siphon.

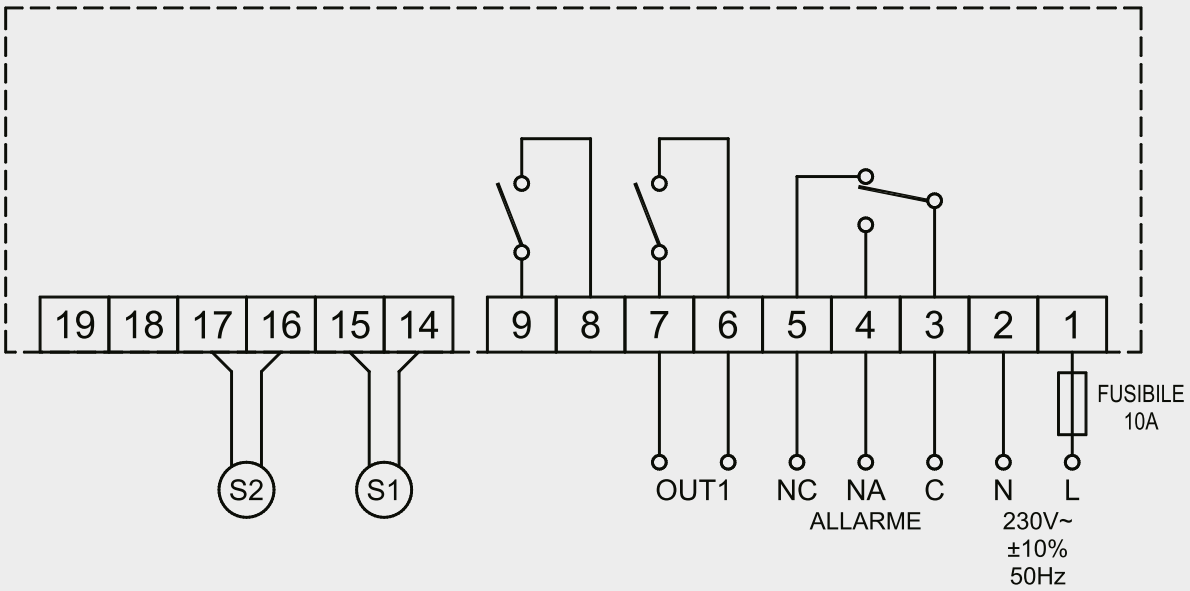
Solar unit connection

The device with solar integration is provided complete with electronic control unit which was pre-wired at the factory.

– sensor S1 must be positioned on the solar collector

CONFIGURATION ACCESSORIES

S1	Solar panel sensor	NA	Alarm contact normally open
S2	Hot water tank sensor	C	Common
OUT1	PSO solar pump output	N	Neutral (power supply)
NC	Alarm contact normally closed	L	Line (power supply)

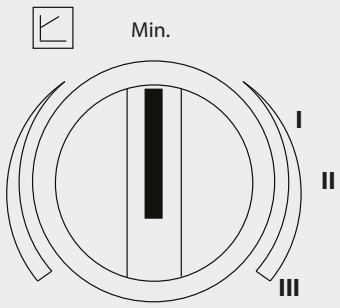


Solar pump PSO

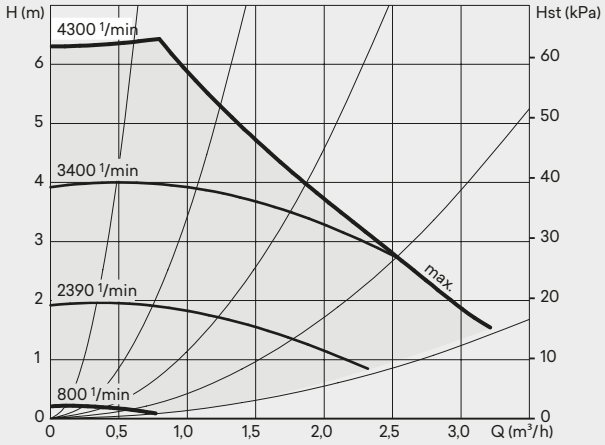
On the front part of the pump body there is a regulator that allows to select the head according to the actual solar system requirement.
The setting of the head value of the solar pump PSO must be carried out with:

- the solar system working
- all distribution valves open
- utilities on

Verify that the tem-perature difference is congruent with the project.



Solar circuit PSO pump flow rate/head graph PSO



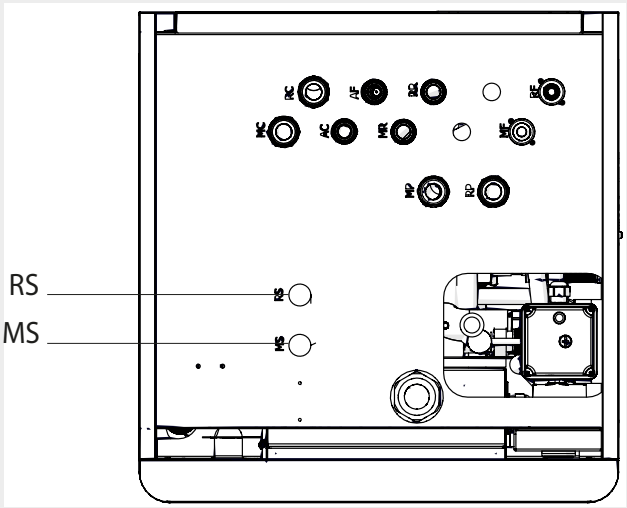
CONFIGURATION ACCESSORIES

Hydraulic connections

Position and dimensions

RS Solar return

MS Solar flow



CONFIGURATION ACCESSORIES

Circulation pumps optional kits

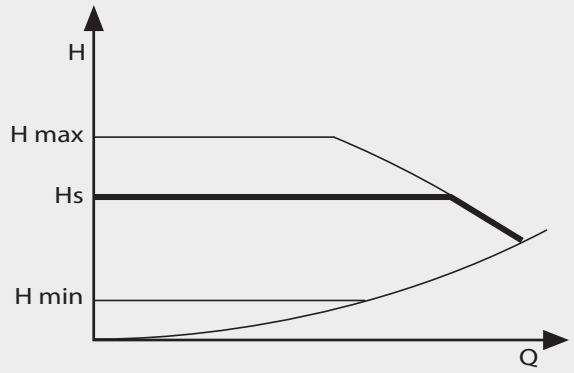
Some optional kits require the use of circulation pumps. The control electronics allow selection of constant or variable head operating modes to allow automatic adaptation of performance to changing operating conditions of the hydraulic system.
On the front of the pump body there is a regulator for selecting the following operating modes:

Constant pressure mode

In this mode (factory-set) the head generated by the pump is kept constant at the set value throughout the permitted flow rate range. This mode is indicated for systems with constant pressure drop, consumers in parallel and 2-way valves.

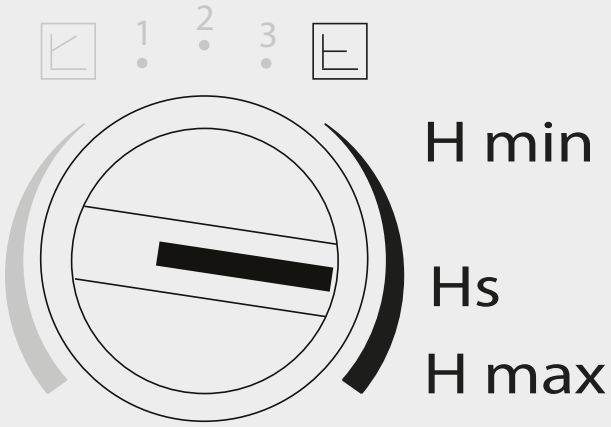
Constant pressure

H	Head
Q	Flow rate
H max	Maximum head
H min	Minimum head
Hs	Set head

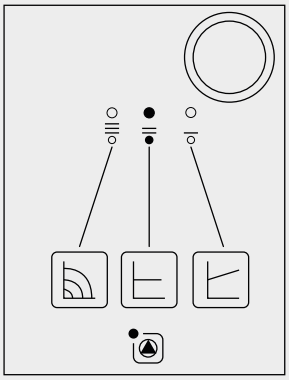


There are two different control modes according to the installed pump model:

Pump model variant 1



Pump model variant 2



Constant head mode

Medium speed

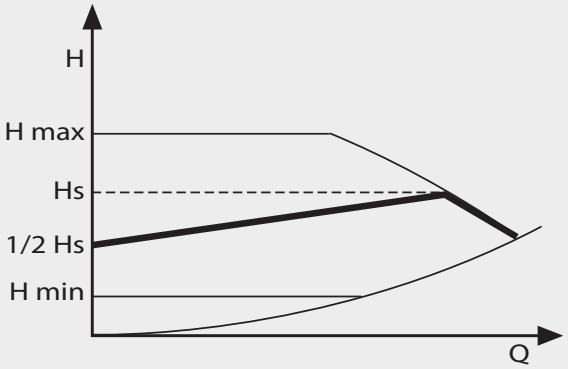
Variable pressure mode

In this mode, the electronic system varies the head developed by the pump between the set value and half of the same as the water flow rate varies. This mode is particularly suitable for plants with constant pressure drop and 3-way valves.

CONFIGURATION ACCESSORIES

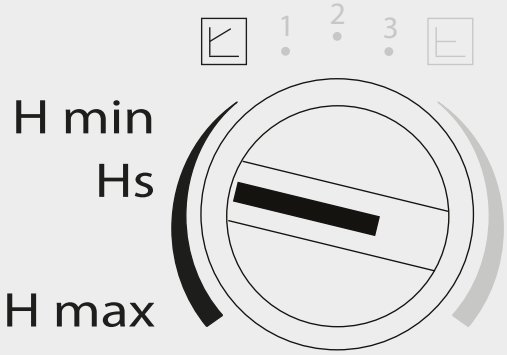
Variable pressure

H	Head
Q	Flow rate
H max	Maximum head
H min	Minimum head
Hs	Set head

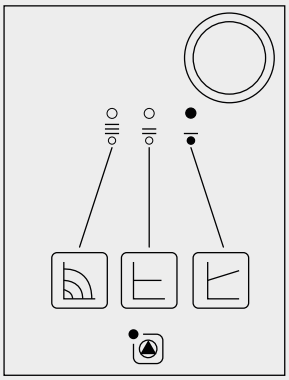


There are two different control modes according to the installed pump model:

Pump model variant 1



Pump model variant 2



Variable head mode
Minimum speed

OUTDOOR UNIT

Outdoor unit features

Structure

Supporting structure made of zinc-magnesium sheet providing excellent mechanical characteristics and long-lasting corrosion resistance. External zinc-magnesium sheet metal panelling, RAL 9003 painted, coated on the inside with heat-insulating and sound-absorbing material.

Wall fixing bracket

The wall mounting bracket is supplied with the outdoor unit. This fixing method is preferred if the device is installed:

- resting on the ground against a wall
- wall-mounted

Fan

Plug-fan type without scroll with reversed blades optimised to minimise noise emissions and increase energy efficiency at the same time, while maintaining the necessary head for ducting of the unit if required. Variable speed DC inverter motor.

Air-side heat exchanger

Inverted V-shaped copper-aluminium finned pack heat exchanger with louver designed to optimise air flow distribution to ensure correct evaporation/condensation. Aluminium fins with advanced geometry to maximise exchange. The hydrophilic surface treatment facilitates the elimination of condensation. Circulation with sub-cooling in the heat exchanger base to prevent condensate freezing.

Compressor

Inverter-controlled hermetic rotary compressor, complete with motor protection against overheating, overcurrents and excessive supply gas temperatures. It is mounted on vibration dampers and complete with oil and refrigerant charge.

REFRIGERATION CIRCUIT

Cooling circuit complete with:

- electronic expansion valve
- check valve
- 4-way cycle reversing valve
- dehydrator filter
- liquid receiver
- suction liquid separator
- pressure transducers
- low-pressure safety
- overpressure safety
- liquid line solenoid valve
- Refrigerant charge R32

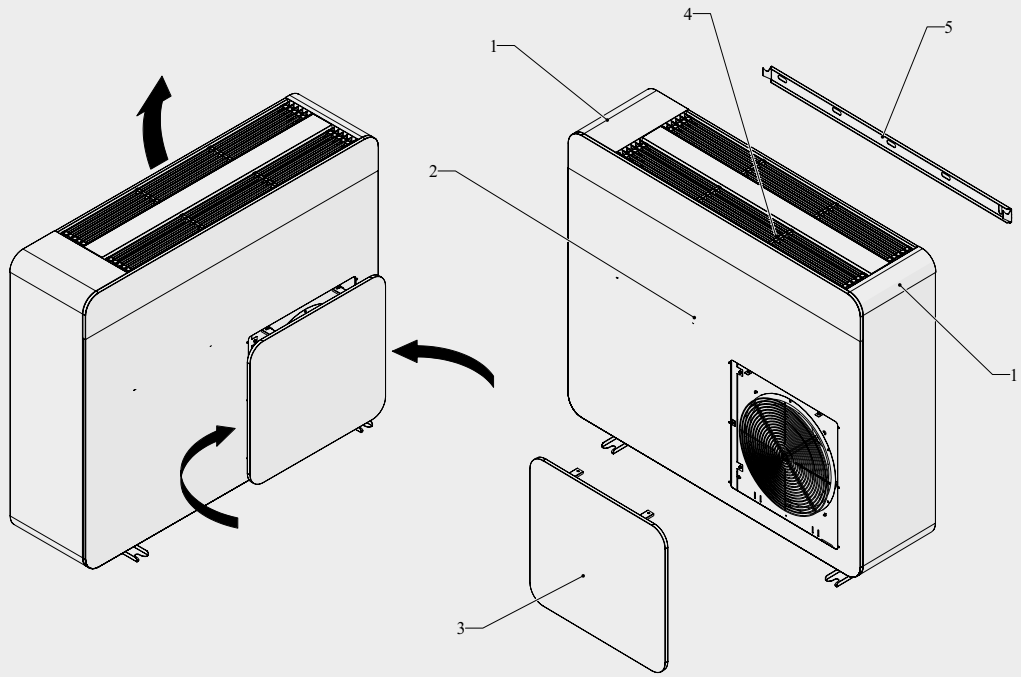
Electrical panel

- terminal block for wiring
- PCB
- inverter for compressor control
- EMC Filter

OUTDOOR UNIT

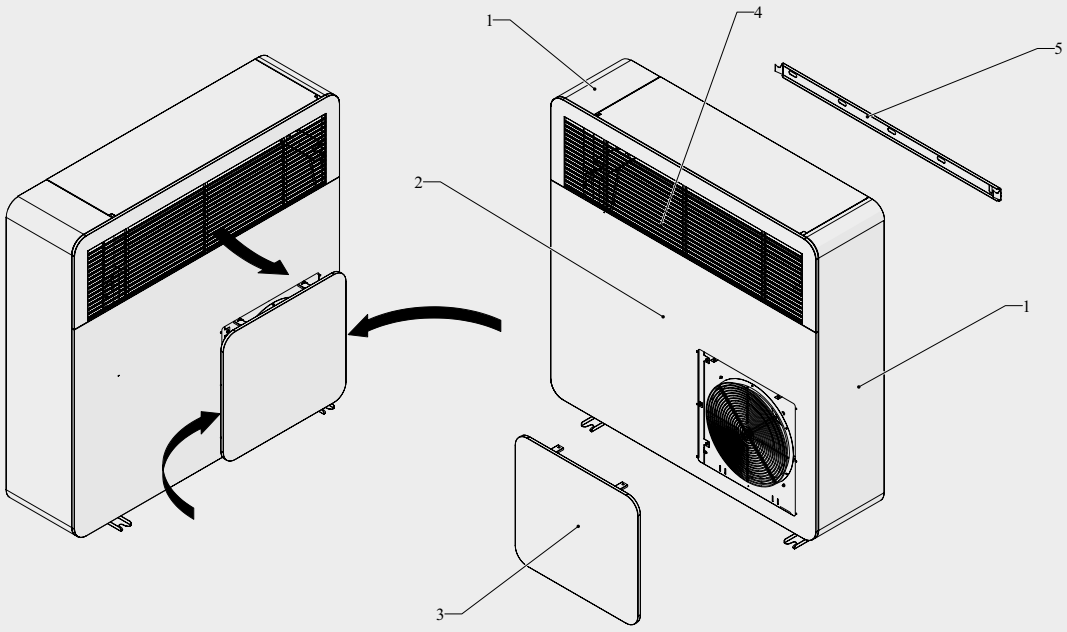
External components

STØNE-V exposed with vertical delivery



1. Cosmetic side panel
2. Cosmetic front panel
3. Fan screen (supplied unassembled)
4. Air outlet grilles
5. Wall mounting bracket

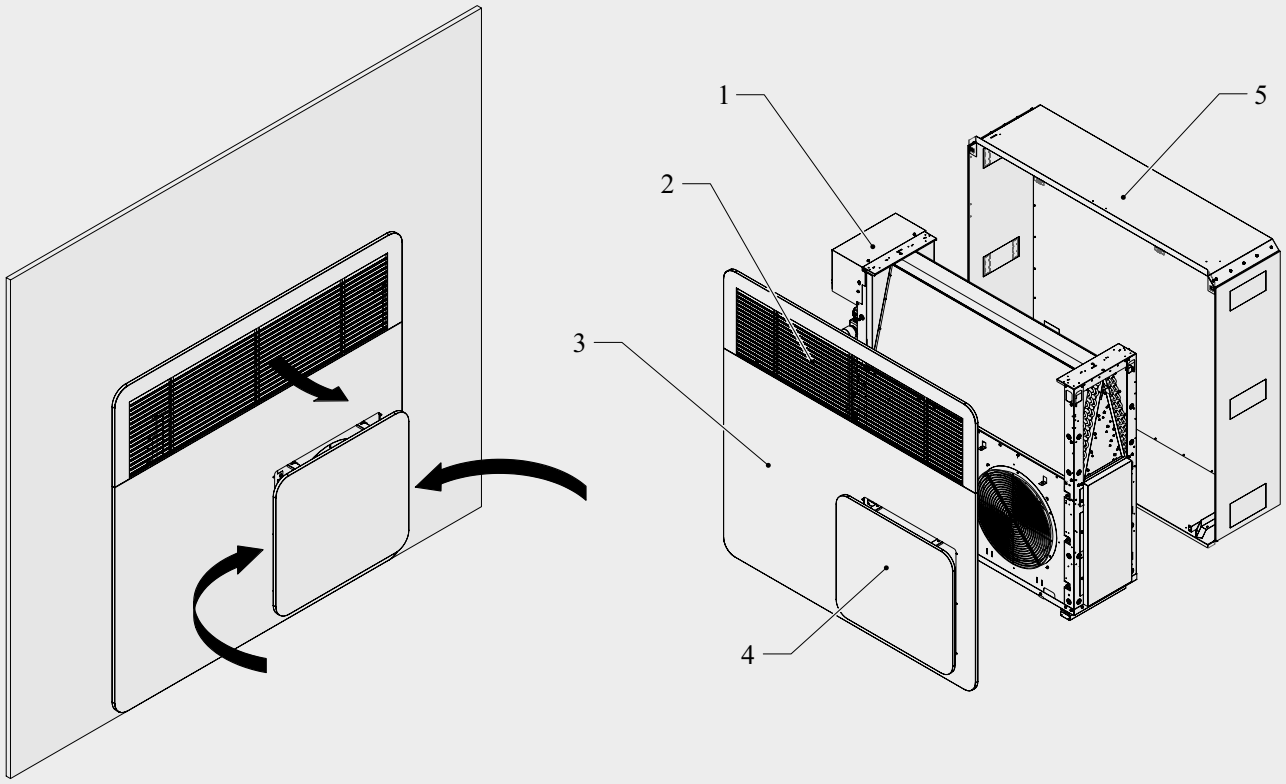
STØNE-H exposed with horizontal delivery



1. Cosmetic side panel
2. Lower front cosmetic panel
3. Fan screen (supplied unassembled)
4. Frontal air outlet grille
5. Wall mounting bracket

OUTDOOR UNIT

STØNE-IN built-in



1. Built-in unit

Cosmetic kit accessory

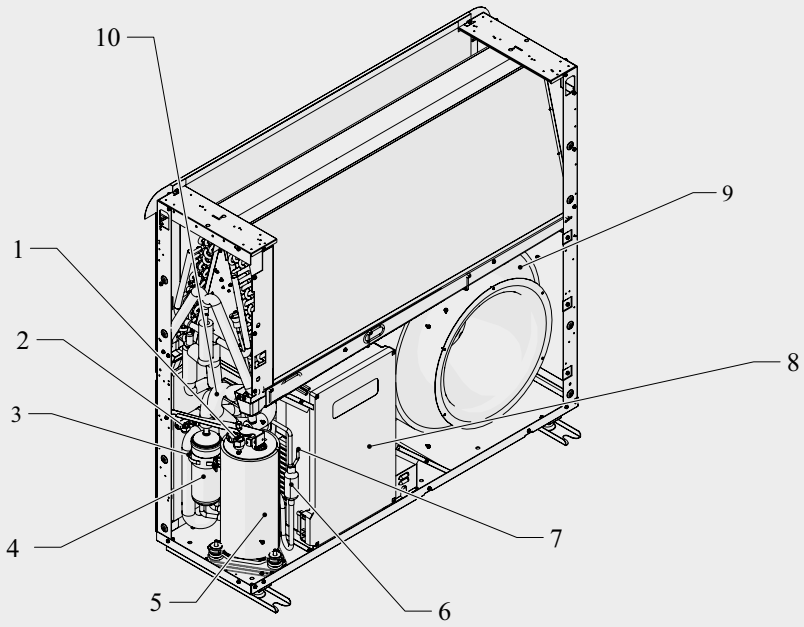
2. Frontal air outlet grille
3. Lower front cosmetic panel
4. Fan screen

Accessory

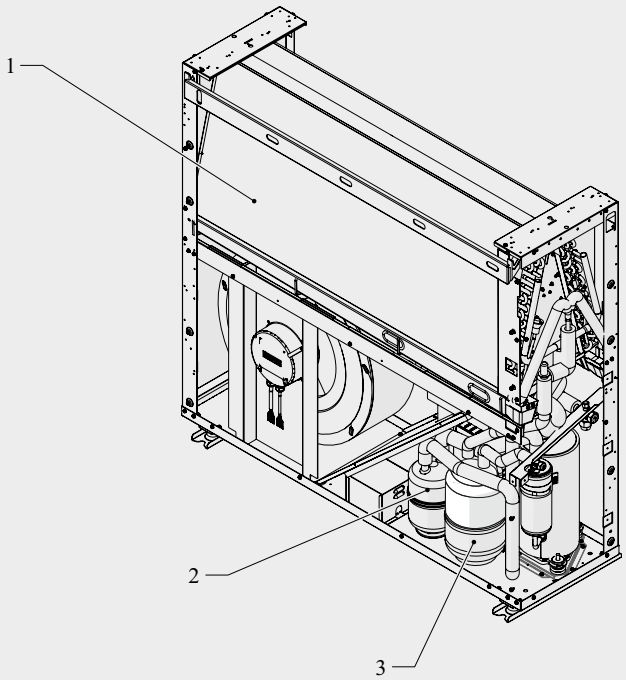
5. Formwork (kit to be assembled on-site)

OUTDOOR UNIT

Internal components



1. Gas fitting
2. Liquid fitting
3. Charging valve
4. Separator
5. Inverter driven rotary compressor
6. Silencer muffler
7. Pressure transducer
8. Electrical panel
9. Single suction fan
10. Valve reversing cycle



1. External air heat exchanger
2. Suction separator
3. Liquid receiver

OUTDOOR UNIT

Accessory

	Accessory description	Combinable products	Code
Accessories supplied separately.			
Metal casing			
	Outdoor unit formwork for “IN” built-in and “PI” semi-built-in version installation	5M 7M	L01070II
		9M 11M 11T	L01071II
		13M 13T 15M 15T	L01072II
Aesthetic front panel			
	Outdoor unit cover panel for “IN” built-in version installation	5M 7M	LC1100II
		9M 11M 11T	LC1101II
		13M 13T 15M 15T	LC1102II
	Outdoor unit cover panel for “PI” semi-built-in version installation	5M 7M	LC1103II
		9M 11M 11T	LC1104II
		13M 13T 15M 15T	LC1105II

OUTDOOR UNIT

Installation site

The location of the appliance must be determined by the plant engineer or a competent person and must take into account both purely technical requirements and any national/local legislation in force.
The appliance is intended for outdoor installation.

Installation mode

Depending on the version, the expected installation methods are:

STØNE-V exposed version with upper air delivery
- exposed in a vertical position with floor positioning
- exposed in a vertical position with wall positioning

STØNE-H exposed version with frontal air delivery
- exposed in a vertical position with floor positioning
- exposed in a vertical position with wall positioning

STØNE-IN built-in version
- built-in

STØNE-PI partially built-in version
- partially built-in

Warnings

Avoid installing the unit near:
- obstacles or barriers that cause recirculation of the exhaust air
- narrow places where the sound level of the appliance can be enhanced by reverberations or resonances
- bedrooms and places used for resting
- environments with the presence of flammable or explosive gases
- very humid environments (laundries, greenhouses, etc.)
- environments with aggressive atmospheres
- environments with the presence of steam or mineral oil mist
- solar radiation and proximity to heat sources
- areas prone to strong gusts of wind
- places with strong voltage fluctuations
- within 1 metre of radio and video equipment
- in locations directly exposed to sea winds. The saline atmosphere accelerates the corrosion process of the materials reducing the life of the unit.
- in utility shafts and/or hopper window
- in corners where dust, leaves and anything else that may reduce the efficiency of the appliance by obstructing the air passage is usual
- in vehicles or on ships

Make sure that:
- the installation site of the unit must be chosen with the utmost care to guarantee adequate protection from shocks and consequent damage
- the supporting surface or wall can bear the weight of the appliance
- the section wall does not involve load-bearing construction elements, piping or electrical lines
- no load-bearing elements of the construction are compromised
- the appliance must be installed in a position where it can be easily serviced
- the safety distances between the units and other appliances or structures are scrupulously respected so that the air entering and leaving the fans is free to circulate
- air expulsion is not hindered by strong winds in the opposite direction

Provide the following:
- a drain and a water supply nearby
- a compliant power supply nearby
- fixing elements suitable for the type of support

The sound level measured under actual installation conditions may be higher than that indicated in the technical data of the unit due to ambient noise and acoustic reflections.
Baffle panels must be installed in case of installation in places with strong gusts of wind in direction opposing the air expulsion. Take the minimum distances shown under into account.
If the appliance is installed incompletely or on an inappropriate wall, it could cause damage to persons or property if it should detach.

Refrigerant-specific warnings

The following checks must be carried out in the presence of refrigerant:
- carry out safety checks to ensure that the risk of combustion is minimised
- avoid working in confined spaces
- delimit the area around the workspace
- ensure safe working conditions around the area by controlling flammable material

OUTDOOR UNIT

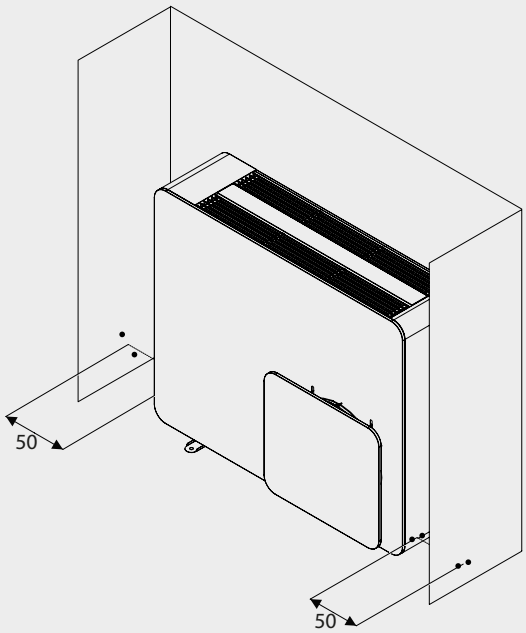
Installation minimum distances

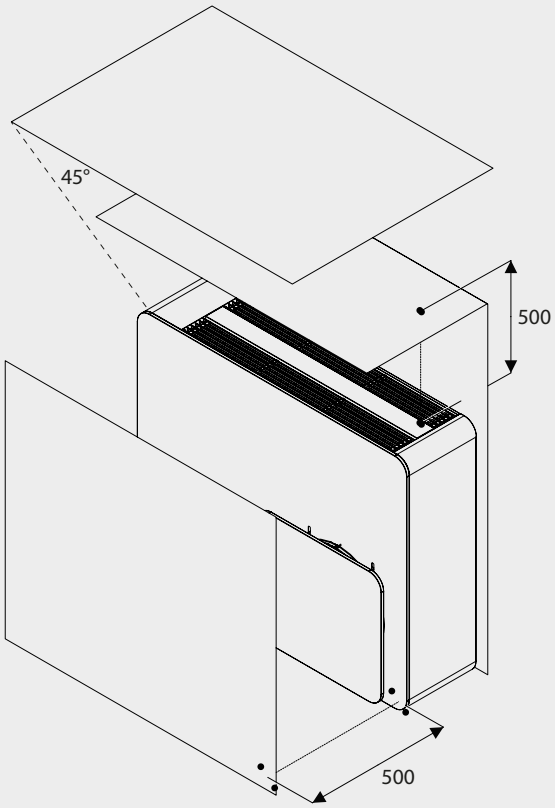
The clearance zones for the installation and maintenance of the appliance are shown in the figure. Established spaces are necessary to avoid barriers to airflow and allow for normal cleaning and maintenance.

Make sure that there is sufficient space to allow the panels to be removed for routine and supplementary maintenance operations.

Single installation

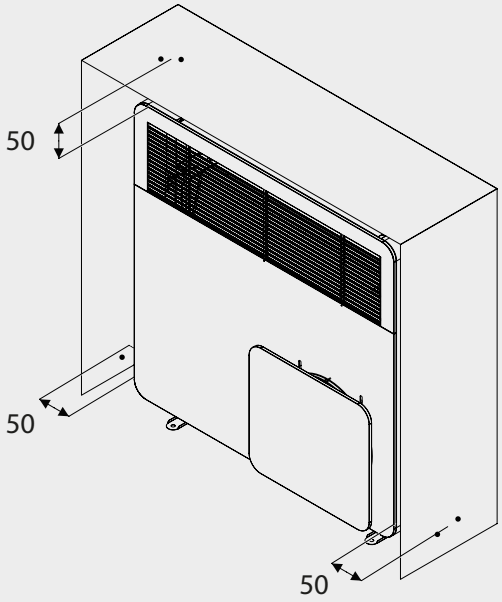
STØNE-V exposed with vertical delivery

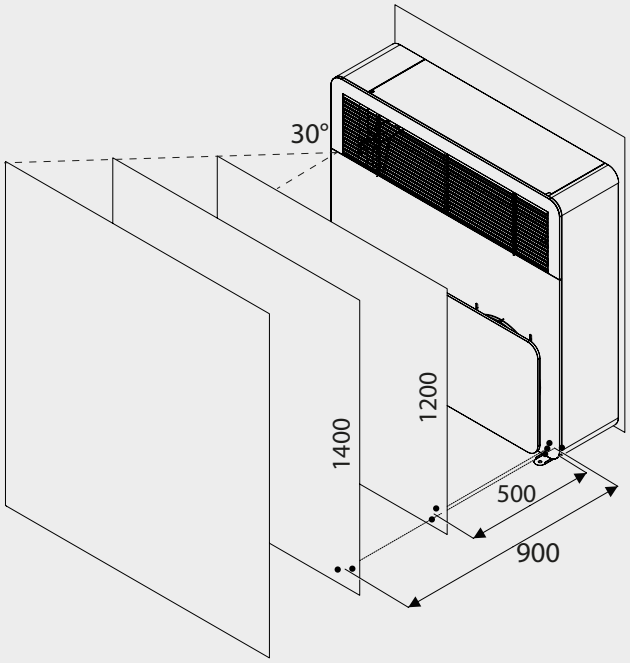




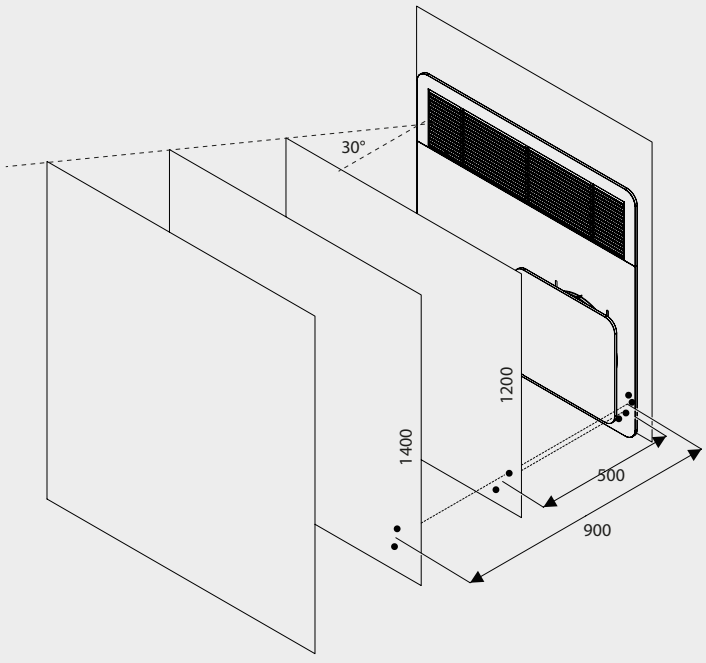
OUTDOOR UNIT

STØNE-H exposed with horizontal delivery





STØNE-IN built-in

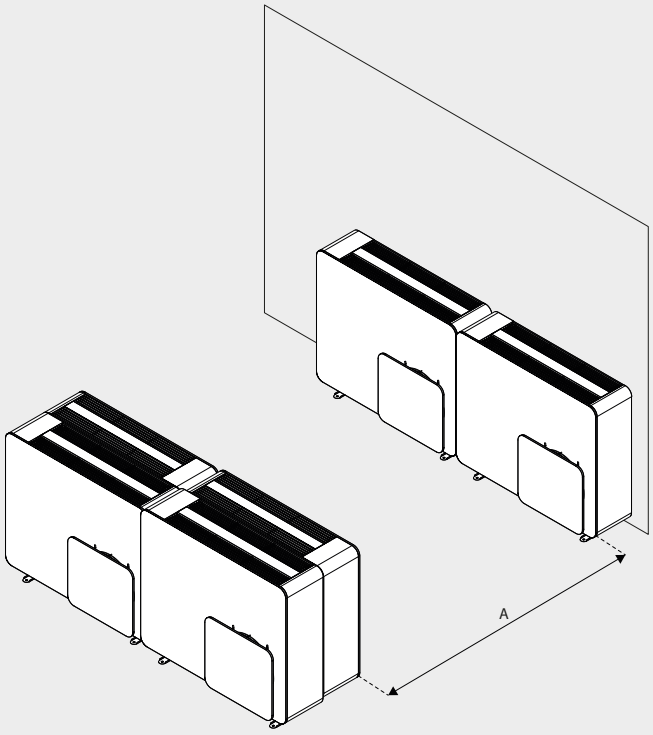


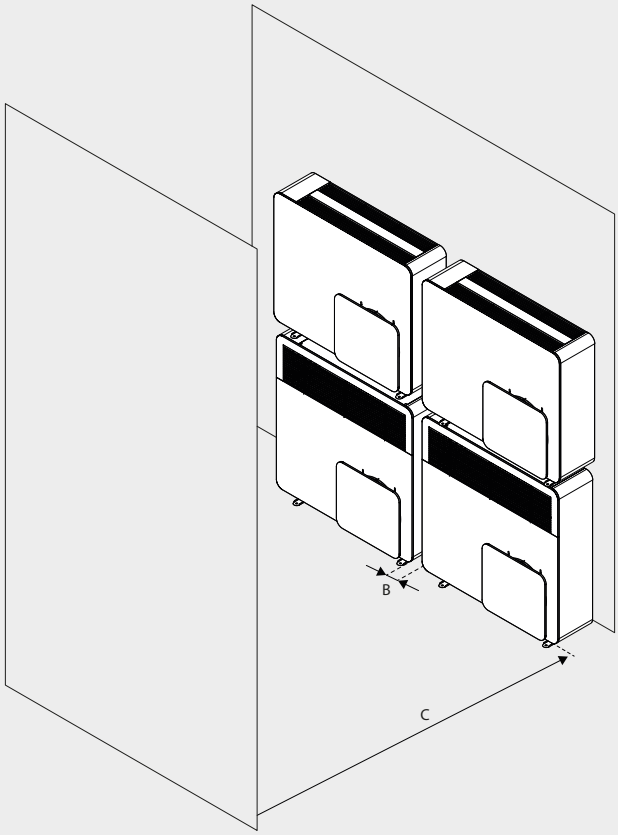
innova

OUTDOOR UNIT

Multiple installation

Each unit must be fixed independently to the supporting wall.
Do not stack the units on top of each other.





A 900 mm

B 50 mm

C Models 05 to 07: 1000, Models 09 to 15: 1500 mm

OUTDOOR UNIT

Positioning

STØNE-V exposed with vertical delivery and STØNE-H exposed with horizontal delivery

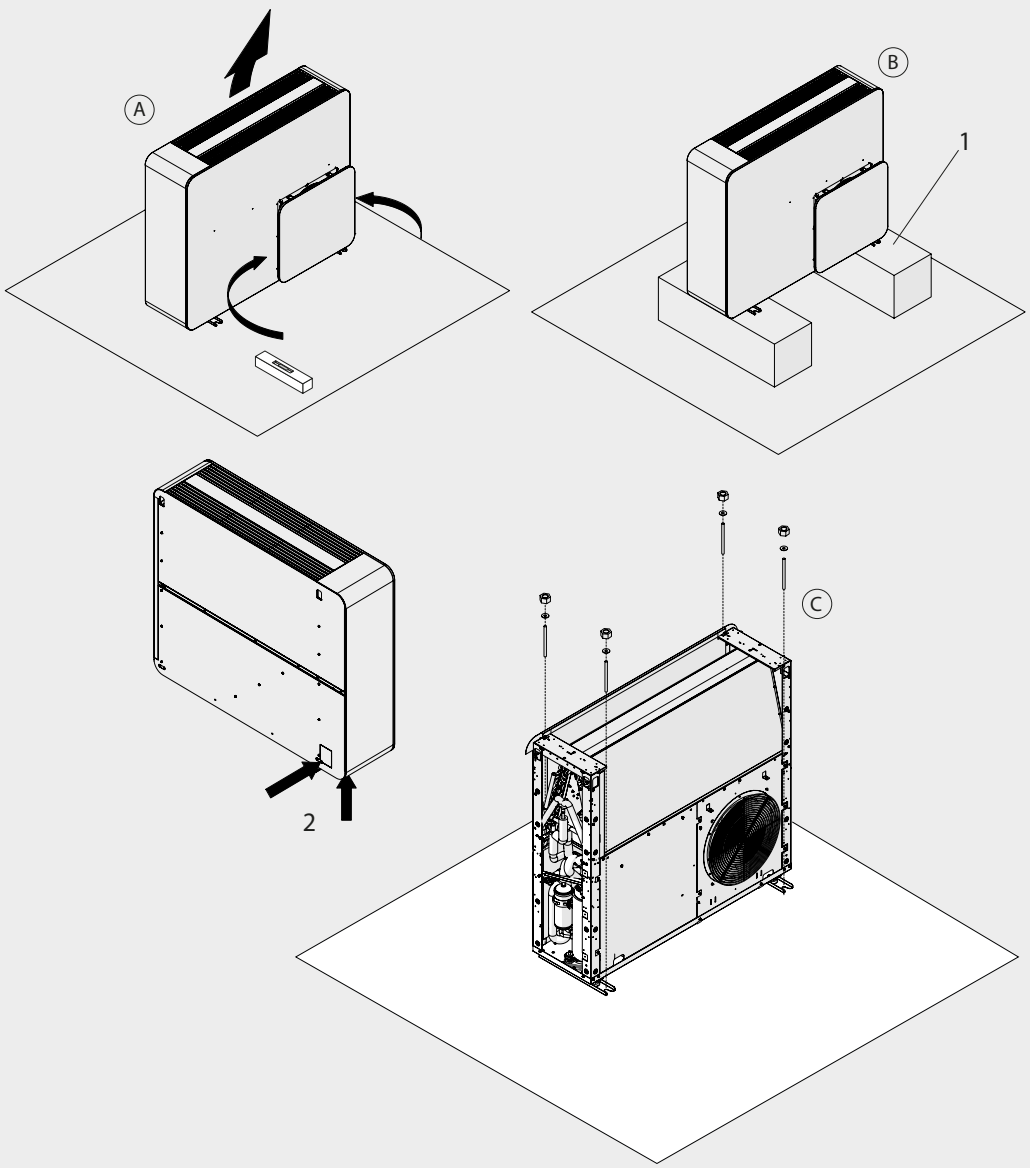
Exposed units can be positioned on the floor or wall

Floor positioning

Before installation, check that:

- the supporting surface supports the weight of the appliance
- the slab is sufficiently rigid and does not transmit vibrations to the rooms below or adjacent to it

The unit must be fixed to the ground and is supplied with the vibration dampers already fitted.



- (A) Positioning on the ground
- (B) Raised positioning
- (C) Ground fixing
- 1. Antivibration
- 2. Connection entry

OUTDOOR UNIT

Wall mounting

Before installation, check that:

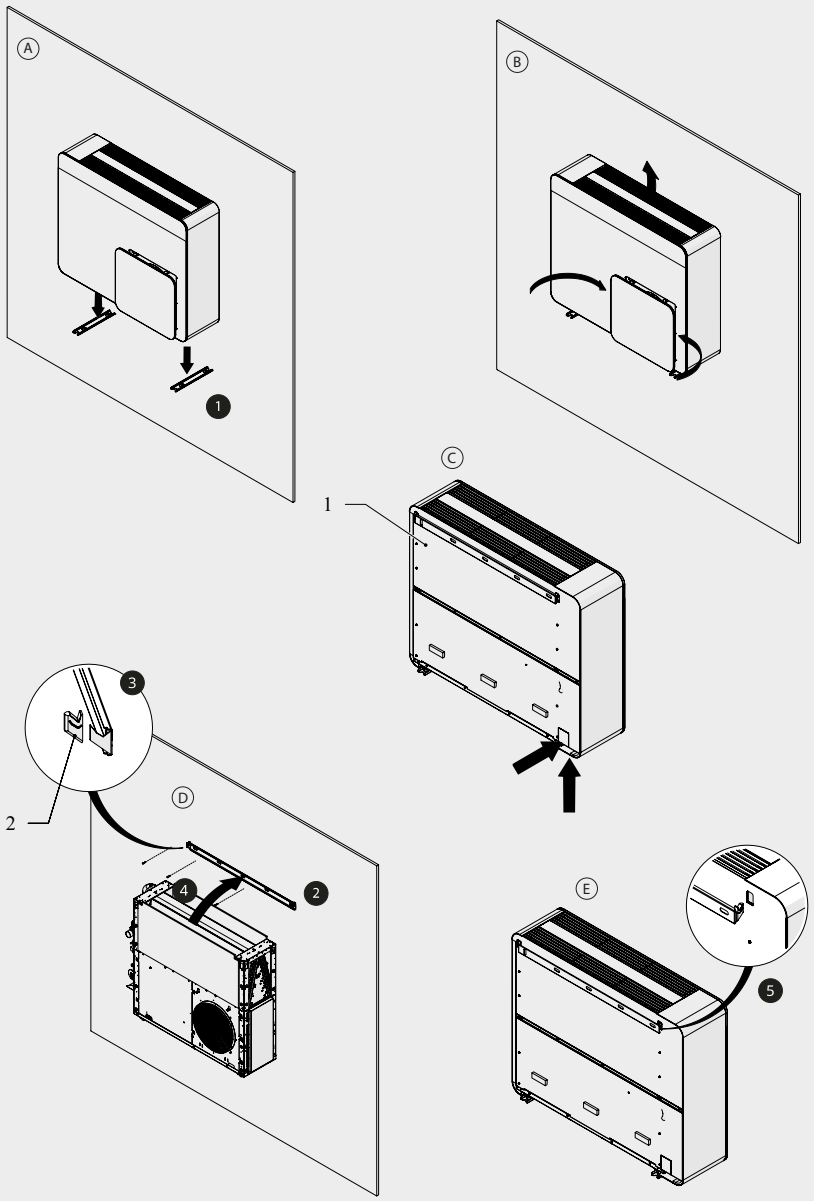
- the wall supports the weight of the appliance
- the section of floor or wall does not concern piping or electrical lines
- the functionality of load-bearing elements is not compromised

The device contains moving parts that can transmit vibrations to the supporting structure. In particular, the following must be avoided when positioning on the wall on the fixing bracket:

- fixing on rigid structures with little mass (e.g. wooden houses) which can amplify the effect and generate resonances
- positioning on exterior walls of rooms in which quietness is required (e.g. bedrooms)

The wall mounting bracket supplied as an accessory is required to position the unit on the wall. It is necessary to remove the support brackets before attaching the unit to the wall-mount bracket.

OUTDOOR UNIT



Ⓐ Removal of ground fixing brackets
Ⓑ Air flow indication
Ⓒ Connection entry
Ⓓ Bracket attachment
Ⓔ Fixing
1. Holes for bracket fixing

STØNE-IN built-in

The following accessories are required to place the unit in the built-in position:

- Metal casing
- Aesthetic front panel

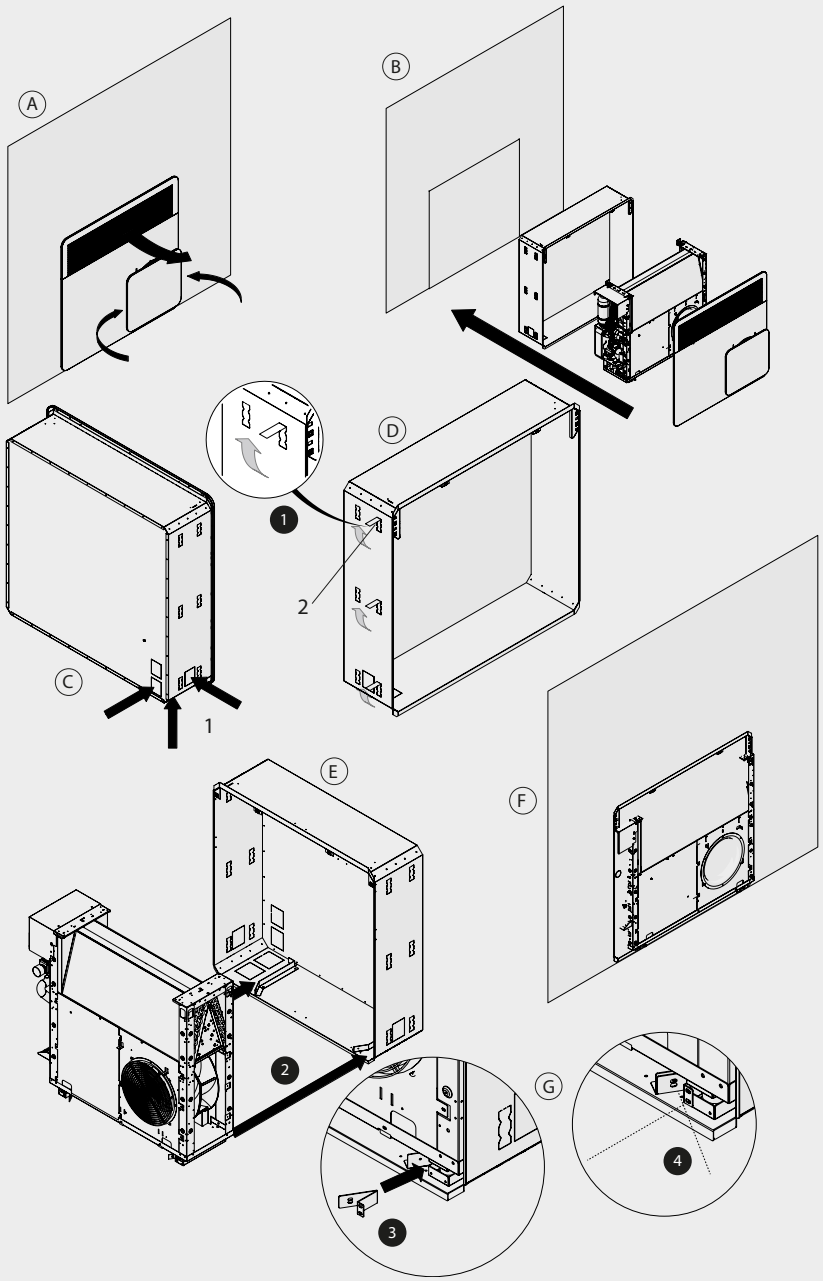
Make sure that:

- the section of floor or wall does not concern piping or electrical lines
- the functionality of load-bearing elements is not compromised

Operating the appliance without installing the cosmetic panel is forbidden.

The formwork is supplied with anchor bolts to anchor the formwork to the wall. Polyethylene formwork insulation, 5 mm thick.

OUTDOOR UNIT



- (A) Air flow indication
- (B) Laying sequence
- (C) Connection entry
- (D) Recessed formwork with fixing anchor bolts
- (E) Inserting the unit into the mold
- (F) Unit installation in formwork
- (G) Appliance fixing

1. Connection entry
2. Anchor bolts for fixing

OUTDOOR UNIT

Refrigeration connections

The length of the connecting pipes must be kept to a minimum. Connecting pipes must be protected from physical damage and must not be installed in an unventilated space if this space is smaller than that shown in the Minimum Floor Area table.
The connecting pipes must be installed in a position where they are unlikely to be exposed to corrosive substances unless they are constructed of materials that are inherently corrosion-resistant or adequately protected against corrosion.

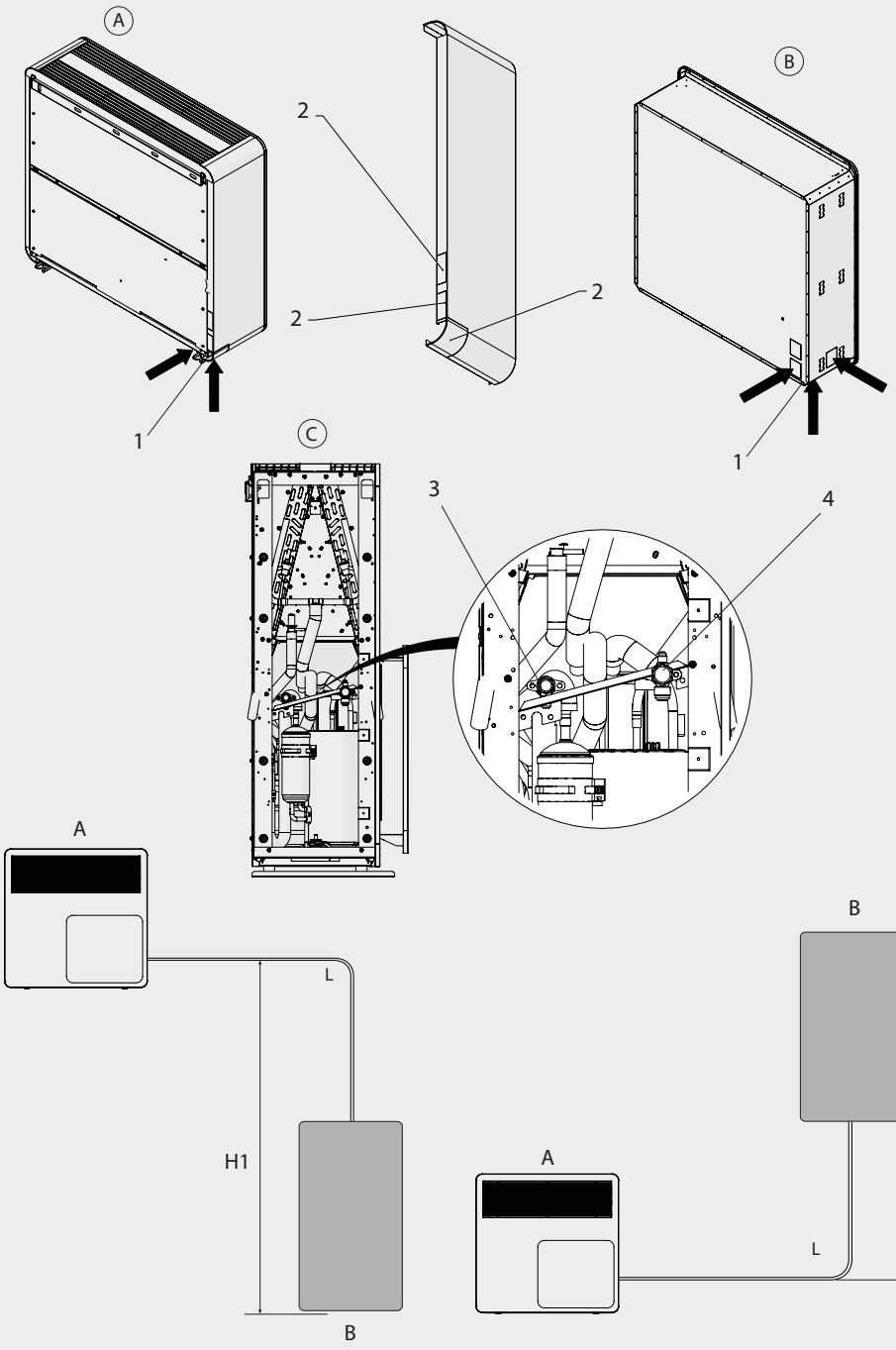
Compliance with national legislation for the gas in use is mandatory.
The refrigerant fittings must be accessible for maintenance purposes.
A controlled procedure must be followed to minimise the risk of flammable gases or vapours being present while working.
Work with heat (welding, soldering, etc.) is prohibited.

Connection diagram

indication	Description	m.u.	
L	Maximum permitted development in length	m	50
H1	Limit difference of elevation between the two units with the outdoor unit positioned higher	m	30
H2	Limit difference of elevation between the two units with the outdoor unit positioned lower	m	15
	Length of connecting pipes without additional gas charge	m	2 ÷ 12
	Additional charge per metre of pipe of liquid between 12 and 50 m	g/m	60
	Indicative reduction in power output for pipe lengths from 12 to 25 m *	%	0,3 ÷ 1
	Indicative reduction in power output for pipe lengths from 25 to 50 m *	%	0,8 ÷ 2

3. * The value changes progressively in the indicated range according to the size of the unit.

OUTDOOR UNIT



- (A) Exposed versions
- (B) Built-in version
- (C) Refrigeration connections

1. Connection entry
2. Pre-cut lines
3. Liquid line connection
4. Gas line connection

A Outdoor unit

B Indoor unit

There is no need for siphons on the refrigeration lines because the compressors of the units are equipped with oil separators.

OUTDOOR UNIT

Additional refrigerant charge

The units are supplied with a charge of refrigerant gas sufficient for a predefined length of pipe connection.

Additional refrigerant charge is required if the length is exceeded.

The default values are indicated in the table below:

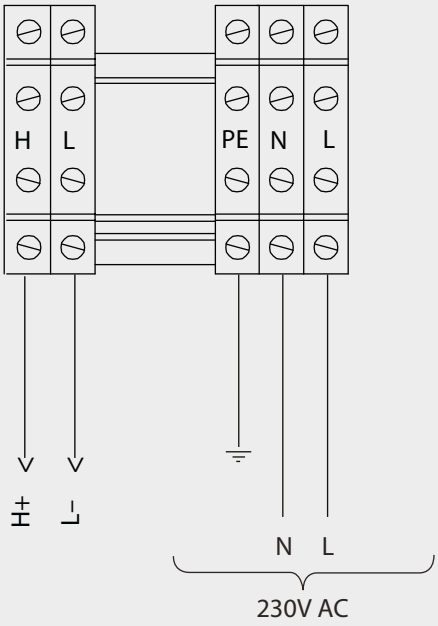
Description	m.u.	
Length of connecting pipes without additional gas charge	m	2 ÷ 12
Additional charge per metre of pipe of liquid between 12 and 50 m	g/m	60
Indicative reduction in power output for pipe lengths from 12 to 25 m *	%	0,3 ÷ 1
Indicative reduction in power output for pipe lengths from 25 to 50 m *	%	0,8 ÷ 2

3. * The value changes progressively in the indicated range according to the size of the unit.

Electric connections

Connection terminal blocks

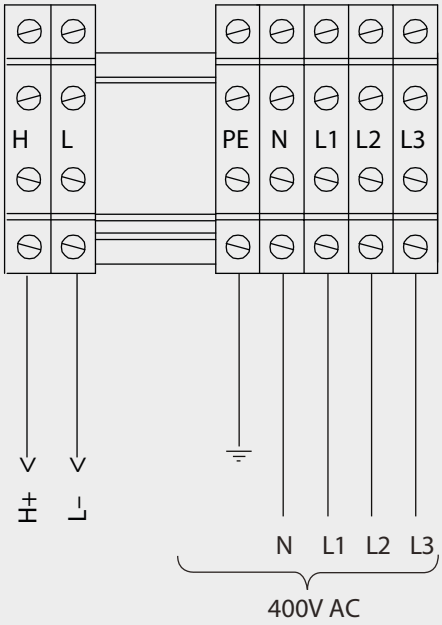
Single-phase unit terminal block



H+ L- serial connection with indoor unit

230V AC Electric power supply from internal unit

Three-phase unit terminal block



H+ L- serial connection with indoor unit

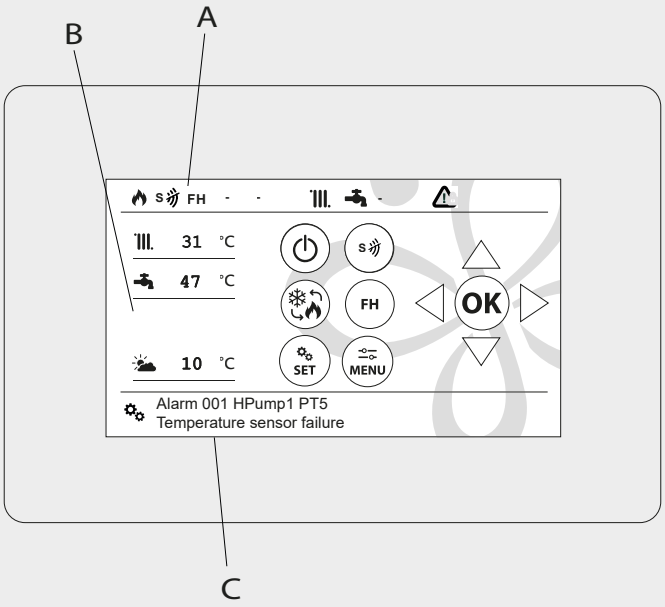
400V AC Electric power supply from internal unit

ADJUSTMENT INTERFACE

The Control Panel regulates and coordinates all the main functions of the appliance. The device can be used to view the machine status, the main temperatures, the alarms and the main operating mode selection.

Display

Statuses and active alarms on display.



Function area

OFF Unit in stand-by mode

Cooling function on

Heating function on

Heating mode for active water frost protection

Heating mode with active heating element

Heating mode with auxiliary generator (boiler) active

Heating mode with heating element and auxiliary generator (boiler) active

Silent low-noise function active

FH Fast heat function active (in heating and cooling mode)

Plant water function active with flashing icon and called with fixed icon

Domestic hot water function active with flashing icon and called with fixed icon

Active alarm

Alarm to be reset manually

Temperature area

Plant water temperature

Domestic hot water temperature (if the function has been activated)

Ext. ambient temperature

Settings area

Settings active. When this symbol is active, the machine parameters can be changed

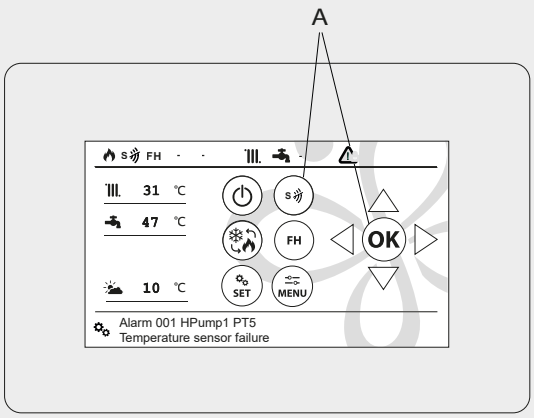
A Function area

B Temperature area

C Settings area

ADJUSTMENT INTERFACE

Keys functions



- This can be used to switch the unit on or off
- This can be used to select the operating mode (Cooling or Heating)
- This can be used to activate the Silent low-noise function
- This can be used to activate the rapid heating of the plant water
- This can be used to modify the selected parameter. Press and hold the button for 3 seconds to reset the manual alarms
- This can be used to enter and exit the main menus, exit without saving
- This can be used to enter the sub-levels of the menus and confirm selections
- This can be used to move between the digits of the values
- This can be used to move through the menus and change parameter values

A Key area

ADJUSTMENT INTERFACE

Function setting

The unit is designed to provide:
- water to plant for heating or cooling the rooms
- domestic hot water

If necessary, it is possible to support the heat output generated by the appliance with auxiliary heating systems (backup), which may be:
- heating elements available as accessories and mounted inside the unit from the factory
- combustion heaters (boilers)
- solar system kit available as an accessory and managed with a dedicated control unit

The appliance has functions that allow the operation to be set to suit the type of plant on which it has been installed.
The settings and function management is done through:
- the Control Panel display

Digital inputs for activating or deactivating some functions or for connecting external enabling (see the Installation Manual of the indoor unit) are provided in the terminal board of the indoor unit.
- via Modbus supervisor

Plant water management

The following plant type is provided:
- system with hydraulic separator and secondary pump, inside the machine to be ordered as a factory-fitted kit

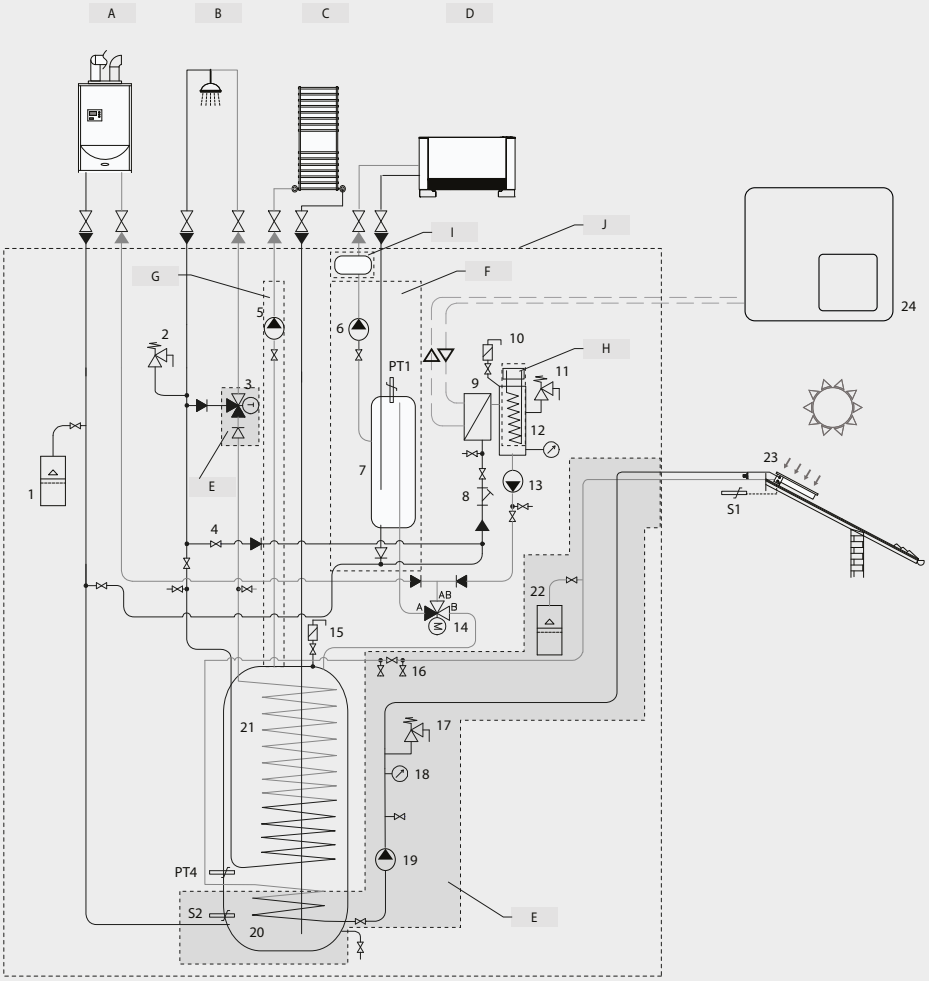
The separator is mandatory. It must be provided on the system if it is not ordered as an accessory.
The system water temperature can be controlled via:

PT1: plant probe. To be placed in the hydraulic separator.
If the secondary separator kit is used, the probe is positioned at the factory.

ADJUSTMENT INTERFACE

Basic diagrams

Schematic diagram with hydraulic separator and secondary pump



A Boiler
B Domestic hot water consumers
C High temperature (radiator) utilities
D System utilities
E Solar heating kit (optional)
F Secondary separator kit (optional)
G Heated towel rail kit (optional)
H Heater kit (optional)
I tank (optional)
J Indoor unit

1. 24 litre system expansion vessel
2. 7-bar safety valve
3. Thermostatic mixing valve (supplied with the solar kit)
4. Filling cock
5. High-temperature circulation pump
6. Secondary circulation pump PP3
7. Hydraulic separator
8. Net filter
9. Plate exchanger
10. Automatic relief valve
11. 3-bar safety valve
12. Collector with heating element
13. PP1 primary circulation pump
14. 3-way on/off valve PV1
15. Boiler relief valve
16. Solar filling cock
17. 4 bar solar safety valve (optional)
18. Pressure gauge
19. Solar circuit pump
20. Solar serpentine
21. 200 litre tank for domestic hot water
22. 24 L solar expansion vessel
23. Solar panel
24. Outdoor unit

ADJUSTMENT INTERFACE

Water temperature control

Setting of the control on PT1 probe to be placed in the separator

PP1 primary circulation pump

The primary pump is set for continuous operation with TA on call.
Continuous operation may be disabled so that the pump stops when the set-point is reached for this type of plant.

Plant cooling/heating function enabling from TA

The connection and activation of an external consents (TA) is essential for the operation of the unit:

- TA from room thermostat
- TA from outside temperature
- TA from Modbus Supervisor

The three types of TA consents can co-exist and the unit will activate when it receives a call from at least one of the three.

TA from room thermostat or a generic potential-free contact contact

Function Logic:
The TA must be connected to digital input PI3:

- on the terminal board of the indoor unit for split versions

Contact logic:

- Closed contact: the unit is switched on for heating or cooling the plant water.
- Open contact: the unit is switched off for heating or cooling the plant water

If the domestic hot water function is active, this function has priority even when the contact is open.

TA from outside temperature

Function Logic:
The room thermostat is enabled according to the outside temperature.

Logic:

- Outdoor temperature > PF35 the unit switches to Cooling mode
- Outside temperature < PF38 the unit switches to Heating mode

Hysteresis 2 °C
The unit does not automatically change the operating mode.
If the domestic hot water function is active, this function has priority.

Enabling:
Use must be enabled by parameter "PF7".

TA from Modbus Supervisor

Function Logic:
The room thermostat is enabled by Modbus Supervisor and controlled by the Modbus register with address 10.

Logic of the register:
The call is managed by the Modbus Supervisor.

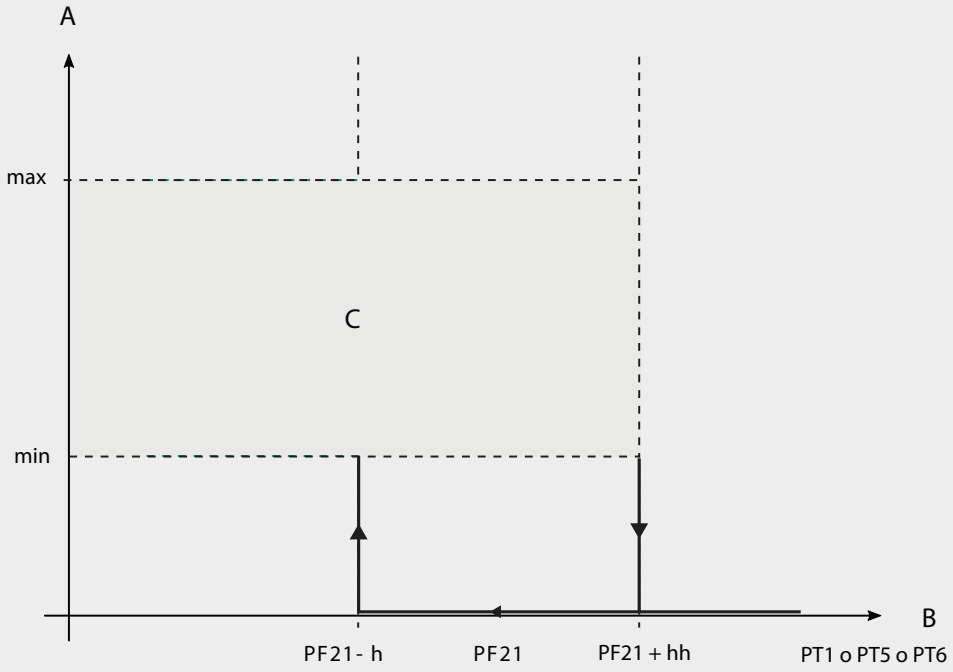
- Value 1: the unit is switched on for heating or cooling the plant water.
- Value 0: the unit is switched off for heating or cooling the plant water.

If the domestic hot water function is active, this function has priority.

Enabling:
Use must be enabled by parameter "PF6".

Regulation logics

Heating logic



A Frequency
B Plant water temperature
C Adaptive control logic

Min and max depend on the logic corresponding to the active mode (heating) and the configuration of the unit.

PT1, 5, 6: Plant temperature probe. This depends on the setting of "PF8".

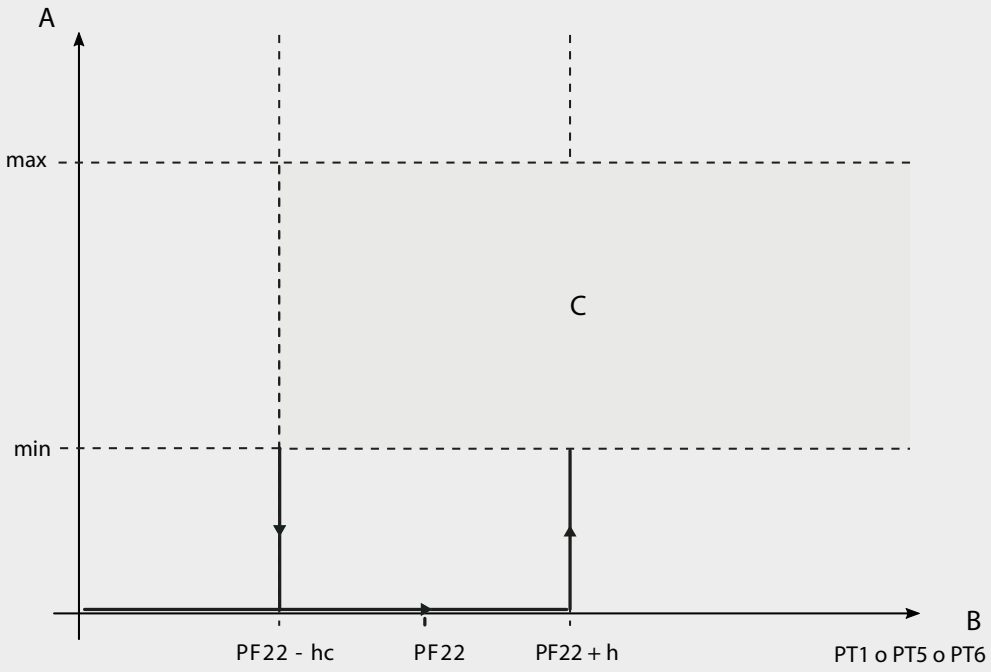
"PF21": Setpoint

h: general hysteresis (2°C)

hh: upper hysteresis (3 °C)
The function is inhibited by the simultaneous request for domestic hot water (which higher priority) but the priority can be reversed for 90 minutes ("PF11") by pressing the Fast Heating button. The temperature in the separator may not exceed 60 °C. During the start-up phase, the compressor reaches the maximum frequency in 3 minutes. The dynamic set adjustment is not active.

ADJUSTMENT INTERFACE

Cooling logic



A Frequency
B Plant water temperature
C Adaptive control logic

Min and max depend on the logic corresponding to the active mode (heating) and the configuration of the unit.

PT1, 5, 6: Plant temperature probe. This depends on the setting of "PF8".

"PF22": Setpoint

h: general hysteresis (2°C)

hc: lower hysteresis (2 °C)
The function is inhibited by the simultaneous request for domestic hot water (which higher priority) but the priority can be reversed for 90 minutes ("PF11") by pressing the Fast Heating button

Domestic hot water management

Schematic diagram with sanitary hot water storage and heating generator

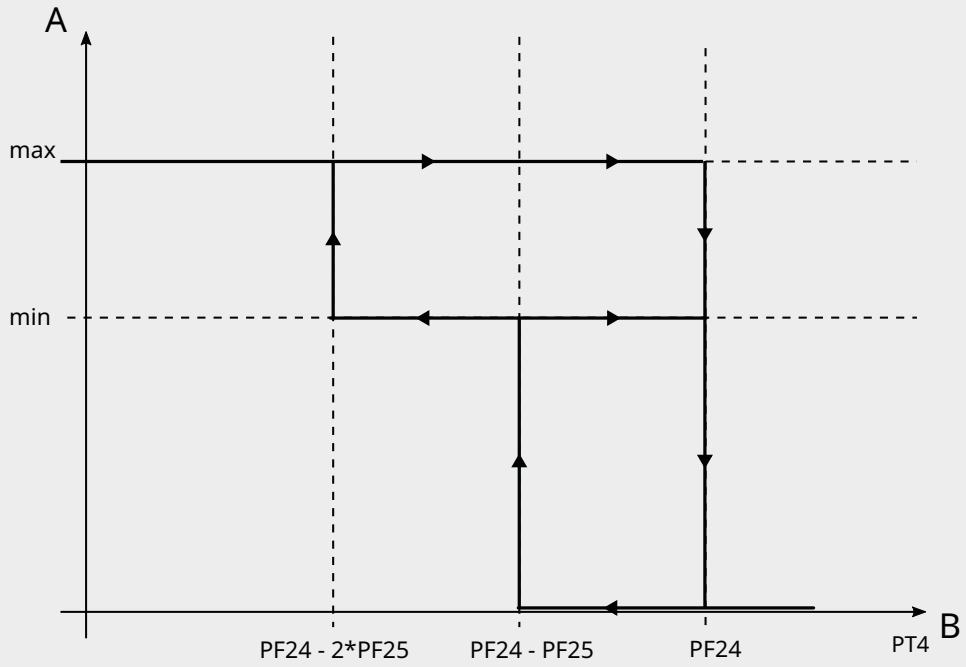
Domestic hot water temperature check

The domestic hot water temperature is controlled by the PT4 probe positioned in the domestic hot water storage tank.

Enable domestic hot water production

The domestic hot water function must be enabled by default.

Domestic hot water logic



A Compressor frequency

B Domestic hot water storage temperature

Min and max depend on the logic corresponding to the active mode (domestic hot water production) and the configuration of the unit.

"PF24": set domestic hot water temperature

"PF25": domestic hot water temperature hysteresis (2.5 °C)

ADJUSTMENT INTERFACE

Auxiliary heater management (heating element or support heat generator)

The system allows the implementation of an auxiliary heating element or a heat generator (Boiler) to support the heat pump.
The auxiliary generators can intervene for producing plant water or domestic hot water with a difference:

- the electrical heating element can operate either in cooperation with the heat pump or switching with heat pump circulation pump
- the boiler can operate only in switching mode using its own circulator

The backup boiler cannot work at the same time as the heat pump.

Function enabling

The auxiliary generators must be enabled by parameter:

"PF47": the presence of a heat generator (boiler) for domestic hot water integration

"PF48": the presence of a heat generator (boiler) for system water integration

"PF49": the presence of a heating element for domestic hot water integration

"PF50": the presence of a heating element for plant water integration
The parameters are already modified if the kit is factory-fitted.
Adjustments and parameter changes must be carried out by the Technical Service Department or a competent person.

Activation logics

The activation logic is the same for the plant water and the domestic hot water.
The production of domestic hot water has priority over plant water heating.
The auxiliary heating element or boiler is activated to support the heat pump in case of:

- Outdoor temperature too low
- setpoint timeout
- water temperature demand higher than the limit that the heat pump can manage

The boiler will shut down in the event of:

- domestic hot water storage temperature too high alarm
- plant water temperature too high

Outdoor temperature too low

The system activates the auxiliary generator when the outside temperature falls below the threshold value. In this case, three situations may occur according to the parameter setting:

PF51	PF57	Activation methods	Type of operation
1	1	Heat pump + Heating element	In collaboration with
0	1	Heat pump or Heating element or Boiler	Switching
0	0	Only heat pump	-

"PF58": sets the threshold value

"PF59": sets the hysteresis value

Setpoint timeout

When the heat pump fails to reach the setpoint within a given time, three situations can occur depending on the setting of the connected parameters:

ADJUSTMENT INTERFACE

PF51	PF60	Activation methods	Type of operation
1	1	Heat pump + Heating element	In collaboration with
0	1	Heat pump or Heating element or Boiler	Switching
0	0	Only heat pump	-

"PF61": sets the plant water timeout value

"PF62": sets the domestic hot water timeout value

Water high-temperature request

The intervention of the auxiliary generator can be enabled when the required water temperature exceeds the maximum value that can be reached by the heat pump:

The setting can be differentiated for plant water and domestic hot water.

Plant Water

PF52	Operating methods	Type
1	Heat pump or Heating element or Boiler	Switching

"PF54": sets the plant water threshold value

"PF55": sets the plant water hysteresis

Domestic hot water

PF53	Operating methods	Type
1	Heat pump or Heating element or Boiler	Switching

"PF56": sets the threshold value for domestic hot water
The auxiliary backup generators will shut down when the storage temperature is less than the maximum allowed temperature.

ADJUSTMENT INTERFACE

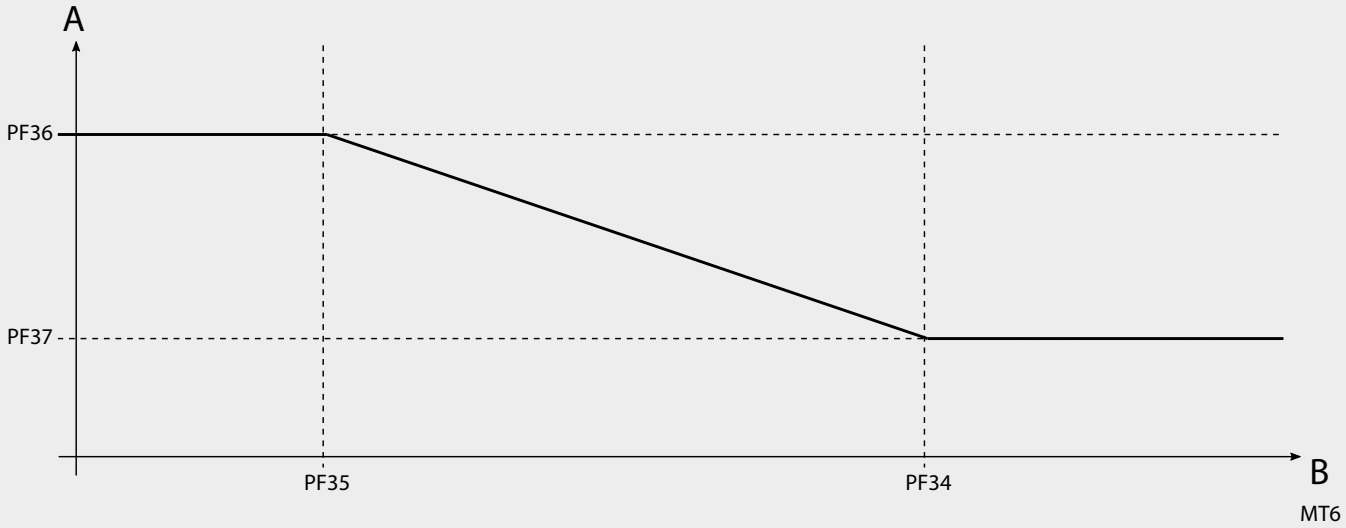
Dynamic set adjustment

The dynamic set function allows the creation of compensation algorithms based on the settable parameters according to the operating mode.

Function enabling

The dynamic set adjustment must be enabled by parameter "PF9".

Cooling mode settings



A System water temperature setpoint

B Outdoor air temperature

Settable parameters:

"PF34": dynamic set maximum temperature

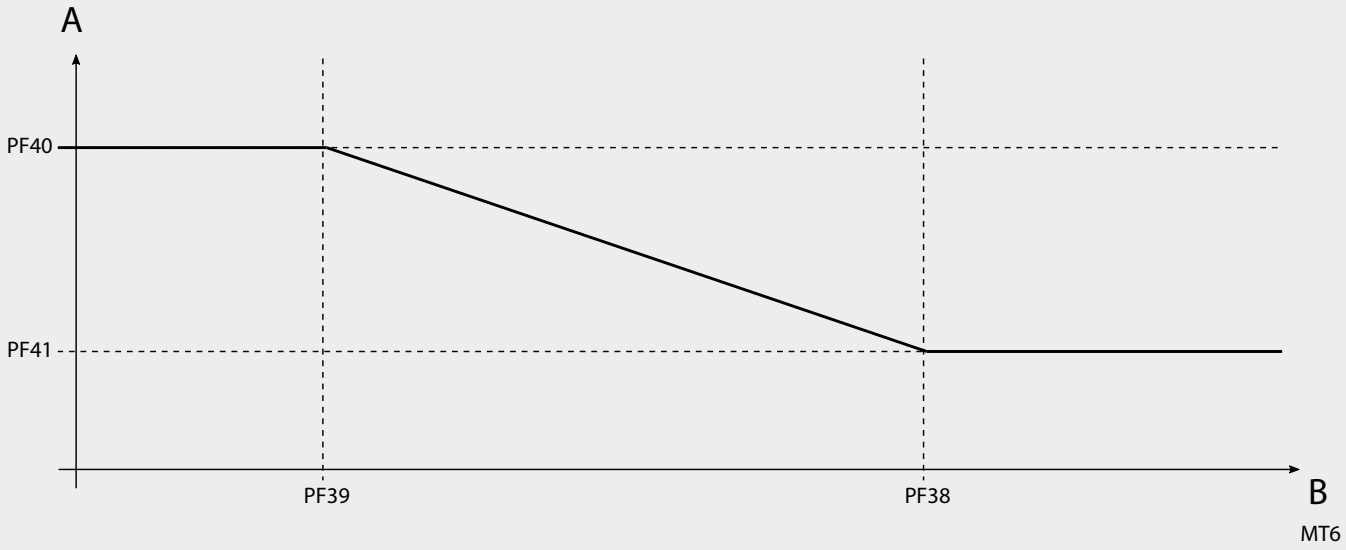
"PF35": dynamic set minimum temperature

"PF36": dynamic set water maximum water temperature

"PF37": dynamic set water minimum water temperature
Check carefully how the parameter setting affects the plant water flow temperature. An excessively high temperature will not allow air dehumidification treated by the hydronic terminals.

ADJUSTMENT INTERFACE

Heating mode settings



A System water temperature setpoint

B Outdoor air temperature

Settable parameters:

"PF38":dynamic set maximum temperature

"PF39": dynamic set minimum temperature

"PF40": dynamic set water maximum water temperature

"PF41": dynamic set water minimum water temperature
Check carefully how the parameter setting affects the plant water flow temperature. An excessively low temperature will not allow sufficient heating of the air treated by the hydronic terminals.

GENERAL TECHNICAL DATA

Models		m.u.	05-M	07-M	09-M	11-M	11-T	13-M	13-T	15-M	15-T
Heating performances (A 7 °C BS; W 35 °C)											
Maximum heat output	(1)	kW	7,54	10,75	11,45	13,53	13,53	15,20	15,20	19,05	19,05
Nominal heat power	(1)	kW	5,51	7,46	9,12	10,63	10,63	12,48	12,48	15,15	15,15
Total absorbed power	(1)	kW	1,16	1,62	1,83	2,37	2,37	2,62	2,62	3,23	3,23
COP	(1)		4,74	4,43	4,67	4,48	4,48	4,76	4,76	4,70	4,70
SCOP	(1)(2)		4,55	4,22	4,52	4,25	4,25	4,68	4,68	4,53	4,53
Energy efficiency class	(2)		A+++	A++	A+++	A++	A++	A+++	A+++	A+++	A+++
Heating performances (A-7 °C BS; W 35 °C)											
Maximum heat output	(3)	kW	4,85	6,45	7,05	7,88	7,88	9,05	9,05	11,42	11,42
Total absorbed power	(3)	kW	1,62	2,26	2,38	2,91	2,91	2,87	2,87	3,91	3,90
COP	(3)		2,98	2,85	2,95	2,70	2,70	3,15	3,15	2,92	2,92
Cooling performances (A35 °C; W 18 °C)											
Maximum cooling capacity	(4)	kW	9,20	11,55	13,05	14,35	14,35	16,90	16,90	20,50	20,50
Nominal cooling power	(4)	kW	6,90	9,50	10,50	12,15	12,15	13,05	13,05	17,45	17,45
Total absorbed power	(4)	kW	1,59	2,25	2,44	2,87	2,87	2,96	2,96	4,04	4,04
EER	(4)		4,33	4,23	4,31	4,23	4,23	4,41	4,41	4,32	4,32
Cooling performances (A35 °C; W 7°C)											
Maximum cooling capacity	(5)	kW	6,70	8,85	9,50	11,15	11,15	12,45	12,45	15,90	15,90
Nominal cooling power	(5)	kW	4,19	6,44	7,78	8,78	8,78	9,98	9,98	12,04	12,04
Total absorbed power	(5)	kW	1,22	2,00	2,33	2,65	2,65	2,99	2,99	3,71	3,71
EER	(5)		3,43	3,22	3,34	3,31	3,31	3,34	3,34	3,24	3,24
Hydraulic data											
Nominal flow rate for heating		L/min	15,9	21,5	26,3	30,6	30,6	35,9	35,9	43,6	43,6
Nominal flow rate for cooling		L/min	11,7	18,6	22,4	25,3	25,3	28,9	28,9	34,9	34,9
available pressure primary circuit		kPa	71,0	60,0	54,0	45,0	45,0	40,0	40,0	43,0	43,0
expansion vessel capacity		L	24	24	24	24	24	24	24	24	24
Minimum system water content		L	20	25	30	35	35	40	40	50	50
Refrigerator fittings											
Suction		"SAE					5/8"				
Liquid		"SAE					3/8"				
Hydraulic connections											
Boiler flow		" GAS	1	1	1	1	1	1	1	1	1
Boiler return		" GAS	1	1	1	1	1	1	1	1	1
Domestic hot water		" GAS	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Hot water feed		" GAS	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4

1. Water temperature in/out 30/35 °C; outdoor air temperature 7 °C; U.R. 85%
2. Seasonal efficiency according to UNI EN 14825. Energy Efficiency Class referred to the Average climate profile for flow temperature of 35 °C in compliance with Regulation 811/2013
3. Water temperature in/out 30/35 °C; outdoor air temperature -7 °C
4. Water temperature in/out 23/18 °C; outdoor air temperature 35 °C
5. Water temperature out 12/7 °C; outdoor air temperature 35°C

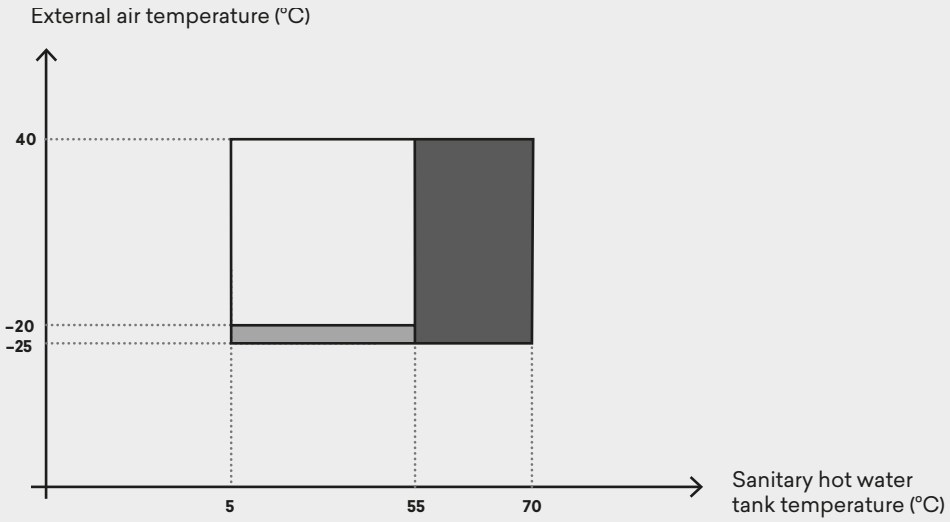
GENERAL TECHNICAL DATA

Models	m.u.	05-M	07-M	09-M	11-M	11-T	13-M	13-T	15-M	15-T
High temperature utilities flow	" GAS	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
High temperature utilities return	" GAS	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Solar flow	mm	12	12	12	12	12	12	12	12	12
Solar return	mm	12	12	12	12	12	12	12	12	12
Plant return	" GAS	1	1	1	1	1	1	1	1	1
Plant delivery	" GAS	1	1	1	1	1	1	1	1	1
Hydraulic data										
Safety valve calibration	bar	3	3	3	3	3	3	3	3	3
Electrical data										
Power Supply	V/ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	400/3/50	230/1/50	400/3/50	230/1/50	400/3/50
Maximum current consumption	A	14,00	18,00	21,30	25,00	8,50	28,00	9,30	34,50	11,50
Maximum power consumption	kW	2,90	3,80	4,50	5,30	5,30	5,90	5,90	7,30	7,30

1. Water temperature in/out 30/35 °C; outdoor air temperature 7 °C; U.R. 85%
2. Seasonal efficiency according to UNI EN 14825. Energy Efficiency Class referred to the Average climate profile for flow temperature of 35 °C in compliance with Regulation 811/2013
3. Water temperature in/out 30/35 °C; outdoor air temperature -7 °C
4. Water temperature in/out 23/18 °C; outdoor air temperature 35 °C
5. Water temperature out 12/7 °C; outdoor air temperature 35°C

OPERATING LIMITS

Domestic hot water



PDC off.
Heating be means of electrical heaters, boiler or solar integration

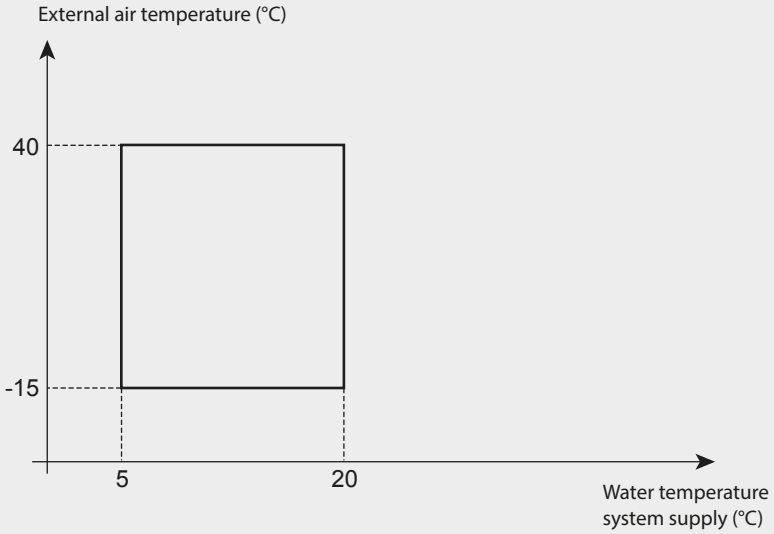
Integration by electrical heaters or boilers

The areas represented by the graph marked by backup heater are simplified. They could be more advantageous (greater contribution of the heat pump) in relation to the operating conditions and internal operating parameters.

the unit may reduce the outlet water temperature of the condenser at outdoor air temperatures below -15 °C.

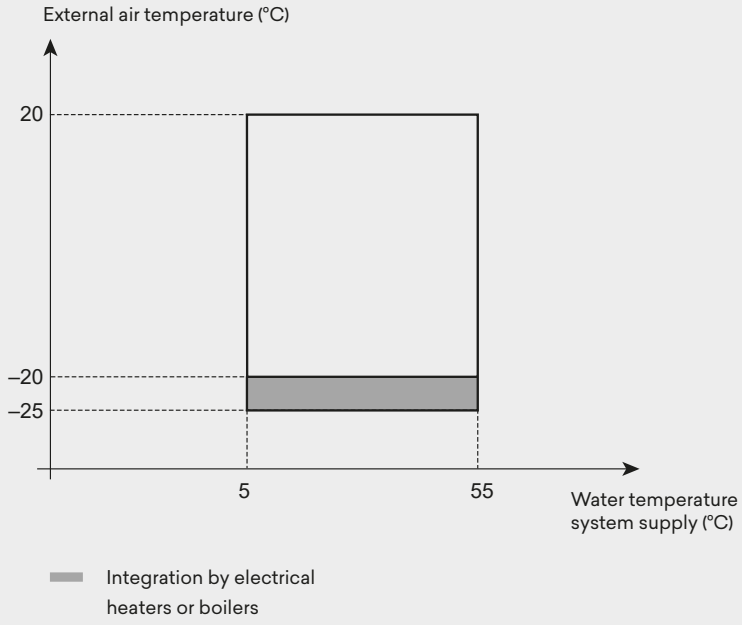
OPERATING LIMITS

Cooling



The area represented by the graph is simplified. It may be more advantageous depending of outdoor and working conditions.

Heating



The areas represented by the graph marked by backup heater are simplified. They could be more advantageous (greater contribution of the heat pump) in relation to the operating conditions and internal operating parameters.

the unit may reduce the outlet water temperature of the condenser at outdoor air temperatures below -15 °C.

PERFORMANCE DATA ACCORDING TO UNI EN 14511

Nominal heating capacity efficiency table

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

Ta: Outdoor temperature (°C)
Tw: Outdoor temperature (°C)

P_H: Heating capacity (kW)
P_I: Total absorbed power (kW)

PERFORMANCE DATA ACCORDING TO UNI EN 14511

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

Ta: Outdoor temperature (°C)
Tw: Outdoor temperature (°C)

P_H: Heating capacity (kW)
P_I: Total absorbed power (kW)

PERFORMANCE DATA ACCORDING TO UNI EN 14511

Maximum heating capacity efficiency table

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

1. Ta: Outdoor temperature (°C)
2. Tw: Outdoor temperature (°C)
3. P_H: Heating capacity (kW)
4. P_I: Total absorbed power (kW)

PERFORMANCE DATA ACCORDING TO UNI EN 14511

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

1. Ta: Outdoor temperature (°C)
2. Tw: Outdoor temperature (°C)
3. P_H: Heating capacity (kW)
4. P_I: Total absorbed power (kW)

PERFORMANCE DATA ACCORDING TO UNI EN 14511

Nominal cooling efficiency table

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

5. Ta: Outdoor temperature (°C)
6. Tw: Outdoor temperature (°C)
7. P_C: Cooling capacity (kW)
8. P_i: Total absorbed power (kW)

PERFORMANCE DATA ACCORDING TO UNI EN 14511

	Ta	20			25			30			35			40			45		
Size	Tw	P_C	P_I	EER P_C	P_C	P_I	EER P_C	P_C	P_I	EER P_C	P_C	P_I	EER P_C	P_C	P_I	EER P_C	P_C	P_I	EER P_C
15	7	13,57	2,56	5,30	13,07	2,95	4,43	12,56	3,33	3,77	12,04	3,71	3,24	11,50	4,09	2,81	10,94	4,46	2,45
	10	14,92	2,46	6,05	14,38	2,89	4,98	13,82	3,30	4,19	13,25	3,71	3,57	12,65	4,12	3,07	12,03	4,52	2,66
	13	16,38	2,34	7,00	15,79	2,79	5,65	15,18	3,24	4,68	14,55	3,69	3,95	13,89	4,12	3,37	13,22	4,56	2,90
	15	17,42	2,24	7,78	16,79	2,72	6,18	16,14	3,19	5,06	15,47	3,65	4,23	14,78	4,11	3,59	14,05	4,57	3,08
	18	19,08	2,06	9,26	18,39	2,57	7,14	17,68	3,08	5,74	16,94	3,58	4,73	16,19	4,07	3,97	15,40	4,56	3,37
	22	21,50	1,76	12,19	20,72	2,33	8,90	19,92	2,88	6,91	19,09	3,43	5,56	18,24	3,98	4,59	17,35	4,51	3,84

5. Ta: Outdoor temperature (°C)
6. Tw: Outdoor temperature (°C)
7. P_C: Cooling capacity (kW)
8. P_i: Total absorbed power (kW)

PERFORMANCE DATA ACCORDING TO UNI EN 14511

Maximum cooling efficiency table

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

9. Ta: Outdoor temperature (°C)
10. Tw: Outdoor temperature (°C)
11. P_C: Cooling capacity (kW)
12. P_i: Total absorbed power (kW)

innova

PERFORMANCE DATA ACCORDING TO UNI EN 14511

	Ta	20			25			30			35			40			45		
Size	Tw	P_C	P_I	EER P_C	P_C	P_I	EER P_C	P_C	P_I	EER P_C	P_C	P_I	EER P_C	P_C	P_I	EER P_C	P_C	P_I	EER P_C
15	7	18,26	4,15	4,40	17,55	4,69	3,74	16,83	5,22	3,22	16,07	5,75	2,79	15,29	6,28	2,44	13,82	6,29	2,20
	10	20,10	4,07	4,94	19,32	4,65	4,15	18,52	5,23	3,54	17,69	5,80	3,05	16,73	6,30	2,66	15,11	6,33	2,39
	13	22,08	3,95	5,59	21,23	4,58	4,64	20,35	5,20	3,91	19,44	5,82	3,34	18,26	6,28	2,91	16,49	6,34	2,60
	15	23,49	3,85	6,11	22,59	4,51	5,01	21,65	5,16	4,19	20,69	5,81	3,56	19,43	6,30	3,08	17,42	6,31	2,76
	18	25,74	3,65	7,04	24,75	4,37	5,67	23,73	5,07	4,68	22,68	5,77	3,93	21,30	6,30	3,38	19,09	6,34	3,01
	22	29,03	3,32	8,74	27,91	4,10	6,80	26,76	4,88	5,48	25,57	5,64	4,53	24,17	6,32	3,82	21,52	6,32	3,40

9. Ta: Outdoor temperature (°C)
10. Tw: Outdoor temperature (°C)
11. P_C: Cooling capacity (kW)
12. P_i: Total absorbed power (kW)

PERFORMANCE DATA ACCORDING TO UNI TS 11300

Heating UNI TS 11300-4

Size	θc	35		45		55	
	θf	DC	COP	DC	COP	DC	COP
5	–7	3,31	2,91	3,26	2,46	3,18	2,12
	2	4,21	3,58	4,13	2,92	4,02	2,44
	7	5,51	4,71	5,38	3,73	5,23	3,06
	12	6,26	5,49	6,12	4,22	5,92	3,38
7	–7	4,53	2,85	4,46	2,43	4,35	2,09
	2	5,54	3,31	5,43	2,72	5,28	2,29
	7	7,43	4,41	7,25	3,54	7,03	2,92
	12	8,45	5,08	8,24	3,96	7,98	3,21
9	–7	5,54	2,91	5,45	2,46	5,33	2,12
	2	6,92	3,50	6,79	2,86	6,61	2,39
	7	9,15	4,64	8,94	3,68	8,69	3,03
	12	10,40	5,40	10,16	4,16	9,85	3,34
11	–7	6,47	2,87	6,37	2,44	6,23	2,10
	2	7,98	3,38	7,82	2,77	7,62	2,32
	7	10,62	4,49	10,40	3,59	10,10	2,96
	12	12,10	5,20	11,82	4,03	11,45	3,25
13	–7	7,47	2,93	7,35	2,47	7,18	2,12
	2	9,68	3,69	9,49	3,00	9,24	2,50
	7	12,46	4,79	12,19	3,78	11,85	3,09
	12	14,17	5,61	13,84	4,28	13,42	3,42
15	–7	9,16	2,94	9,01	2,48	8,80	2,12
	2	11,74	3,63	11,51	2,95	11,20	2,46
	7	15,23	4,73	14,90	3,74	14,47	3,06
	12	17,33	5,52	16,92	4,22	16,39	3,38

θf: External ambient (or source, air) temperature (°C)
θc: Water outlet temperature (or hot well, water) (°C)

DC: Declared thermal power (kW)
COP: Coefficient of performance

PERFORMANCE DATA ACCORDING TO UNI TS 11300

Cooling UNI TS 11300-3

Size	Φgn	θc / θf	35 / 7	30 / 7	25 / 7	20 / 7
		Fk	100	75	50	25
5	4,19	EER	3,43	3,99	4,70	5,63
7	6,44	EER	3,22	3,73	4,38	5,21
9	7,78	EER	3,34	3,88	4,57	5,48
11	8,75	EER	3,31	3,85	4,53	5,43
13	9,98	EER	3,34	3,88	4,57	5,47
15	12,04	EER	3,24	3,77	4,43	5,30

Φgn: Declared cooling capacity (kW)
θf: Water outlet temperature (or hot well, water) (°C)
θc: External ambient (or source, air) temperature (°C)
Fk: Machine load factor (%)

PERFORMANCE DATA ACCORDING TO UNI EN 14825

Performance according to EN 14825

Mod.	C.p	T. r	P design	PLR	DC	COP_{DC}	COP_{PL}	CR	fCOP	fCOP (on- off)
5	T design	–10	4,53							
	A	–7	3,99	0,88	4,01	3,02	3,02	1,000	1,000	
	B	2	2,45	0,54	4,98	3,95	4,57	0,491	1,157	
	C	7	1,59	0,35	5,67	5,83	5,67	0,280	0,973	
	D	12	0,68	0,15	7,65	7,92	7,83	0,089	1,011	0,897
7	T design	–10	6,35							
	A	–7	5,62	0,88	5,62	2,79	2,79	1,000	1,000	
	B	2	3,42	0,54	6,76	3,40	4,13	0,510	1,217	
	C	7	2,20	0,35	8,21	4,42	5,52	0,270	1,249	
	D	12	0,98	0,15	10,51	6,38	7,52	0,090	1,180	0,894
9	T design	–10	7,13							
	A	–7	6,31	0,88	6,31	3,07	3,07	1,000	1,000	
	B	2	3,84	0,54	7,13	3,42	4,30	0,540	1,260	
	C	7	2,47	0,35	8,55	4,38	6,51	0,290	1,490	
	D	12	1,10	0,15	11,08	6,38	9,59	0,100	1,500	0,911
11	T design	–10	8,25							
	A	–7	7,30	0,88	7,30	2,99	2,99	1,000	1,000	
	B	2	4,44	0,54	8,27	3,39	4,10	0,540	1,210	
	C	7	2,86	0,35	10,06	4,42	5,62	0,290	1,270	
	D	12	1,27	0,15	12,87	6,38	7,65	0,100	1,200	0,903
13	T design	–10	9,38							
	A	–7	8,30	0,88	8,30	3,03	3,03	1,000	1,000	
	B	2	5,05	0,54	10,63	4,15	4,77	0,360	1,150	
	C	7	3,25	0,35	13,93	6,06	5,76	0,180	0,990	
	D	12	1,44	0,15	15,96	8,39	7,90	0,070	0,990	0,921
15	T design	–10	12,66							
	A	–7	11,20	0,88	11,21	2,97	2,97	1,000	1,000	
	B	2	6,82	0,54	13,96	3,93	4,53	0,490	1,150	
	C	7	4,38	0,35	18,61	5,76	5,71	0,240	0,990	
	D	12	1,95	0,15	21,33	7,77	7,73	0,090	0,990	0,919

T.r: Reference temperatures (°C)
C.p: Partial load conditions
P design: Design capacity (kW)
T design: Design temperature (°C)
FDP: Climate load factor (%)

DC: Declared thermal power at full load (kW)
CR: Load factor
COP_{DC}: Thermal power coefficient of performance at full load
COP_{PL}: Thermal power coefficient of performance at partial load
fCOP: Thermal power coefficient of performance at partial load

PERFORMANCE DATA ACCORDING TO UNI EN 14825

Energy efficiency data

ErP		5M	7M	9M	11M	11T	13M	13T	15M	15T
Average climate - Low temperature 35 °C										
Generator energy class	(1)	A+++	A++	A+++	A++	A++	A+++	A+++	A+++	A+++
ηs	(1)	176	164	178	165	165	181	181	176	176
SCOP	(1)	4,55	4,22	4,52	4,25	4,25	4,68	4,68	4,53	4,53

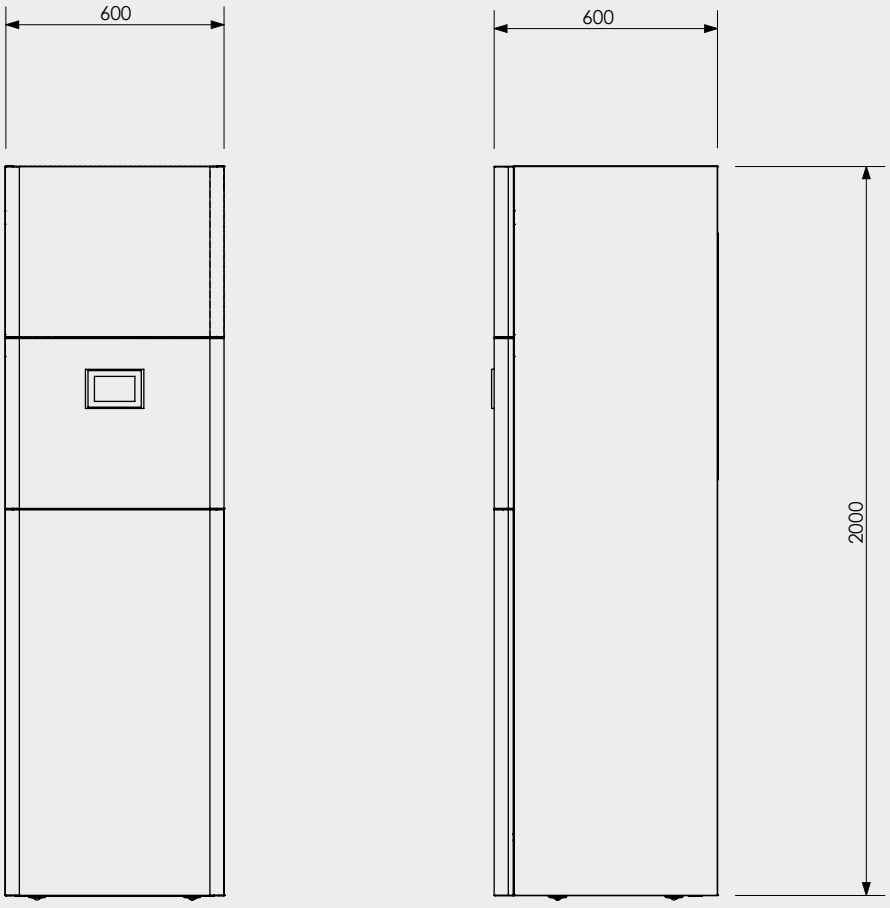
(1) Seasonal Efficiency according to EN 14825 and Energy Efficiency Class according to European Commission Regulation 811/2013 and 813/2013, Climate Average, Low Temperature 30/35 °C
ηs: Percentage efficiency (%)
SCOP: Seasonal coefficient of performance

DATA FOR TAX DEDUCTIONS

Data for Ecobonus, Superbonus 110%, Thermal account

Tradename	Model	Outdoor unit identification code	Thermal power [kWt]	Inverter presence	COP	EER
air/water	STØNE M1 5 M (V, H, IN, PI)	SM1D05(V,H,I,P)C3II	5,51	SI	4,74	4,33
air/water	STØNE M1 7M (V, H, IN, PI)	SM1D07(V,H,I,P)C3II	7,46	SI	4,43	4,23
air/water	STØNE M1 9M (V, H, IN, PI)	SM1D09(V, H, I, P)C3II	9,12	SI	4,67	4,31
air/water	STØNE M1 11M (V, H, IN, PI)	SM1D11(V, H, I, P)C3II	10,63	SI	4,48	4,23
air/water	STØNE M1 11T (V, H, IN, PI)	SM1D11(V, H, I, P)C5II	10,63	SI	4,48	4,23
air/water	STØNE M1 13M (V, H, IN, PI)	SM1D13(V,H,I,P)C3II	12,48	SI	4,76	4,41
air/water	STØNE M1 13T (V, H, IN, PI)	SM1D13(V,H,I,P)C5II	12,48	SI	4,76	4,41
air/water	STØNE M1 15M (V, H, IN, PI)	SM1D15(V,H,I,P)C3II	15,15	SI	4,70	4,32
air/water	STØNE M1 15T (V, H, IN, PI)	SM1D15(V,H,I,P)C5II	15,15	SI	4,70	4,32

Indoor unit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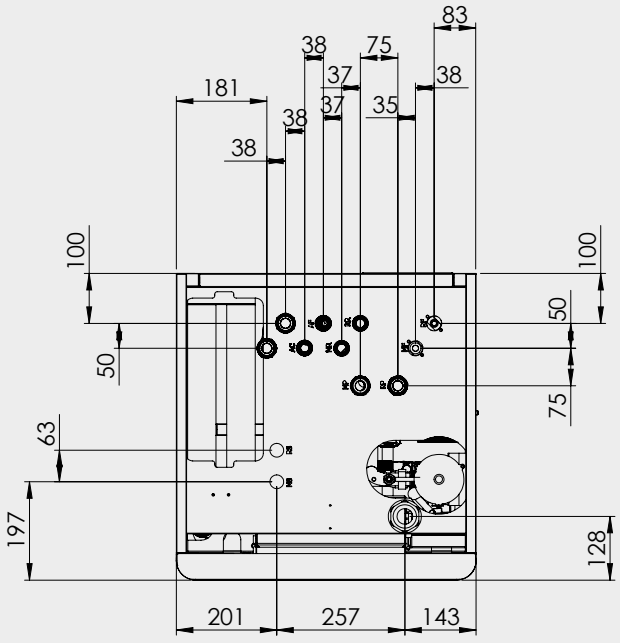
600
2000


83
38
75
37
38
181
37
35
38
38
100
100
50
50
75
63
197
128
201
257
143

DIMENSIONS

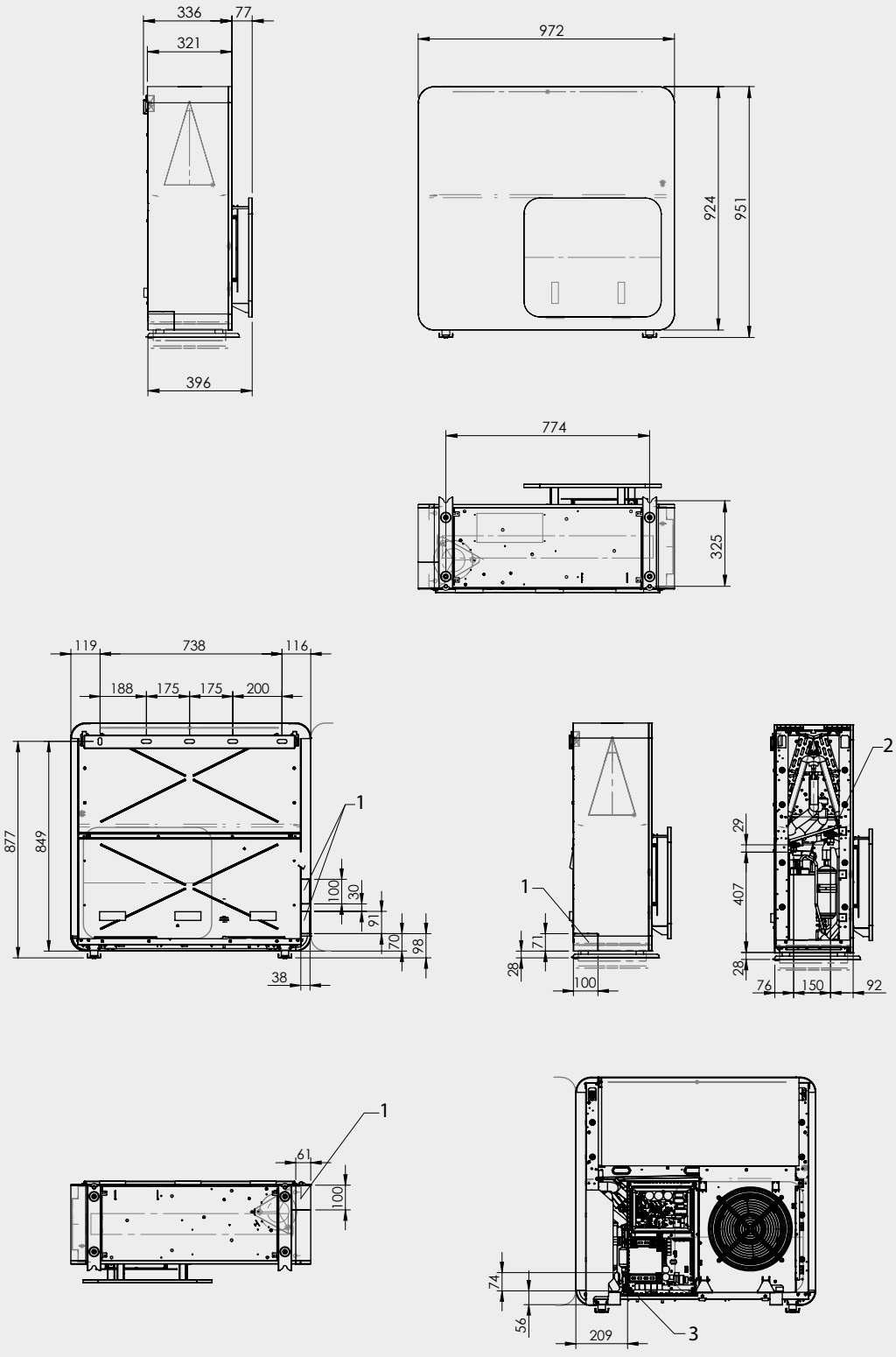
Weight

Models	m.u.	05	07	09	11	13	15
Empty weight	kg	172,0	172,0	172,0	172,0	172,0	172,0

Outdoor unit

STØNE-V exposed with vertical delivery

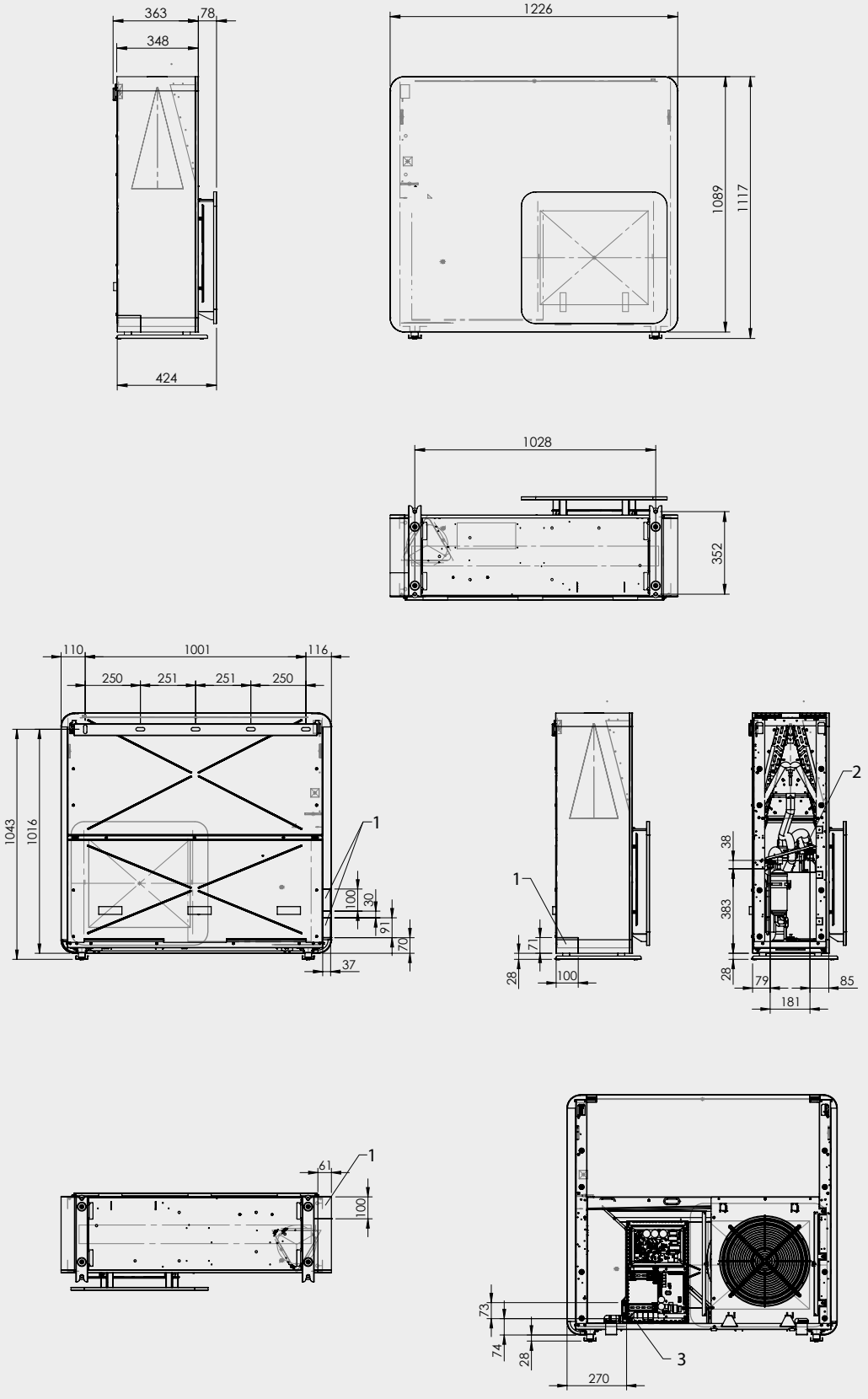
Model 5 - 7



1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

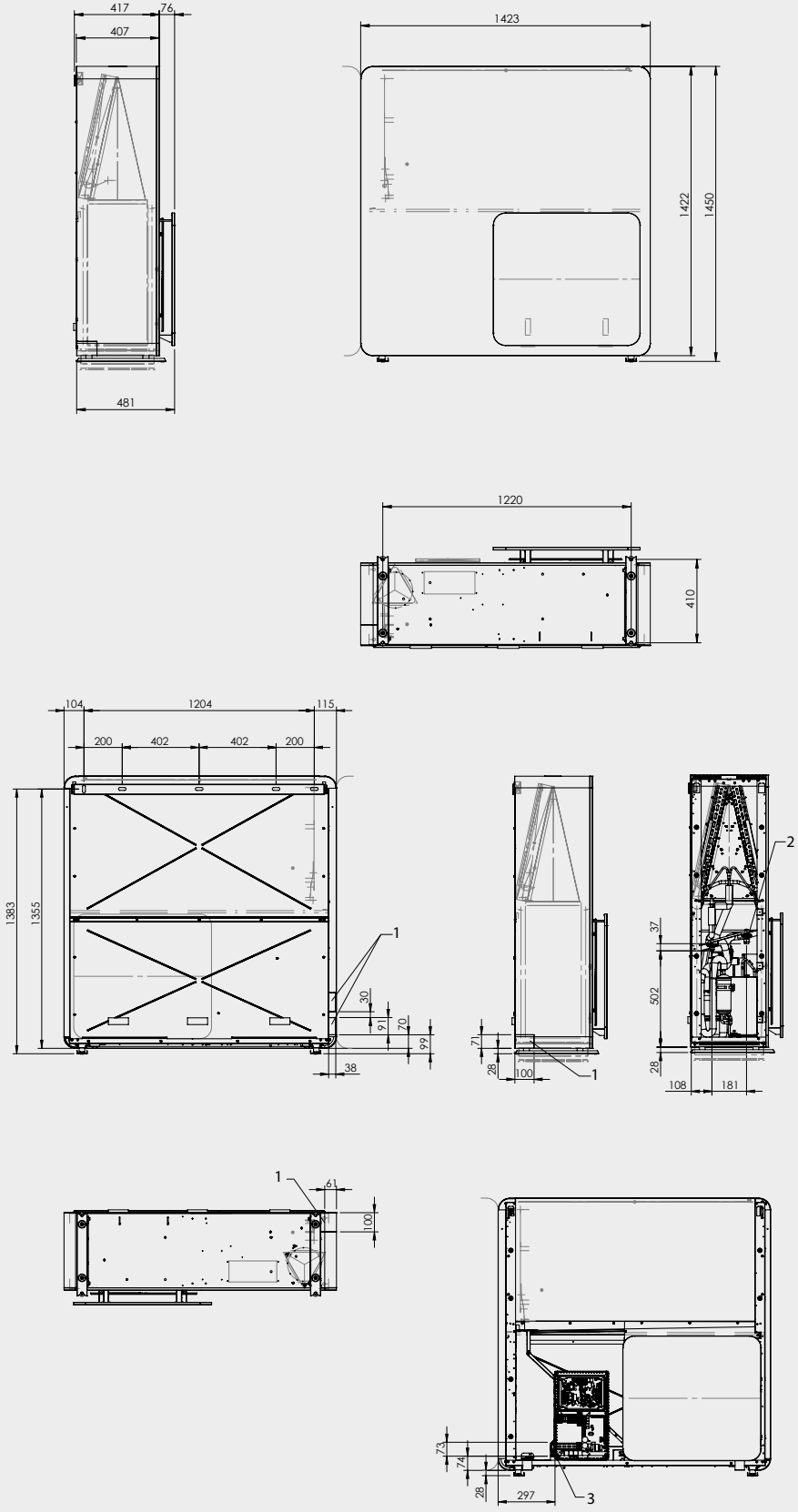
DIMENSIONS

Model 9 - 11



1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

Model 13 - 15

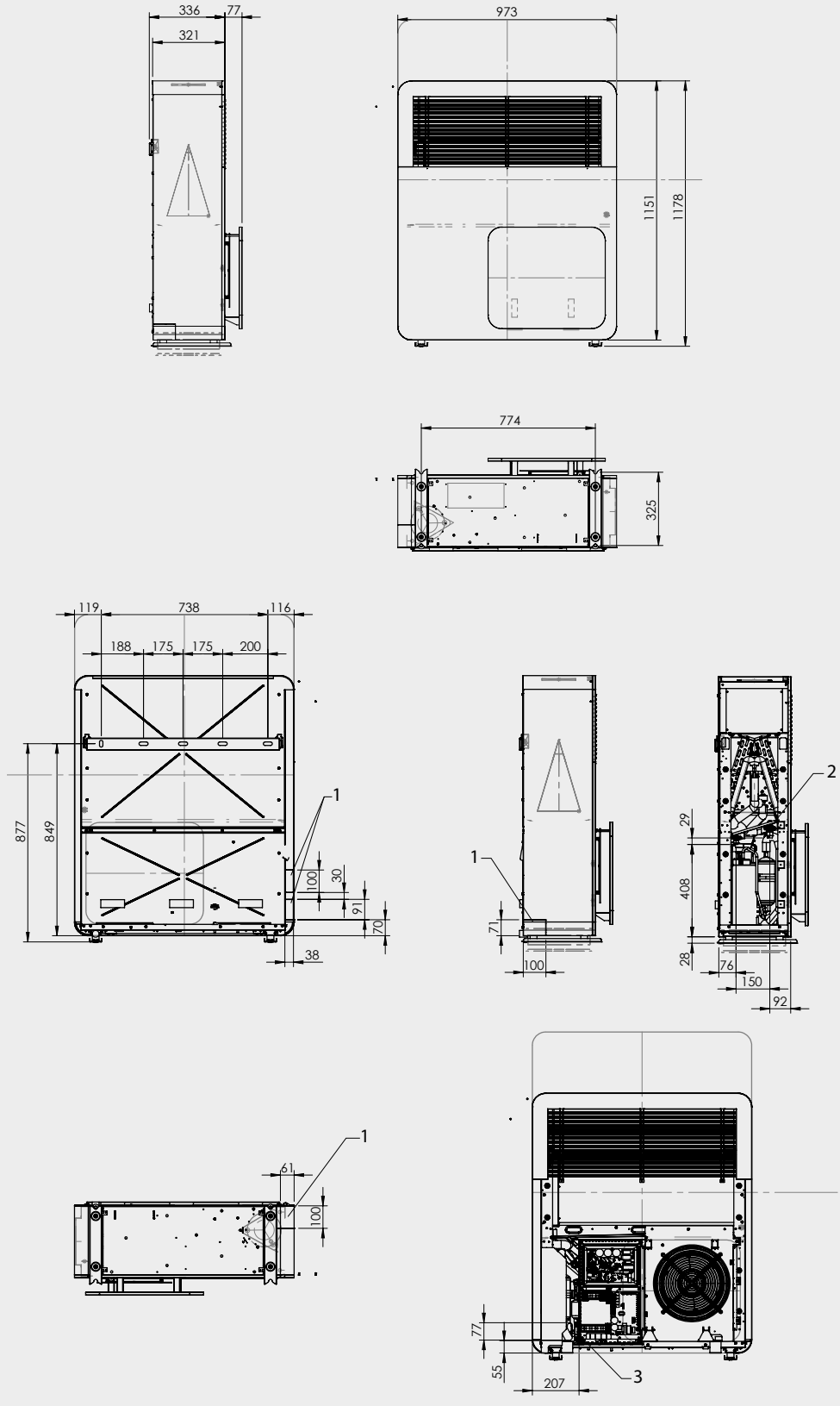


1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

DIMENSIONS

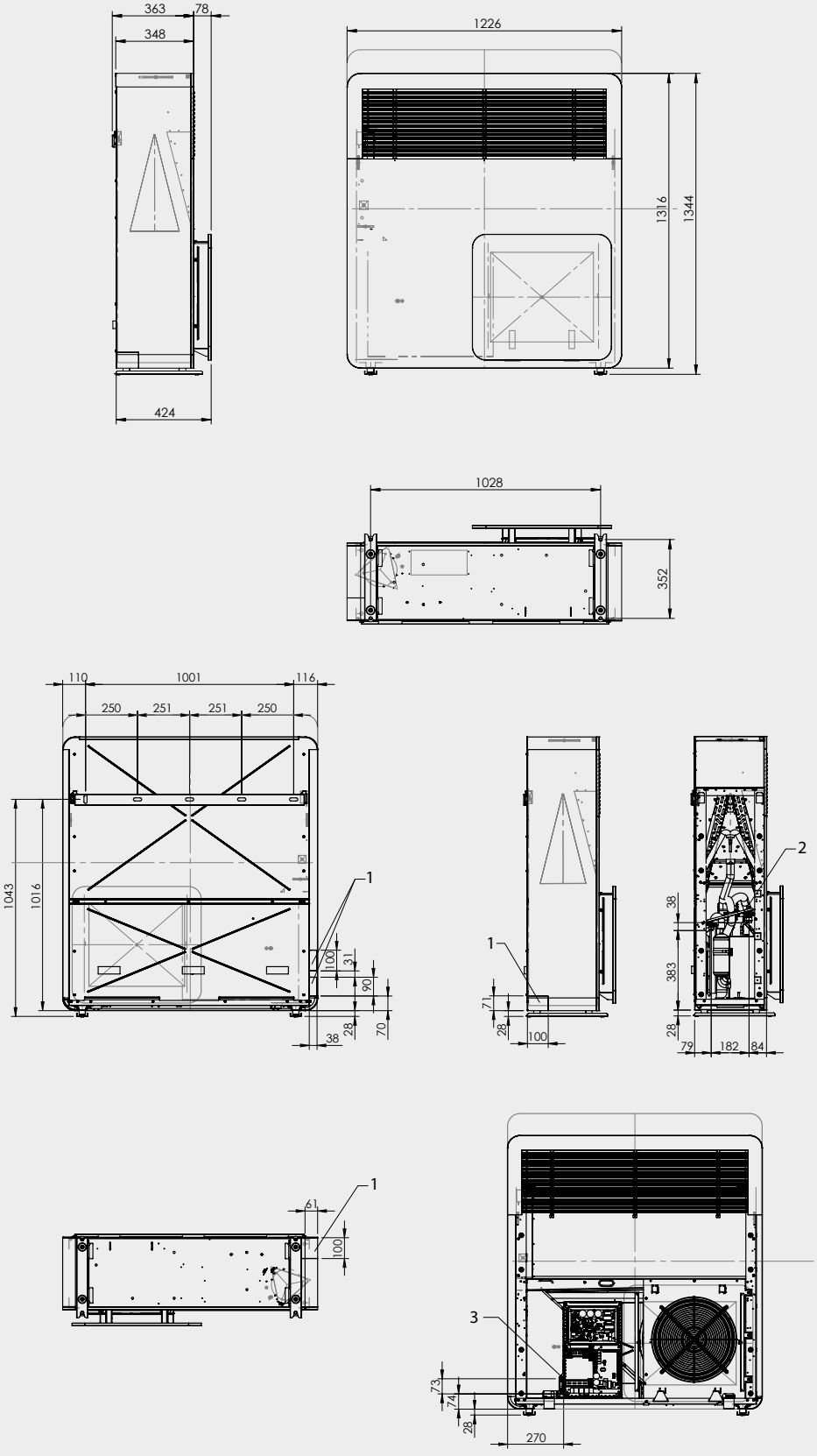
STØNE-H exposed with horizontal delivery

Model 5 - 7



1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

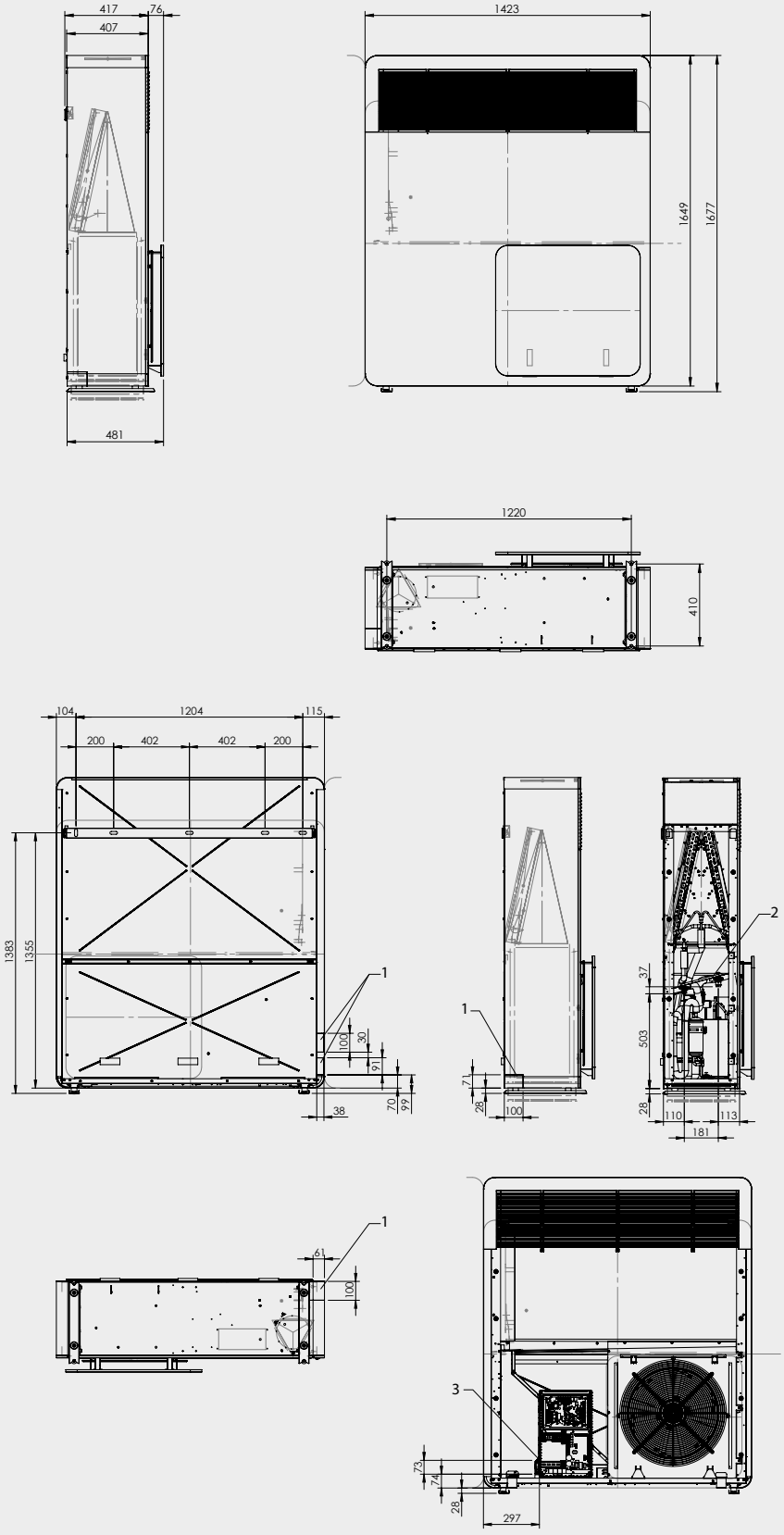
Model 9 - 11



1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

DIMENSIONS

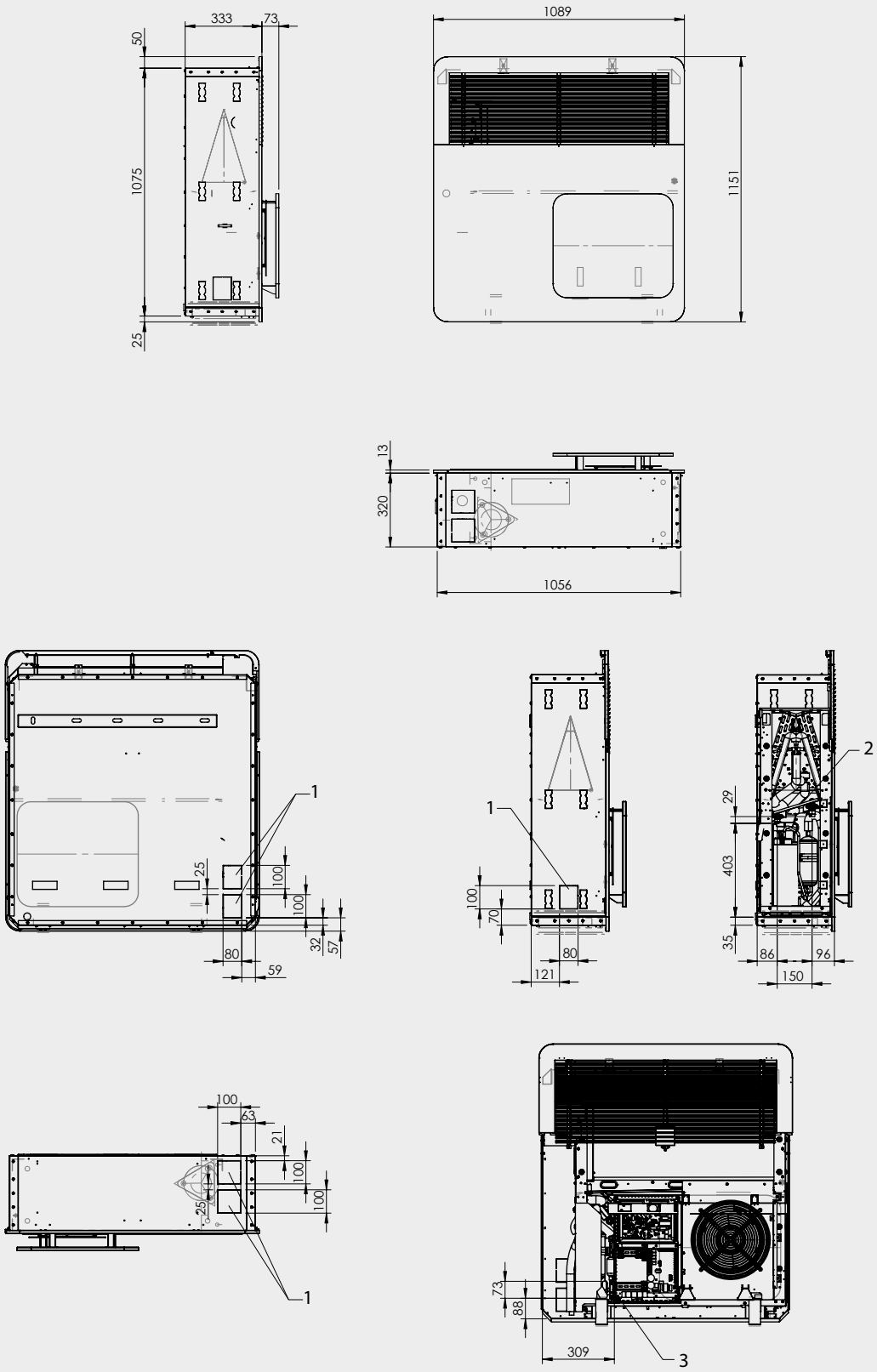
Model 13 - 15



1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

STØNE-IN built-in

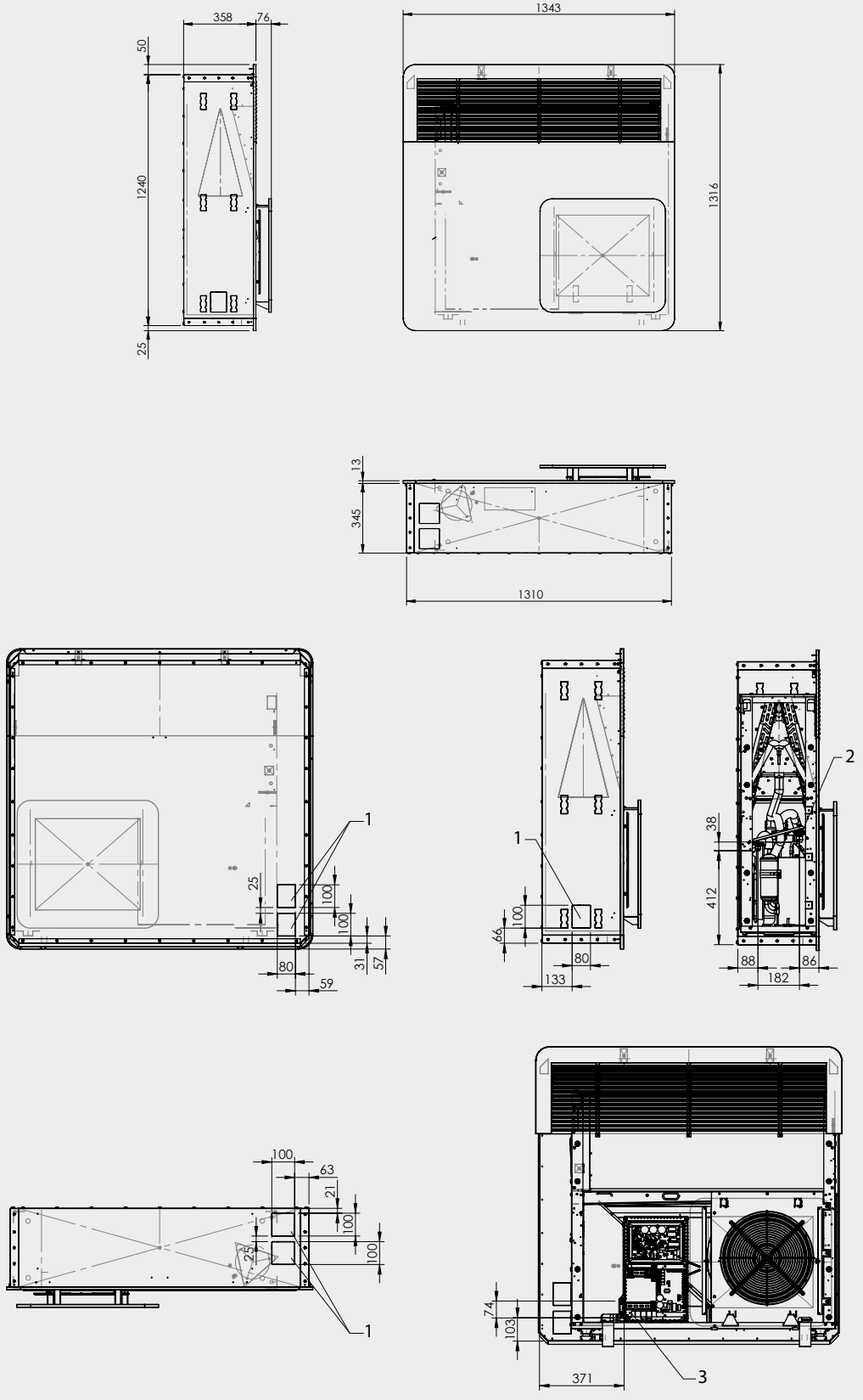
Model 5 - 7



1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

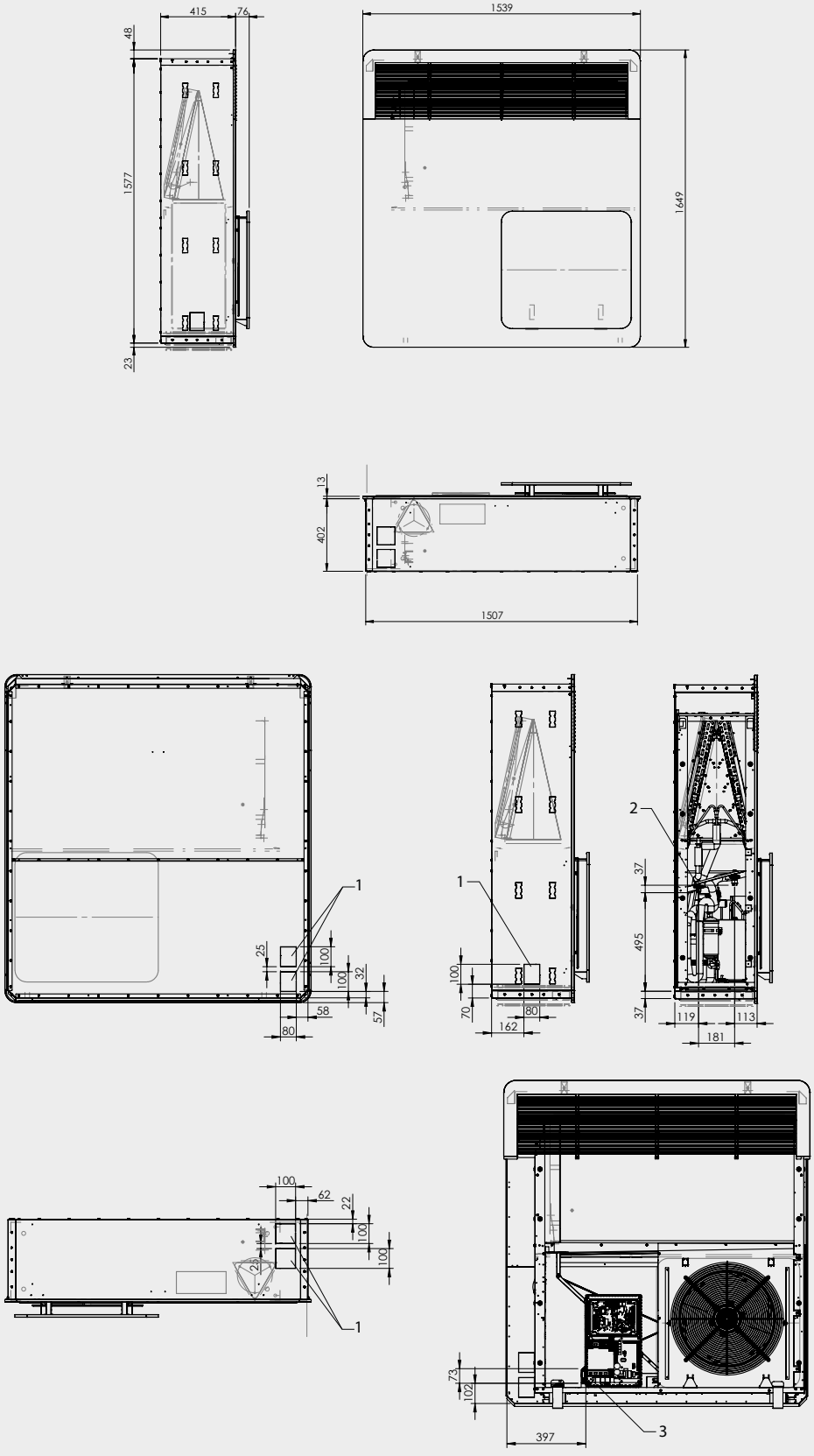
DIMENSIONS

Model 9 - 11



1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

Model 13 - 15



1. Connection entry pre-cut lines
2. Refrigeration connections
3. Electric connections

DIMENSIONS

Weight

STØNE-V exposed with vertical delivery

Models	m.u.	5	7	9	11	13	15
Net weigth	kg	92,5	100,0	113,0	119,0	133,0	139,0

STØNE-H exposed with horizontal delivery

Models	m.u.	5	7	9	11	13	15
Net weigth	kg	91,0	105,0	118,0	123,5	138,0	143,5

STØNE-IN built-in

Models	m.u.	5	7	9	11	13	15
Net weigth	kg	83,0	91,0	101,0	106,0	121,0	126,0

STØNE RANGE OVERVIEW

Monoblock configuration

STØNE RANGE OVERVIEW

Split configuration

STØNE RANGE OVERVIEW

realized by innova technical dept.

INNOVA S.r.l.
Via I Maggio 8 - 38089 Storo (TN) - ITALY
tel. +39.0465.670104 – fax +39.0465.674965
info@innovaenergie.com

innova