Alféa Extensa Duo A.I.

Air/water heat pump
split 2 services

U0611405_1873_EN_4
15/12/2017

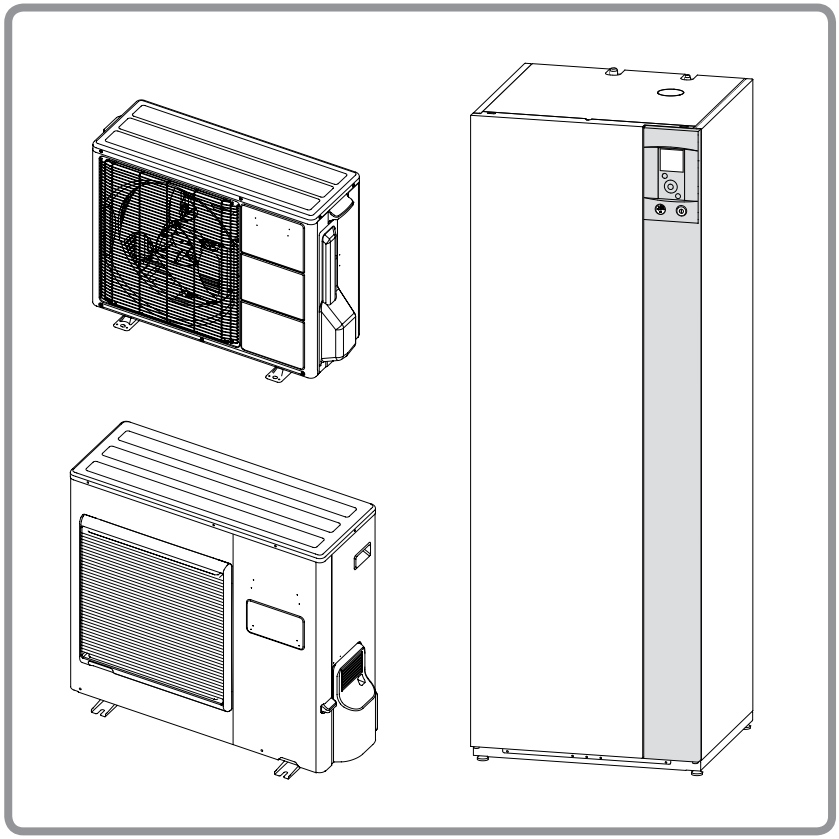
FR NL DE **EN** IT
ES PT PL

Outdoor unit

- ☐ WOYA 060 LFCA
- ☐ WOYA 080 LFCA
- ☐ WOYA 100 LFTA

Hydraulic unit

- ☐ 024127
- ☐ 024128



Installation and commissioning instructions

for professionals

to be kept by the user for future reference

atlantic

atlantic-comfort.com

☞ Installation and maintenance regulations

The appliance must be installed and maintained by an approved professional in accordance with current regulations and codes of practice.

☞ Handling

The outdoor unit must not be placed in a horizontal position during transport.

If not kept upright during transport, the appliance could be damaged through displacement of the refrigerant and damage to the compressor suspension.

Any damage caused by transportation in a horizontal position is not covered by the warranty.

If necessary, the outdoor unit may be tilted only during manual handling (to go through a door or up a staircase). This operation must be conducted very carefully and the appliance must be immediately restored to the upright position.

☞ Containment of refrigeration circuits

All refrigeration circuits are sensitive to contamination from dust and moisture. If any such pollutants penetrate the refrigeration circuit, they can affect the reliability of the heat pump.

☞ **Make sure that the connections and refrigeration circuits (hydraulic unit, outdoor unit) are protected correctly.**

☞ **In the event of a subsequent failure and following an inspection, the presence of moisture or foreign bodies in the compressor oil would automatically void the warranty.**

- Check upon receipt that the fittings and refrigeration circuit caps mounted on hydraulic unit and outdoor unit are properly seated and secured (cannot be loosened with bare hands). If this is not the case, tighten them using a C spanner.
- Check also that the refrigeration connections are sealed (plastic caps or tubes crimped at the ends and brazed). If the caps must be removed during the installation (tubes to be re-cut for example), put them back as soon as possible.

☞ Hydraulic connections

The connection must comply with industry standard practice according to current regulations.

Remember: Seal everything when fitting in accordance with industry standard practice for plumbing work:

- Use suitable seals (fibre gasket, O-ring).
- Use Teflon or hemp tape.
- Use sealing paste (synthetic depending on the case).

Use glycol/water mix if the minimum flow temperature is set below 10°C. If you are using a glycol/water mix, arrange for an annual check on the quality of the glycol. Use monopropylene glycol only. The recommended concentration is 30% minimum. **Never use monoethylene glycol.**

Remember: The presence at installation of a CB-type disconnection function, for preventing heating water being returned to the drinking water system, is required by articles 16.7 and 16.8 of the Local Plumbing Regulations.

☞ **In some installations, the presence of different metals can cause corrosion problems; the formation of metal particles and sludge can appear in the hydraulic circuit.**

☞ **In this case, it is advisable to use a corrosion inhibitor in the proportions indicated by the manufacturer.**

- Please refer to the chapter "Treatment of domestic and heating water" in our price catalogue.

☞ **You must also ensure that treated water does not become corrosive.**

☞ Electrical connections

• Before any maintenance operation, ensure that the general power supply is switched off.

• Specifications of electricity supply

The electrical installation must be carried out in accordance with current regulations.

Electrical connections will only be made once all other installation operations (fastening, assembly, etc.) have been completed.

☞ **Warning!**

The contract signed with the energy provider must be sufficient not only to cover the heat pump's power requirements but also the combined sum of all the appliances likely to be operating at the same time. If the power is too low, check the power rating stated in your contract with your energy provider.

Never use a power socket for the power supply.

The heat pump must be supplied directly with power (without external switch) by special protected leads from the electric panel via dedicated bipolar circuit breakers, C curve for the outdoor unit, C curve for the electrical heating and domestic water backups (see tables page 37).

The electrical installation must be fitted with a 30mA RCD.

This appliance is designed to operate using a nominal voltage of 230 V +/- 10%, 50 Hz.

• General remarks on electrical connections

It is essential to maintain neutral-phase polarity when making electrical connections.

Rigid wires are preferable for fixed installations, particularly in a building.

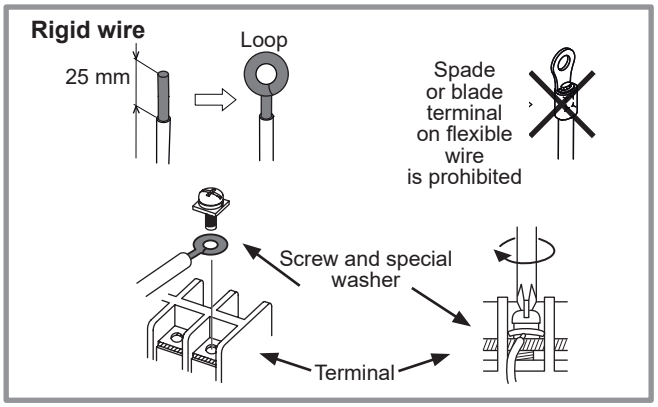
Tighten the cables using the cable glands to prevent the feed wires from being accidentally disconnected.

The earth connection and its continuity must be ensured.

• Connecting to screw terminals

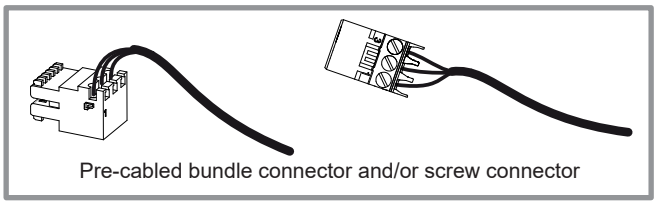
☞ **The use of ring, spade or blade terminals or caps is prohibited.**

- Always select wire that complies with current standards.
- Bare the end of the wire to around 25 mm.
- With round end pliers, form a loop with a diameter which matches the tightening screws on the terminal.
- Tighten the terminal screw firmly onto the loop created. Insufficient tightening can cause overheating, leading to breakdown or even fire.



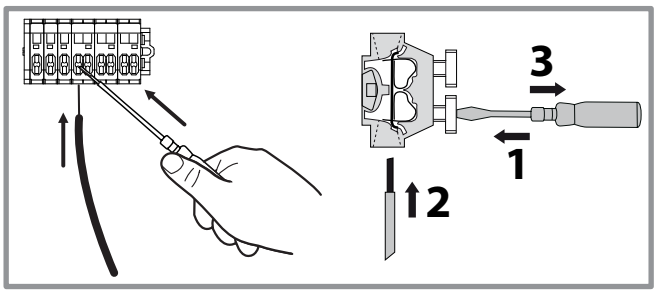
• Connecting to controller boards

- Remove the corresponding connector and make the connection.



• Connecting to spring terminals

- Bare the end of the wire to around 10 mm.
- Push the spring with a screwdriver so that the wire enters the cage.
- Slide the wire into the opening provided for this purpose.
- Remove the screwdriver and then check that the wire stays gripped by the cage by pulling on it.



This appliance must be installed by qualified personnel holding a certificate of competence in the handling of refrigerants.

Contents

1 Description of the equipment

1.1 Packing

- **1 package**: Outdoor unit.
- **1 package**: Hydraulic unit and outside temperature sensor.

1.2 Unpacking and supplies

While the courier is still present, carefully check the general appearance of the appliances and check that the outdoor unit has not been laid in a horizontal position.

In the event of a dispute, send any relevant reservations to the carrier in writing within 48 hours and send a copy of the letter to Customer Services.

1.3 Definitions

- Split: The heat pump consists of two elements (an outdoor unit to be installed outdoors and a hydraulic unit to be installed inside the dwelling).
- Air/water: The surrounding air is the energy source. This energy is transmitted to the heating circuit water by the heat pump.
- Inverter: The fan and compressor speeds are modulated according to the heating requirements. This technology enables you to save on energy and operate on a single-phase power supply, whatever the heat pump's output, by avoiding pulling significant amounts of current at start-up.
- COP (Coefficient of Performance): This is the relationship between the energy transmitted to the heating circuit and consumed electrical energy.

Packing contents list

Heat Pump		*Outdoor unit*		*Hydraulic unit*	
Model	*Export code*	*Reference*	*Code*	*Reference*	*Code*
Alféa Extensa Duo A.I. 5	526236	WOYA060LFCA	700171	Alféa Extensa Duo A.I. 5	024127
Alféa Extensa Duo A.I. 6	526237			Alféa Extensa Duo A.I. 6-8-10	024128
Alféa Extensa Duo A.I. 8	526238	WOYA080LFCA	700172		
Alféa Extensa Duo A.I. 10	526239	WOYA100LFTA	700173		

Optional equipment

- ***Dual circuit kit*** (code 074011) for connecting 2 heating circuits.
- ***Electrical back-ups kit*** (code 074044)
- ***Boiler connection kit*** (code 073990) for connecting a boiler to the heat pump.
- ***Wireless room sensor A59***(code 074208) for correcting the ambient temperature.
- ***Wireless room sensor A75*** (code 074213), ***Wireless room sensor A78*** (code 074214) for correcting the ambient temperature and programming the heat pump.
- ***Cooling kit*** (code 075328).
- ***High flow rate circulation pump kit*** (code 074077) for the installation of 1 underfloor heating circuit.
- ***Anti-vibration blocks*** (code 523574).
- ***White PVC floor support*** (ref. 809532) or ***Black rubber floor support*** (ref. 809536).

Operating Range

This heat pump provides:

- Heating in winter,
- The management of electrical backups*, for extra heating on the coldest days,

or

- Installation with boiler connection* for extra heating on the coldest days,
- Management of two heating circuits*,
- Production of domestic hot water.
- Cooling in summer* (for underfloor heating-cooling system or fan-convectors).

*: These options require the use of additional kits (see chapter "Required accessory" or "Optional equipment").

1.4 General characteristics

Model name	Alféa Extensa Duo A.I.	5	6	8	10
Rated heating performances (outdoor temp. / flow temp.)					
Heat output					
+7°C/+35°C - Underfloor heating system	kW	4.50	6.00	7.50	10.00
-7°C/+35°C - Underfloor heating system	kW	4.10	4.60	5.70	7.40
+7°C/+45°C - LT radiator	kW	4.50	5.10	6.20	8.27
-7°C/+45°C - LT radiator	kW	4.10	4.45	5.05	7.40
+7°C/+55 °C - Radiator	kW	4.50	4.50	5.00	7.00
-7°C/+55°C - Radiator	kW	3.70	3.85	5.20	7.00
Power consumption					
+7°C/+35°C - Underfloor heating system	kW	1.00	1.41	1.84	2.49
-7°C/+35°C - Underfloor heating system	kW	1.47	1.74	2.23	2.97
+7°C/+45°C - LT radiator	kW	1.31	1.50	1.87	2.53
-7°C/+45°C - LT radiator	kW	1.86	2.04	2.47	3.70
+7°C/+55°C - Radiator	kW	1.79	1.79	1.94	2.86
-7°C/+55°C - Radiator	kW	2.20	2.33	3.34	4.15
Coefficient of Performance (COP)	**(+7°C/+35°C)**	**4.52**	**4.26**	**4.08**	**4.02**
Electrical specifications					
Electrical voltage (50 Hz)	V		230		
Maximum current for appliance	A	11	12.5	17.5	18.5
Nominal current	A	4.5	6.3	8.1	10.9
Maximum current of the Heating system electrical backup (option)	A		13.05 / 26.1		
Power of the Heating system electrical backup (option)	kW		6 kW		
Fan actual power consumption	W	49	49	49	100
Circulation pump actual power consumption	W		24		
Maximum power consumed by the outdoor unit	W	2530	2875	4025	4255
DHW electrical backup power	W		1500		
Rate according to EN14825		0.0100	0.0070	0.0057	0.0044
Hydraulic Circuit					
Maximum operating pressure heating / hot water tank	MPa (bar)		0.3 (3) / 1 (10)		
Flow rate of the hydraulic circuit for 4°C<Δt<8°C (rated conditions) minimum / maximum	l/h	490 / 980	650 / 1300	810 / 1620	1080 / 2160
Miscellaneous					
Weight of outdoor unit	Kg	41	41	42	60
Weight of hydraulic unit (empty / full of water)	Kg		155 / 373		
Water capacity of the hydraulic unit / hot water tank	l		24 / 190		
Noise level at 1 m [1] (hydraulic unit)	dB (A)		39		
Sound power level in accordance with EN 12102 [2] (hydraulic unit)	dB (A)		46		
Noise level at 5 m [1] (outdoor unit)	dB (A)	40	40	47	47
Sound power level in accordance with EN 12102 [2] (outdoor unit)	dB (A)	63	63	69	69
Heating system operating limits					
Outdoor temperature min/max	°C		-20 / +35		
Max. heating water flow temperature underfloor heating	°C		45		
Max. heating water flow temperature low temperature radiator	°C		52		
Refrigeration circuit					
Gas pipe diameters	Inches	1/2	1/2	5/8	5/8
Liquid Piping Diameters	Inches	1/4	1/4	1/4	3/8
Factory fill of refrigerant R410A [3]	g	1100	1100	1400	1800
Maximum operating pressure	MPa (bar)		4.15 (41.5)		
Minimum / Maximum length of pipes [4]	m		5 / 15		
Maximum length of pipes [5] / Maximum level difference	m		30 / 20		

[1] Sound pressure level at (x) m from the appliance, 1.5m off the ground, open field directionality 2.

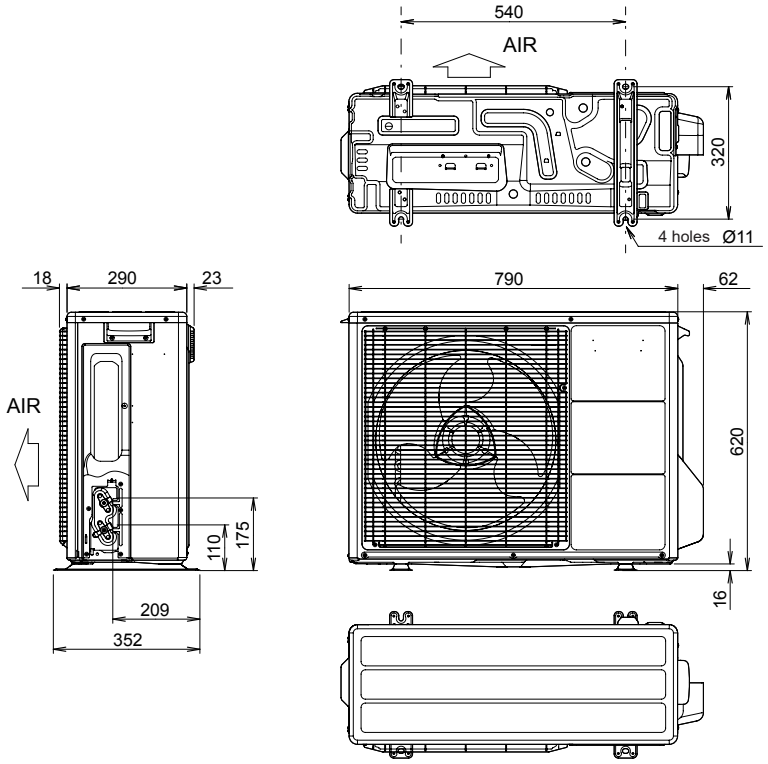
[2] The sound power level is a laboratory measurement of the emitted sound power. It does not correspond to a measurement of the perceived sound power.

[3] Refrigerant R410A as per NF EN 378.1 standard.

[4] Filling with refrigerant R410A is done at the factory.

[5] Taking into account a possible additional fill of refrigerant R410A (see "Additional filling", page 27).

☞ **Outdoor Unit,**
Alféa Extensa Duo A.I. 5, 6 and 8



☞ **Outdoor Unit,**
Alféa Extensa Duo A.I. 10

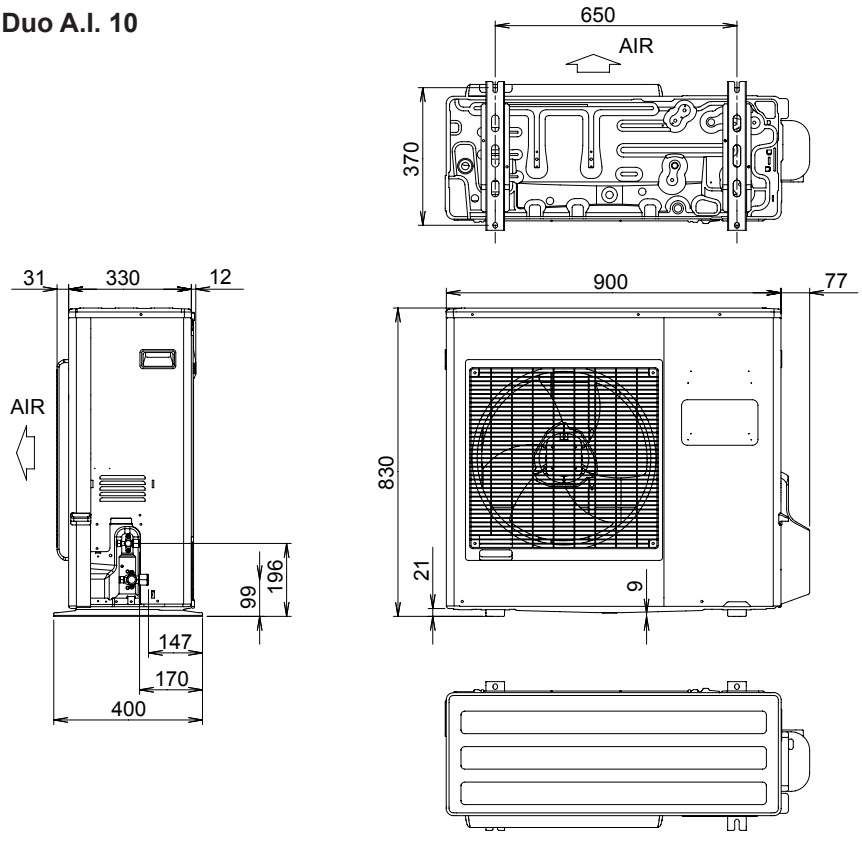
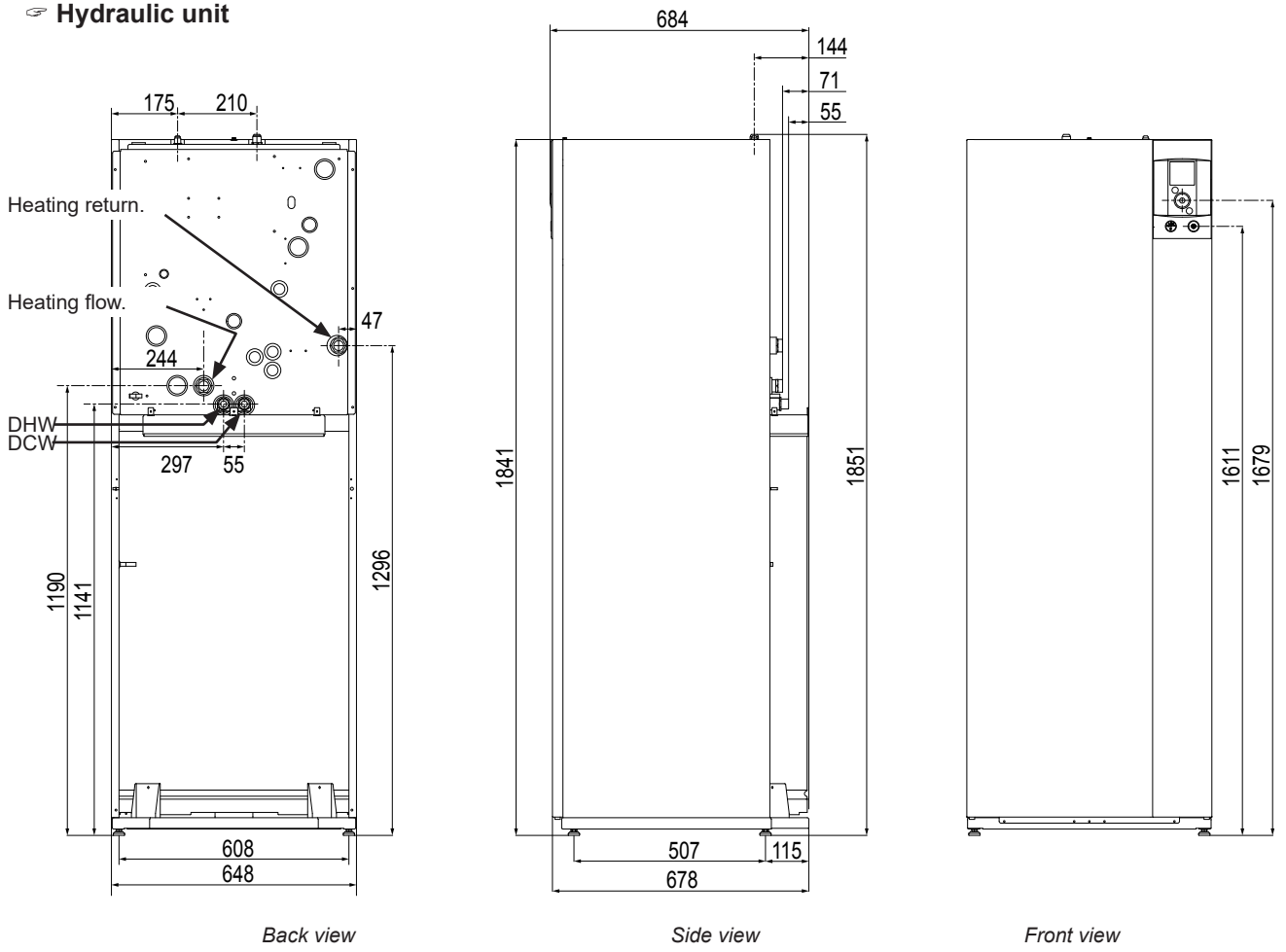


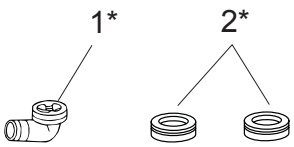
figure 1 - Dimensions in mm

Hydraulic unit



Space requirements of the hydraulic unit, see figure 15, page 20.

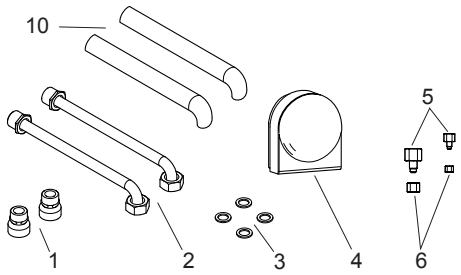
figure 2 - Dimensions in mm



1*	Elbow	for condensate evacuation.
2*	Plugs (x2) (depending on model)	

* only for Alféa Extensa Duo A.I. 10.

figure 3 - Accessories provided with the outdoor unit



1	Dielectric connections	for connections to the DHW circuit
2	DCW pipes	
3	Gaskets	
4	Outside sensor	to monitor the outside temperature
5	Adapter 1/2" - 5/8" and/or 1/4" - 3/8"	for flared connections to the hydraulic unit (depending on model).
6	Nut 1/2" and/or 1/4"	
10	Insulation tube	to insulate connections and tubes

figure 4 - Accessories provided with the hydraulic unit

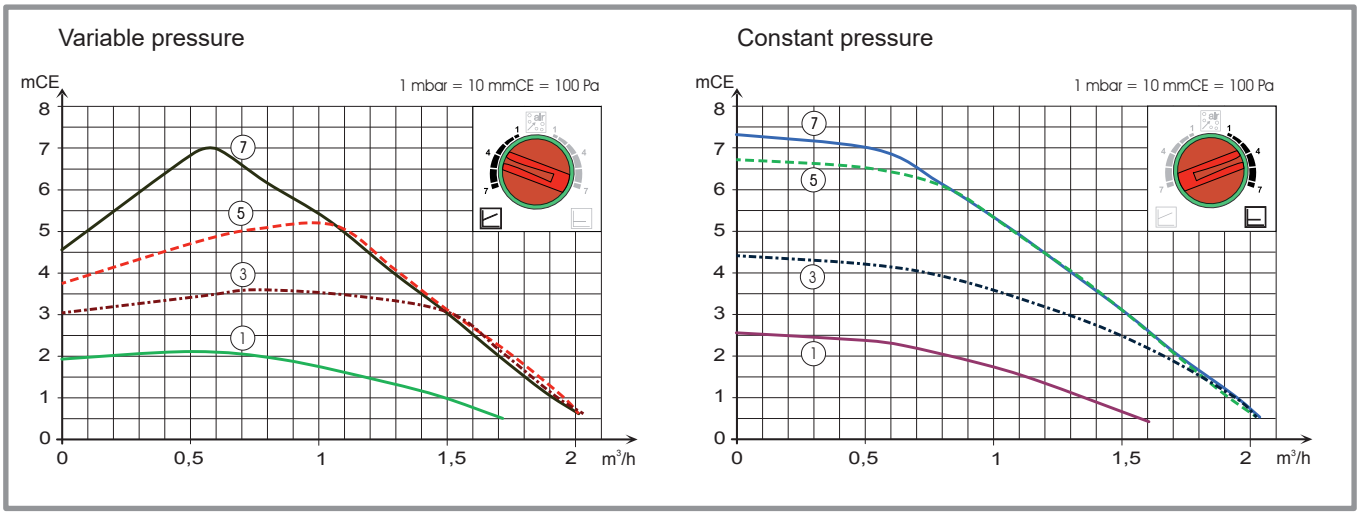


figure 5 - Available hydraulic pressures and flow rates

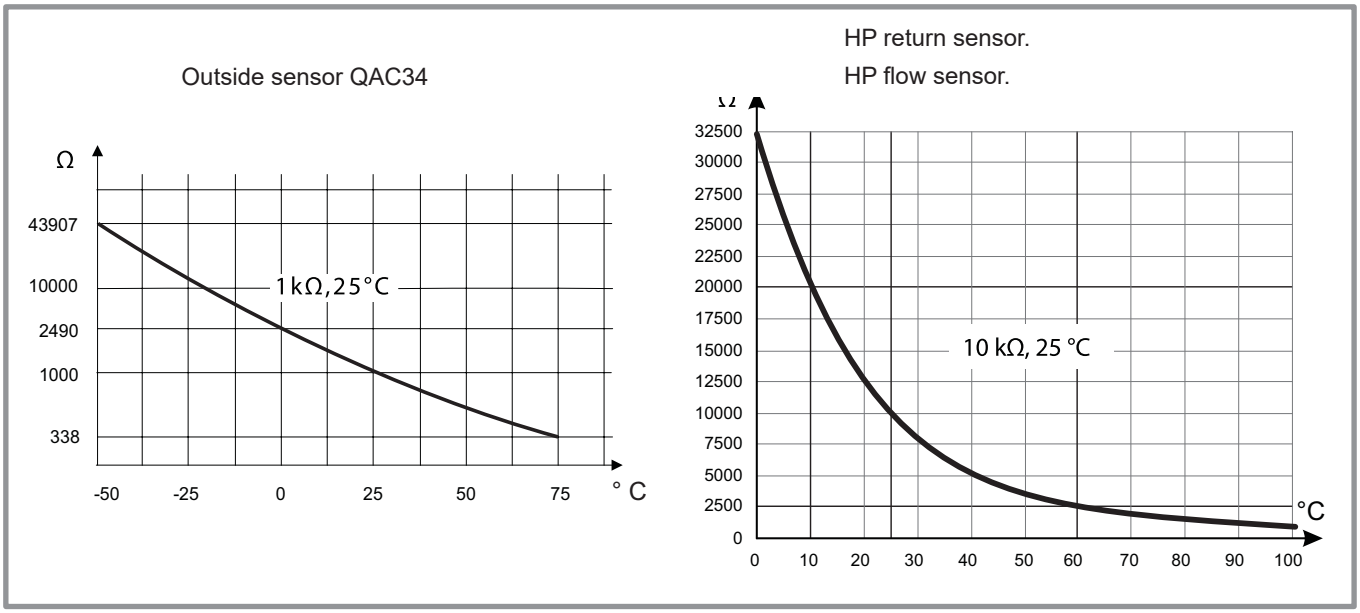


figure 6 - Ohmic sensor values (Hydraulic unit)

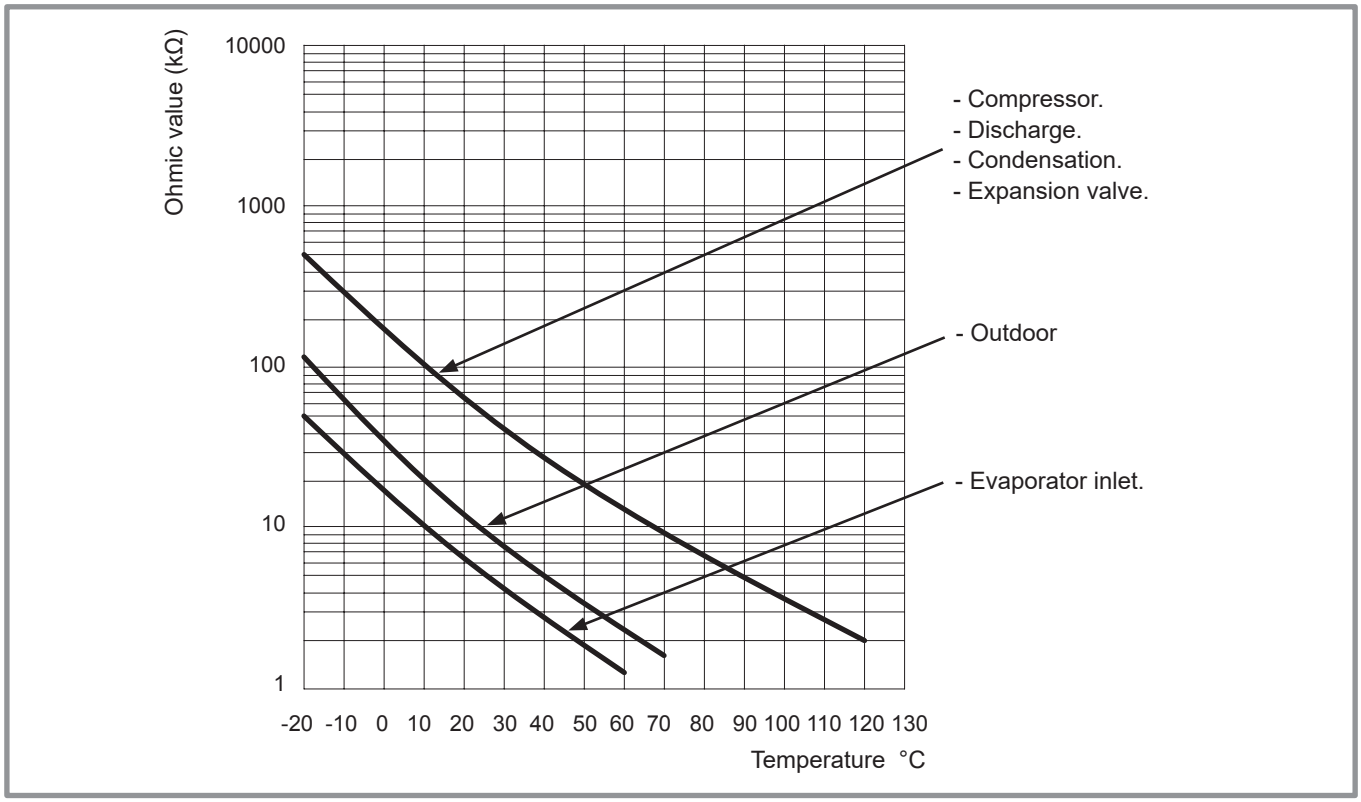
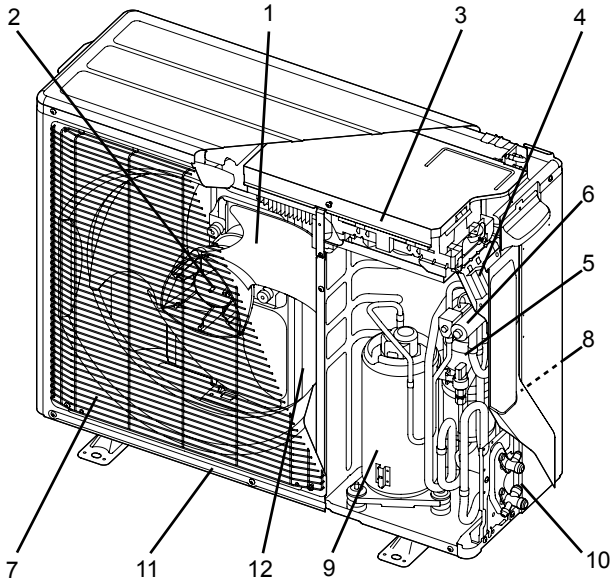


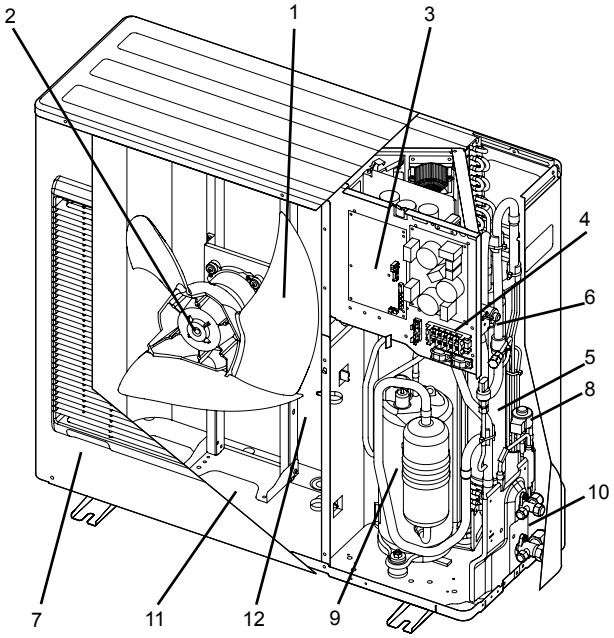
figure 7 - Ohmic sensor values (Outdoor unit)

1.5 Description

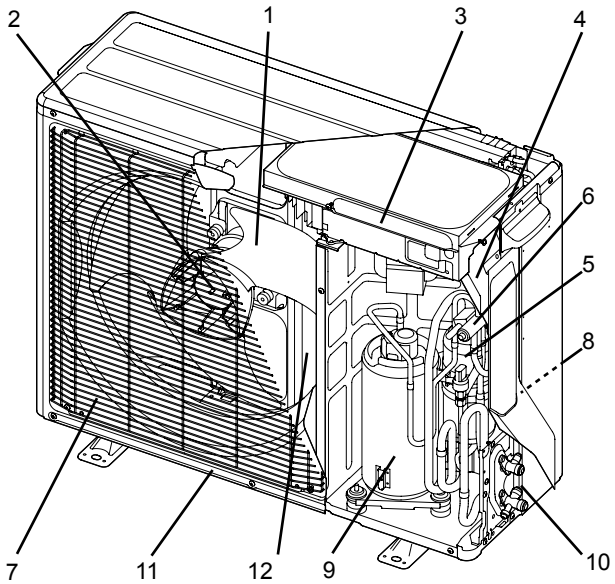
☞ **Alféa Extensa Duo A.I. 5 and 6**



☞ **Alféa Extensa Duo A.I. 10**



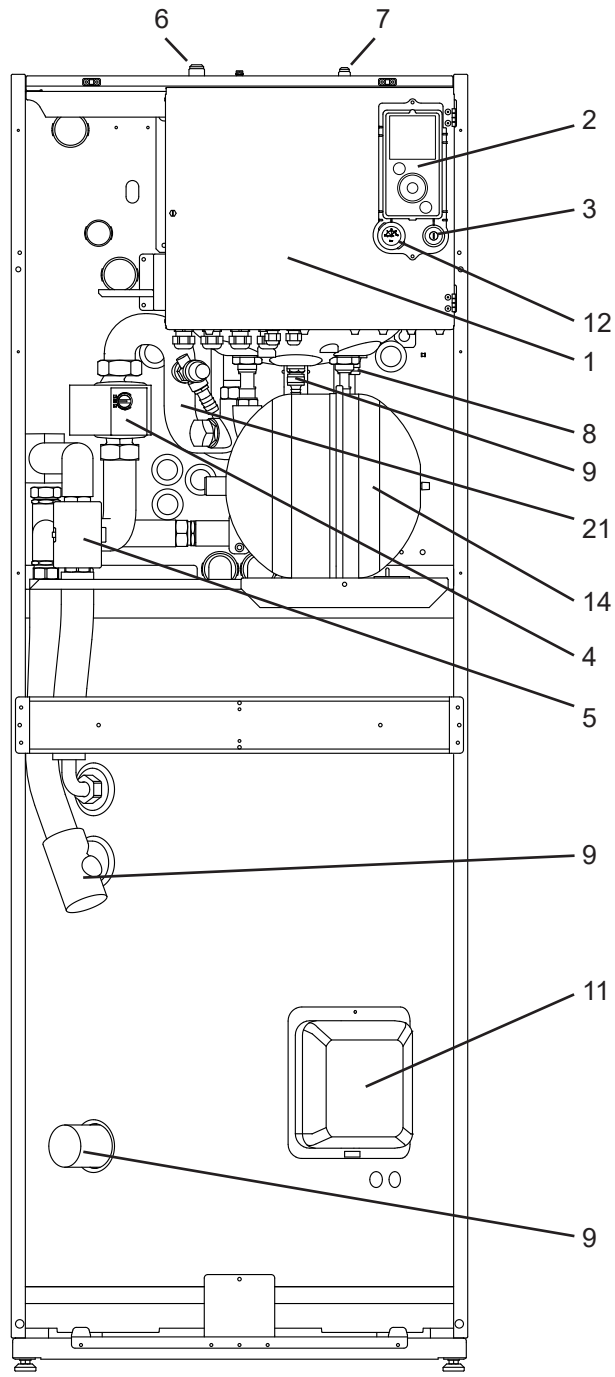
☞ **Alféa Extensa Duo A.I. 8**

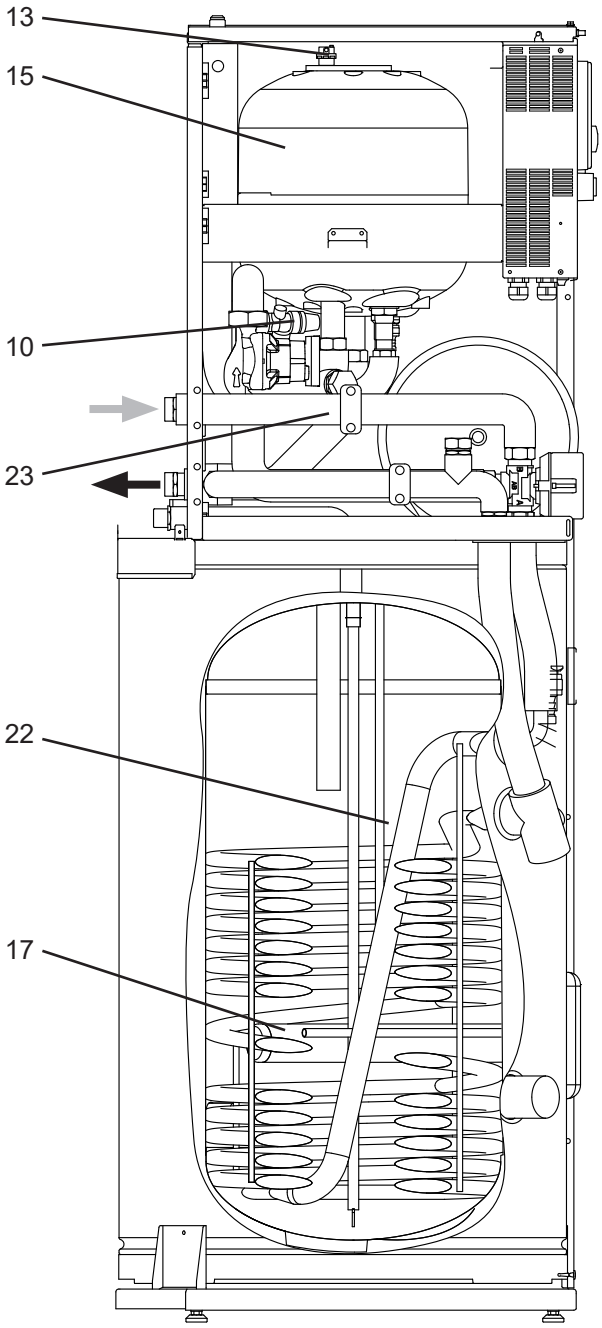


Key:

1 - High performance and low noise impeller.
2 - Electrical motor with variable "inverter" operation.
3 - "Inverter" control unit.
4 - Connection terminal blocks (power supply and interconnection).
5 - Refrigerant storage bottle.
6 - 4-way valve.
7 - Anti-corrosion treated bodywork.
8 - Main circuit electronic expansion valve.
9 - Noise and thermally insulated "inverter" compressor.
10 - Refrigeration connection valves (flared connectors) with protective caps.
11 - Holding tank with condensate drain hole.
12 - High-performance exchange surface evaporator; anti-corrosion treated hydrophilic aluminium fins and grooved copper tubes.

figure 8 - Outdoor unit components





Key:

1 - Electric control box.
2 - Controller / User interface.
3 - Start/stop switch.
4 - Hydraulic unit circulation pump.
5 - Distribution valve.
6 - "Gas" refrigeration connection.
7 - "Liquid" refrigeration connection.
8 - Condensation sensor.
9 - Drain valve.
10 - Safety valve.
11 - Safety thermostat.
12 - Pressure gauge.
13 - Manual bleeder valve.
14 - Expansion vessel.
15 - Condenser.
17 - DHW electrical backup.

Sensors:
21 - HP return sensor.
22 - DHW sensor.
23 - HP flow sensor.

figure 9 - Hydraulic unit components

1.6 Operating principle

The heat pump transmits the energy contained in the surrounding air into the dwelling to be heated and for production of domestic hot water.

The heat pump consists of four main parts, in which a refrigerant (R410A) circulates.

- In the evaporator (ref. **12**, figure 8, page 12): The calories are taken from the outside air and transmitted to the refrigerant. Because it has a low boiling point, it changes from a liquid to a vapour, even in cold weather (down to -20°C outside temperature).
- In the compressor (ref. **9**, figure 8, page 12): The vaporised refrigerant is pressurised and takes on even more calories.
- In the condenser (ref. **15**, figure 9): The energy of the refrigerant is transmitted to the heating circuit. The refrigerant returns to its liquid state.
- In the expansion valve (ref. **8**, figure 8, page 12): The liquefied refrigerant is returned to a low pressure and regains its initial temperature and pressure.

The heat pump is equipped with a controller which controls the room temperature based on the outdoor temperature measurement. The room thermostat (option) provides a corrective action for the temperature control.

The hydraulic unit is fitted with an electrical backup or boiler connection* which intervenes to provide additional heat during the coldest periods.

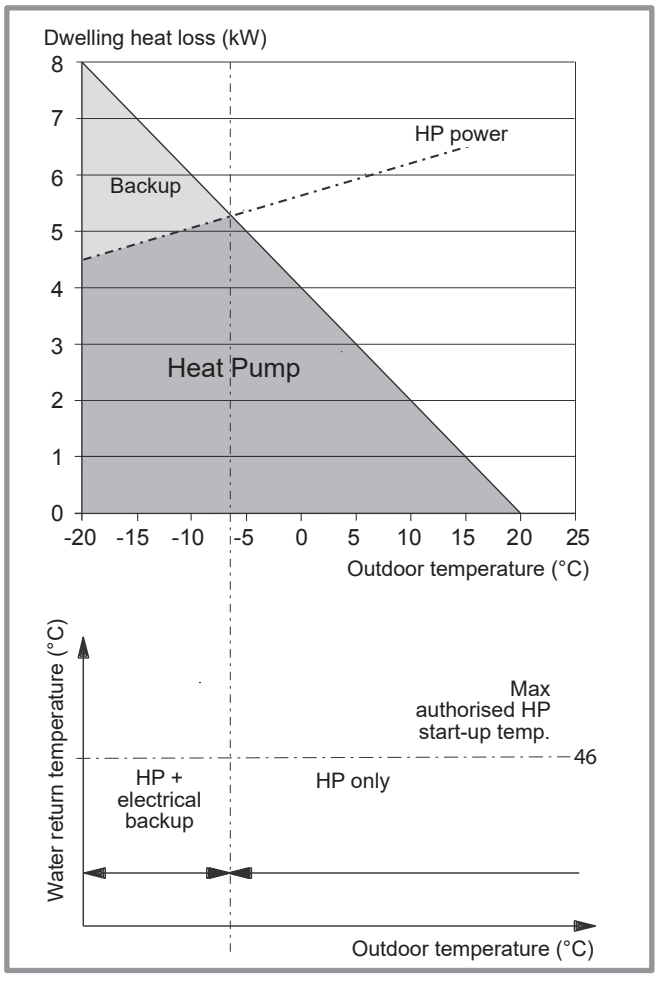


figure 10 - Examples and operating limits

• Control functions

- The heating circuit's flow temperature is controlled by the temperature control.
- Depending on the heating flow temperature, the outdoor unit's power is modulated by the "Inverter" compressor.
- Control of the backup electrical heating*.
- The daily timer program is used to set the periods where the ambient temperature is comfortable or reduced.
- Summer/winter time mode switchover is automatic.
- Management of the boiler backup*.
- Room sensor*: The room sensor provides a corrective action for the temperature control.
- Control of a second heating circuit*.
- Domestic hot water: Heating timer program, management of the DHW circulation pump.
- Managing cooling*.

* Where the heat pump is fitted with options and associated kits.

• Protective functions

- Anti-legionella cycle for domestic hot water.
- Anti-corrosion tank protection with titanium anode (ACI).
- Frost protection: Frost protection cuts in if the heating circuit's flow temperature falls below 5°C (provided that the heat pump's electrical power supply is not interrupted).

• Domestic hot water (DHW) operating principle

Two domestic hot water (DHW) temperatures can be set: comfort and reduced.

The default DHW program is set to the comfort temperature between 00:00 and 05:00 and between 14:30 and 17:00 and to the reduced temperature for the rest of the day. This optimises electrical consumption while ensuring comfortable water temperatures.

The reduced temperature setpoint may be useful to avoid restarting the DHW too often and for too long during the day.

The production of domestic hot water (DHW) is started when the temperature in the tank drops to 7°C below the temperature setpoint.

The heat pump produces the domestic hot water, which is then additionally heated, if required, by the tank's electrical backup or by the boiler. To ensure a DHW setpoint over 55°C, the electrical backup heating must be left on.

If the contract signed with the energy provider includes a day/night tariff, the electrical backup is subject to the supplier's power tariff and the comfort temperature may only be reached at night.

If no particular contract has been signed, the comfort temperature can be reached at any time, including during the day.

The production of DHW takes priority over heating; nevertheless the production of DHW is managed by cycles that regulate the amount of time assigned to heating and production of DHW in the event of simultaneous demand.

Anti-legionella cycles can be programmed.

• Fan convectors with integrated control system

Do not use a room sensor in the area in question.

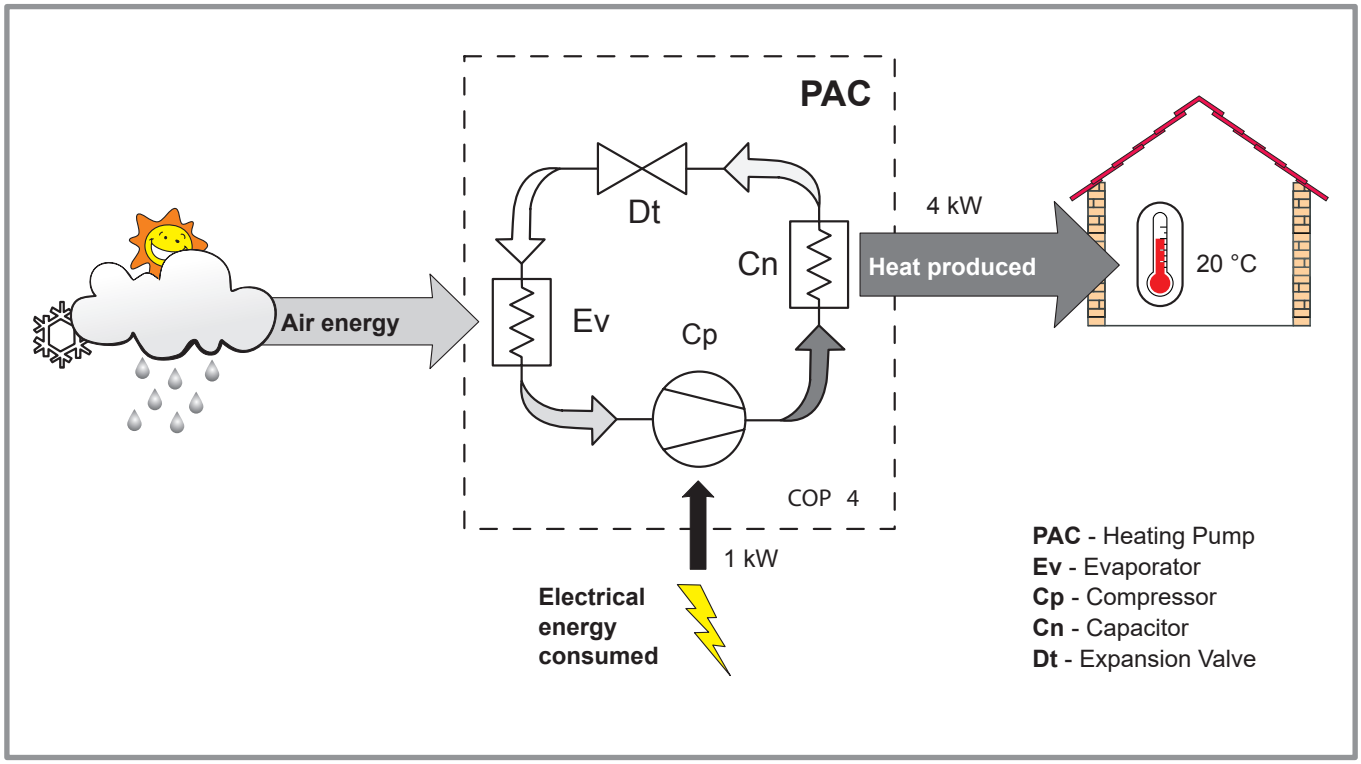


figure 11 - Heat pump operating principle

2 Installation

2.1 Installation of refrigeration connections

☞ ⚠ **Bend the pipes into position and make holes for them through the floor or walls either with their protective caps in place or after brazing.**

☞ **Keep the protective caps in place or ends brazed until the appliance is commissioned.**

The outdoor unit must be connected to the hydraulic unit **only with brand new separately insulated copper connections** (refrigerant quality).

Maintain the same pipe diameters (figure 19).

Observe the maximum and minimum distances between the hydraulic unit and the outdoor unit (figure 19, page 22); the guarantee of performance and the service lifespan of the system depend on this.

The minimum length of the refrigeration connections for correct operation is 5 m.

The appliance's warranty will be void if it is operated with refrigeration connections less than 5 m long (tolerance +/- 10%).

If the refrigeration connections are exposed to weathering or UV radiation and the insulation is not resistant, protection must be provided.

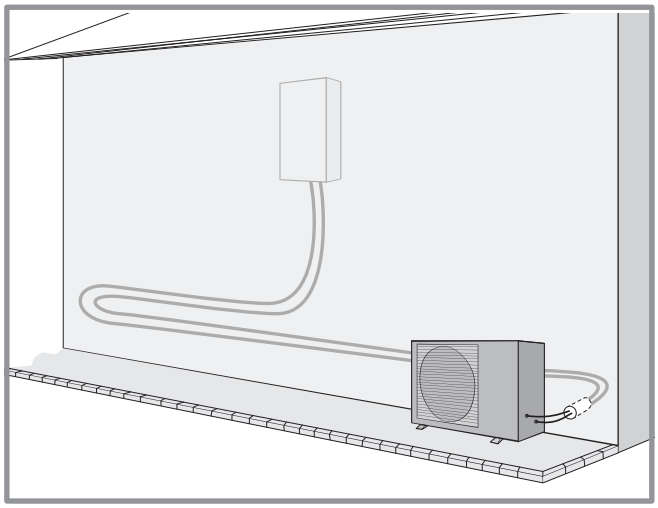


figure 12 - Example of recommendation for layout of refrigeration connections

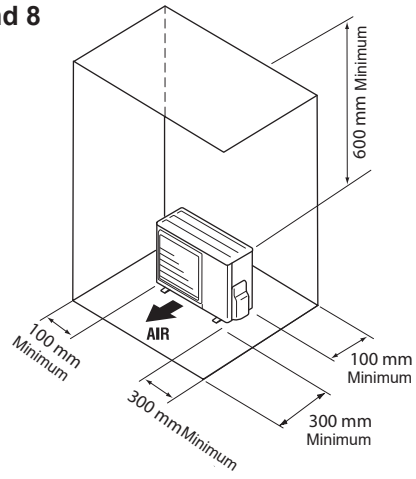
2.2 Installation of the outdoor unit

2.2.1 Installation precautions

☞ **The outdoor unit must only be installed outside. If a shelter is required, it must have broad openings on all 4 sides and installation clearances must be observed (figure 13).**

- Choose the location of the appliance after discussion with the client.
- We recommend choosing a site that is sunny but sheltered from strong cold prevailing winds.
- The unit must be easily accessible for future installation and maintenance work (figure 13).
- Ensure that connections to the hydraulic unit can be made easily.
- The outdoor unit is able to withstand bad weather but avoid installing it in a position where it is likely to be exposed to significant dirt or flowing water (e.g. under a broken gutter).
- Water may flow out of the outdoor unit when it is operating. Do not install the unit on a paved terrace; choose a well-drained location (e.g. gravel or sand). If installation is carried out in an area where the temperature stays below 0°C for long periods, check that the presence of ice does not present any danger. A drainage pipe can also be connected to the outdoor unit (figure 14).
- Nothing should obstruct the air circulation through the evaporator and out from the fan (figure 13).
- Keep the outdoor unit away from heat sources and flammable products.

☞ **Alféa Extensa Duo A.I. 5, 6 and 8**



☞ **Alféa Extensa Duo A.I. 10**

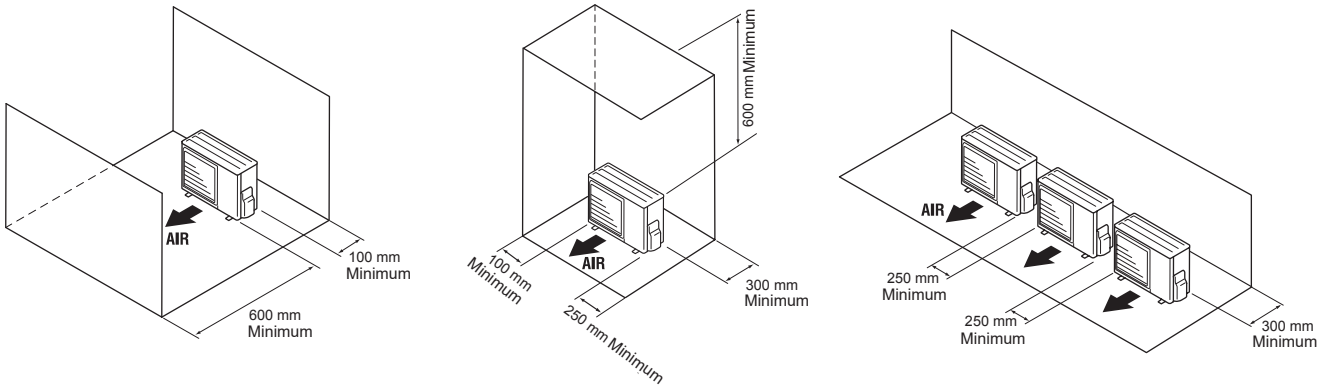


figure 13 - Minimum installation clearances around the outdoor unit

• Make sure that the unit does not disturb the surrounding area or inhabitants (noise level, draught, low temperature of the ejected air freezing the plants in its path).

• The surface on which the appliance is installed must:

- Be permeable (soil, gravel, etc.).
- Support its weight easily.
- Allow a solid fastening base,
- Not transmit any vibration to the dwelling. Anti-vibratory blocks are available as an option.

• The wall bracket cannot be used where it is likely to transmit vibrations. Installing the unit on the ground is preferred.

2.2.2 Positioning Outdoor Unit

The outdoor unit must be raised at least 50 mm above ground level. In areas prone to snow, this height should be increased but should not exceed 1.5 m (figure 14).

- Fasten the outdoor unit by means of screws and rubber tightening or toothed lock washers to prevent them from coming loose.

☞ **Warning**

In areas with heavy snowfall, if the intake and outlet of the outdoor unit is blocked with snow, heating may become difficult and a failure is likely to occur.

Construct a canopy or place the unit on a high stand (local configuration).

- Place the unit on a solid stand in order to minimise impacts and vibrations.
- Do not place the unit directly on the ground as this will cause problems.

2.2.3 Condensate drain pipe

(see figure 14)

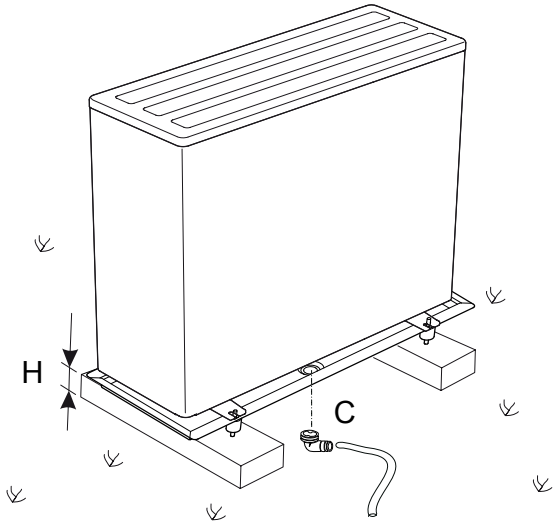
☞ **The outdoor unit can generate a large volume of water (called condensate).**

If the use of a drain pipe is necessary:

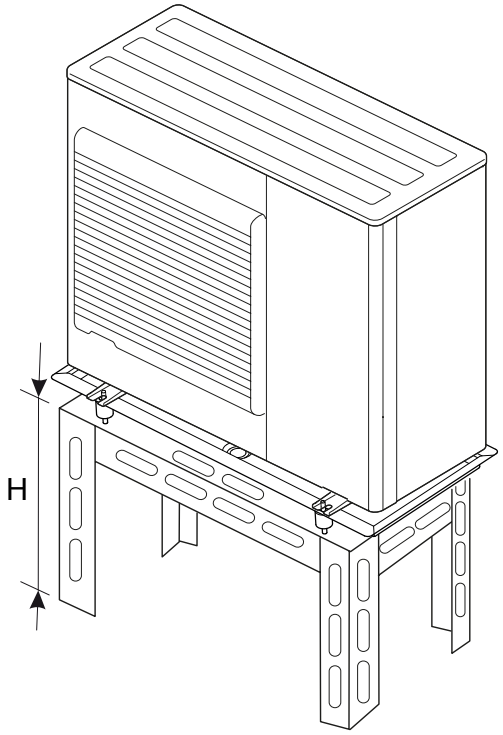
- Install the condensate drain pan (optional / code 074008) for Alféa Extensa Duo A.I. models 5, 6 and 8 only.
- Use the elbow provided (**C**) and connect a 16 mm-diameter hose for draining the condensate.
- Use the plug(s) provided (**B**) to block the opening of the condensate drain pan.

Allow for the condensate to flow away under the force of gravity (waste water, rain water, gravel bed).

☞ **If installation is carried out in an area where the temperature stays below 0°C for long periods, equip the drain pipe with trace heating to avoid it icing up. Trace heating must heat not only the drain pipe but also the bottom of the appliance's condensate collection tank.**



* In areas with heavy snowfall,
(H) must be higher than the average snow layer



☞ **Only Alféa Extensa Duo A.I. 10**

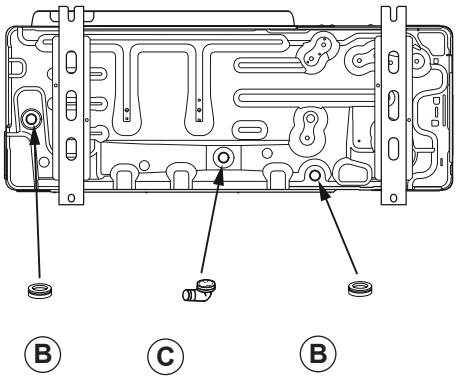


figure 14 - Installation of the outdoor unit evacuation of condensates

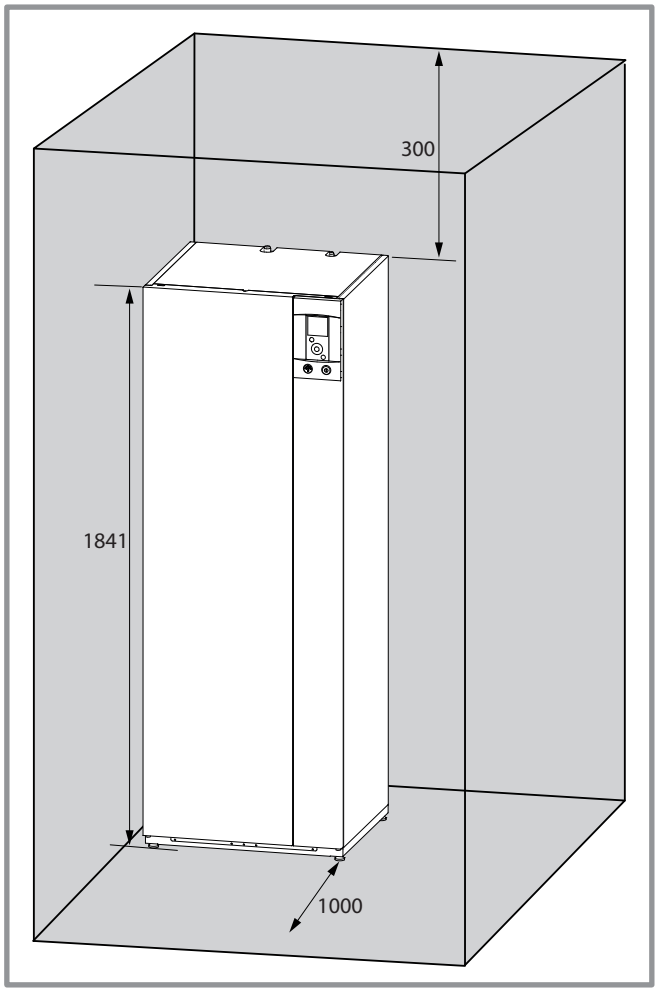


figure 15 - Minimum installation clearances around the hydraulic unit and distances away from fuel storage areas

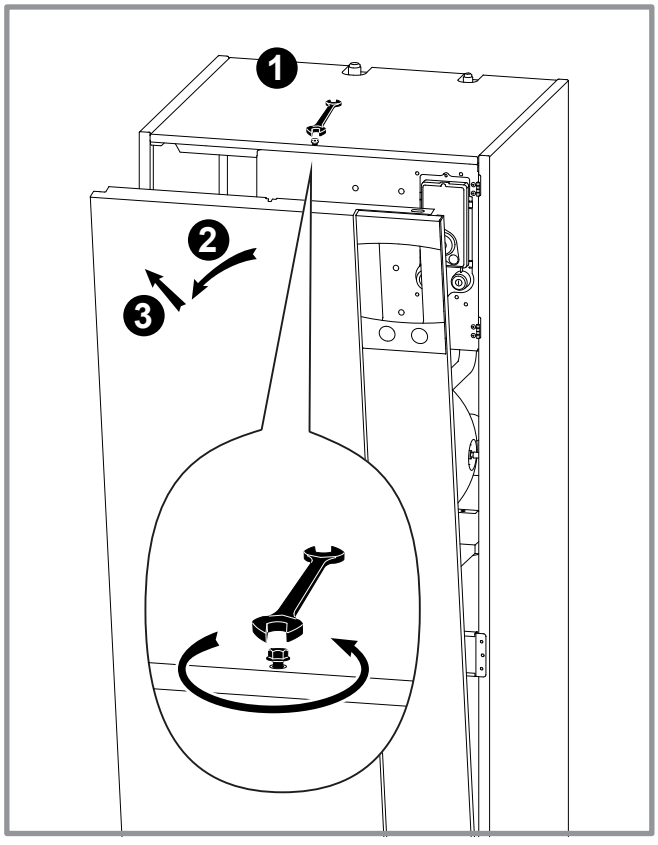


figure 16 - Open the front cover

2.3 Installation of the hydraulic unit

2.3.1 Installation precautions

- Choose the location of the appliance after discussion with the client.
- The installation space should comply with current regulations.
- To facilitate maintenance and to allow access to the various components, we recommend that you provide sufficient space all around the hydraulic unit (figure 15).
- In accordance with EN 378-1 -2017 standard (Refrigerating systems and heat pumps - Safety and environmental requirements), the system's hydraulic unit and all refrigeration connections passing through inhabited areas must comply with the minimum room volume requirements shown hereafter.

  The minimum volume of a room (in m^3) is calculated using the formula: "fluid fill load" (in kg) / 0.39.

  Alternatively, you must ensure that

- the location has natural ventilation through another room where the combined volume of the two rooms is greater than "liquid fill load" (in kg) / 0.39 kg/m^3. The opening between the two rooms must have a door clearance of at least 1 cm.
- or that the location is mechanically ventilated.
- Be careful not to bring flammable gas near the heat pump during installation, in particular when brazing is required. The appliances are not fireproof and should not therefore be installed in an explosive environment.
- To avoid condensation inside the condenser, remove the refrigeration circuit caps **only when making the refrigeration connections**.
- If the refrigeration connection is only performed at the end of the installation, make sure that the refrigeration circuit caps* remain in place and tight throughout the installation.
  * (Hydraulic unit side and outdoor unit side)
- After each maintenance operation on the refrigeration circuit and before the final connection, take care to put the caps back in position to avoid any pollution of the refrigeration circuit (sealing with adhesive is prohibited).

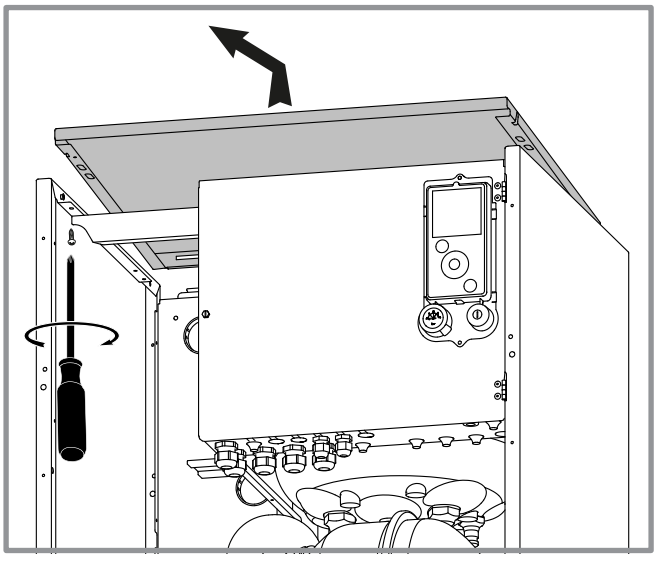


figure 17 - Removing the cover

3 Refrigeration connections and filling the installation with gas

☞ **This appliance uses refrigerant R410A.**

Comply with the legislation on handling of refrigerants.

3.1 Rules and precautions

☞ **Connections must be made on the same day the installation is filled with gas (see para. page 24).**

• Minimum tools required

- Set of pressure gauges (*Manifold*) with hoses exclusively designed for HFCs (Hydrofluorocarbons).
- Vacuum gauge with isolation valves.
- Vacuum pump specifically for HFCs (using a standard vacuum pump is allowed if, and only if, it is fitted with a non-return valve on the suction side).
- Flaring tool, Pipe-cutter, Deburring tool, Spanners.
- Certified refrigerant gas leak detector (sensitivity 5g/year).

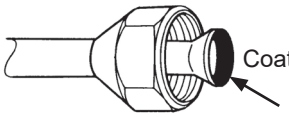
☞ **Using tools that have been in contact with HCFCs (R22 for example) or CFCs is prohibited.**

☞ **The manufacturer declines any liability with regard to the warranty if the above instructions are not observed.**

• Flared connections

☞ **Lubricating with mineral oil (for R12, R22) is prohibited.**

- Lubricate only with polyolester oil (POE). If POE is not available, fit without lubrication.



Coat the flared surface with **POE refrigeration oil**.
Do not use mineral oil.

• Brazing the refrigeration circuit (if necessary)

- Silver brazing (40% minimum recommended).
- Brazing only with dry nitrogen internal flux.

• Other remarks

- After each maintenance operation on the refrigeration circuit and before final connection, take care to put the caps back in position to avoid any pollution of the refrigeration circuit.
- To eliminate any filings getting into the pipes, use dry nitrogen to avoid introducing any humidity that may adversely affect the appliance's operation. In general, take every precaution to avoid humidity penetrating into the appliance.
- Proceed with thermal insulation of the gas and liquid pipes to avoid any condensation. Use pipe insulators resistant to temperatures over 90°C. In addition, if the humidity level in areas where the refrigerant pipes are installed is expected to exceed 70%, protect the pipes with pipe insulators. Use an insulating material thicker than 15mm if the humidity level reaches 80%, and an insulating material thicker than 20mm if the humidity exceeds 80%. If the recommended thicknesses are not observed under the conditions described above, condensation will form on the surface of the insulation material. Lastly, use insulating sleeves whose thermal conductivity will be less than or equal to 0.045 W/mK if the temperature is equal to 20°C. The insulation must be impermeable in order to withstand the passage of vapour during the defrosting cycles (glass wool is prohibited).

3.2 Shaping the refrigeration pipes

3.2.1 Bending

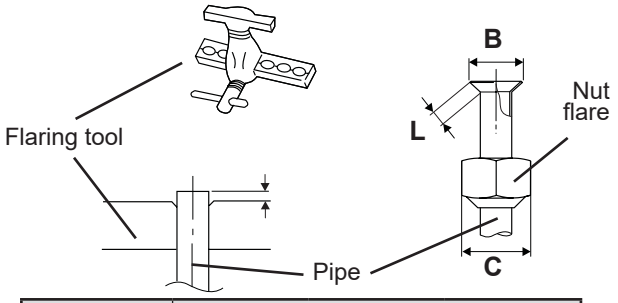
The refrigeration pipes must be shaped only on a bending machine or with a bending spring in order to avoid any risk of crushing or breaking them.

☞ **Warning!**

- Remove the insulation material from the section of pipe to be bent.
- Do not bend copper to an angle greater than 90°.
- Never bend pipes more than 3 times in the same place otherwise traces of fracturing may appear (hardening of the metal).

3.2.2 Creating the flarings

- Cut the pipe to an appropriate length with a pipe-cutter without damaging it.
- Carefully deburr it, holding the pipe pointing downward to avoid introducing filings into the pipe.
- Remove the flared connection nut situated on the valve to be connected and slide the pipe into the nut.
- Proceed to flare it, letting the pipe protrude out of the flaring tool's tube.
- After flaring, check the state of the working radius (**L**). This must not present any scratches or signs of fracturing. Also check the dimension (**B**).



Pipe ø	Dimensions in mm		
	L	B $^{0}/_{-0.4}$	C
6.35 (1/4")	1.8 to 2	9.1	17
9.52 (3/8")	2.5 to 2.7	13.2	22
12.7 (1/2")	2.6 to 2.9	16.6	26
15.88 (5/8")	2.9 to 3.1	19.7	29

figure 18 - Flaring of the flared connections

HP model		Alféa Extensa Duo A.I. 5, 6		Alféa Extensa Duo A.I. 8		Alféa Extensa Duo A.I. 10	
		gas	liquid	gas	liquid	gas	liquid
Outside unit connections		1/2"	1/4"	5/8"	1/4"	5/8"	3/8"
Refrigeration connections	Diameter:	(D1) 1/2"	(D2) 1/4"	(D1) 5/8"	(D2) 1/4"	(D1) 5/8"	(D2) 3/8"
	Minimum length (L)	5		5		5	
	Maximum length** (L)	30		30		30	
	Maximum Height Difference** (D)	20		20		20	
Male-female adapter (reduction)		(R1) 1/2" - 5/8"	(R2) 1/4" - 3/8"	without	(R2) 1/4" - 3/8"	without	
Hydraulic unit connections		5/8"	3/8"	5/8"	3/8"	5/8"	3/8"

**: Including any additional filling (see "Additional filling", page 27).

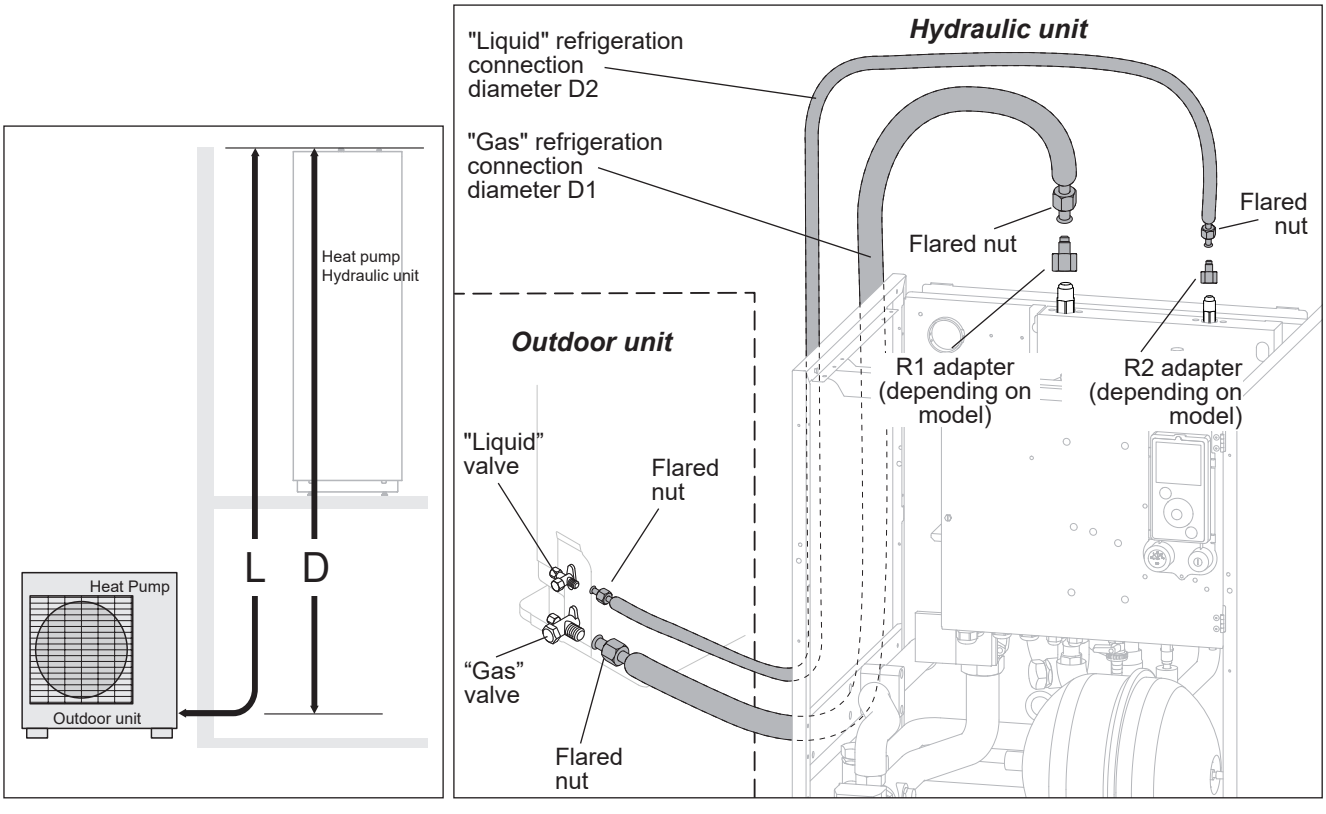


figure 19 - Refrigeration connections (authorised diameters and lengths)

3.3 Checks and connection

☞ **The refrigeration circuit is very sensitive to dust and humidity: check that the area around the connection is clean and dry before removing the plugs protecting the refrigeration connectors.**

☞ **<u>Indicated blowing value</u>: 6 bar for minimum 30 seconds for connection of 20 m.**

<u>Checking the gas connection (large diameter).</u>

① Connect the gas connection to the outdoor unit. Blow dry nitrogen into the gas connection and inspect its end:

- If water or impurities emerge, use a brand new refrigeration connection.

② Otherwise, proceed with flaring and connect the refrigeration connection to the outdoor unit immediately.

<u>Checking the liquid connection (small diameter).</u>

③ Connect the liquid connection to the hydraulic unit. Blow nitrogen into the **gas-condenser-liquid connection** system and inspect its end (outdoor unit side).

- If water or impurities emerge, use a brand new refrigeration connection.
- Otherwise, proceed with flaring and connect the refrigeration connection to the outdoor unit immediately.

☞ **Take particular care to position the tube opposite its connector so as not to risk damaging the threads. A properly aligned connector can be attached easily by hand without much force being required.**

- Where necessary, connect an adapter (reducer) 1/4"- 3/8" or 1/2"- 5/8" (see figure 19).
- Remove the plugs from the pipes and the refrigeration connections.
- Comply with the indicated tightening torques.

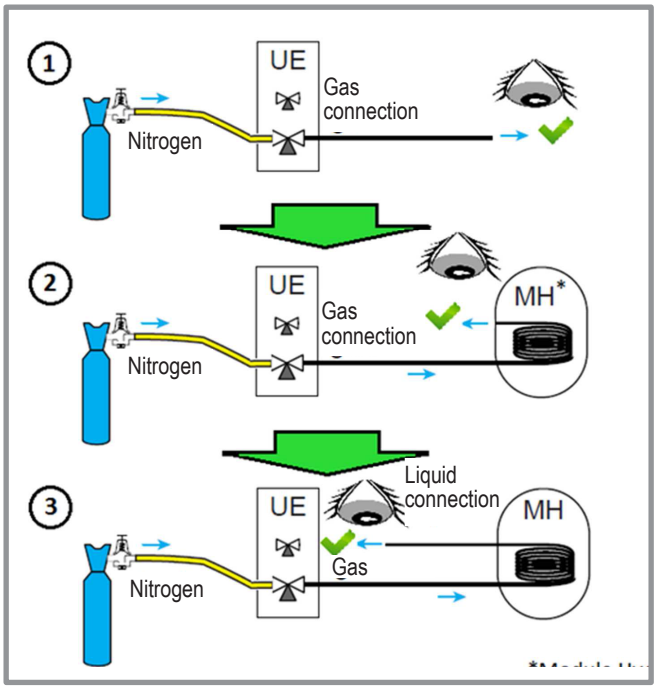
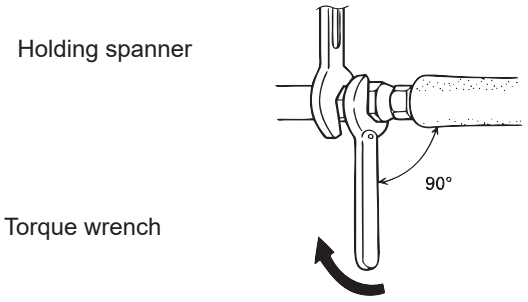


figure 21 - Checking refrigeration connections



Designation	*Tightening torque*
Flare 6.35 mm (1/4")	14 to 18 Nm
Flared nut 9.52 mm (3/8")	33 to 42 Nm
Flared nut 12.7 mm (1/2")	50 to 62 Nm
Flared nut 15.88 mm (5/8")	63 to 77 Nm
Plug (A) 3/8", 1/4"	20 to 25 Nm
Plug (A) 1/2"	25 to 30 Nm
Plug (A) 5/8"	30 to 35 Nm
Plug (B) 3/8", 5/8"	10 to 12 Nm
Plug (B) 1/2", 1/4"	12.5 to 16 Nm

Plug (A) and (B) : see figure 22, page 25.

figure 20 - Tightening torques

3.4 Filling the installation with gas

- ☞ **This operation is reserved for installers familiar with the legislation for handling refrigerants.**
- ☞ **Creating a vacuum with a calibrated vacuum pump is essential (see APPENDIX 1).**
- ☞ **Never use equipment used previously with any refrigerant other than a HFC.**
- ☞ **Only remove the refrigeration circuit caps when performing the refrigeration connections.**

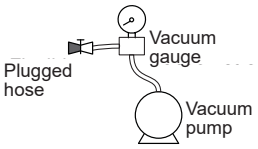
☞ **If the outdoor temperature is below +10°C:**

- You must use the triple evacuation method (see APPENDIX 2).
- We recommend installing a dehydrator filter (and this is highly recommended if the outdoor temperature is below +5°C).

APPENDIX 1

Method for calibrating and checking a vacuum pump

- Check the vacuum pump's oil level.
- Connect the vacuum pump to the vacuum gauge as shown in the diagram.



- Pump down for 3 minutes.
- After 3 minutes, the pump reaches its threshold vacuum limit and the vacuum gauge's needle stops moving.
- Compare the obtained pressure value against the table of values. Depending on the temperature, this pressure should be lower than that shown in the table.

  => If this is not the case, replace the gasket, hose or pump.

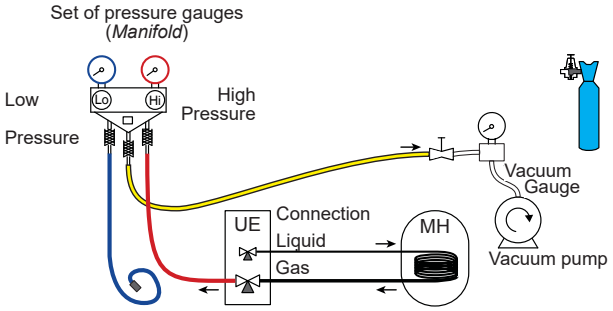
T °C	5°C<T<10°C	10°C<T<15°C	15°C < T
Pmax - bar - mbar	0.009 9	0.015 15	0.020 20

APPENDIX 2

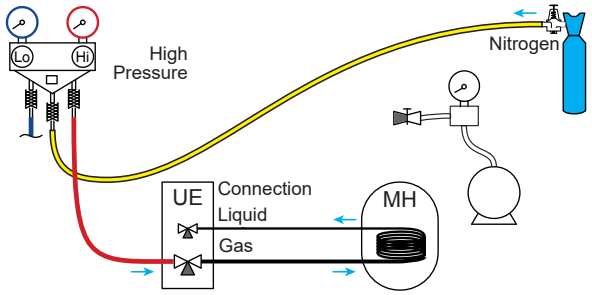
Triple Evacuation Method

- Connect the *Manifold* high-pressure hose to the filling hole (gas connection). A valve must be fitted to the vacuum pump's hose so you can shut it off.

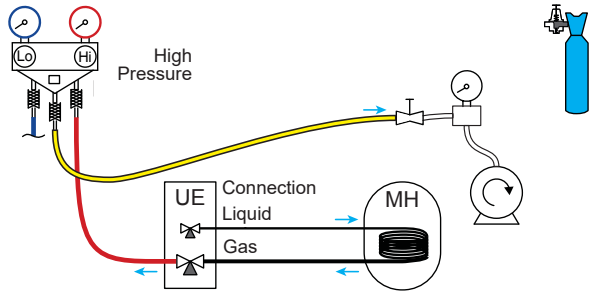
a) Create a vacuum until the desired value is reached and maintain this value for 30 mins (see table in APPENDIX 1),



b) Switch off the vacuum pump, close the valve at the end of the service hose (yellow), connect this hose to the expansion valve on the nitrogen bottle, fill to 2 bar, close the hose's valve again,



c) Connect this hose to the vacuum pump again, switch it on and slowly open the hose's valve.

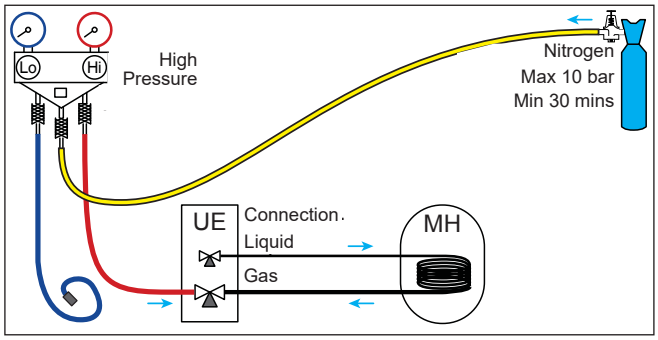


d) Repeat this operation at least three times.

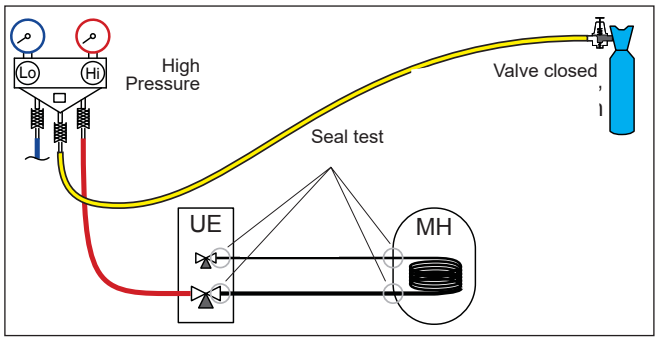
☞ **<u>Remember</u>: performing these operations using refrigerant is strictly prohibited.**

3.4.1 Seal test

- Remove the protective plug (**B**) from the filling hole (*Schrader*) in the gas valve (large diameter).
- Connect the high pressure hose from the *Manifold* to the filling hole (figure 22).
- Connect the nitrogen bottle to the *Manifold* (only use dehydrated nitrogen type U).
- Fill the refrigeration circuit with nitrogen to maximum 10 bar (**gas-condenser-liquid connection** system).
- Maintain this pressure in the circuit for 30 minutes.



- If a pressure drop occurs, bring it back down to 1 bar and look for leaks with a leak detector, repair and repeat the test.



- Once the pressure is steady and there are no leaks, empty the nitrogen by leaving the pressure above atmospheric pressure (between 0.2 and 0.4 bar).

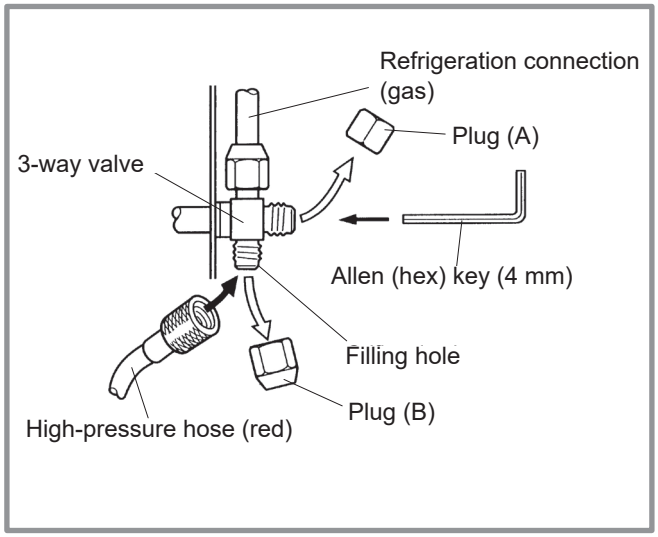
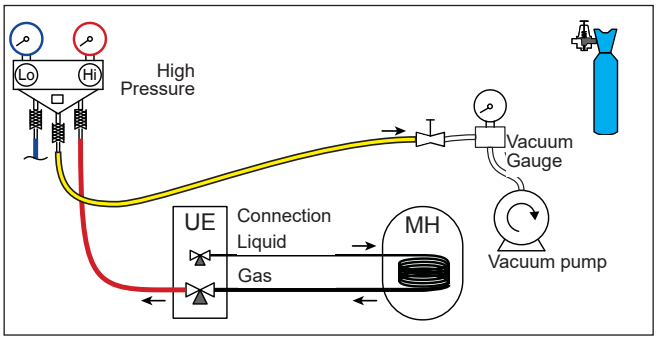


figure 22 - Connecting the hose to the gas valve

3.4.2 Creating a vacuum

⚠ The triple evacuation method (APPENDIX 2) is strongly recommended for any installation and especially when the outdoor temperature is below 10°C.

- If necessary, calibrate the manometers(s) of the *Manifold* to 0 bar. Adjust the vacuum gauge to the atmospheric pressure (≈ 1013 mbar).
- Connect the vacuum pump to the *Manifold*. Connect a vacuum gauge if the vacuum pump is not equipped with one.



- Create a vacuum until the residual pressure* in the circuit falls below the value given in the following table (* measured with the vacuum gauge).

T °C	5°C<T<10°C	10°C<T<15°C	15°C < T
Pmax			
- bar	0.009	0.015	0.020
- mbar	9	15	20

- Let the pump continue to operate for another 30 minutes minimum after reaching the vacuum.
- Close the *Manifold* valve, then stop the vacuum pump without disconnecting any of the hoses in place

3.4.3 Filling with gas

⚠ If additional filling is required, do it before filling the hydraulic unit with gas. Refer to paragraph "Additional filling", page 27.

- Remove the access plugs (**A**) from the valve controls.
- First of all fully open the liquid valve (small) and then the gas valve (large) using an Allen (hex) key (anti-clockwise direction) without using excessive force against the stop.
- Quickly disconnect the hose from the *Manifold*.
- Refit the 2 original caps (be sure they are clean) and tighten them to the recommended tightening torque indicated in the table figure 20, page 23. A seal is achieved in the caps only with metal to metal.

The outdoor unit does not contain any additional refrigerant allowing the installation to be bled.

Bleeding by flushing is strictly forbidden.

3.4.4 Final sealing test

The sealing test must be carried out with a certified gas detector (sensitivity of 5g/year).

Once the refrigeration circuit has been gassed as described above, check that all the refrigeration connectors are gas-tight (4 connectors). If the flarings have been made correctly, there should be no leaks. If necessary, check the seal of the refrigeration valve caps.

☞ **If the event of a leak:**

- Return the gas to the outdoor unit (pump down). The pressure should not drop below atmospheric pressure (0 relative bar read on the *Manifold*) so as not to contaminate the recovered gas with air or moisture.
- Redo the connection,
- Restart the commissioning procedure.

3.4.5 Additional filling

The amount needed to fill the outdoor units corresponds to the maximum distances between the outdoor unit and the hydraulic unit as defined here page 22. If the distances are greater, an additional amount of R410A is required. For each type of appliance, this additional amount depends on the distance between the outdoor unit and the hydraulic unit. Any additional filling with R410A must be carried out by an approved specialist.

Alféa Extensa Duo A.I. 5, 6, 8 *(Outdoor unit WOYA060LFCA, WOYA080LFCA)*
15m < Length of the connections ≤ 30m
(Length of the connections - 15 m) x 25 g/m = g

Model / Factory fill	Length of the connections in m	16	17	X	29	30
Alféa Extensa Duo A.I. 5, 6 / 1100 g	Fill amount in g	1125	1150	1100 + (X - 15) x 25 = g	1450	1475
Alféa Extensa Duo A.I. 8 / 1400 g		1425	1450	1400 + (X - 15) x 25 = g	1750	1775

Alféa Extensa Duo A.I. 10 *(Outdoor unit WOYA100LFTA)*
15m < Length of the connections ≤ 30m
(Length of the connections - 15 m) x 40 g/m = g

Model / Factory fill	Length of the connections in m	16	17	X	29	30
Alféa Extensa Duo A.I. 10 / 1800 g	Fill amount in g	1840	1880	1800 + (X - 15) x 40 = g	2360	2400

Filling must be carried out after creating a vacuum and before gassing the hydraulic unit, as follows:

- Disconnect the vacuum pump (yellow hose) and connect a bottle of R410A in its place **in the fluid extraction position.**
- Open the bottle's valve.
- Bleed the yellow hose by loosening it slightly on the *Manifold* side.
- Place the bottle on scales with a minimum accuracy of 10g. Note the weight.
- Carefully open the blue valve slightly and check the value shown on the scales.
- As soon as the value displayed has dropped by the value for the calculated additional fill amount, close the bottle and disconnect it.
- Quickly disconnect the hose connected to the appliance.
- Proceed to fill the hydraulic unit with gas.

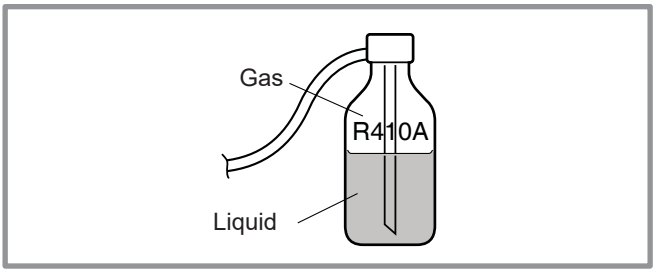


figure 23 - Gas bottle R410A

☞ **Warning!**

- Only use R410A!
- Only use tools suitable for R410A (set of pressure gauges).
- Always fill in the liquid phase.
- Never exceed the maximum length or difference in level.

3.4.6 Recovering the refrigerant in the outdoor unit

> ☞ **Before performing any maintenance, make sure that all power supplies have been cut off.**
>
> ☞ ⚠ **Stored energy: after cutting off the power supplies, wait for 1 minute before accessing the internal parts of the equipment.**

Perform the following procedures to collect the refrigerant.

- **1**- Switch the start/stop switch to the 0 position (mark **3**, figure 9, page 13). Disconnect the outdoor unit's power supply.
- **2**- Remove the front panel. Open the power control box. Then turn **ON** the **DIP SW1** on the interface board,
- **3**- Reconnect the power supply. Switch the start/stop switch to position 1. (The green and red LEDs start flashing; 1s on / 1s off). The outdoor unit begins cooling operation about 3 minutes after being switched on.
- **4**- The circulation pump starts.
- **5**- Close the liquid valve on the outdoor unit **maximum** 30 secs after the outdoor unit starts.
- **6**- Close the gas valve on the outdoor unit when the pressure is below 0.02 relative bar read on the *Manifold*, or 1-2 minutes after the liquid valve has been closed, while the outdoor unit continues to operate.
- **7**- Disconnect the power supply.
- **8**- Recovery of the refrigerant is complete.

Notes:

- The pump down operation cannot be activated even if **DIP SW1** is set to **ON** while the heat pump is in operation.
- Do not forget to switch **DIP SW1** back to **OFF** after the pump down operation has been completed.
- Select the heating mode.
- If the pump down operation fails, try the operation again by turning the machine off and opening the "liquid" and "gas" valves. Then after 2-3 minutes, restart the pump down operation.

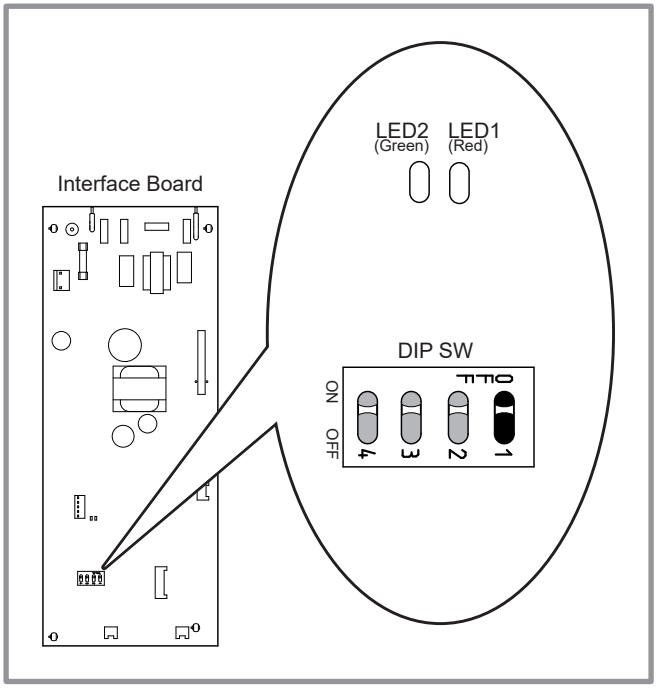


figure 24 - Location of DIP switches and LEDs on the hydraulic unit interface board

4 Hydraulic connections

4.1 Connecting the hydraulic unit to the heating circuit

4.1.1 Flushing the installation

Before connecting the hydraulic unit to the installation, **rinse out the heating system correctly** to eliminate any particles that may affect the appliance's correct operation.

Do not use solvents or aromatic hydrocarbons (petrol, paraffin, etc.).

In the case of an old installation, provide a sufficiently large decanting pot with a drain on the return from the boiler and at the lowest point in the system in order to collect and remove any impurities.

Add an alkaline product and a dispersant to the water.

Flush the installation several times before proceeding to the final filling.

4.1.2 Connections

The heating circulation pump is built into the hydraulic unit.

Connect the central heating pipes to the hydraulic unit correctly according to the direction of circulation.

The pipe between the hydraulic unit and the heat collector must be at least one inch in diameter (26x34 mm).

Calculate the diameter of the pipes based on flow rates and lengths of the hydraulic systems.

Tightening torque: 15 to 35 Nm.

Use union connectors to make it easier to remove the hydraulic unit.

Try to use connection hoses to avoid transmitting noise and vibrations to the building.

Connect the drains from the drain valve and the safety valve to the main sewer system.

Verify that the expansion system is correctly connected. Check the expansion vessel pressure (pre-inflated to 1 bar) and the safety valve is calibrated.

The flow rate of the installation must be at least equal to the minimum value mentioned in the specifications table (section 1.4, page 7). The installation of a regulator (other than those included in our configurations) which reduces or stops the flow through the hydraulic unit is prohibited.

4.1.3 Volume of the heating system

You must maintain the minimum installation water volume. Install a buffer tank on the return from the heating circuit in case the volume is lower than this value. Where the system is fitted with one or more thermostatic valves, you must ensure that this minimum water volume is able to circulate.

Heat Pump	Min. volume in litres PER CIRCUIT (excl. HP)		
	Mandatory Fan-coil	**Recommendation** Radiators	**Recommendation** Heating-cooling floor
Alféa Extensa Duo A.I. 5	23	12	2
Alféa Extensa Duo A.I. 6	23	12	2
Alféa Extensa Duo A.I. 8	36	33	15
Alféa Extensa Duo A.I. 10	49	44	22

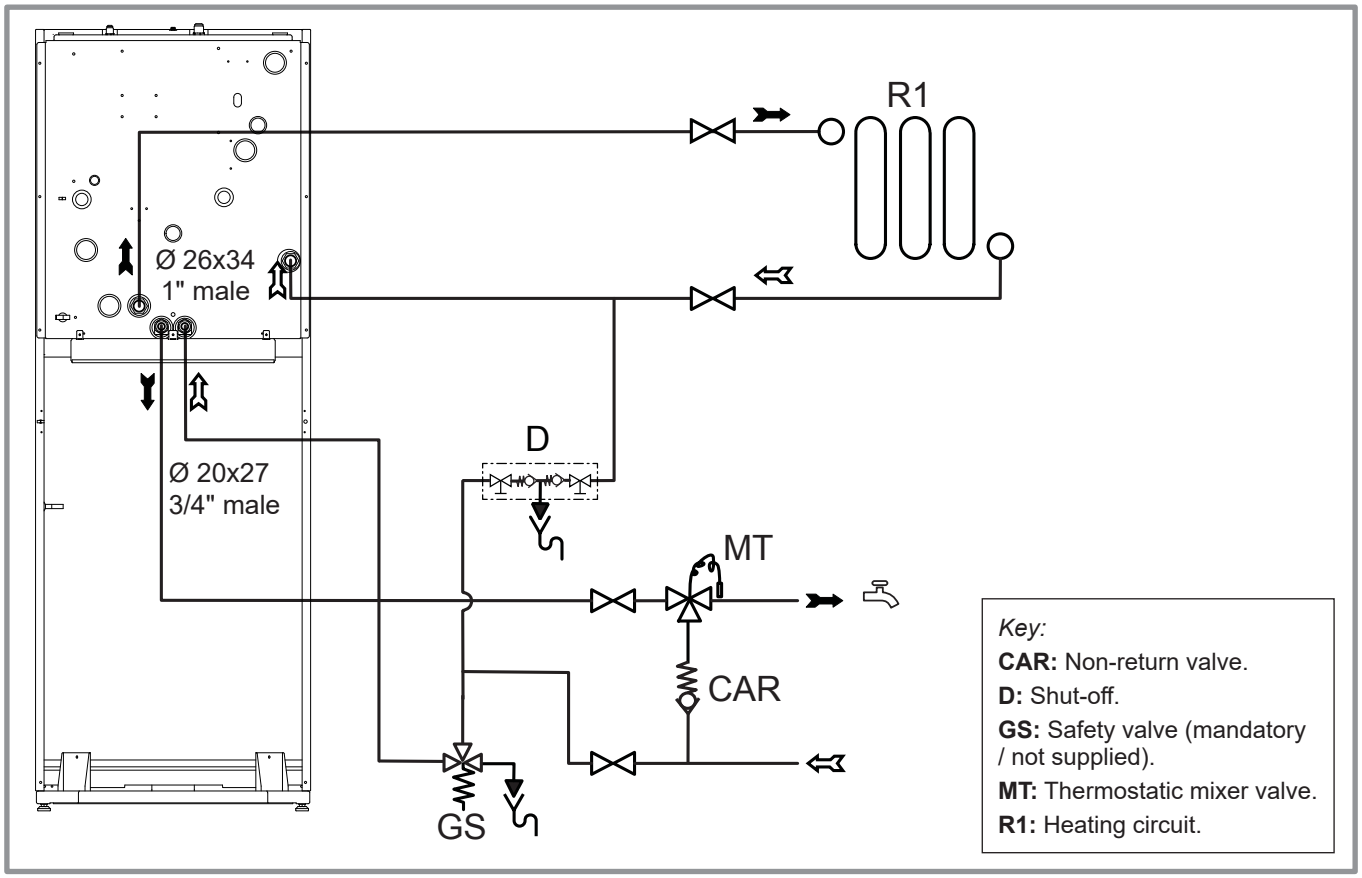


figure 25 - Basic Hydraulic Layout

4.2 Connecting to the DHW circuit

Attach dielectric connections and DHW pipes to the tank (see figure 26). Insulate the pipes with the insulation provided.

☞ **Be sure to place the DHW sensor back in the bottom of the tank thermowell.**

Mandatory: On the cold water inlet, place a safety valve calibrated to between 7 and 10 bar max. (depending on local regulations) and connected to a drain pipe leading to the sewer. Operate the safety valve according to manufacturer's specifications. The domestic hot water tank must be fed with cold water passing through a safety valve. There must be no other valves between the safety valve and the tank.

Connect the safety valve to the sewer.

We recommend installing a thermostatic mixing valve on the hot water outlet.

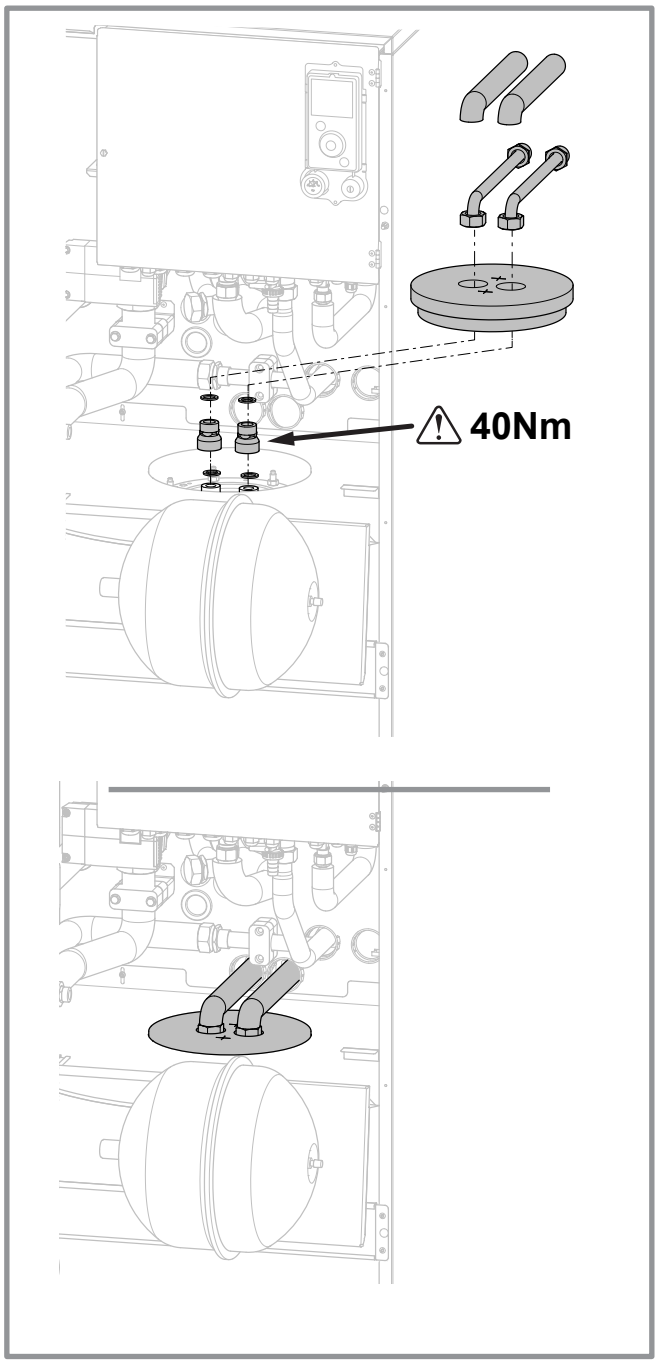


figure 26 - Attaching DHW pipe connections

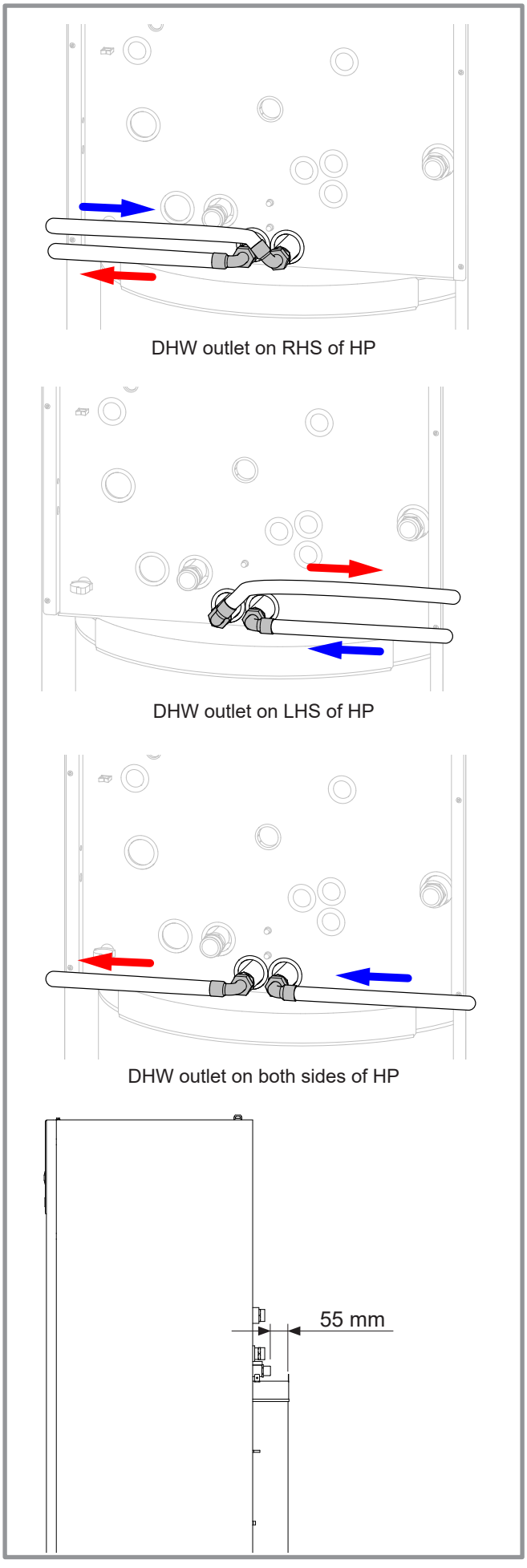


figure 27 - DHW circuit outlets

4.3 Filling and bleeding the installation

Check the pipe fixings, tightness of the connectors and the stability of the hydraulic unit.

Check the direction in which the water is circulating and that all the valves are open.

Proceed to fill the installation.

Do not operate the circulation pump during filling. Open all the drain valves in the installation and the bleeder valve on the hydraulic unit (**P**) to expel the air contained in the pipes.

Close the drain valves and add water until the pressure in the hydraulic circuit reaches 1 bar.

Check that the hydraulic circuit has been bled correctly.

Check there are no leaks.

After the "Commissioning", page 42 stage, and once the machine has started, bleed the hydraulic unit again (2 litres of water).

☞ **Precise filling pressure is determined by the water pressure in the installation.**

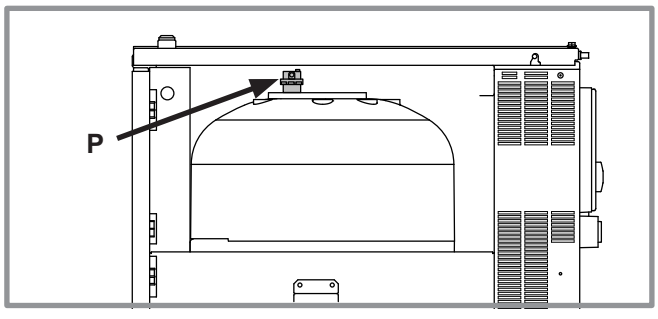
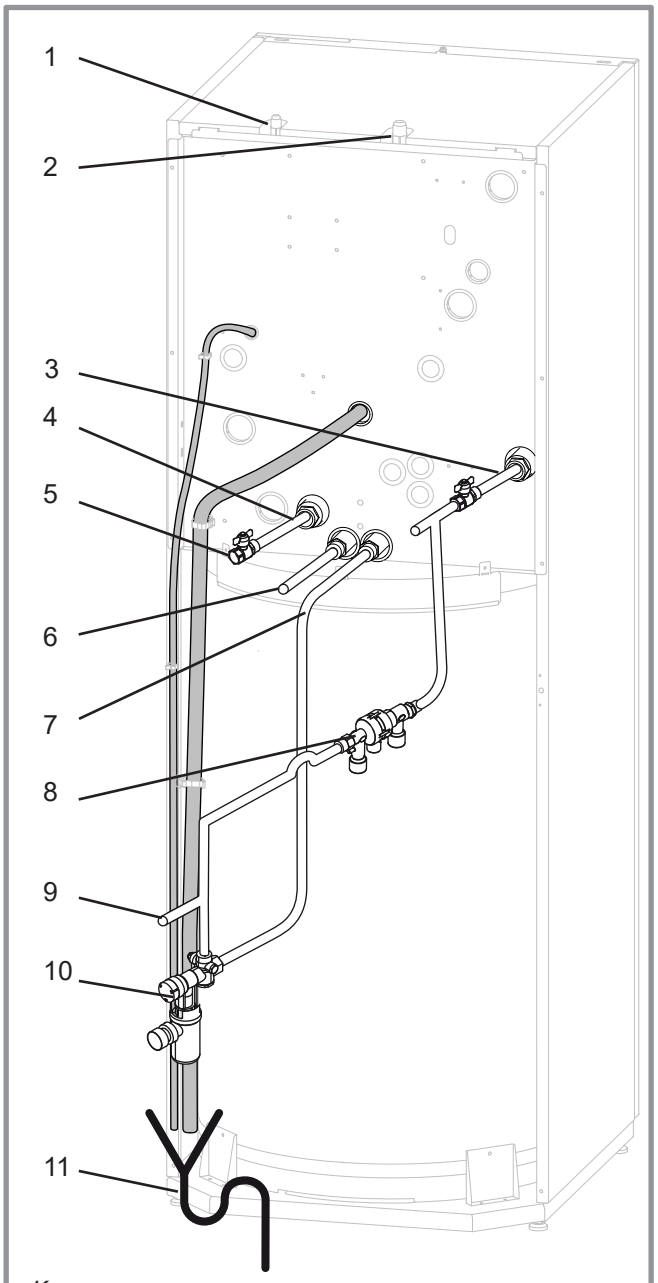


figure 29 - Hydraulic unit manual bleeder valve

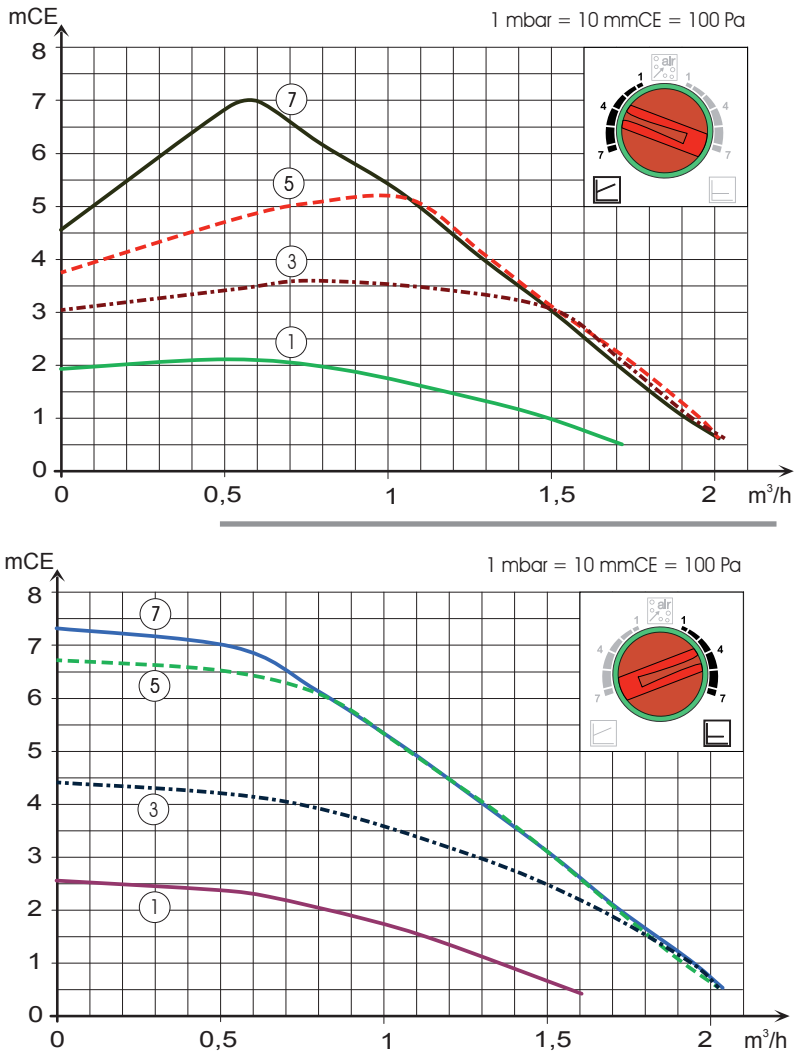


Key:

1. "Liquid" refrigeration connection.
2. "Gas" refrigeration connection.
3. Heating return (1 circuit).
4. Heating flow (1 circuit).
5. Stop valve (not provided).
6. DHW outlet (domestic hot water).
7. DCW inlet (domestic cold water).
8. Shut-off (not provided).
9. Filling.
10. Safety valve (mandatory / not supplied).
11. Connections to sewer with siphon (safety valve).

figure 28 - Connections

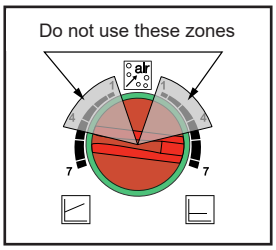
4.4 Heating circulation pump speed settings



Variable pressure

The circulation pump varies the water pressure depending on the flow rate.

Recommended for an installation fitted with **radiators** (particularly any system with thermostatic valves or zone solenoids).



Constant pressure

The circulation pump maintains a constant water pressure whatever the flow rate.

Recommended for an installation with constant pressure drops such as **an underfloor heating system**.

figure 30 - Available hydraulic pressures and flow rates

	OFF	LED Off: The circulation pump is not working, no power supply.
	✓	Green LED On: The circulation pump is operating normally.
	air **10 min.**	Green LED flashing: Venting mode in operation (10 minutes).
	Auto Test	Red/green LED flashing: Operating error with automatic restart.
		Red LED flashing: Operating error.

figure 31 - Operating signals of the HP circulation pump

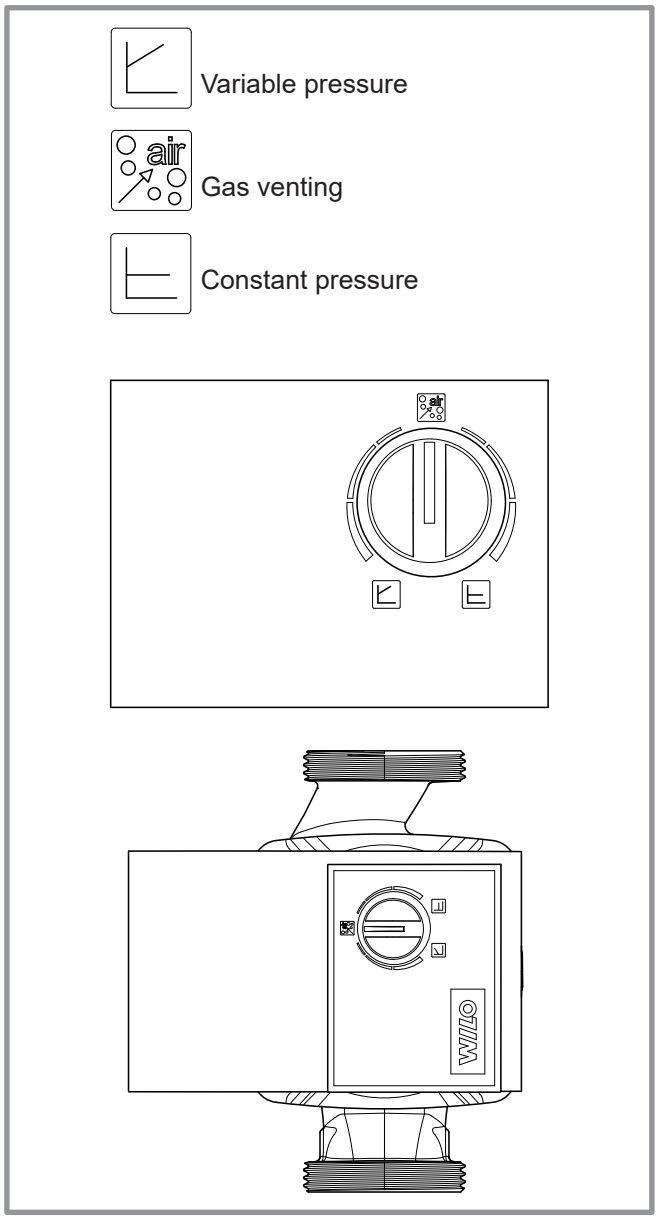


figure 32 - Circulation pump control button

Circulation pump fouled or stuck:

If the motor becomes stuck, a start-up cycle is launched.

If the motor remains stuck, it will be permanently stopped.

☞ **Cut off the power supply to the circulation pump for 30 secs in order to free it and allow a new start-up cycle to begin.**

5 Electrical connections

☞ **Before any maintenance operation, ensure that the general power supply is switched off.**

☞ **Electrical installation must be performed in accordance with current regulations.**

The electrical diagram for the hydraulic unit is shown on figure 48, page 73.

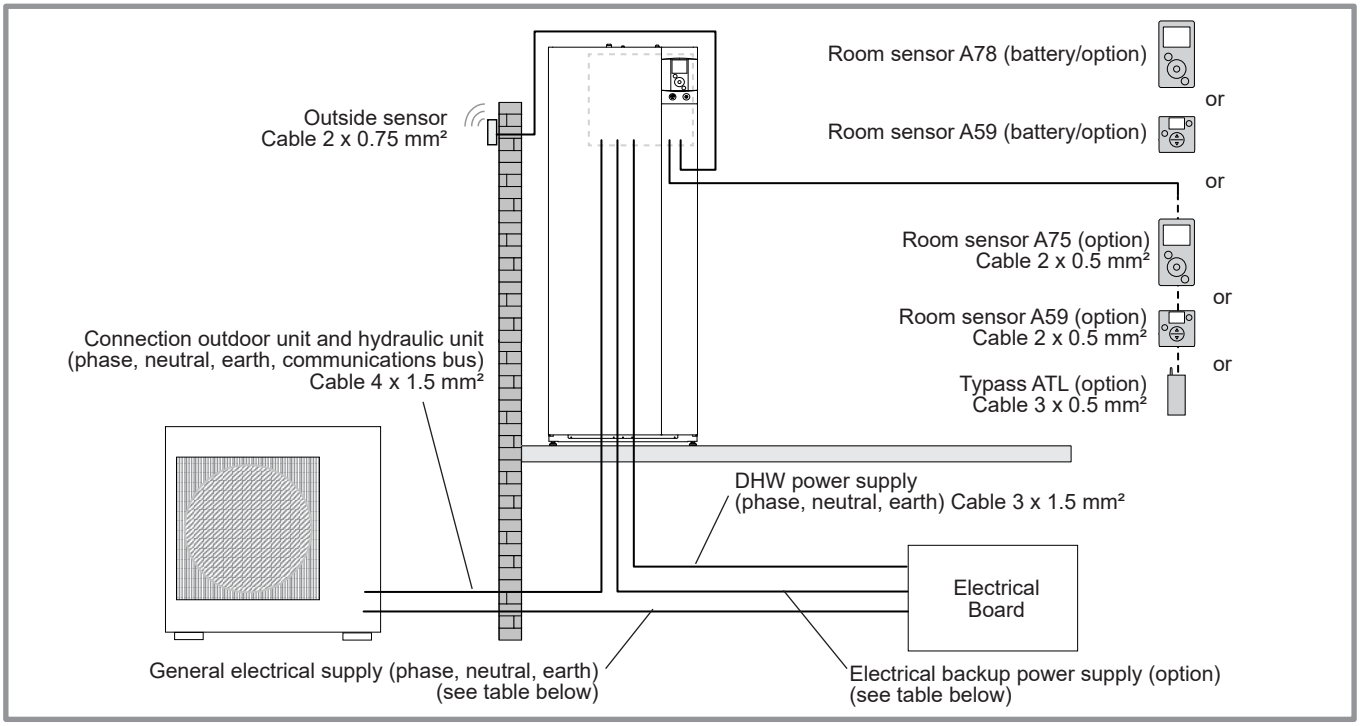


figure 33 - Overall layout of electrical connections for a simple installation (1 heating circuit)

5.1 Cable dimensions and protection rating

These cable dimensions are provided for information purposes only and do not exempt the installer from checking that these dimensions match requirements and comply with current standards.

• Outdoor Unit Power Supply

Heat Pump (HP)		*Electricity supply 230 V - 50 Hz*	
Model	*Max. power consumption*	*Connection cable (phase, neutral, earth)*	*Circuit breaker C curve*
Alféa Extensa Duo A.I. 5	2530 W	3 x 1.5 mm²	16 A
Alféa Extensa Duo A.I. 6	2875 W		
Alféa Extensa Duo A.I. 8	4025 W	3 x 2.5 mm²	20 A
Alféa Extensa Duo A.I. 10	4255 W		

• Interconnection between outdoor unit and hydraulic unit

The hydraulic unit is powered by the outdoor unit by means of a 4 x 1.5 mm² cable (phase, neutral, earth, communication bus).

• DHW power supply

The DHW section is powered directly via a 3 x 1.5 mm² cable (phase, neutral, earth).
Protection by circuit breaker (16 A, C curve).

• Electrical backup power supply (option)

The hydraulic unit contains a electrical backup circuit (option) installed in the storage tank.

Heat pump	*Electrical backups*		*Electrical backup power supply*	
Model	*Power*	*Nominal current*	*Cable (phase, neutral, earth)*	*Circuit breaker C curve*
Alféa Extensa Duo A.I. 5, 6, 8 and 10 with 6 kW Backup Kit	2 x 3 kW	26.1 A	3 x 6 mm²	32 A

5.2 Electrical connections on the outdoor unit side

Access to connection terminals:

• Alféa Extensa Duo A.I. models 5, 6 and 8

- Remove the cowl.

• Alféa Extensa Duo A.I. model 10

- Remove the front panel and cowl.
- Make the connections according to the diagram (figure 34).
- Use cable clamps to prevent any power cables from being disconnected accidentally.
- Fill in the space where the cables enter the outdoor unit with the insulating plate.

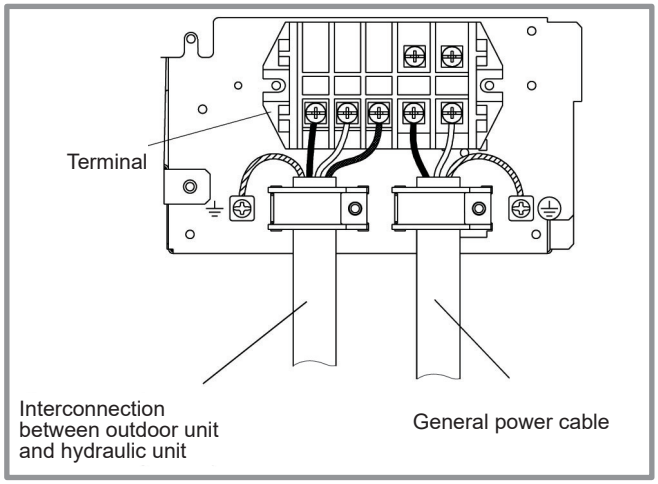
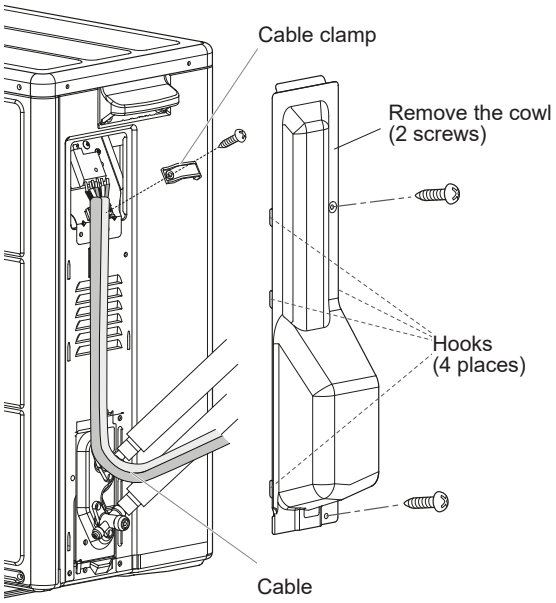


figure 34 - Connections to outdoor unit's terminal block

Alféa Extensa Duo A.I. 5, 6 and 8



Alféa Extensa Duo A.I. 10

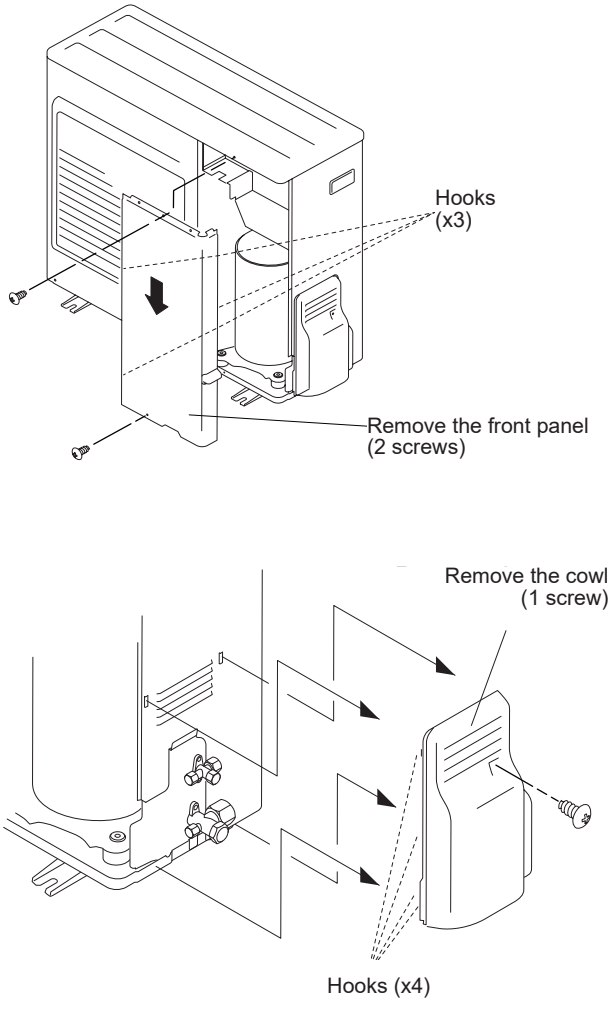


figure 35 - Access to outdoor unit's terminal block

5.3 Electrical connections on the hydraulic unit side

Access to connection terminals:

- Remove the front plate.
- Open the power control box.
- Make the connections according to the diagram (figure 37).

Do not place the sensor and power supply lines parallel to each other to avoid interference due to voltage spikes in the power supply.

Make sure that all electrical cables are housed in the areas provided for this purpose.

• Interconnection between outdoor unit and hydraulic unit

Match up the terminal block markers on the hydraulic unit to those of the outdoor unit exactly when connecting the interconnection cables.

An incorrect connection could result in the destruction of one or other of the units.

• Electrical backup (option)

If the heat pump is not installed with a boiler connection:

- Connect the power supply for the backup to the electrical panel.

• Boiler connection (option)

☞ **If the boiler connection option is used, the electric backup option must not be connected.**

- Please refer to the instructions supplied with the boiler connection kit.
- Please refer to the instructions supplied with the boiler.

• Second heating circuit (option)

- Refer to the instructions supplied with the double hydraulic circuit kit.

• Contract with Energy Supplier

The heat pump can be set to operate within particular types of energy contract, e.g. off-peak, day/night. In particular, domestic hot water (DHW) at the comfort temperature will be produced at off-peak times when electricity is at its cheapest.

- Connect the "energy supplier" to the EX2 input.
- Set the DHW configuration to "Off-Peak".

• 230V on input EX2 = "Peak Hours" information activated.

• Power limitation or EDR (Energy Demand Reduction)

Power limitation is designed to reduce electricity consumption when it is too high for the contract signed with the energy supplier.

- Connect the power limiter device to input EX1. Heat pump and DHW backups will be shut off in the event of over-consumption by the dwelling.

• 230 V on input EX1 = power limitation in progress

• Faults external to the heat pump

Any component which reports back information (Underfloor heating safety switch, thermostat, pressure switch, etc.) may signal an external problem and stop the heat pump.

- Connect the external component to input EX3.

• 230 V on input EX3 = heat pump stopped (system displays Error 369).

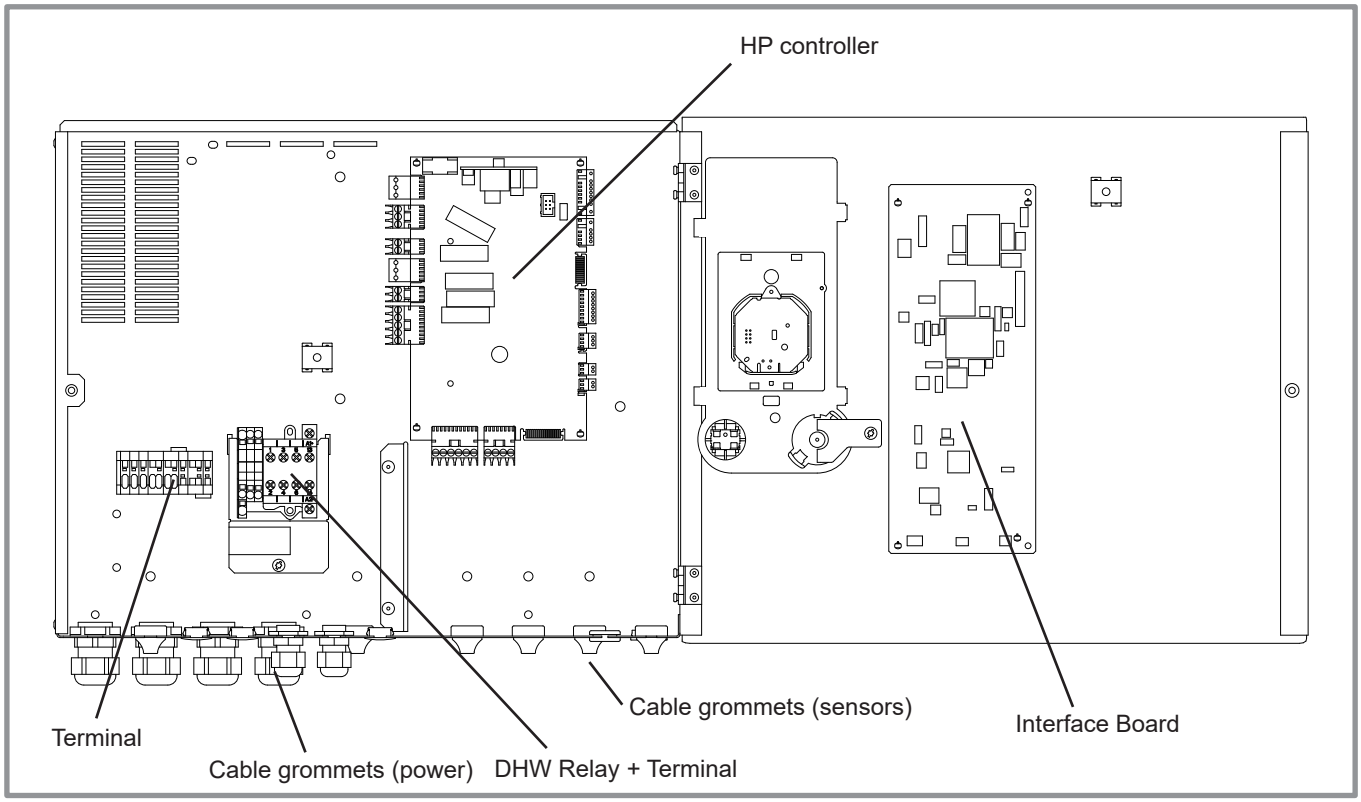


figure 36 - Description of the hydraulic module's electrical control box

5.4 Outside sensor

The outside sensor is required for correct operation of the heat pump.

Please see the fitting instructions on the sensor's packaging.

Place the sensor on the coldest side of the building, generally the northern or north-western side.

It must not be exposed to morning sun.

It must be installed so as to be easily accessible but at least 2.5m from the ground.

It is essential that it is not placed near any sources of heat such as flues, upper parts of doors and windows, near extractor vents, under balconies and eaves, or anywhere which would insulate the sensor from variations in the outdoor air temperature.

- Connect the outside sensor to connector **X84** (terminals **M** and **B9**) on the heat pump control board.

5.5 Room sensor (option)

The room sensor is optional.

Please see the fitting instructions on the sensor's packaging.

The sensor must be installed in the living room area on an unobstructed wall. It must be installed so as to be easily accessible.

Avoid direct sources of heat (chimney, television, cooking surfaces, sun) and draughty areas (ventilation, door, etc.).

Draughts in buildings are often brought about by cold air blowing through the electrical ducting. Lag the electrical ducts if there is a cold draught behind the room sensor.

5.5.1 Installing a room sensor

• Room sensor A59

- Connect the sensor's power supply to connector **X86** on the HP control board using the connector provided (terminals **2** and **3**).

• Room sensor A75

- Connect the sensor's power supply to connector **X86** on the HP control board using the connector provided (terminals **2** and **3**).

5.5.2 Installing a Typass ATL

- Connect the Typass ATL to connector **X86** on the HP control board using the connector provided (terminals **1**, **2** and **3**).

5.5.3 Fan convector zone

If the installation is equipped with fan convectors or dynamic radiators, **do not use a room sensor**.

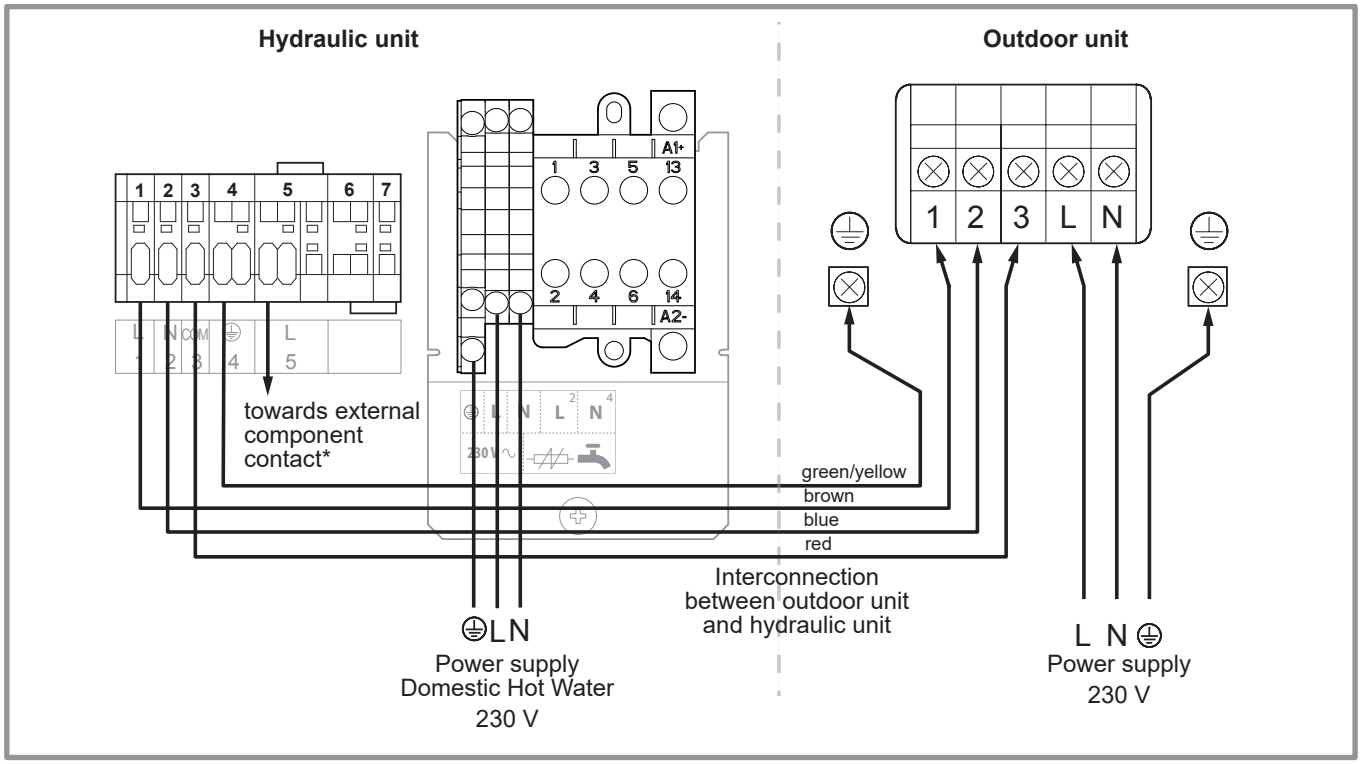
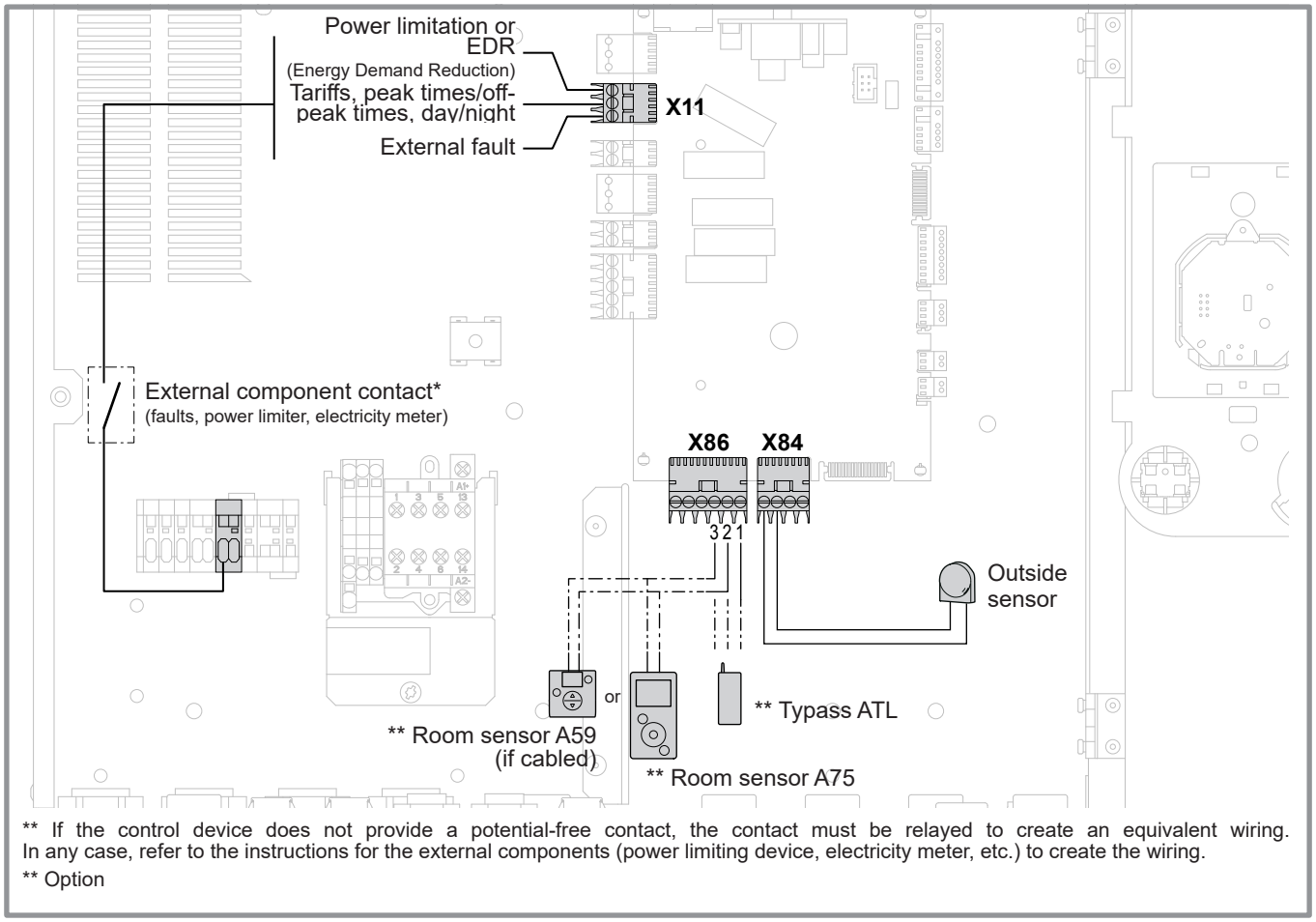


figure 37 - Connection to terminal blocks and power relay



** If the control device does not provide a potential-free contact, the contact must be relayed to create an equivalent wiring. In any case, refer to the instructions for the external components (power limiting device, electricity meter, etc.) to create the wiring.

** Option

figure 38 - Connections on the heat pump controller (accessories and options)

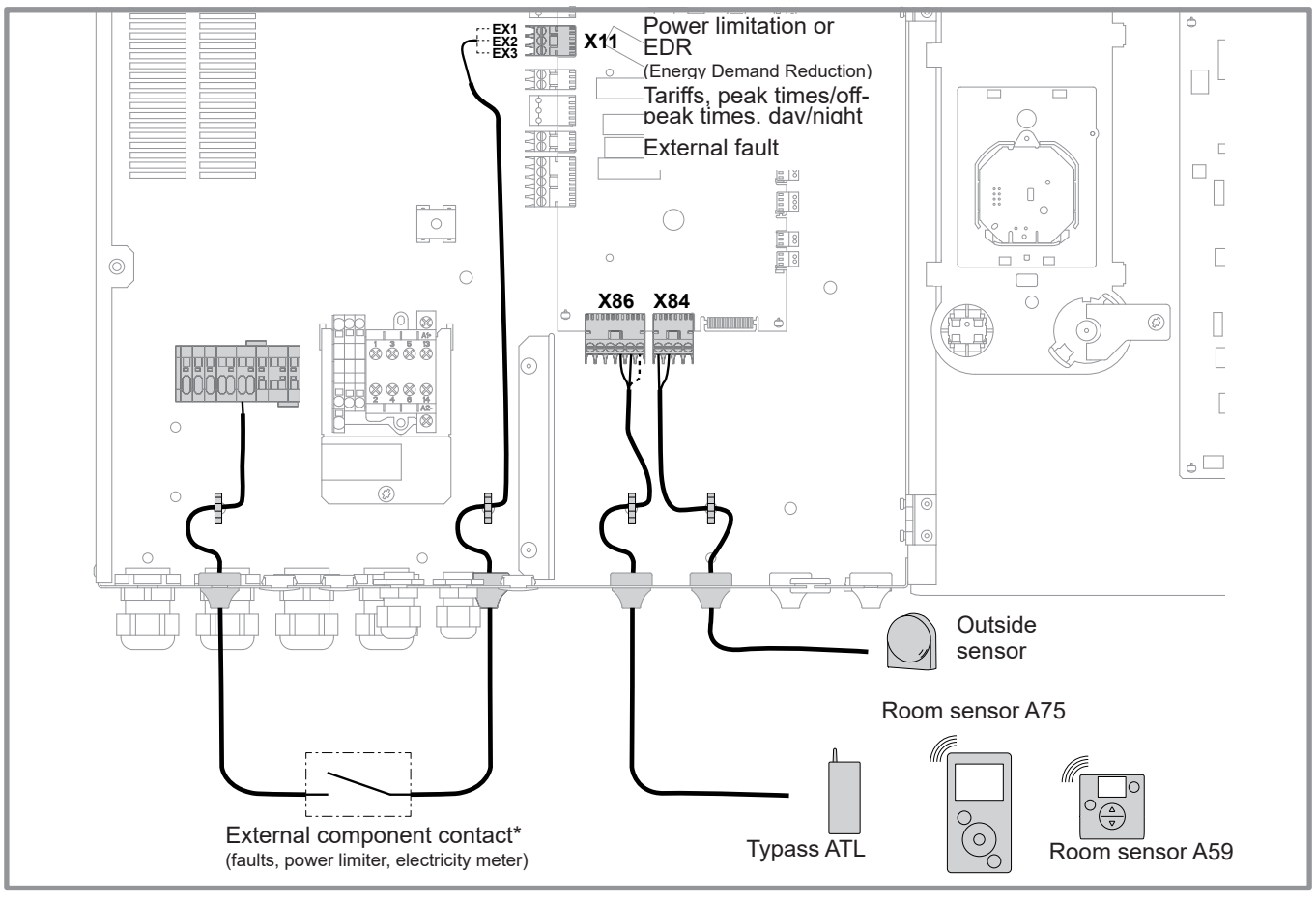


figure 39 - Sensor cable feeds

6 Commissioning

- Close the installation's main circuit breaker.

  Upon initial start-up (or in winter), to preheat the compressor, engage the installation's main circuit breaker (outdoor unit power supply) several hours before starting any tests.

- Press the heat pump's Start/Stop button.

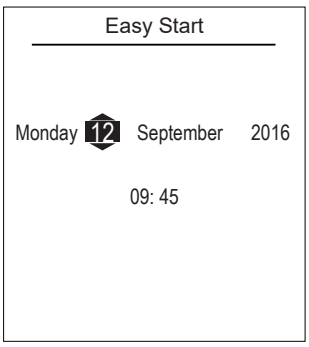
  To ensure that inputs EX1, EX2 and EX3 operate correctly: Check that the electricity supply's neutral phase polarity has been respected.

When the power is switched on and every time that the ON/OFF button is switched off and then switched on again, the outdoor unit will take approximately 4 minutes to start up, even if the setting is requesting heating.

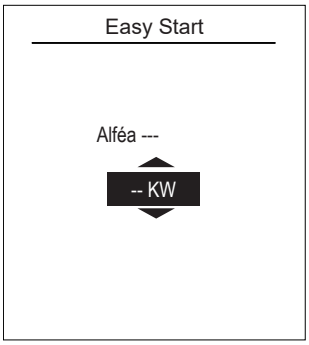
When the power is switched on, the "*Easy Start*" quick start function allows you to set the appliance's initial settings.

- Turn the knob to choose the language.
- Press the knob to accept.

- Turn the knob to adjust the date. Press the knob to accept.
- Repeat this operation for the month, year, hours and minutes.

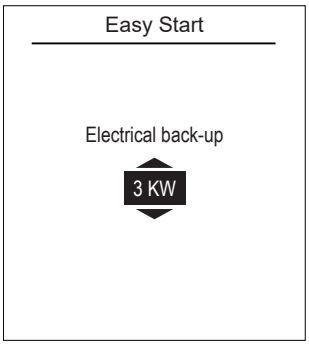


- Set the appliance's power.

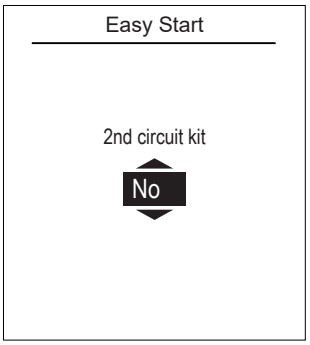


- Set the Electrical backup power:

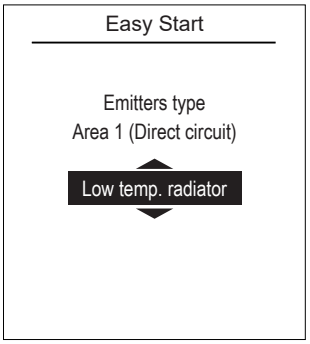
  3kW / 6kW / 9kW / None.



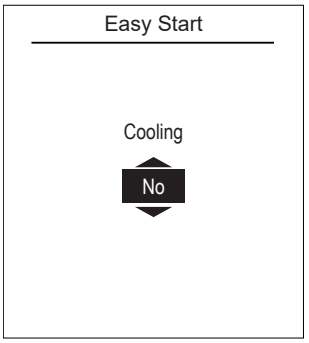
- If the installation covers 2 zones, set "*2nd circuit kit*" to "*Yes*".



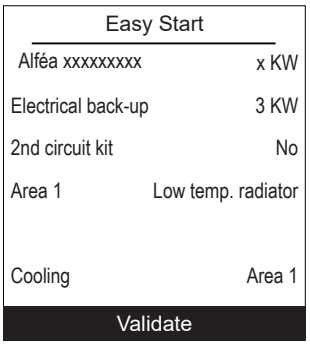
- Choose the radiator type for each zone:
  Low temp. radiator / Heat. floor system / Dynamic Radiators / Radiators.



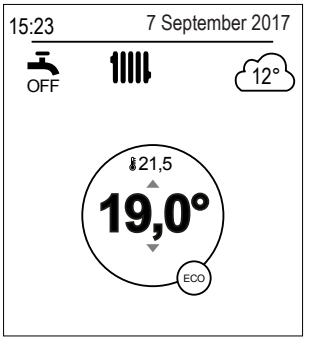
- If the installation is fitted with cooling function, choose the zone(s)*:*
  None / Area 1 / Area 2 / Area 1 and 2.



- Appliance settings summary screen. Press the knob to accept.
- The appliance starts initialising.



- The welcome screen is displayed (screen varies depending on installed options).

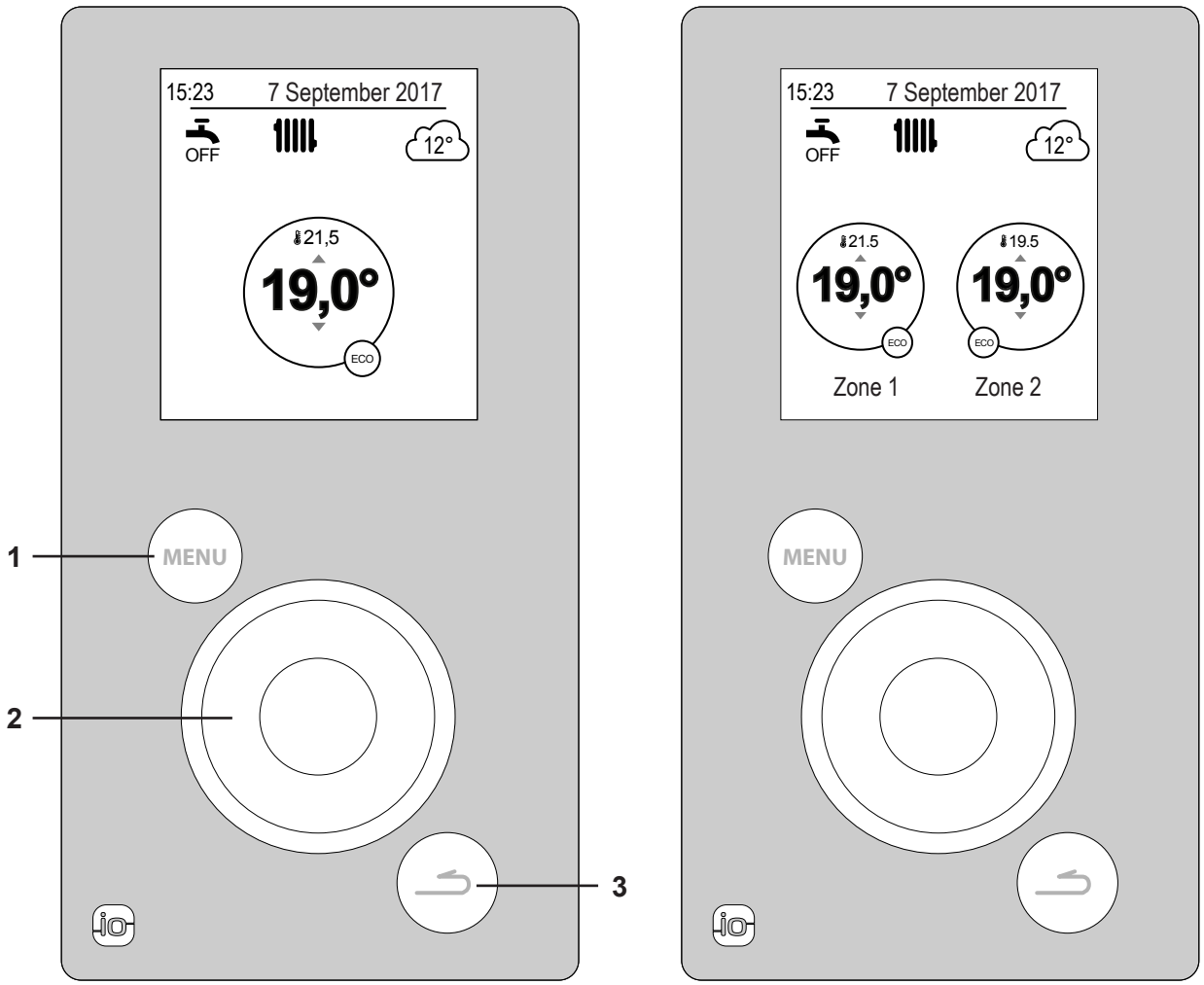


Upon commissioning, the electrical backup heaters or boiler are liable to start up even if the outdoor temperature at the time is above the heaters' trigger temperature.

The controller uses the initial average outdoor temperature of 0°C and needs time to update this temperature.

7 Controller Interface

7.1 User Interface

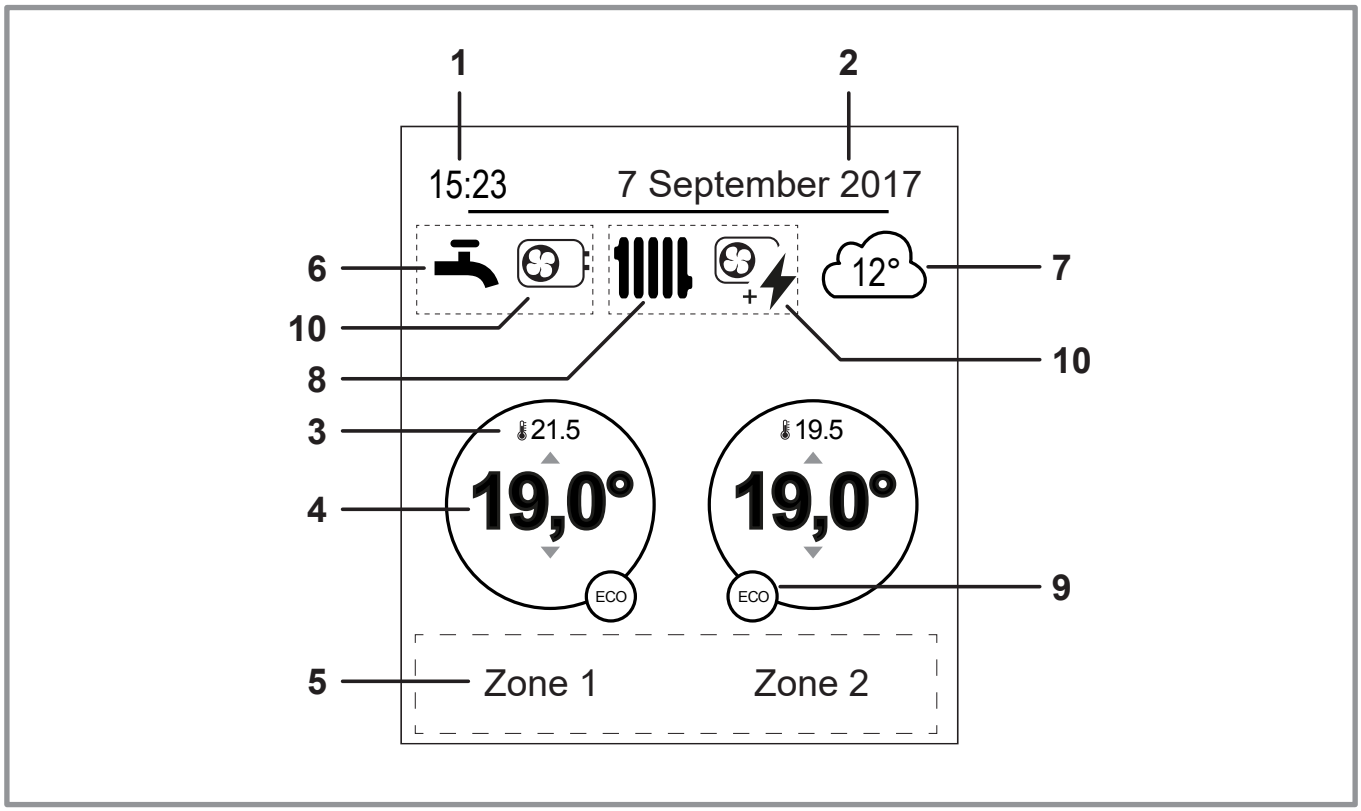


☞ **1 heating Circuit version + domestic hot water (DHW)**

☞ **2 heating circuit version + domestic hot water (DHW)**

N°	Description
1	Menu button
2	Navigation knob (rotate knob), accept (press knob)
3	Back button

7.2 Display Description



N°	Symbols	Definitions
1	15:23	Time
2	7 September 2017	Date
3	21.5	Temperature measured by the room sensor*
4	19,0°	Room temperature setpoint
5		Information (Area names, emergency mode, test mode, error display, etc.)
6	**Domestic Hot Water (DHW):**	
		Activated
	BOOST	Boosting in progress
	OFF	Deactivated
7	12°	Temperature measured by the outside sensor
8	**Operation**	
		Heating
		Cooling*

N°	Symbols	Definitions
9	**Mode**	
		Comfort
		Manual (exemption)
	ECO	ECO
		Holiday
		Floor drying
		Stop (except frost)
10	**Production via ...**	
		Heat Pump
		Electrical backup*
		HP + electrical backup*
		HP + Fuel/Gas*
		Fuel/Gas*

* Option

7.3 Installer Menu

To access the Installer Menu, press and hold the MENU button and turn the knob a **quarter turn to the right.**
To return to the User Menu, repeat the same operation.

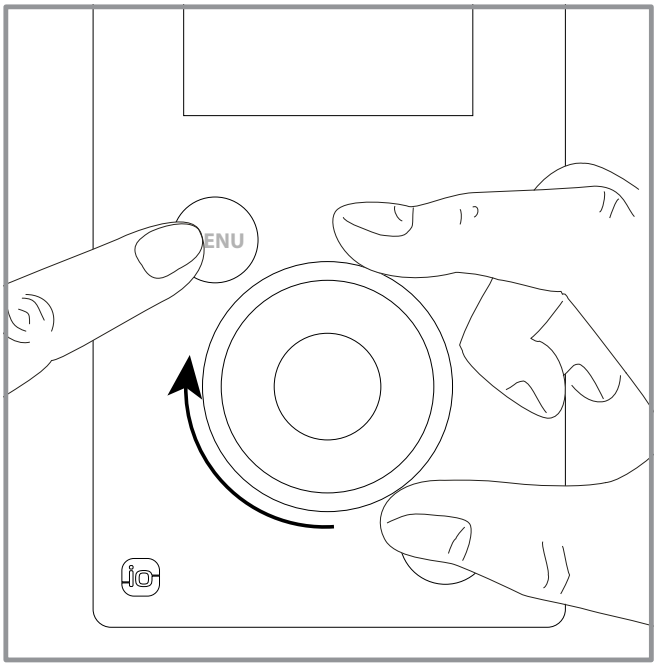


figure 40 - Installer Menu

7.4 Navigating the Menus

To ...	Action:
Access the menu	Press MENU.
Choose a menu item	Turn the knob to highlight your choice. Press the knob to accept.
Return to the previous menu	Press ⮌.
Return to the main menu	Press MENU twice.
Return to the welcome screen	Press MENU or ⮌ on the main menu.

Note: *Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).*

7.5 Modifying Settings

- Turn the knob to highlight the setting you wish to change.
- Press the knob to accept the change.
- Turn the knob to adjust the setting.
- Press the knob to accept your choice.

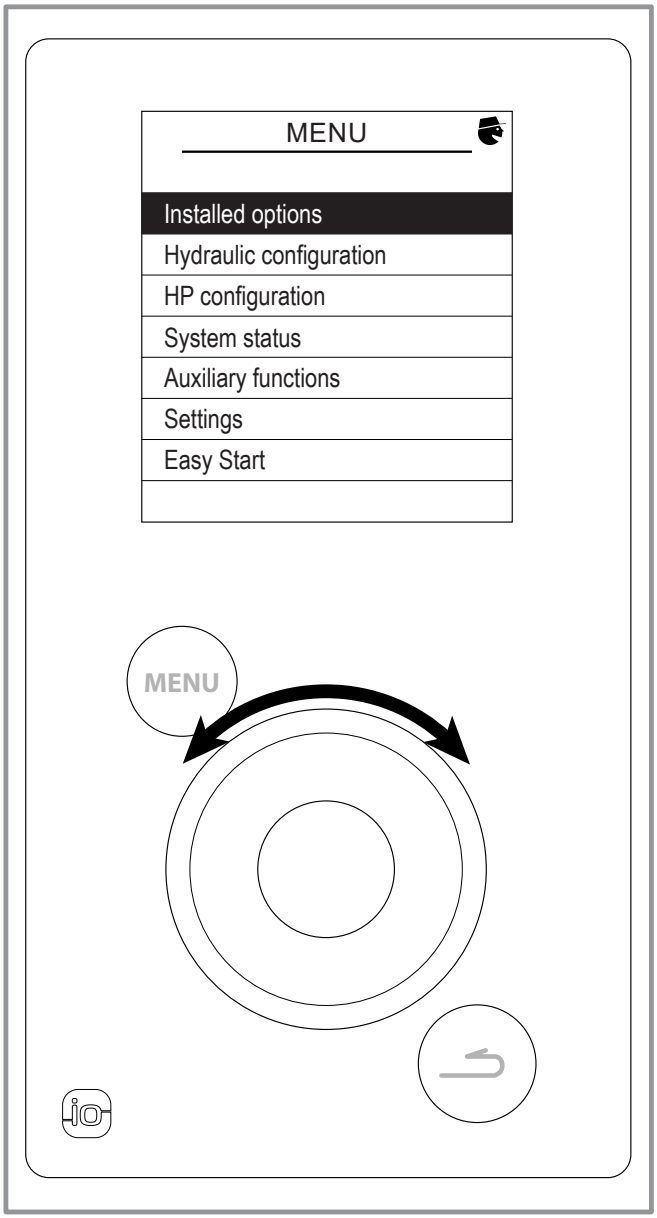


figure 41 - Navigation

7.6 Temperature control

The heat pump's operation is subject to the temperature control.

The heating circuit water temperature setpoint is adjusted according to the outdoor temperature.

If there are thermostatic valves on the installation, these must be fully open or set higher than the normal temperature setpoint.

7.6.1 Setting

During the installation, the temperature control must be configured to suit the radiators and level of insulation of the dwelling.

The temperature control graphs (figure 42) refer to a room temperature setpoint of 20°C.

The temperature control's gradient determines the impact of variations in the outdoor temperature on variations in the heating flow temperature.

The steeper the gradient, the more likely a slight reduction in the outdoor temperature will cause a significant increase in the water flow temperature in the heating circuit.

The temperature control off-set modifies the flow temperature of all graphs, without modifying the gradient (figure 43).

Corrective actions to take in the case of discomfort are listed in the table (figure 44).

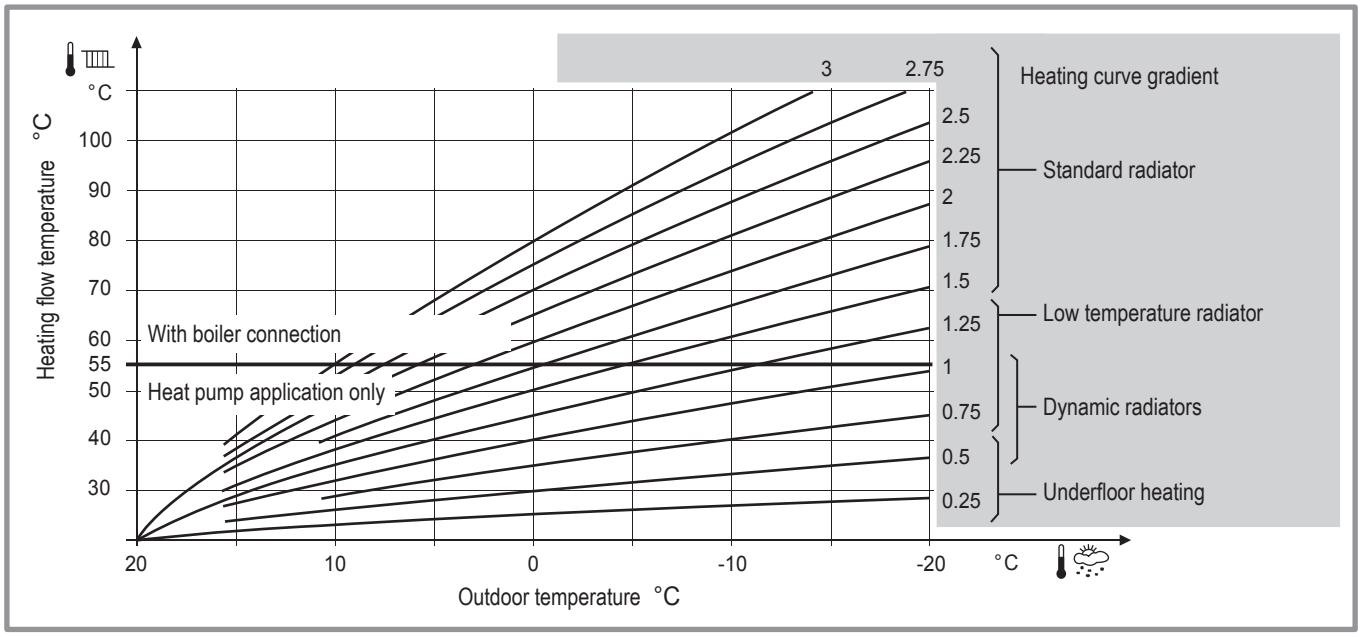


figure 42 - Heating curve gradient

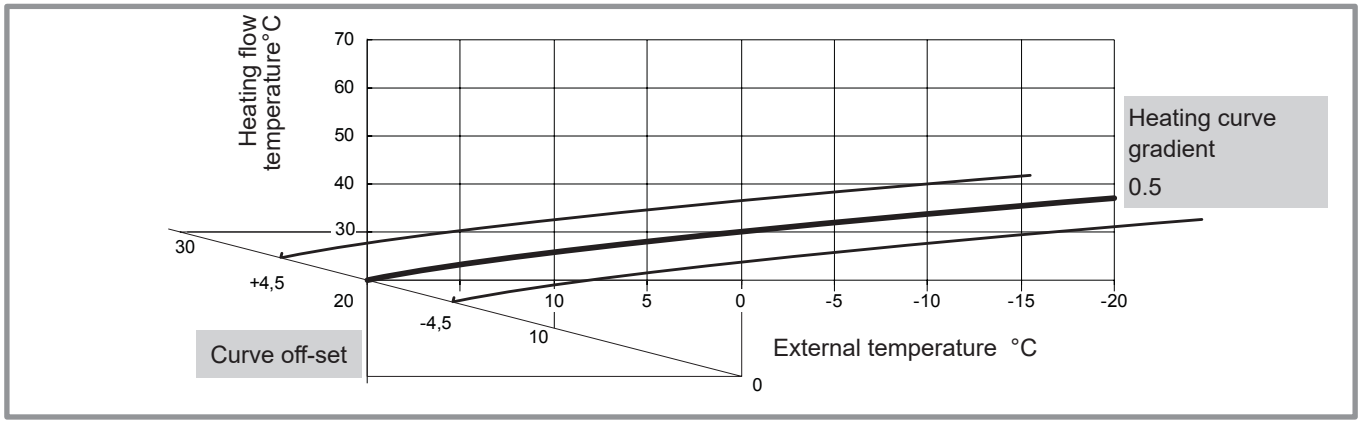


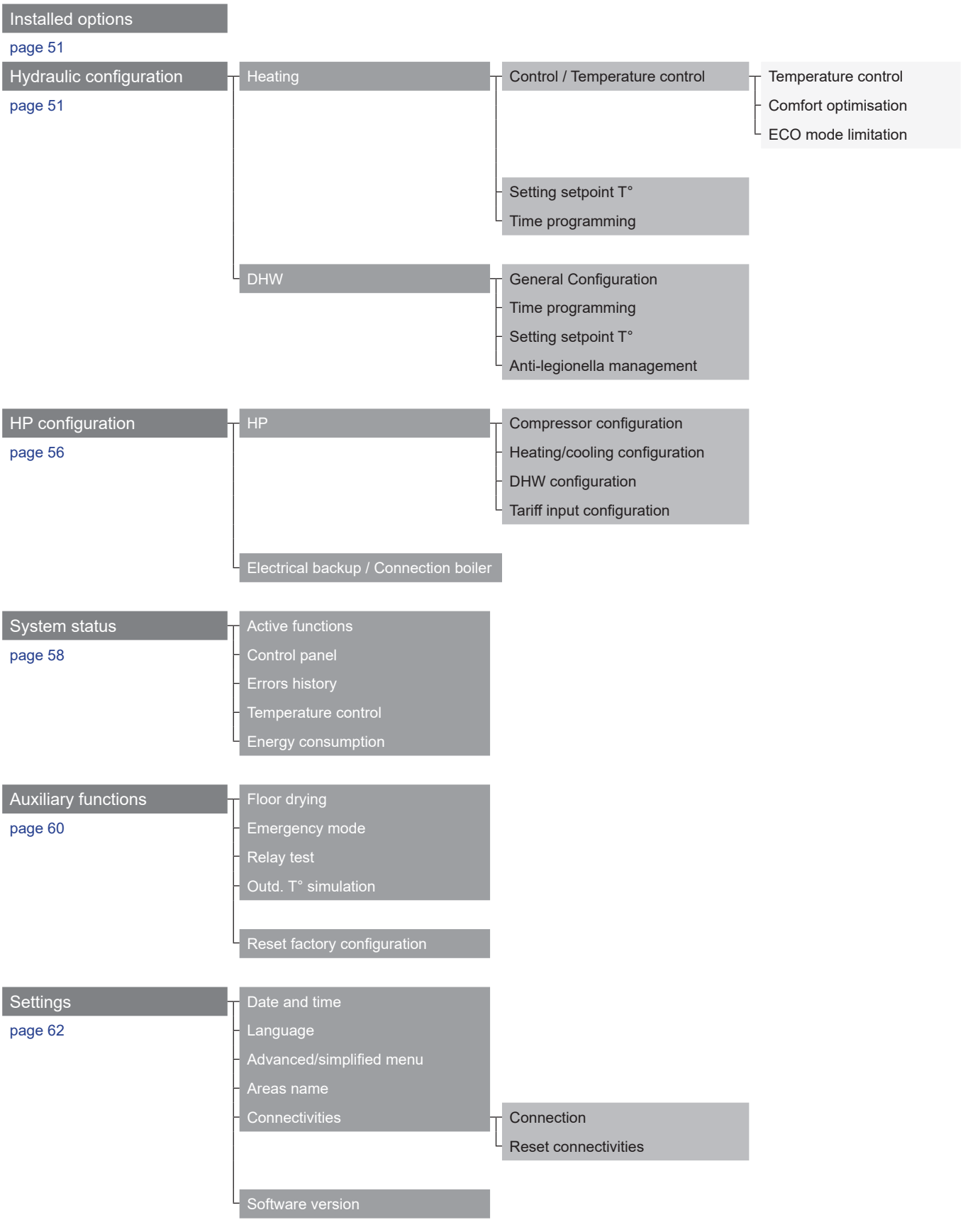
figure 43 - Transferral of the heating curve

Sensations...				Corrective actions on the temperature control:	
...in mild weather		...in cold weather		Gradient	Off-set
Good	&	Good	→	No correction	No correction
Cold	&	Hot	→	−	+
Cold	&	Good	→	−	+
Cold	&	Cold	→	No correction	+
Good	&	Hot	→	−	No correction
Good	&	Cold	→	+	No correction
Hot	&	Hot	→	No correction	−
Hot	&	Good	→	+	−
Hot	&	Cold	→	+	−

figure 44 - Corrective actions in case of discomfort

8 Controller Menu

8.1 Menu Structure

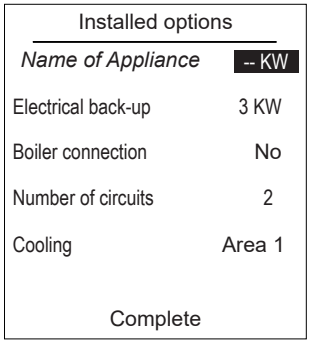


Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

Installed options

8.2 Installed options

Installed options are configured during commissioning (see page 42). However, you can modify them by accessing the "*Installed Options*" menu.



Name of Appliance

- Choose the appliance's power.

Electrical backup

- Choose the electrical backup power.

Boiler connection

- If the electrical backup is set to "*No*", you can then set the boiler connection to "*Yes*".
- If a power setting is applied to the electrical backup, the boiler connection setting remains set to "*No*" and cannot be changed.

Number of Circuits

- Choose the number of circuits.

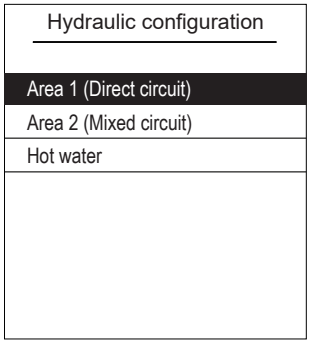
Cooling

- If the installation is fitted with cooling function, choose the zone(s):
  None / Area 1 / Area 2 / Area 1 and 2.

Hydraulic configuration > Area 1

8.3 Hydraulic configuration

8.3.1 Heating / Cooling



- Choose the heating zone to configure.

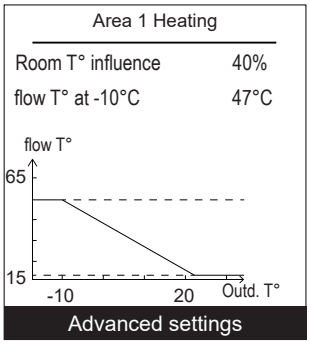
Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

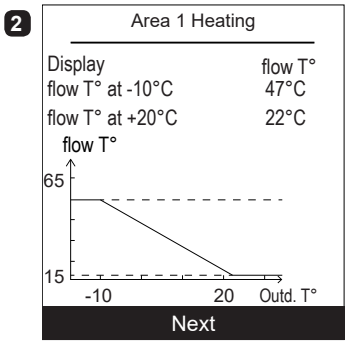
✍ **Choose the temperature control to adjust: "*Heating*".**

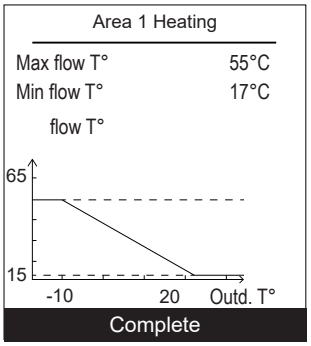
✍ **Two methods for adjusting the temperature control are available: flow temperature or gradient control.**

● Control using flow temperature

1 - Set "*Room T° influence*" then select "*Advanced settings*".
2 - Set "Display" to "*flow T°*". Set "*flow T° to -10°C*" and "*flow T° to +20°C*".
3 - Set "*Max flow T°*" and "*Min flow T°*".

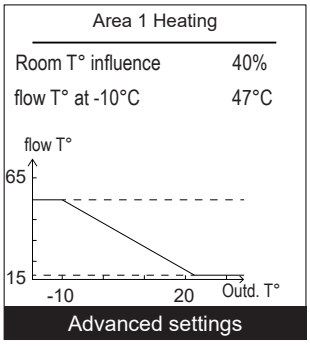
1


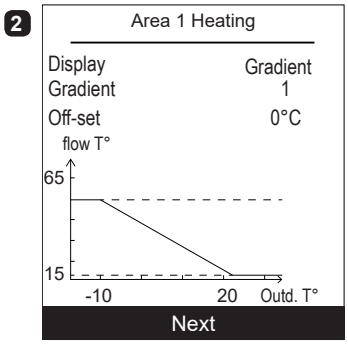
2


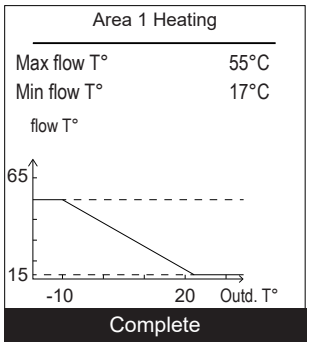
3


● Control using gradient

1 - Set "*Room T° influence*" then select "*Advanced settings*".
2 - Set "*Display*" to "*Gradient*". Set "*Gradient*" and "*Off-set*".
3 - Set "*Max flow T°*" and "*Min flow T°*".

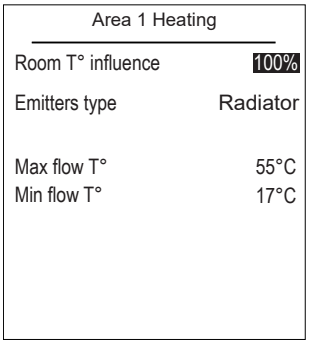
1


2


3


● Use 100% ambient temperature

If set to use 100%, adjust the radiator type.



Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

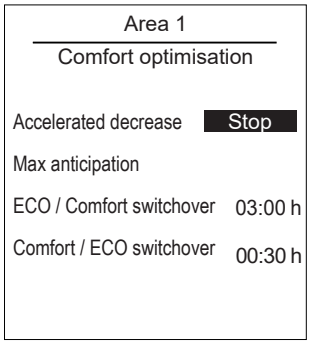
Hydraulic configuration > Area 1 > Control / Temperature control

Comfort optimisation

"*Accelerated decrease*": *ON / Stop.*

"*ECO / Comfort switchover*" *Anticipates time needed to reach the comfort setpoint.*

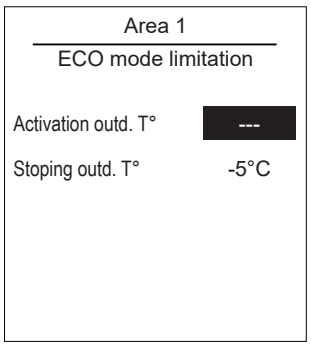
"*Comfort / ECO switchover*" *Anticipates time needed to switch from comfort setpoint to ECO setpoint.*



ECO mode limitation

"*Activation outd. T°*": *-30°C / +10°C.*

"*Stoping outd. T°*": *-30°C / +10°C.*



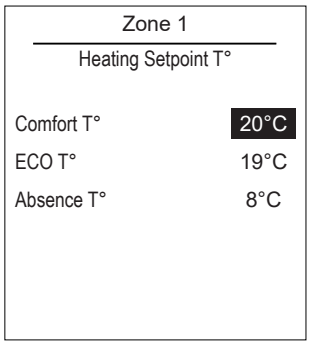
Hydraulic configuration > Area 1

Setting setpoint T°

"*Comfort T°*": *ECO Temperature … 35°C.*

"*ECO T°*": *Holiday Temperature ... Comfort Temperature.*

"*Absence T°*": *4°C… ECO Temperature.*



✍ **Heating temperatures factory settings:**
Comfort 20°C, ECO 19°C, Absence 8°C.

✍ **Cooling temperatures factory settings:**
Comfort 24°C, ECO 26°C, Absence 35°C

Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

Hydraulic configuration > Area 1

Time programming

1 - Choose *"Heating" or "Cooling"* as well as the appropriate zone by accessing the menu: *"Programming" > "Heating" / "Cooling" > "Area 1" / "Area 2".*

2 - Select the day.

3 - Adjust the Comfort period start and end times.

✍ **If 2 or 3 Comfort periods are not required, click on "--:--".**

- To return to the previous setting (e.g. end 1st heating period to start of 1st heating period), press the ⮌ button.

• To copy the program to other days:

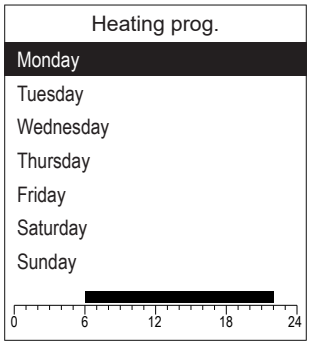
4 - Select "*Validate and copy*".

5 - Set the required days to "*Yes*" and then select "*Complete*".

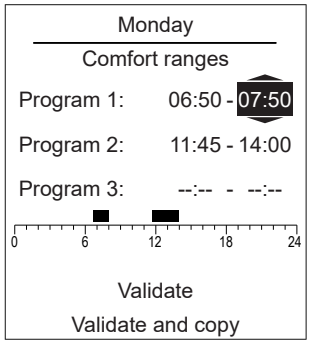
• Else "*Validate*".

✍ **Heating / cooling period factory setting: 06:00 - 22:00.**

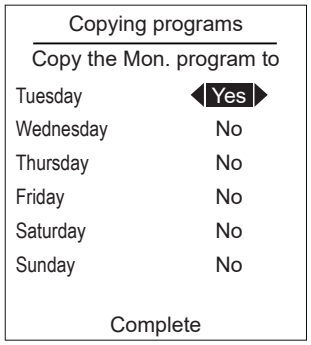
2



3

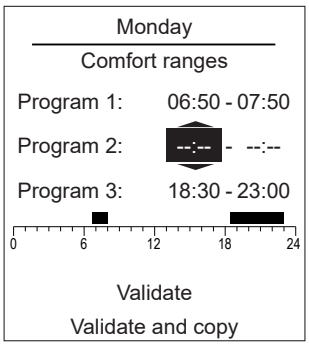


5



To delete a Comfort period, set its start and end times to the same value.
When accepting a setting, the screen displays:

Program X: --:-- - --:--

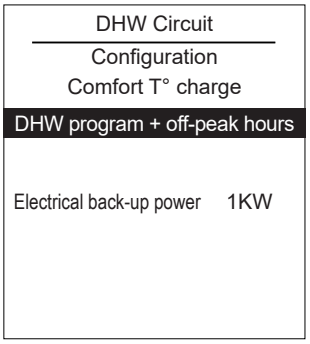


Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

8.3.2 Hot Water (HW)

General Configuration

"*Comfort T° charge*": *DHW program + off-peak hours / Off-peak hours / Permanent.*
Electrical back-up power: *0 to 20 KW.*



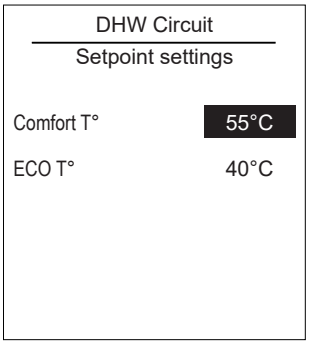
Time programming

See "Time programming", page 54.

☞ **DHW period factory setting: 00:00 - 05:00, 14:30 - 17:00.**

Setting setpoint T°

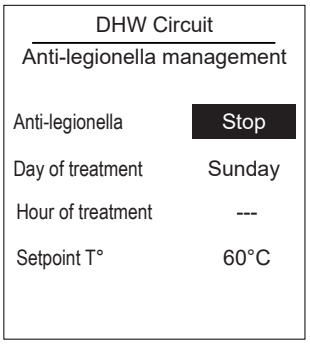
"*Comfort T°*": *ECO Temp Setpoint … 65°C.*
"*ECO T°*": *8°C... Comfort Temp setpoint.*



✍ **DHW temperature factory settings: Comfort 55°C, ECO 40°C.**

Anti-legionella management

"*Anti-legionella*": *Stop, ON.*
"*Day of treatment*": *Monday / Tuesday / Wednesday / Thursday / Friday / Saturday / Sunday.*
"*Hour of treatment*": *00:00.*
"*Setpoint T°*": *55°C... 95°C.*



Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

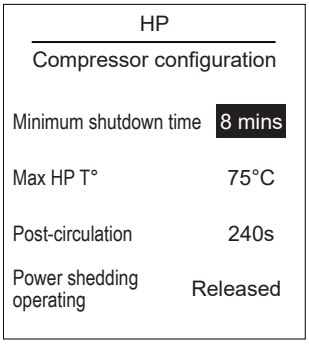
8.4 Heat Pump Configuration

8.4.1 Heat Pump

Compressor configuration

"*Minimum shutdown time*": *0 mins... 120 mins.*
"*Max HP T°*": *8°C... 100°C.*
"*Post-circulation*": *10 secs... 600 secs.*
"*Power shedding operating*": *Automatic*, *When needed.*

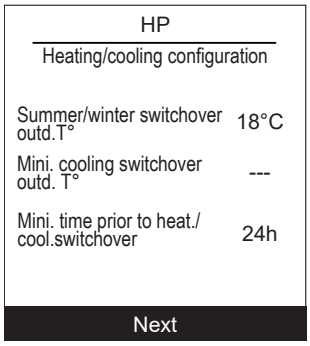
Released: HP = Start / DHW Backup = Stop / 1st HP Backup = Stop / 2nd HP Backup = Stop / Boiler = Start.
When needed (Locked): HP = Stop / DHW Backup = Stop / 1st HP Backup = Stop / 2nd HP Backup = Stop / Boiler = Start.



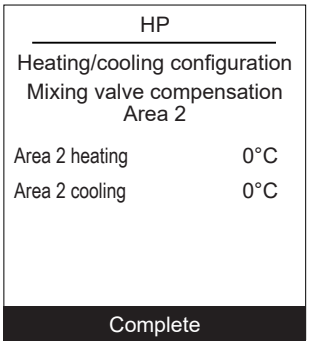
Heating/cooling configuration

1 - "*Summer/winter switchover outd.T°*" Zone 1: *8°C... 30°C.*
"*Mini. cooling switchover outd. T°*": *8°C... 35°C.*
"*Mini. time prior to heat./cool.switchover* ": *8h... 100h.*
2 - "*Circuit 2 heating*": *0°C... 20°C.*
- "*Circuit 2 cooling*": *0°C... 20°C.*

1

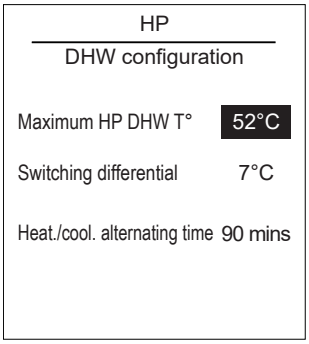


2



DHW configuration

"*Maximum HP DHW T°*": *0°C... 80°C.*
"*Switching differential*": *0°C... 20°C.*
"*Heat./cool. alternating time*": *10 mins... 600 mins.*
(with dynamic radiator, set to 40 mins).

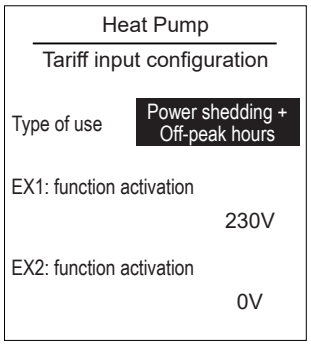


Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

HP configuration > HP

Tariff input configuration

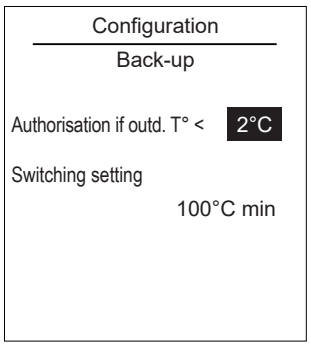
"*Type of use*": *Power shedding + Off-peak hours / Smartgrid.*
"*EX1: function activation*": *230V / 0V.*
"*EX2: function activation*": *230V / 0V.*



HP configuration > Electrical back-up

8.4.2 Electrical back-up

"*Authorisation if outd. T° <*": *-50°C... 50°C.*
"*Switching setting*": *0°Cmin... 500°Cmin.*

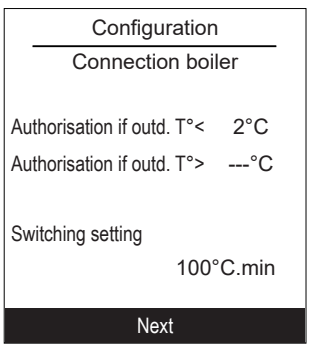


HP configuration > Connection boiler

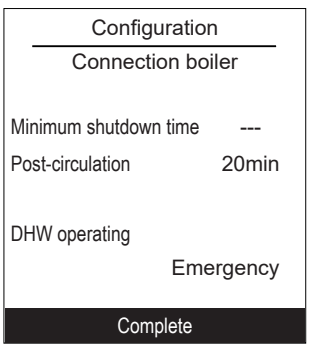
1 - "*Authorisation if outd. T°<*" : *--- , -15°C... 10°C.*
"*Authorisation if outd. T°>*" : 0°C... 30°C.
"*Switching setting*" : 10°C.min... 500°C.min.

2 - "*Minimum shutdown time*" : ---, 1min... 120min.
"*Post-circulation*" : 0min... 120min.
"*DHW operating*" : *Emergency / Back-up / Priority.*

1



2



Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

8.5 System status

Active functions

The "*Active Functions*" page tells you which services are operating and allows you to change their status.

- "*Indoor comfort*": *Heating / Cooling / Stop.*
- *"Area 1" / "Area 2" / "Hot water"*: *ON / Stop.*

✍ **If "Indoor Comfort" is set to "Stop", Area 1 and 2 cannot be modified.**

Active functions	
Indoor comfort	Heating
Area 1	Start
Area 2	Start
Hot water	Start

Control panel

The "*Control Panel*" allows you to see the status of the different functions and actuators.

1 - Press the knob to access the "*Control Panel*" second screen.

3 - Press the knob to return to the "*System Status*" menu.

1

Control panel	
Generator	40%
Elec. backup	Stop
HP circulation pump	ON
Area 2 circulation pump	ON
Mixing valve	Stop
DHW valve	Circuit
DHW backup	ON
Mode	Heating
Next	

2

Control panel	
HP flow T°	11.0°C
Return T°	9.0°C
Area 2 flow setpoint	38.0°C
Area 2 flow T°	12.0°C
Outdoor T°	26.0°C
Setpoint T° DHW	55.0°C
Hot Water T°	55.0°C
Next	

3

Control panel	
Power shedding input	Inactive
Smartgrid EX2	Active
External fault input	Inactive
Complete	

Errors history

10: Outside sensor, **32**: Flow sensor 2, **33**: Flow sensor HP, **44**: Return sensor HP, **50**: DHW sensor 1, **60**: Room sensor 1, **65**: Room sensor 2, **83**: BSB short-circuit, **127**: Legionella temp, **441**: BX31 no function, **442**: BX24 no function, **443**: BX33 no function, **444**: BX34 no function, **369**: External, **370**: Thermodynamic source, **516**: Heat pump missing.

For more info about errors § "Fault Diagnosis", page 74.

Errors history		
10/09/2016	Error	441
10/09/2016	Error	369
09/09/2016	Error	441
09/09/2016	Error	369
20/08/2016	Error	369
20/08/2016	Error	369
01/08/2016	Error	441
01/08/2016	Error	369
14/07/2016	Error	441
06/05/2016	Error	441

Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

System status

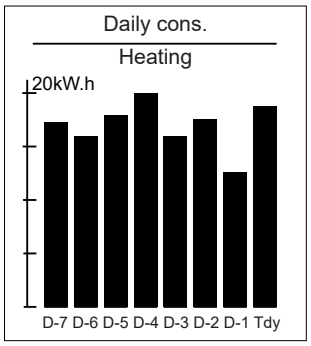
Temperature control

See "7.6 Temperature control", page 48.

Energy consumption

Consumption can be displayed per usage:
- Heating (Zones 1 and 2).
- Cooling.
- Domestic Hot Water (DHW).
- Total (Heating + Cooling + Hot Water).

This information is available for:
- the last 8 days: daily consumption (Tdy = Today, D-1 = yesterday, etc.).
- the last 12 months: monthly consumption (Initial letter of month. e.g. J = January, etc.).
- the last 10 years: annual consumption (last 2 digits. e.g. 16 = 2016).



Example for daily consumption of the heating system.

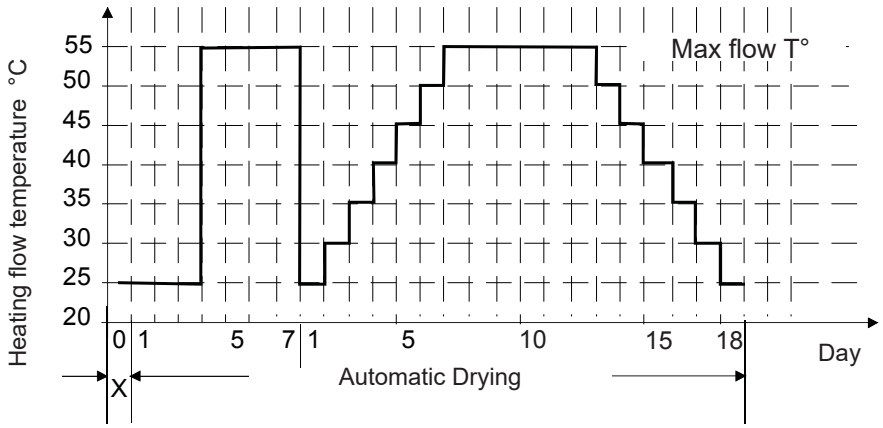
Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

8.6 Auxiliary functions

Floor drying

- Choose the zone.
- Choose the "*Drying type*": *Stop / Automatic / Manual.*

• *Automatic Drying*



Area 1 floor drying

Drying type	Stop
Flow T° setpoint	25°C

• *Manual Drying*

Manual mode enables you to programme your own concrete slab drying time.
The function ends automatically after 25 days.

- Set the "*Flow T° setpoint*": *0°C... 95°C.*

☞ **Please comply with the standards and instructions of the manufacturer of the building ! A good performance of this function is only possible with an installation correctly implemented (hydraulic, electricity and adjustments) ! This function can be stopped by anticipation when setting the adjustment to "Off".**

Emergency mode

- Stop: The HP is operating normally (with backup if necessary).
- Start: The HP is using the backup heating or boiler connection.

Use the "Start" setting only in emergency or test mode
as your heating bill could be large.

Emergency mode

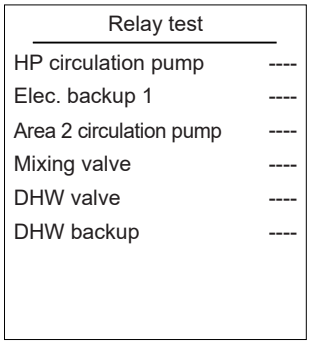
Activate emergency mode

Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

Auxiliary functions

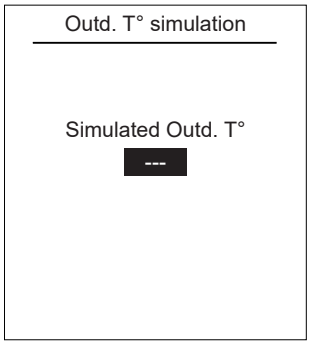
Relay test

- *"HP circulation pump": ON / ----*
- *"Elec. backup 1": ON / ----*
- *"Area 2 circulation pump": ON / ----*
- *"Mixing valve": Open / Close / ----*
- *"DHW valve": DHW / ----*
- *"DHW backup": ON / ----*
- *"Boiler connection": ON / ----*
- *"Boiler connection ON / Stop": ON / ----*



Outd. T° simulation

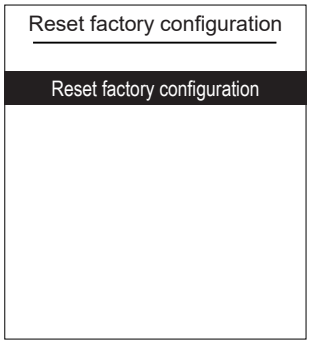
- *"Simulated Outd. T°" : -55°C... 50°C.*



Reset factory configuration

The factory settings, stored within the controller, will replace and delete any custom programs.

✍ **Your custom settings will therefore be lost.**

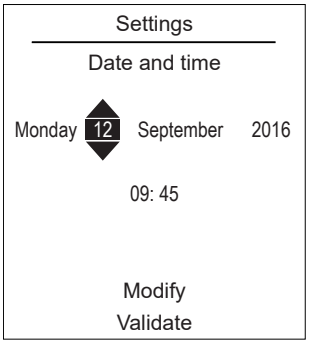


Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

8.7 Settings

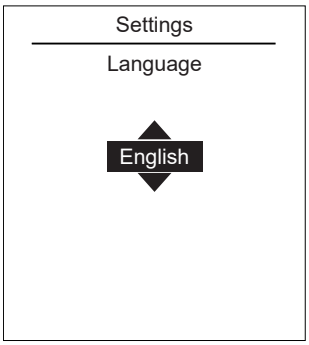
Date and time

To set the appliance's date and time, access the menu:
"Settings" > "Date and Time".



Language

To set the appliance's language, access the menu:
"Settings" > "Language".



Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

Settings

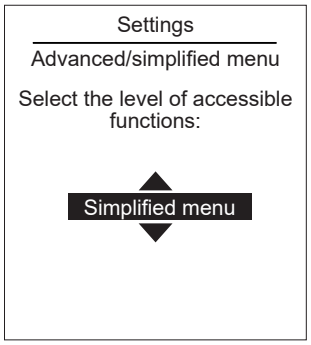
Advanced/simplified menu

Two display modes for menus and appliance functions are available:

- **Advanced menu**:
  - The appliance follows the time programming defined in paragraph "Time programming", page 54.
- **Simplified menu***:
  - The appliance operates at a constant temperature set directly by the user.
  - Some functions are no longer accessible.

* The "*Simplified Menu*" setting is not compatible with the Cozytouch application.

Choose the display mode from the menu:
"Settings" > "Advanced/Simplified menu".



✍ Setting the temperature in the Simplified Menu

✍ **1 zone**

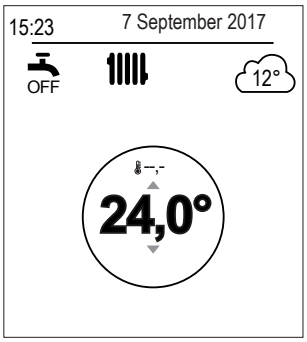
1 - Turn the knob to adjust the temperature **directly**.

✍ **2 zones**

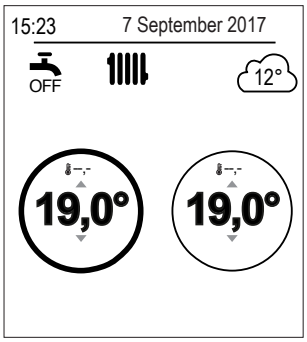
2 - Select the zone. Accept.

4 - Set the temperature using the knob. Accept.

1



2



Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

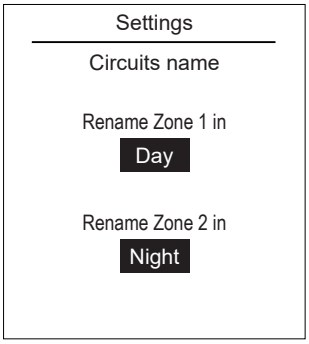
Settings

Areas name

You can customise the zone names from the menu:

"Settings" > "Areas name".

Available names: "*Area 1*" / "*Area 2*" / "*Day area*" / "*Night area*" / "*1st floor*" / "*Lounge*" / "*G. floor*" / "*Bedroom*" / "*Floor*" / "*Radiator*".



Settings > Connectivities

Connection

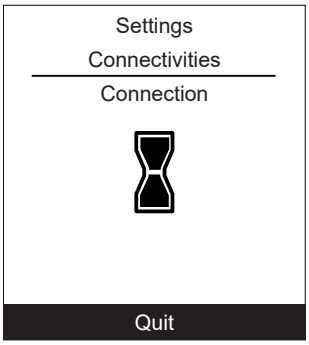
To connect a room sensor, go to the menu:

"Settings" > "Connectivities" > "Connection".

The appliance waits for pairing for 10 minutes.

✍ **See the room sensor's installation instructions.**

✍ **The "Connection" menu is no longer accessible if a sensor has already paired.**

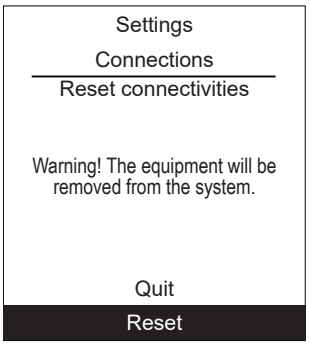


Reset connections

⚠ All pairings are re-initialised annually.

Select "Re-set" in the menu:

"Settings" > "Connections" > "Re-set Connections".



Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

Settings

Software versions

Show the display and controller software versions.

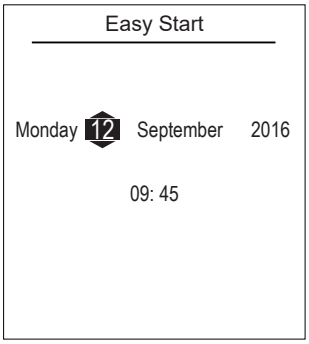
Software version
HMI:
xxxx xxxx xxxx xxxx
Controller:
RVS21 - 85.002.030

Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

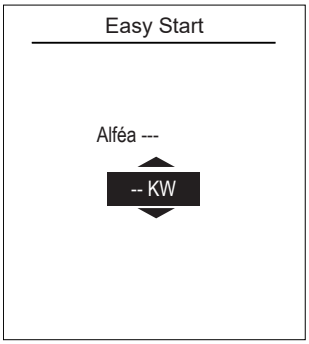
8.8 Easy Start

- Turn the knob to choose the language.
- Press the knob to accept.

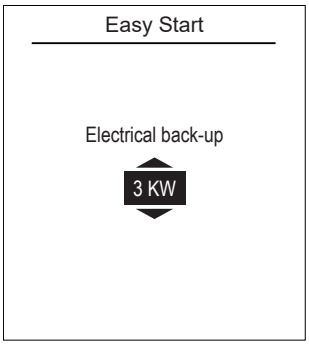
- Turn the knob to adjust the date. Press the knob to accept.
- Repeat this operation for the month, year, hours and minutes.



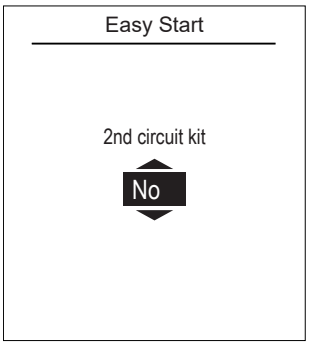
- Set the appliance's power.



- Set the Electrical backup power:
  3kW / 6kW / 9kW / None.

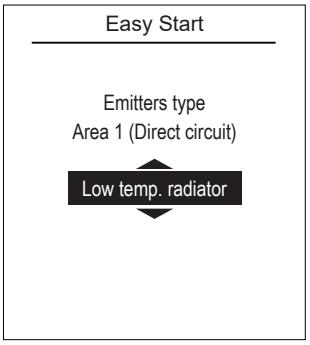


- If the installation covers 2 zones, set "*2nd circuit kit*" to "*Yes*".

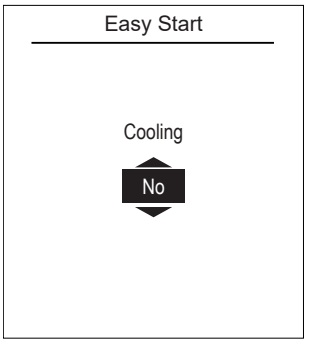


Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

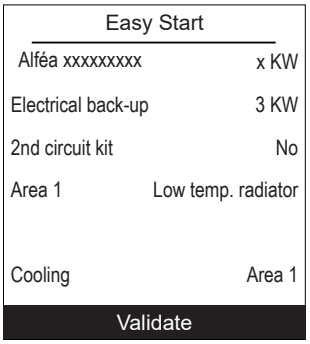
- Choose the radiator type for each zone:
  Low temp. radiator / Heat. floor system / Dynamic Radiators / Radiators.



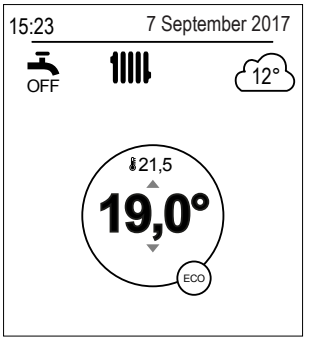
- If the installation is fitted with cooling function, choose the zone(s)*:*
  None / Area 1 / Area 2 / Area 1 and 2.



- Appliance settings summary screen. Press the knob to accept.
- The appliance starts initialising.



- The welcome screen is displayed (screen varies depending on installed options).



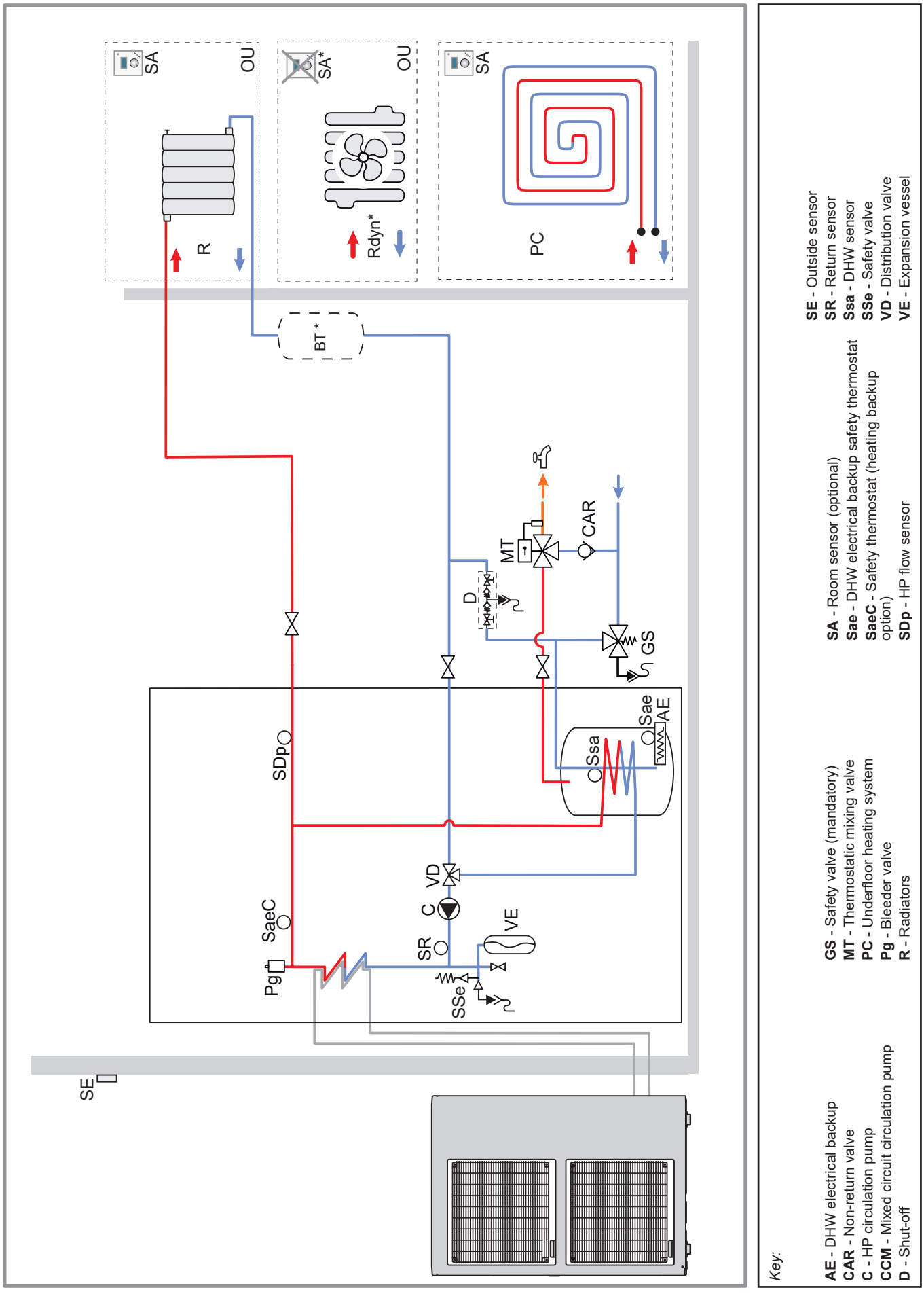
Upon commissioning, the electrical backup heaters or boiler are liable to start up even if the outdoor temperature at the time is above the heaters' trigger temperature.

The controller uses the initial average outdoor temperature of 0°C and needs time to update this temperature.

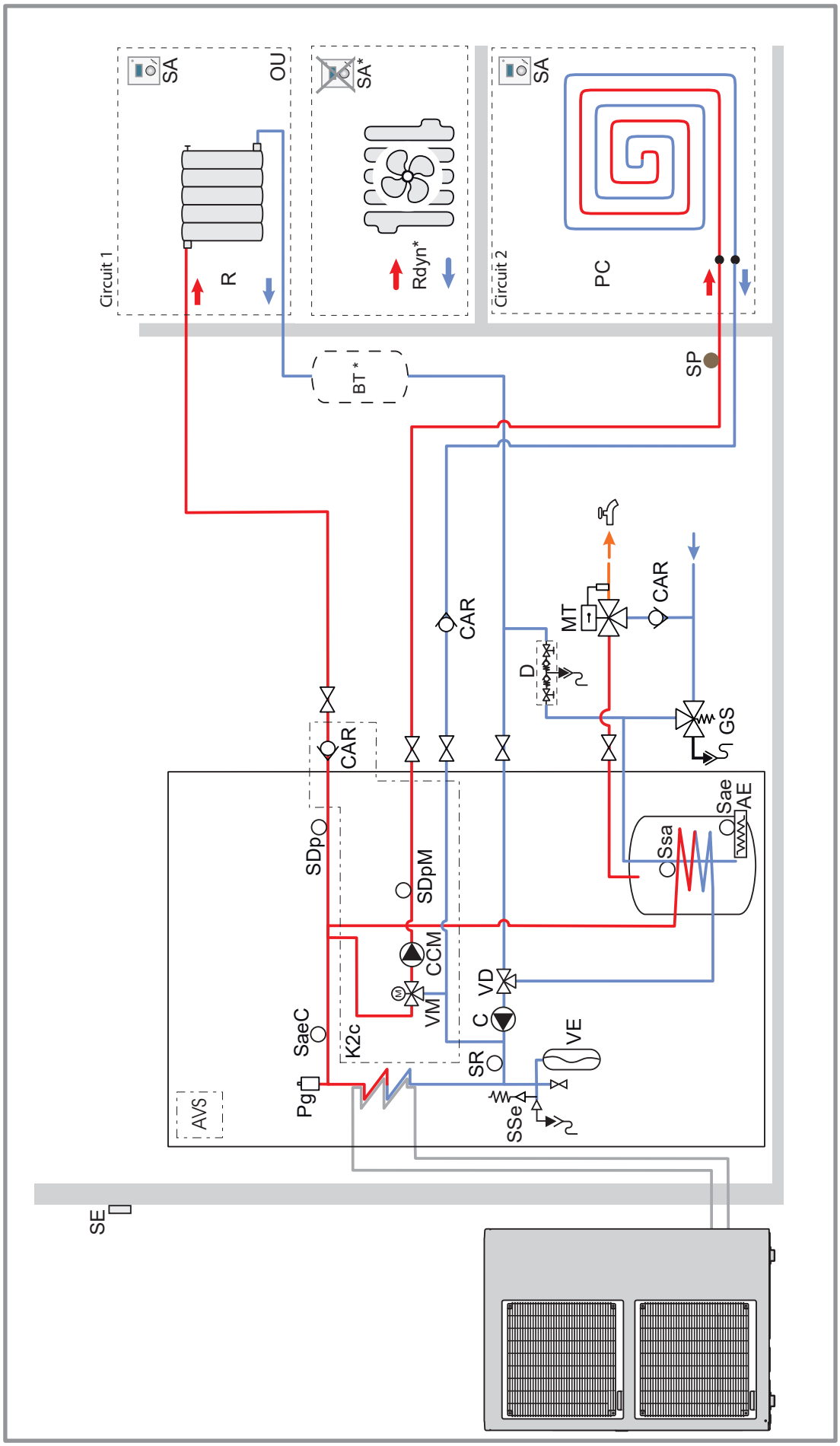
Some settings (or menus) might not be displayed. They are dependent on the installation's configuration (and installed options).

9 Basic Hydraulic Layout

• Configuration 1: 1 heating circuit



• Configuration 2: 2 heating circuits



Key:

AE - DHW electrical backup
AVS - Extension board, 2 circuits
CAR - Non-return valve
C - HP circulation pump
CCM - Mixed circuit circulation pump
D - Shut-off
GS - Safety valve (mandatory)
K2c - 2 circuit kit
MT - Thermostatic mixing valve
PC - Underfloor heating system
Pg - Bleeder valve
R - Radiators
SA - Room sensor (optional)
Sae - DHW electrical backup safety thermostat
SaeC - Safety thermostat (heating backup option)
SDp - HP flow sensor
SDpM - Mixed circuit flow sensor
SE - Outside sensor
SP - Heated floor safety fuse
SR - Return sensor
Ssa - DHW sensor
SSe - Safety valve
VD - Distribution valve
VE - Expansion vessel
VM - Circuit mixer valve

10 Electrical Cabling Plans

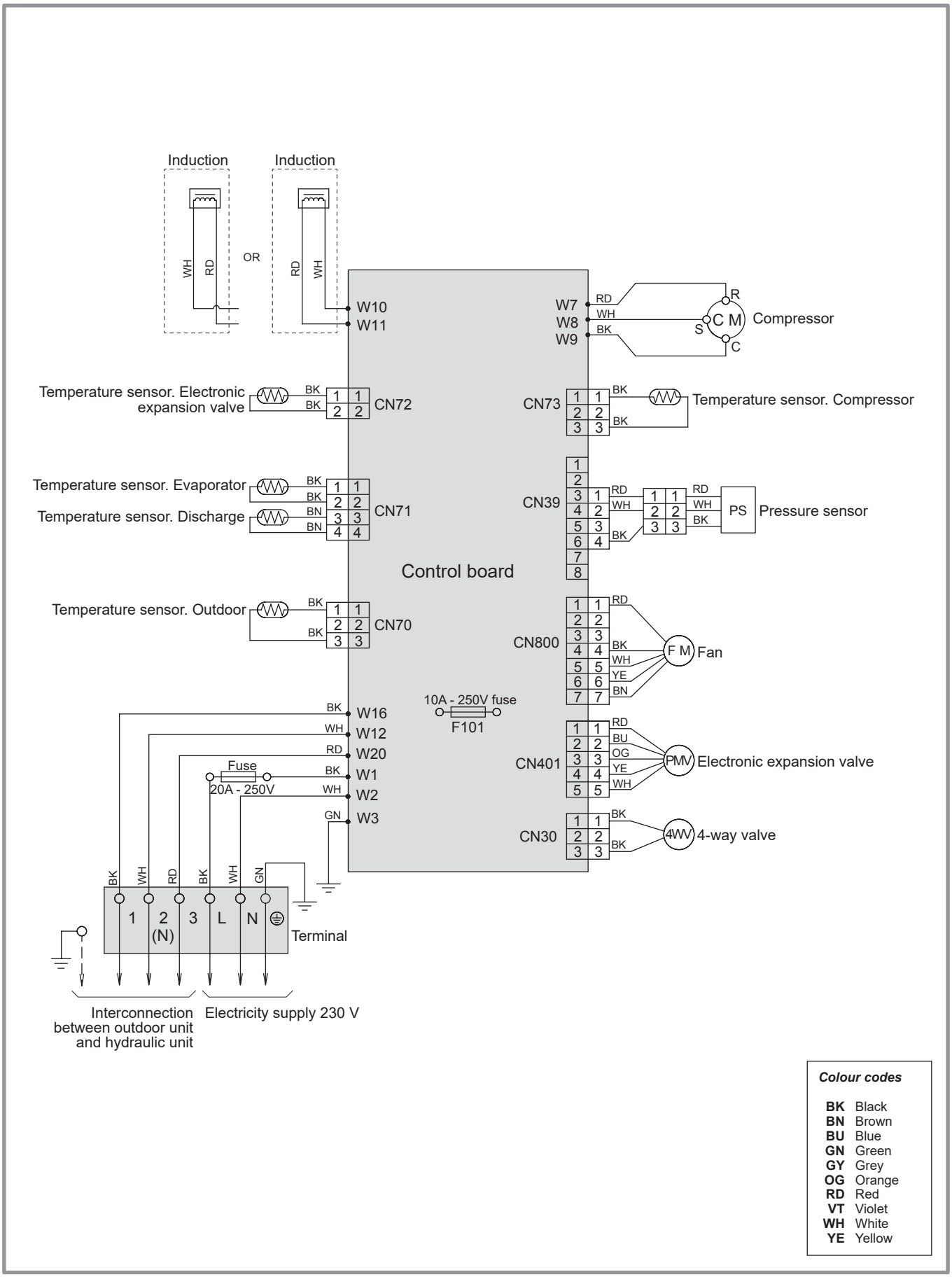


figure 45 - Outdoor unit electrical cabling Alféa Extensa Duo A.I. 5 and 6

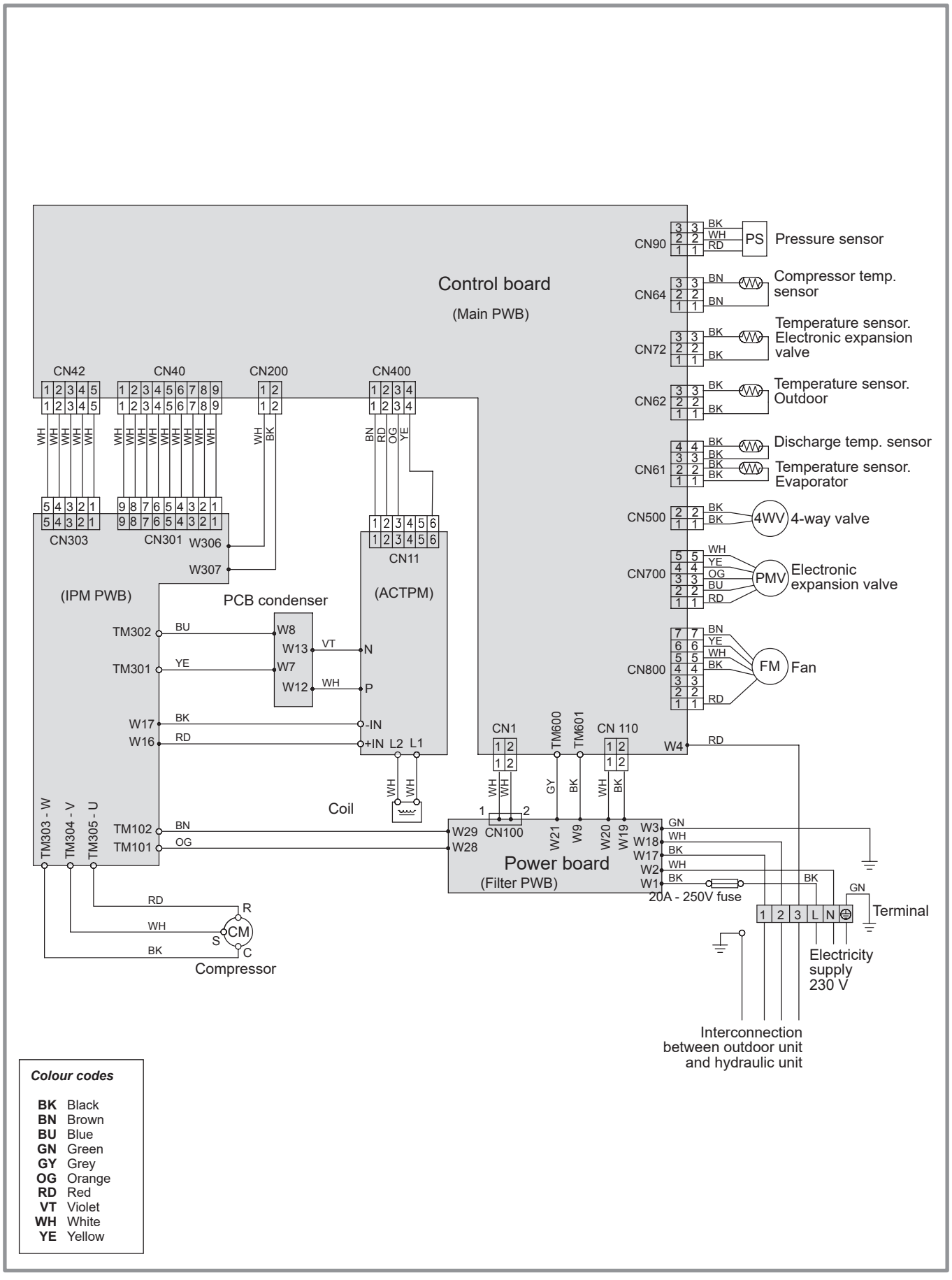


figure 46 - Outdoor unit electrical cabling Alféa Extensa Duo A.I. 8

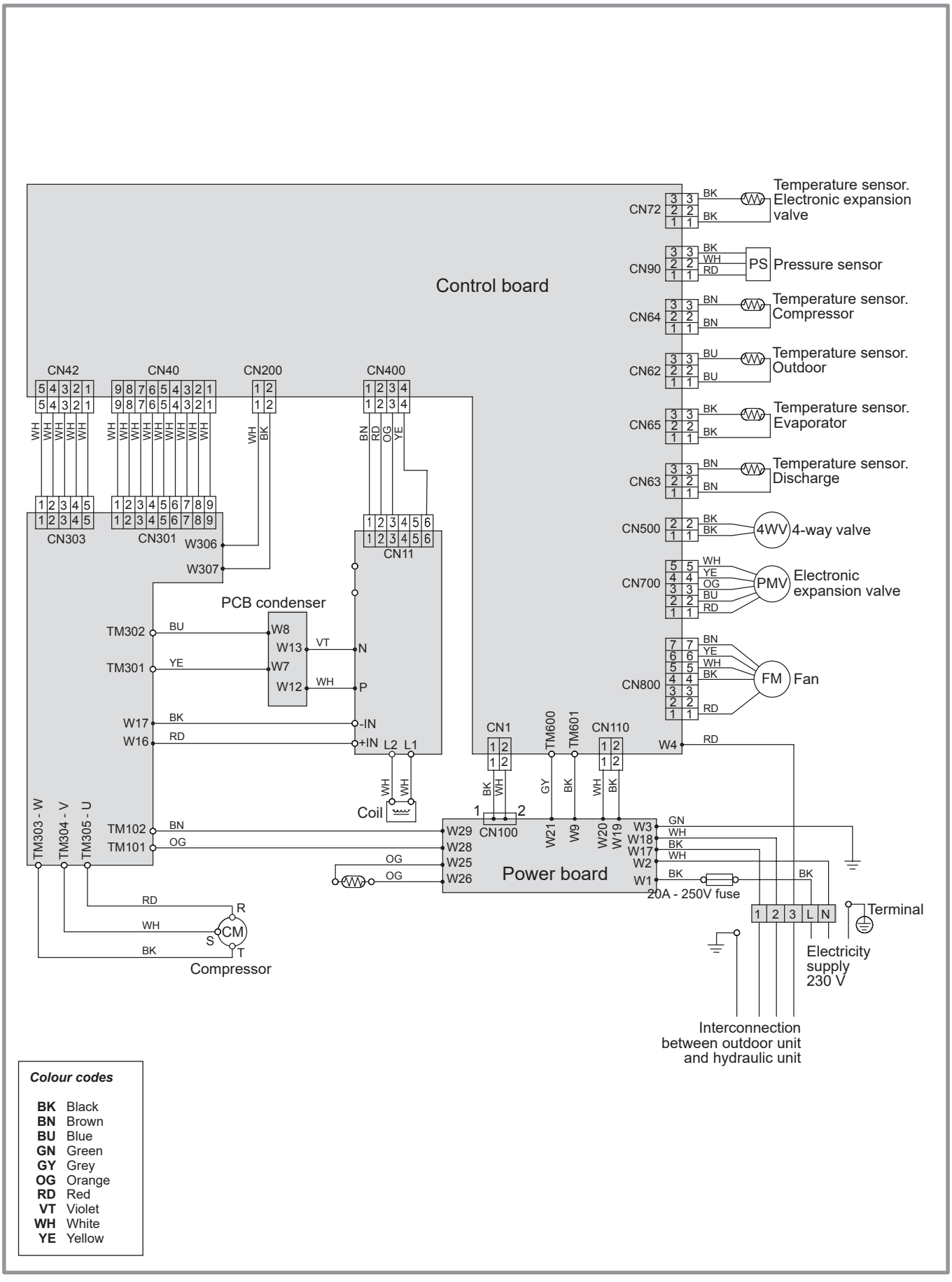


figure 47 - Outdoor unit electrical cabling Alféa Extensa Duo A.I. 10

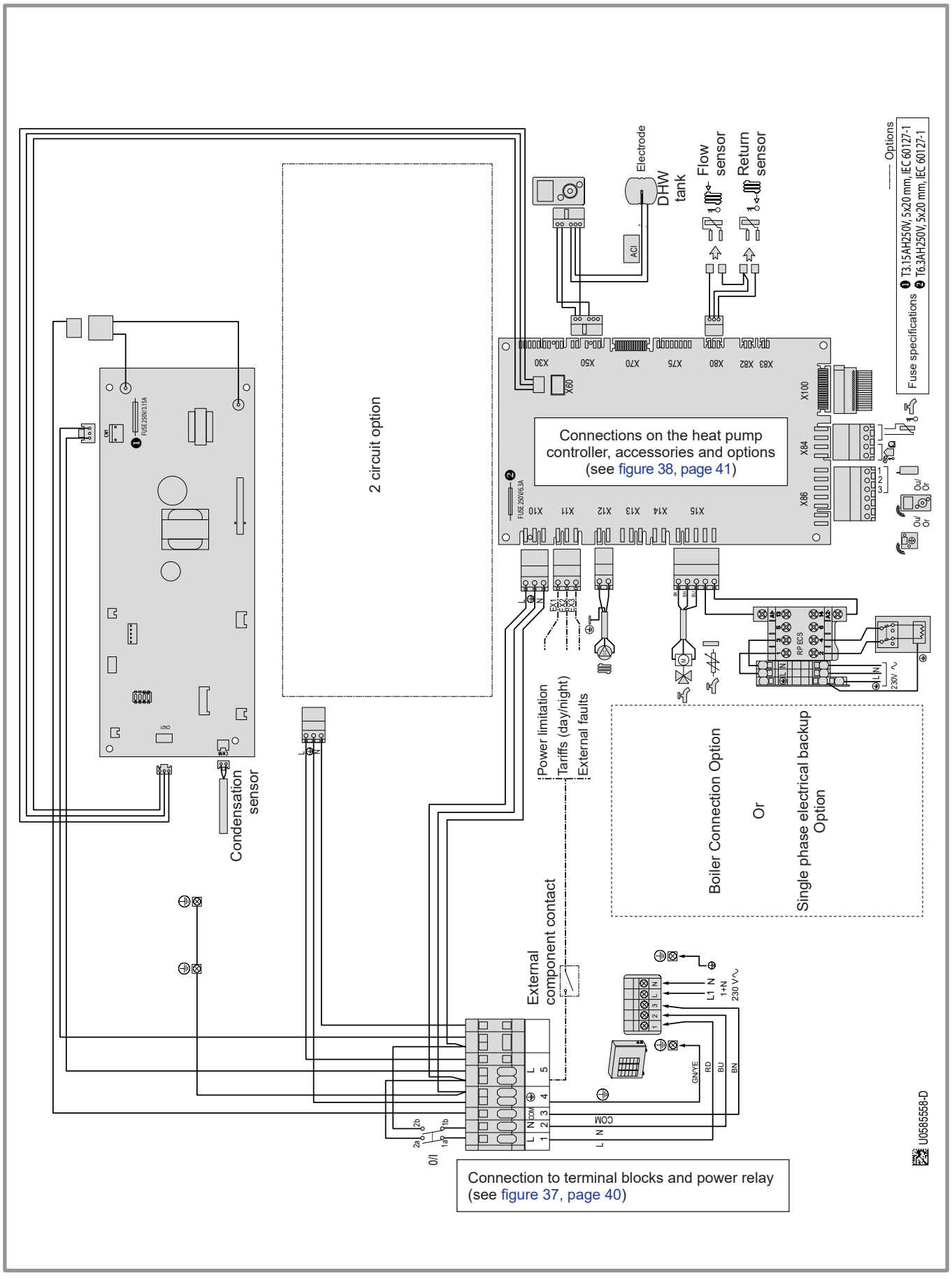
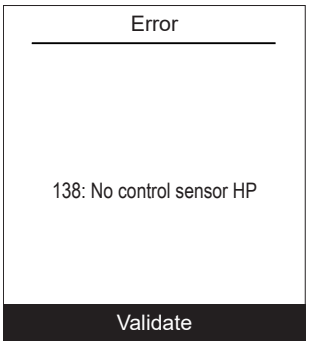


figure 48 - Electrical wiring of hydraulic unit (excluding connections made by installer)

11 Fault Diagnosis

If a fault occurs, the error number appears on the welcome screen.
To obtain the error's designation, select it using the knob.

☞ **In the event of an error originating in the outdoor unit, the user interface displays error code "370: Thermodynamic Generator" followed by the outdoor unit error.**



☞ **The error log can be viewed in the "System Status" > "Errors history", page 58.**

11.1 Faults in the Hydraulic Unit

Error	Designation	Probable causes	Proposed actions
10	Outside sensor	Short-circuit. Unplugged or disconnected sensor. Faulty sensor. Other fault.	- Check the sensor's wiring. - Replace the sensor.
32	Flow sensor 2		
33	Flow sensor HP		
44	Return sensor HP		
50	DHW sensor 1		
60	Room sensor 1		
65	Room sensor 2		
83	BSB, short circuit	Wiring problem (between the sensor or remote control, display and controller).	- Check the wiring.
127	Legionella temp	Anti-legionella temp setpoint not reached.	- Check the wiring of the DHW backup / boiler connection.
441	BX31 no function	Short-circuit. Unplugged or disconnected sensor. Faulty sensor. Other fault.	- Check the sensor's wiring. - Replace the sensor.
442	BX24 no function		
443	BX33 no function		
444	BX34 no function		
369	External	External safety triggered EX3.	-
370	Thermodynamic source	See details in "Faults in the outdoor unit".	-
516	Heat pump missing	Loss of connection between controller and HP.	- Check the wiring between X60 and the interface board.

☞ **Before any maintenance operation, make sure that the general power supply is switched off.**

☞ **Frost protection is not available when the heat pump is not powered up.**

11.2 Faults in the outdoor unit

Error	Interface Board		Outdoor Unit Board	Error designation
	LED Green	LED Red	LED	
11	1	1	Off	Serial communication error
			1	
32	3	2	-	UART communications error
42	4	2	22	Hydraulic unit heat-exchange thermistor error
63	6	3	18	Inverter error
64	6	4	19	Active filter error, PFC error
71	7	1	2	Discharge thermistor error
72	7	2	8	Compressor thermistor error
73	7	3	5	Heat-exchange thermistor error (center)
			4	Heat-exchange thermistor error (outlet)
74	7	4	7	Outdoor thermistor error
77	7	7	9	Heat sink thermistor error (inverter)
			10	Heat sink thermistor error (P.F.C.)
78	7	8	6	Expansion valve thermistor error
84	8	4	-	Current sensor error
86	8	6	3	Pressure sensor error / Pressure switch error
94	9	4	13	Current tripped
95	9	5	15	Compressor motor control error
97	9	7	16	Outdoor unit fan motor error
			17	
A1	10	1	11	Discharge temperature 1 protection
A3	10	3	12	Compressor temperature protection
A5	10	5	20	Low pressure abnormal
-	-	-	-	Outdoor unit error

12 Maintenance of the installation

☞ **Before any maintenance operation, make sure that the general power supply is switched off.**

12.1 Checking the hydraulic circuit

☞ **If frequent refills are required it is absolutely essential that you check for any leaks. If refilling and a pressure reset are necessary, check what type of fluid was used initially.**

Recommended filling pressure: between 1 and 2 bar (the exact filling pressure is determined by the water pressure in the installation).

Every year,

- Check the expansion circuit pressure (pre-inflation to 1 bar) and the correct operation of the safety valve.
- Check the safety valve on the cold water supply inlet. Make it operate as advised by the manufacturer.
- Check the shut-off.
- Check the correct operation of the distribution valve.

12.2 Maintenance of the DHW tank

Maintenance on the tank must be carried out annually (frequency may vary according to water hardness).

12.2.1 Emptying the hot water tank

- Remove the front panel from the HP.
- Close the cold water inlet into the tank.
- Open a hot water tap and open the water tank drain valve (ref. **1**).

12.2.2 Descaling

- Empty the water tank.
- Remove the cowl from the electrical backup (ref. **2**).
- Disconnect the electrical backup.
- Disconnect the ACI.
- Remove the electrical backup (ref. **3**).
- Descale the exchanger to maintain performance.
- Remove any scale deposits that may have accumulated in the tank. It is best to leave any scale sticking to the sides of the tank: this forms a protective layer.
- Gently remove any scale deposits on the thermowell. Do not use any metal objects or chemical or abrasive products.
- Replace the electrical backup's gasket (ref. **4**) each time it is dismantled.
- Reinstall the electrical backup and tighten alternate nuts in rotation.
- Reconnect the electrical backup.
- Reconnect the ACI.
- Replace the cowl on the electrical backup.

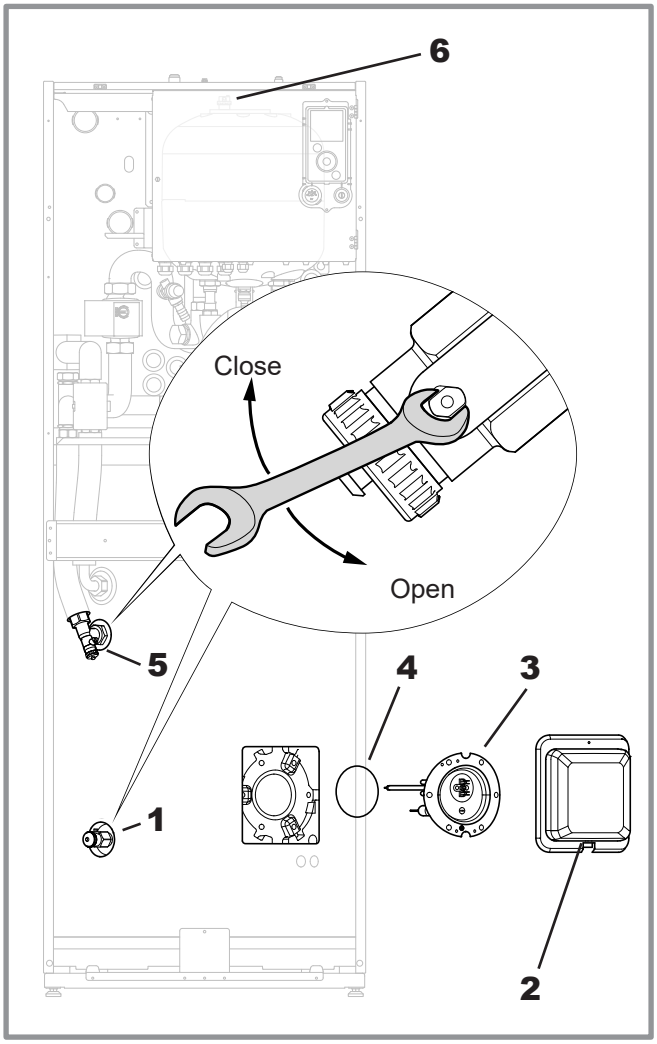


figure 49 - Draining the hydraulic unit and/or hot water tank

12.3 Checking the outdoor unit

- Remove any dust from the exchanger, if necessary, while making sure not to damage the blades.
- Straighten the blades using a comb.
- Check that there is nothing blocking the air flow.
- Check the fan.
- Verify that condensate drain is not obstructed.

• Checking the refrigeration circuit :

If the amount of refrigerant in the system exceeds 2kg (models > 10kW), the refrigeration circuit must be checked annually by an approved engineer (they must have a certificate of competence for the handling of refrigerants).

- Check there are no leaks (connections, valves…).

12.4 Checking the electrical circuit

- Check the connections and re-tighten if necessary.
- Check the state of the cables and plates.

13 Other maintenance

13.1 Emptying the hydraulic unit

- Remove the front panel of the hydraulic unit.
- Place the distribution valve in the middle position.
- Open the drain valve (ref. **5**x).
- Check that the hydraulic unit's bleeder valve are opened (ref. **6**).
- Open the installation's bleeder valve(s).

13.2 Distribution valve

Ensure the distribution valve is fitted in the correct direction:

Channel **AB**: outlet towards the hydraulic unit.

Channel **A** open: Return from DHW tank.

Channel **B** open: Return from the heating circuit.

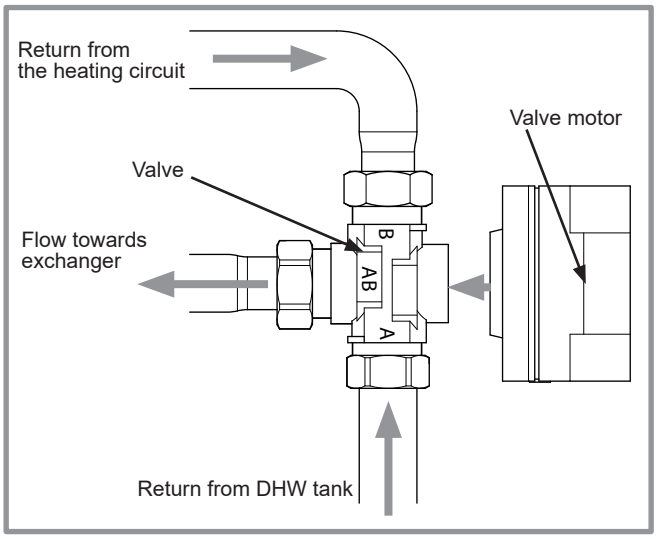
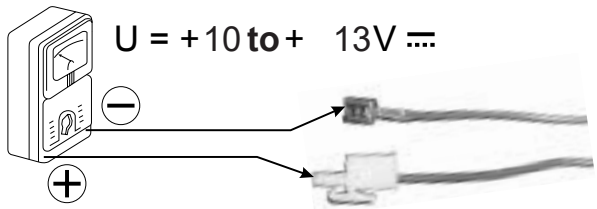


figure 50 - Mounting the distribution valve

13.3 ACI check

- Check polarity.
- Check voltage: With the appliance powered on, the voltage value must be positive and lie between +10 and +13 V DC.

ACI power supply control



ACI connection:
- to the tank body,
+ to the electrode connector.

Connection

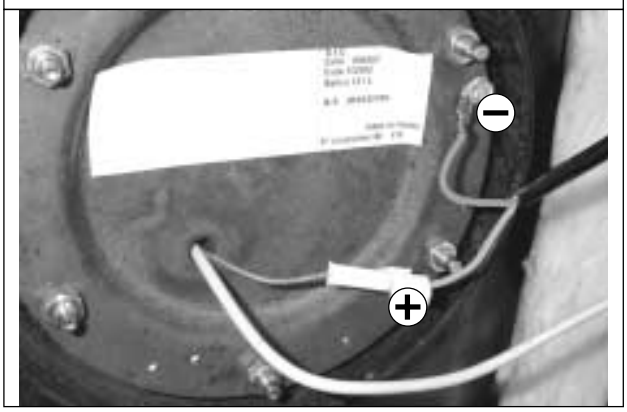


figure 51 - ACI check

14 Start-up procedure

Before switching on the hydraulic unit:

- Check the electric wiring.
- Check the refrigeration circuit and make sure that it has been gassed.
- Check the hydraulic circuit's pressure (1 to 2 bar), check that the heat pump has been bled, along with the rest of the installation.
- Make sure that ALL DIP SW are OFF before starting up.

14.1 Start-up check-list

14.1.1 Before starting-up

• Sight checks

Outdoor unit (see chapter "Installation of the outdoor unit", page 18).	OK	Not compliant	
Location and fittings, condensate evacuation.			
Comply with distances from obstacles.			

• Hydraulic checks

Hydraulic unit (see chapter "Installation of the hydraulic unit", page 20).	OK	Not compliant	Value
Connection of pipes, valves and pumps (heating circuit, DHW).			
Installation water volume (expansion vessel of adequate capacity?).			
No leaks.			
Main system pressure and degassing.			

• Refrigeration connections and checks

(see chapters "Refrigeration connections and filling the installation with gas", page 21).	OK	Not compliant	
Check the refrigeration circuits (sealing, no dust or humidity).			
Connections between units (pipe length, flare tightening torque...).			
Installation of HP pressure gauges and vacuum gauges on the gas line (large tube).			
Pump down mandatory.			
Nitrogen leak test (~ 10 bar).			
Opening of refrigeration valves to outdoor unit.			
Filling hydraulic unit and pipes with refrigerant.			

• Electrical checks

Outdoor unit (see chapter "Electrical connections", page 36).	OK	Not compliant	Value
Main power supply 230v.			
Protection by rated circuit breaker.			
Cable dimensions.			
Earth connection.			

Hydraulic unit (see chapter "Electrical connections on the hydraulic unit side", page 39).	OK	Not compliant	
Connection to the outdoor unit (L, N, Earth).			
Sensors connection (positioning and connections).			
Distribution valve connections (boiler and DHW) and circulation pump.			
Power supply and protection of electric backup (option).			

14.1.2 Starting-up

• Start-up

(see chapter "Controller Interface", page 44).	OK	Not compliant	
Close the installation's main circuit breaker (outdoor unit power supply) 2 hours before testing => Preheating of the compressor.			
Press the On/Off Switch => Initialisation takes several seconds.			
Operation of the heating circulation pump.			
Outdoor unit starts after 4 mins.			
Configure Time, Date and Heating circuit, DHW timer programs if different from the default values.			
Configure the hydraulic circuit.			
Set the heating gradient.			
Adjust the max flow setpoint.			

• Outdoor unit checks

	OK	Not compliant	Value
Operation of fan(s), compressor.			
Current measurement.			
After several minutes measure the difference in air temperature.			
Check condensation and evaporation pressure/temperature.			

• Hydraulic unit checks

	OK	Not compliant	Value
After 15 mins of operation.			
Primary water temp. difference.			
DHW priority (switching of distribution valve).			
Operation of heating, mixing valve, boiler backup, etc.			

• Control

(see chapter "Controller Interface", page 44).	OK	Not compliant	
Settings, maintenance, checks.			
Program the heating periods.			
Adjust the setpoints for the heating circuits if different from the default values.			
Adjust the DHW setpoints if different from the default values.			
Setpoint display.			
Explanations of use.			

The heat pump is ready for operation!

14.2 Commissioning technical datasheet

Site		**Installer**	

Outdoor unit	Serial N°.		**Hydraulic unit**	Serial N°.	
	Model			Model	

Refrigerant type			Refrigerant load	Kg

Checks			**Operating voltage & current on outdoor unit**		
Compliance with positioning distances			L/N	V	
Condensate evacuation correct					
Electric connections / connections tightness			L/T	V	
No GAS leaks (unit ID N°.:)					
Installation refrigeration connection correct (length m)			N/E	V	
Taken in operation when HOT					
Compressor discharge temperature		°C	Icomp	A	
Liquid line temp.		°C			
Condensation temperature	HP = bar	°C	Under-cooling		°C
Tank water output temperature		°C	ΔCondensation Temp.		°C
Tank water input temperature		°C	ΔSecondary Temp.		°C
Evaporation temperature	LP = bar	°C			
Suction Temp.		°C	Overheating		°C
Battery air input temperature		°C	ΔEvaporation Temp.		°C
Battery air output temperature		°C	ΔBattery Temp.		°C

Hydraulic network on hydraulic unit				
Secondary system	Underfloor heating system		Circulation pump brand	Type
	LT Radiators			
	Fan coils			
Domestic hot water; tank type				
Estimated water volume of secondary system		L		

Options & accessories:					
Electric backup kit			Room sensor A59		
Correct location of room sensor			Wireless room sensor A75		
2 circuit kit			Wireless room sensor A78		
Boiler connection kit					
Cooling kit			Details		

Control settings		
Configuration type		
Essential settings		

15 ErP performance figures

15.1 Definition of ErP

The term "ErP" includes two directives that are part of the European program for reducing greenhouse gases:

- The Ecodesign Directive establishes efficiency thresholds and prohibits the marketing of products whose efficiency is below these thresholds.
- The Energy Labelling Directive requires an energy performance label for products, in order to encourage customers to buy products that consume less energy.

15.2 ErP specification

Trademark / Product name:	**Atlantic / Alféa ...**		**Extensa Duo A.I. 5**		**Extensa Duo A.I. 6**		**Extensa Duo A.I. 8**		**Extensa Duo A.I. 10**	
Export code			**526226**		**526227**		**526228**		**526229**	
Heating applications			35°C	55°C	35°C	55°C	35°C	55°C	35°C	55°C
Air/water heat pump			Yes							
Equipped with a backup heater			Yes							
Heat pump combination heating appliance			Yes							
Average climate - Space heating										
Energy class (product)	-	-	A++	A+	A++	A+	A++	A+	A++	A+
Energy class (package)	-	-	A++	A+	A++	A+	A++	A+	A++	A+
Rated heat output (2)	P_{rated}	kW	4	4	5	5	7	6	8	8
Rated energy efficiency	η_s	%	169	115	169	115	156	118	155	113
Rated energy efficiency with outside sensor (1)	η_s	%	171	117	171	117	158	120	157	115
Rated energy efficiency with room sensor (1)	η_s	%	173	119	173	119	160	122	159	117
Annual energy consumption	Q_{he}	kWh	2160	3027	2505	3180	3375	3886	4415	5415
Average climate - Domestic hot water production										
Filling profile	-	-	L		L		L		L	
Energy class	-	-	A+		A+		A+		A+	
Energy efficiency	η_{wh}	%	120		120		120		120	
Annual energy consumption	AEC	kWh	880		880		880		880	
Daily electricity consumption	Q_{elec}	kWh	4		4		4		4	
Colder climate - Space heating										
Rated heat output (2)	P_{rated}	kW	NA							
Rated energy efficiency	η_s	%								
Annual energy consumption	Q_{he}	kWh								
Colder climate - Domestic hot water production										
Filling profile	-	-	NA							
Energy efficiency	η_{wh}	%								
Annual energy consumption	AEC	kWh								
Daily electricity consumption	Q_{elec}	kWh								
Warmer climate - Space heating										
Rated heat output (2)	P_{rated}	kW	4	4	5	4	6	5	8	6
Rated energy efficiency	η_s	%	217	139	212	138	207	138	196	136
Annual energy consumption	Q_{he}	kWh	1090	1423	1167	1531	1439	1934	2203	2422
Warmer climate - Domestic hot water production										
Filling profile	-	-	L		L		L		L	
Energy efficiency	η_{wh}	%	120		120		120		120	
Annual energy consumption	AEC	kWh	880		880		880		880	
Daily electricity consumption	Q_{elec}	kWh	4		4		4		4	

Trademark / Product name:	Atlantic / Alféa ...		Extensa Duo A.I. 5		Extensa Duo A.I. 6		Extensa Duo A.I. 8		Extensa Duo A.I. 10	
Export code			**526226**		**526227**		**526228**		**526229**	
Heating applications			35°C	55°C	35°C	55°C	35°C	55°C	35°C	55°C
Acoustic data										
Sound power level of hydraulic unit	L_{WA}	dB (A)	46							
Sound power level of outdoor unit	L_{WA}	dB (A)	63		63		69		69	
Declared heat output with a partial load for an indoor temperature of 20°C and an outdoor temperature of Tj										
Tj = -7°C	Pdh	kW	4.0	3.8	4.6	4.0	5.8	5.3	7.5	6.7
Tj = +2°C	Pdh	kW	2.4	2.3	2.8	2.5	3.5	3.1	4.5	4.1
Tj = +7°C	Pdh	kW	2.0	1.7	2.3	1.7	2.3	2.0	3.5	3.2
Tj = +12°C	Pdh	kW	2.3	2.1	2.3	2.1	2.4	2.2	4.0	4.0
Tj = bivalent temperature	Pdh	kW	4.0	3.8	4.6	4.0	5.8	5.3	7.5	6.7
Tj = operating temperature limit	Pdh	kW	3.9	3.2	4.5	3.5	5.6	4.9	7.0	5.9
Bivalent temperature	T_{biv}	°C	-7	-7	-7	-7	-7	-7	-7	-7
Degradation coefficient (3)	Cdh	-	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Declared coefficients of performance with a partial load for an indoor temperature of 20°C and an outdoor temperature of Tj										
Tj = -7°C	COP_d	-	2.86	1.86	2.65	1.79	2.35	1.77	2.35	1.74
Tj = +2°C	COP_d	-	4.10	2.82	4.17	2.86	3.82	2.93	3.81	2.74
Tj = +7°C	COP_d	-	5.00	4.00	5.99	4.03	5.69	4.12	5.71	4.10
Tj = +12°C	COP_d	-	8.12	5.84	8.29	5.84	8.16	5.81	7.16	5.72
Tj = bivalent temperature	COP_d	-	2.86	1.86	2.65	1.79	2.35	1.77	2.35	1.74
Tj = operating temperature limit	COP_d	-	2.65	1.54	2.57	1.56	2.02	1.47	2.16	1.44
For air/water heat pumps: operating temperature limit	TOL	°C	-10	-10	-10	-10	-10	-10	-10	-10
Maximum heating water operating temperature	WTOL	°C	55	55	55	55	55	55	55	55
Backup heater										
Rated heat output (2)	P_{sup}	kW	0.6	1.1	0.7	1.0	0.9	1.2	1.4	1.7
Type of energy used	-	-	Electric							
Electricity consumption in modes other than the active mode										
Shutdown mode	P_{OFF}	W	6	6	6	6	6	6	5	5
Thermostat shutdown mode	P_{TO}	W	19	17	23	16	30	16	43	22
Standby mode	P_{SB}	W	10	10	10	10	9	9	8	8
Casing resistance mode	P_{CK}	W	0	0	0	0	0	0	0	0
Other characteristics										
Power control	-	-	Inverter							
For air/water heat pumps, rated air flow rate, outdoors	-	m^3/h	2070		2340		3600		6200	

(1) The calculation details are available on the package datasheet. The room unit refers to: sensors, thermostats and remote controllers included, or not included, in the kits.

(2) For heat pump space heaters and heat pump combination heaters, the rated heat output P_{rated} is equal to the rated calorific load $P_{designh}$, and the rated heat output of the backup heater P_{sup} is equal to the calorific output of the extra backup heating (Tj).

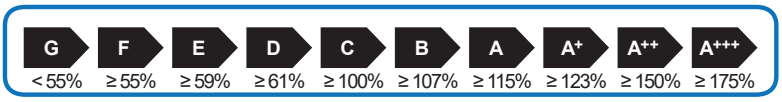
(3) If Cdh is not determined by measurement then the default degradation coefficient is Cdh=0.9.

15.3 Package datasheet

Outside sensor included in the combined package	
Controller class	II
Seasonal efficiency contribution	2%

Modulating room thermostat references (outdoor sensor included in the package)	074208 (Navilink A59) 074213 (Navilink A75) 074214 (Navilink A78)
Regulator class	VI
Seasonal efficiency contribution	4%

☞ Application 35°C



Product name Alfea ...	Extensa Duo A.I. 5		Extensa Duo A.I. 6		Extensa Duo A.I. 8		Extensa Duo A.I. 10	
Export code	**526226**		**526227**		**526228**		**526229**	
Seasonal energy efficiency of heat pump for space heating	169%		169%		157%		155%	
Type of temperature control - Outdoor sensor (included in the package) - Modulating room thermostat (outdoor sensor included in the package)	class II -	- class VI	class II -	- class VI	class II -	- class VI	class II -	- class VI
Bonus	2%	4%	2%	4%	2%	4%	2%	4%
Seasonal space heating energy efficiency of package **in average climate conditions**	171%	173%	171%	173%	159%	161%	157%	159%
Energy class of the package	A++	A++	A++	A++	A++	A++	A++	A++
Seasonal space heating energy efficiency of package **in warmer climate conditions**	219%	221%	214%	215%	209%	211%	198%	200%
Seasonal space heating energy efficiency of package **in colder climate conditions**	NA							

The energy efficiency of the combined product provided for in this datasheet may not correspond to its actual energy efficiency once the combined product has been installed in a building, as the efficiency is influenced by other factors such as heat loss in the distribution system and the capacity of the products in relation to building size and characteristics.

☞ Application 55°C

Product name Alfea ...	Extensa Duo A.I. 5		Extensa Duo A.I. 6		Extensa Duo A.I. 8		Extensa Duo A.I. 10	
Export code	**526226**		**526227**		**526228**		**526229**	
Seasonal energy efficiency of heat pump for space heating	115%		115%		118%		113%	
Type of temperature control - Outdoor sensor (included in the package) - Modulating room thermostat (outdoor sensor included in the package)	class II -	- class VI	class II -	- class VI	class II -	- class VI	class II -	- class VI
Bonus	2%	4%	2%	4%	2%	4%	2%	4%
Seasonal space heating energy efficiency of package **in average climate conditions**	117%	119%	117%	119%	120%	122%	115%	117%
Energy class of the package	A+	A+	A+	A+	A+	A+	A+	A+
Seasonal space heating energy efficiency of package **in warmer climate conditions**	141%	143%	140%	142%	140%	142%	138%	140%
Seasonal space heating energy efficiency of package **in colder climate conditions**	NA							

The energy efficiency of the combined product provided for in this datasheet may not correspond to its actual energy efficiency once the combined product has been installed in a building, as the efficiency is influenced by other factors such as heat loss in the distribution system and the capacity of the products in relation to building size and characteristics.

16 Instructions for the end user

Explain to the user the operation of the installation (heating and hot water temperature settings), especially the ambient sensor functions and the programs that are accessible via the user interface.

Emphasise that a heated floor has significant inertia and that therefore any adjustments must be made gradually.

Also explain to the end user how to check the filling of the heating circuit.

☞ **End-of-life of the appliance**

The appliances must be dismantled and recycled by a specialised service. The appliances must not, under any circumstances, be thrown out with household waste, bulky waste or at a tip.

At the end of its service life, please contact your installer or local representative to proceed with its dismantling and recycling.

This equipment complies with:

- Low Voltage Directive 2014/35/EC in accordance with NF EN 60335-1, NF EN 60335-2-40, NF EN 60529, NF EN 60529/A2 (IP) standards,
- Electromechanical Compatibility Directive 2014/30/EC,
- Machines Directive 2006/42/EC,
- Pressure Equipment Directive 2014/68/EC in accordance with NF EN 378-2 standard,
- Ecodesign Directive 2009/125/EC,
- Energy Labelling Directive 2010/30/EC.

This appliance also complies with:

- Decree No. 92-1271 (and its modifications) relating to certain refrigeration fluids used in refrigeration and air conditioning equipment.
- Regulation 842/2006 of the European Parliament on certain fluorinated greenhouse gases.
- Standards relating to the product and testing methods used: Air-conditioners, liquid chiller units and heat pumps with a compressor driven by an electric motor for heating and refrigeration EN 14511-1, EN 14511-2, EN 14511-3, EN 14511-4.
- EN 12102 standard: Air-conditioners, heat pumps and dehumidifiers with compressor driven by electric motor. Measurement of airborne noise. Determination of the level of sound power.

012

Keymark Certification:

012-007 - Alféa Extensa Duo A.I. 5 / 012-008 - Alféa Extensa Duo A.I. 6
012-009 - Alféa Extensa Duo A.I. 8 / 012-010 - Alféa Extensa Duo A.I. 10

This appliance is marked with this symbol. It means that all electrical and electronic products must be strictly separated from household waste.
A specific recovery system for this type of product is in place in the countries of the European Union (*), Norway, Iceland and Liechtenstein.
Do not attempt to dismantle this product yourself. This can have adverse effects on your health and on the environment.
Refrigerant liquid, oil and other parts must be reprocessed by a qualified installer in accordance with applicable local and national laws.
In terms of recycling, this appliance must be processed by a specialised service and must not, under any circumstances, be thrown out with household waste, bulky waste or at a tip.
Please contact your heating engineer or After Sales service for further information.

* Depending on the national regulations of each member state.

Commissioning date:

Contact details of your heating engineer or After Sales service.

atlantic-comfort.com

Société Industrielle de Chauffage
SATC - BP 64 - 59660 MERVILLE - FRANCE