

Installation and Commissioning Instructions

E-Tec Hybrid

Hybrid Heat Pump Package

For Technical help or for Service call ...
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Leave these instructions with the User

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1 INTRODUCTION

The Alpha E-Tec 33 Hybrid is a hybrid heat pump specifically designed to increase energy efficiency when replacing old appliances, even on traditional radiator systems. Thanks to its compact size, it represents the ideal solution to easily install a hybrid generator to replace an old gas boiler, with extremely easy installation and reduced installation time.

Composed of a 4 kW single-phase air/water mono block outdoor unit (with R32 coolant) and an indoor condensing gas boiler connected hydraulically in series.

A control unit is also supplied as standard, to manage both boiler and heat pump. The smart logic, integrated in the system's electronics, is able to determine the most convenient energy source at that moment (heat pump or boiler) and therefore to choose the source to be activated.

Operation in central heating takes place with the use of a heat pump and boiler, with the option of activating the two units at the same time.

The complete 'package' consists of the following main components:

Outdoor unit with mono block heat pump, which mainly includes:

Swing-type rotary compressor with liquid separator, management electronics, lamination valve, finned coil for exchange with external air (with single fan), external probe for sliding temperature operation, water/coolant gas heat exchanger, 3 bar water safety valve, water side filter (already mounted inside the system return), anti-vibration feet. The supply also includes a thermostatic antifreeze valve (which is only triggered in the absence of electricity, as the electronics include an antifreeze function with activation of the pump and of the boiler if required), isolating valves for flow and return with vacuum breaker valve. The cooling circuit is hermetically sealed (R32 coolant). Inertial buffer tank only required for systems with water content lower than 20 litres.

Wall-mounted indoor boiler unit which includes:

- Total pre-mixing combustion system with steel multigas cylindrical burner, complete with ignition electrode and ionisation control, double shutter pneumatic gas valve.
- Gas/water primary heat exchanger with internal coil made of single-pipe Stainless steel, fanned for flue with electronically variable speed.
- Condensate disposal including trap and flexible drain hose.
- Stainless steel water/water secondary heat exchanger for the production of domestic hot water.
- Hydraulic unit consisting of a 3-way valve, a 7 m modulating pump, a 3 bar safety valve, a flow switch for detecting domestic hot water withdrawal, an 8 litre expansion vessel with 1.0 bar pre-charge and pressure gauge.
- System water flow/return and flue sensors.
- Control panel including: microprocessor P.C.B. with 3 sensor continuous flame modulation (1 DHW and 2 C.H.) with P.I.D. control, modulation range from 4.3 to 33 kW .
- Electronic ignition with ionisation control, ignition delay device in central heating mode, anti-freeze protection system (standard to -5 °C), pump anti-block device function, post-ventilation function, chimney sweep function and pump functioning mode selection.
- Solar delay timing function for coupling with solar thermal systems, with the option of connecting a domestic hot water sensor
- Screed heater function.
- Self-diagnosis system.
- IPX5D electrical insulation rating.
- Sample points for combustion analysis, lower cover for connection group, gas and mains water isolation valves.

Control unit:

To manage boiler and heat pump, optimising the system in the most efficient way. A boiler mounted receiver and gateway unit with bus connection via a cable between the outdoor and indoor units. Using a separate wireless controller with built in room thermostat with App connection for smart phone remote user control.

2 SAFETY SYMBOLS



GENERIC HAZARD

Strictly follow all of the indications next to the symbol. Failure to follow the indications can generate hazard situations resulting in possible harm to the health of the operator and user in general.



ELECTRICAL HAZARD

Strictly follow all of the indications next to the symbol. The symbol indicates the appliance's electrical components or, in this manual, identifies actions that can cause an electrical hazard.



SHARP SURFACES

The symbol indicates the appliance's components or parts that can cause cuts if touched.



EARTH TERMINAL CONNECTION

The symbol identifies the appliance's earth terminal connection point.



READ AND UNDERSTAND THE INSTRUCTIONS

Read and understand the appliance's instructions before performing any operation, carefully following the indications provided.



INFORMATION

Indicates useful tips or additional information.



The user must not dispose of the appliance at the end of its service life as municipal waste, but send it to appropriate collection centres.

PERSONAL PROTECTIVE EQUIPMENT



SAFETY GLOVES



SAFETY GOGGLES

3 TECHNICAL DATA

3.1 TECHNICAL PERFORMANCE DATA E-TEC 33 HYBRID BOILER



Domestic hot water maximum heating power		kW (kcal/h)	28.8 (24.773)
Central heating maximum heat input		kW (kcal/h)	24.6 (21.194)
DHW maximum useful heat output		kW (kcal/h)	28.3 (24.295)
CH maximum useful heat output		kW (kcal/h)	24.1 (20.717)
Minimum nominal heat input		kW (kcal/h)	4.5 (3.862)
Minimum nominal heat output		kW (kcal/h)	4.3 (3.689)
Efficiency at 100% P _n (80/60°C)		%	97.8
Efficiency at 30% of the load (80/60°C)		%	102.3
Efficiency at 100% P _n (50/30°C)		%	106.1
Efficiency at 30% of the load (50/30°C)		%	108.3
Efficiency at 100% P _n (40/30°C)		%	108.2
Efficiency at 30% of the load (40/30°C)		%	108.3
Room central heating seasonal efficiency (η _s)		%	93
Water heating energy efficiency (η _{wh})		%	87
Central heating circuit			
Adjustable central heating temperature (min. / max)		°C	min. 20 - 50 / max 85
System max. working temperature		°C	90
System max. working pressure		bar	3
System expansion vessel nominal/(real) capacity		litres	8.0 / (5.8)
System expansion vessel factory-set pressure		bar	1.0
Minimum design system flow rate		L/h	500
Head with 1000 l/h flow rate		kPa (m c.a.)	40.6 (4.1)
Minimum system water content		litres	20
DHW circuit			
Hot water production useful heat output		kW (kcal/h)	28.3 (24.295)
DHW adjustable temperature		°C	30 - 60
Domestic hot water circuit min. dynamic pressure		bar	0.3
Domestic hot water circuit / DHW Circuit max. pressure		bar	8
D.H.W. min. withdrawal		litres/min	1.5
Flow rate in continuous service (ΔT 30°C)		litres/min	13.7
Gas supply			
Gas flow rate at METHANE burner (G20)	MIN - MAX	m³/h	0.48 - 2.61 (3.06 DHW)
Gas flow rate at LPG burner (G31)	MIN - MAX	kg/h	0.35 - 1.91 (2.25 DHW)
Electric power supply		V/Hz	230 - 50
Nominal power absorption		A	0.60
Installed electric power		W	80
Power absorbed by pump max speed		W	41
Power absorbed in stand-by		W	2
Electric insulation rating	IP		X5D
Water content		litres	2.2
Empty condensation unit weight		kg	33.6
Effective efficiency at 100% output			>93+2·log P _n
(Italian Lgs. D. 192/05 as amended)			(P _n = 24.1 kW)

3.2 TECHNICAL PERFORMANCE DATA BOILER COMBUSTION FEATURES



		Methane (G20)	LPG (G31)
Combustion efficiency 100% Pn (80/60°C)	%	97.8	97.8
Combustion efficiency P min (80/60°C)	%	97.8	97.8
Effective efficiency at 100% Pn (80/60°C)	%	97.8	97.8
Effective efficiency P min (80/60°C)	%	95.5	95.5
Effective efficiency at 100% Pn (50/30°C)	%	106.1	106.1
Effective efficiency P min (50/30°C)	%	106.1	106.1
Effective efficiency at 100% Pn (40/30°C)	%	108.2	108.2
Effective efficiency P min (40/30°C)	%	108.3	108.3
Chimney losses with burner on (100% Pn) (80/60°C)	%	1.7	1.7
Chimney losses with burner on (P min) (80/60°C)	%	2.2	2.2
Chimney losses with burner off	%	0.02	0.02
Casing losses with burner on (100% Pn) (80/60°C)	%	0.2	0.2
Casing losses with burner on (Pmin) (80/60°C)	%	2.3	2.3
Casing losses with burner off	%	0.34	0.34
Flue gas temperature Maximum Heat Input	°C	70	70
Flue gas temperature Minimum Heat Input	°C	64	63
Flue flow rate at Central Heating Maximum Heat Input	kg/h	38	37
Flue flow rate at Maximum Domestic Hot Water Heat Input	kg/h	44	43
Flue flow rate at Minimum Heat Input	kg/h	8	7
CO ₂ at the Maximum Central Heating Heat Input	%	9.70	11.40
CO ₂ at Maximum Domestic Hot Water Heat Input	%	9.70	11.40
CO ₂ at Minimum Heat Input	%	8.80	10.60
CO at Maximum Heat Input	mg/kWh	321	316
CO at Minimum Heat Input	mg/kWh	5	5
NO _x at the Maximum Heat Input	mg/kWh	59	85
NO _x at Minimum Heat Input	mg/kWh	34	55
Weighted CO	mg/kWh	20	-
Weighted NO _x	mg/kWh	35	-
NO _x class	-	6	6
Intake/exhaust available head (min-max flow rate)	Pa	2 - 240	

Gas flow rates refer to the NHV at the temperature of 15° C and pressure of 1013 mbar.

Flue temperature values refer to an air inlet temperature of 15°C and flow/return temperature = 80/60°C.

3.3 TECHNICAL PERFORMANCE DATA E-TEC EXTERNAL HEAT PUMP



Central heating circuit		
Nominal power in CH mode with water set at 35 °C / Air 7 °C	kW	3.98
Nominal power in CH mode with water set at 45 °C / Air 7 °C	kW	3.80
Nominal power in CH mode with water set at 55 °C / Air 7 °C	kW	3.32
Nominal power in CH mode with water set at 35 °C / Air 2 °C	kW	2.97
Nominal power in CH mode with water set at 35 °C / Air -7 °C	kW	3.53
Absorbed power in CH mode with water set at 35 °C / Air 7 °C	kW	0.87
Absorbed power in CH mode with water set at 45 °C / Air 7 °C	kW	1.15
Absorbed power in CH mode with water set at 55 °C / Air 7 °C	kW	1.33
Absorbed power in CH mode with water set at 35 °C / Air 2 °C	kW	0.79
Absorbed power in CH mode with water set at 35 °C / Air -7 °C	kW	1.31
CH mode nominal COP with water set at 35 °C / Air 7 °C		4.55
CH mode nominal COP with water set at 45 °C / Air 7 °C		3.30
CH mode nominal COP with water set at 55 °C / Air 7 °C		2.50
CH mode nominal COP with water set at 35 °C / Air 2 °C		3.78
CH mode nominal COP with water set at 35 °C / Air -7 °C		2.70
CH flow temperature range	°C	25 ÷ 55
Outdoor temp. limits for operation (DHW)	°C	- 15 ÷ 25 (35)
Heat pump general data		
Electric power supply	V/Hz	230/50
Permitted voltage range	V	198 ÷ 264
Maximum absorbed power (outdoor condensing unit)	W	2600
Fuse required / MCB	A	16
Degree of protection	IP	X4D
C.H. sound power level	dB(A)	59
Type of refrigerant / (GWP)		R32 / 675
Refrigerant fluid load (R32)	kg	0.56
Weight	kg	45
Water content	l	2.0

4.3 EXTERNAL HEAT PUMP DIMENSIONS AND CONNECTIONS

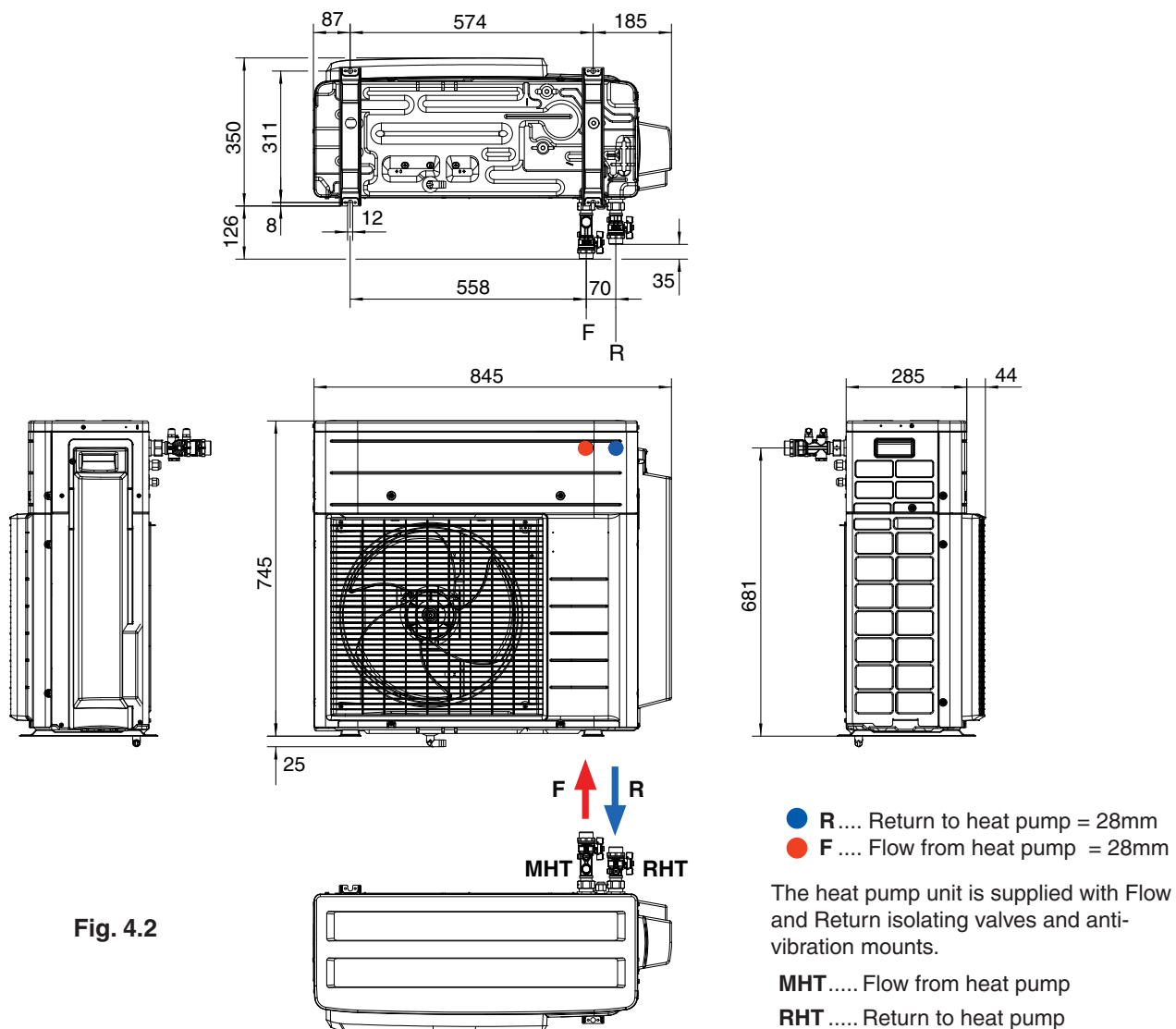


Fig. 4.2

4.3 GRUNDFOS UPM4 PUMP SETTINGS

The indoor boiler is equipped with a low power consumption pump with variable speed regulator, the pump also works for the heat pump, since the two generators are placed in series with each other.

The pump speed is set using the parameters present in the Assistance Menu -> System Definition of the Control panel.

For the hybrid heat pump to work properly, it is not allowed to drop below the minimum value indicated in Fig. 4.3.

In domestic hot water mode, the pump always runs at full speed. The pump speed settings should not be adjusted.

NOTE: The boiler is supplied with the by-pass closed.

For correct operation of the system, the boiler by-pass must be kept closed.

It is essential for correct operation that a branch of the system always remains open; otherwise it will be required to install an external by-pass (especially in the case of zone valves or thermostatic valves on the radiators) the purpose is to allow the antifreeze function to be carried out (which occurs when the pump is restarted).

For proper system operation, make sure that the minimum flow rate in operating conditions never drops below 500 l/h.

An inline filter must be fitted in the return to the heat pump.

Treating the system water allows you to prevent problems and maintain the function and efficiency of the boiler over time.

Chemical treatment of the thermal system water, must be in compliance with the BS 7953.

NOTE: To ensure correct operation of the heat pump a minimum water content in the system is required, which must be 20 litres for all kinds of systems.

So attention must be paid to the systems spread over several zones, where the water content available to the unit changes continuously.



4.4 AVAILABLE PUMP HEAD AND POWER CONSUMPTION

Total head available to the system.

To obtain the available head for the system, subtract the head losses of the outdoor heat pump from the available head of the boiler.

Available head to boiler

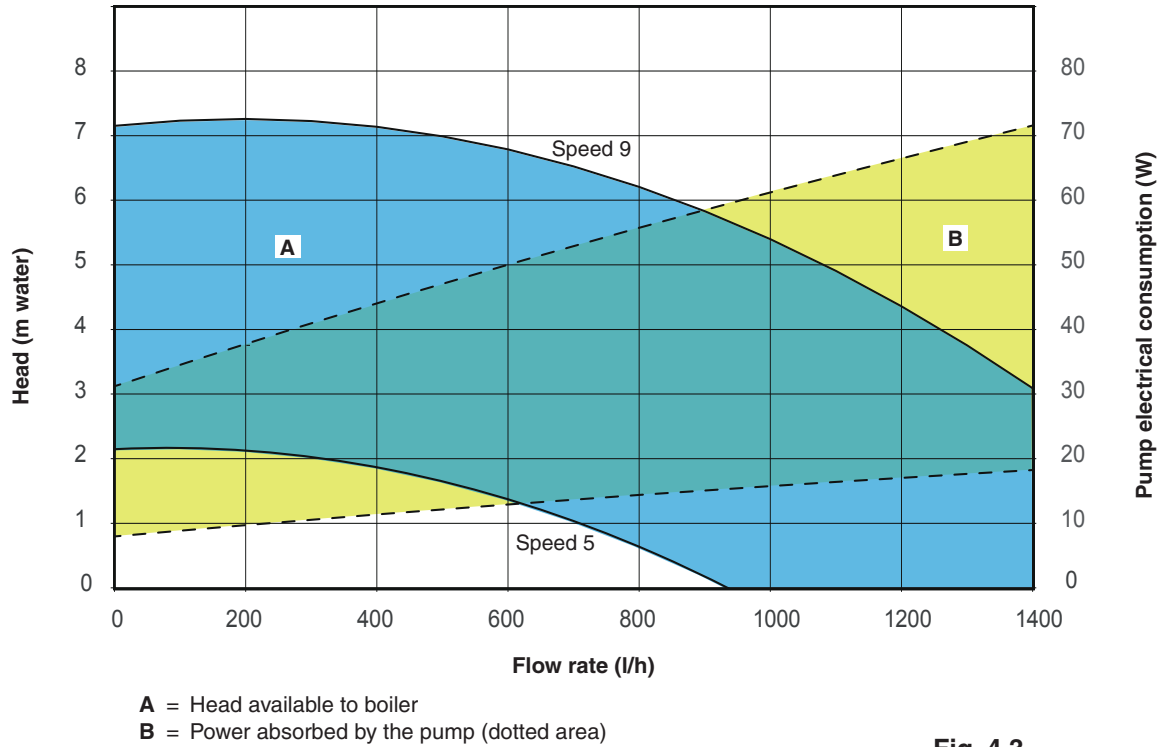


Fig. 4.3

4.5 OUTDOOR HEAT PUMP HEAD LOSS

The resistance of the hydraulic circuit of the outdoor heat pump must be taken into account when calculating the flow rate and head values available to the system.

The graph, Fig. 4.4, shows the resistance (pressure drops) of the outdoor heat pump circuit as the system flow rate varies.

For the correct connection of the outdoor unit, refer to the E-Tec EHP instructions.

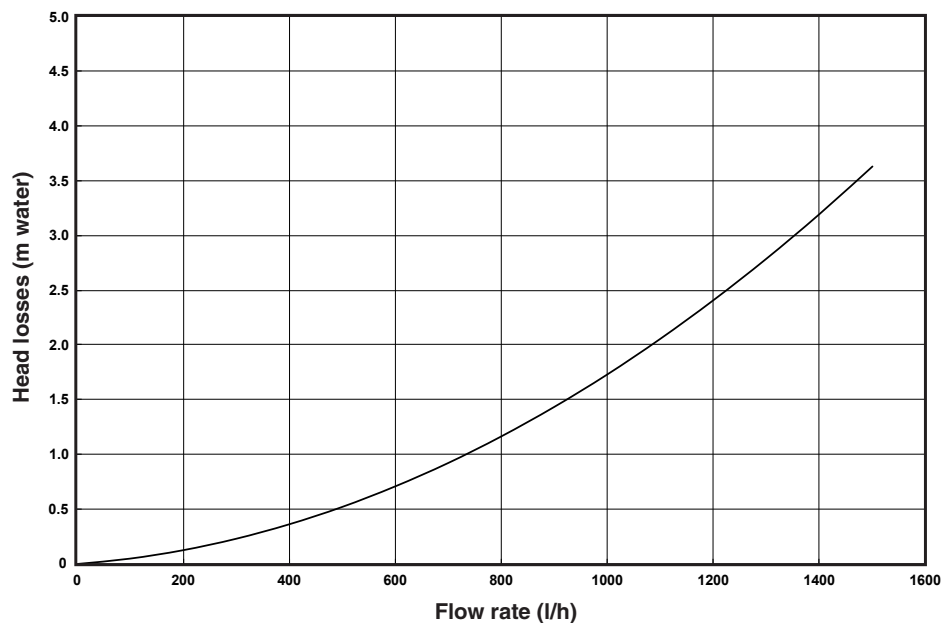
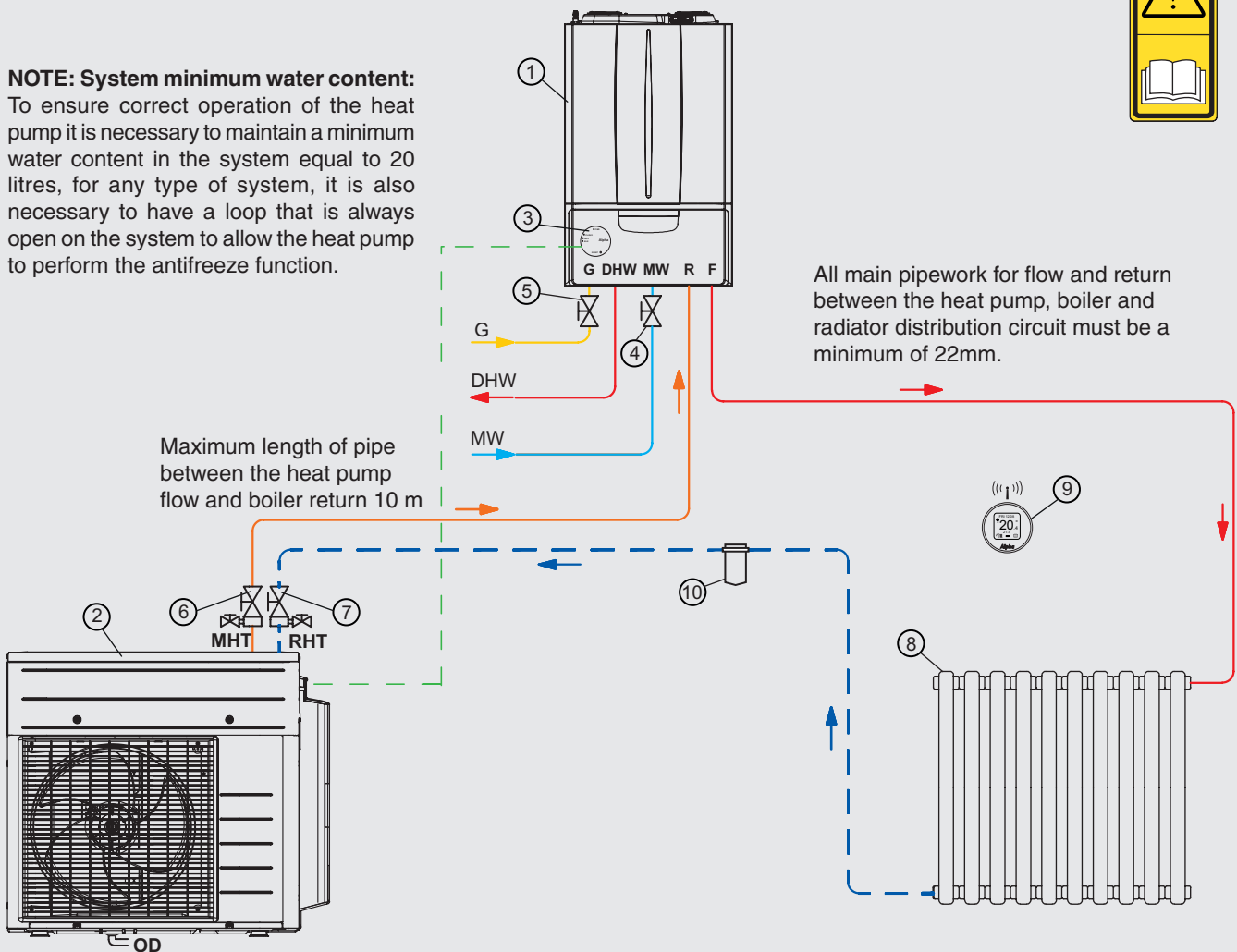


Fig. 4.4

4.6 SYSTEM HYDRAULIC DIAGRAM

NOTE: System minimum water content:

To ensure correct operation of the heat pump it is necessary to maintain a minimum water content in the system equal to 20 litres, for any type of system, it is also necessary to have a loop that is always open on the system to allow the heat pump to perform the antifreeze function.



- 1 Alpha hybrid boiler (indoor unit)
- 2 Alpha heat pump (external unit)
- 3 Smartech boiler mounted receiver
- 4 Domestic hot water inlet isolating valve
- 5 Gas isolating valve
- 6 Heat pump flow isolating valve with vent
- 7 Heat pump return isolating valve with vent
- 8 Heating system
- 9 Smarttech thermostat controller
- 10 Magnetic system filter (not supplied)

- G..... Gas supply
- DHW Domestic hot water outlet
- MW Mains water inlet
- C..... Condensate drain
- F System flow
- R..... System return
- MHT..... Flow from heat pump
- RHT Return to heat pump
- OD Outdoor unit water drain

NOTE: This diagram is an example. It is also required to convey the condensate drain of the heat pump and boiler.

Fig. 4.5

The connection between the boiler and the external heat pump must be made as shown in Figs. 5.14 and 5.15. Specifically, a connection (2 BUS cables) must be provided between the Smartech boiler receiver unit and the external heat pump, observing the polarity. The receiver must also be connected (4 wires) to the terminal board of the boiler. The fitting and connection of the receiver (Fig.4.8) is necessary for the operation of the hybrid heat pump and for programming its settings.



4.8 BOILER SCHEMATIC

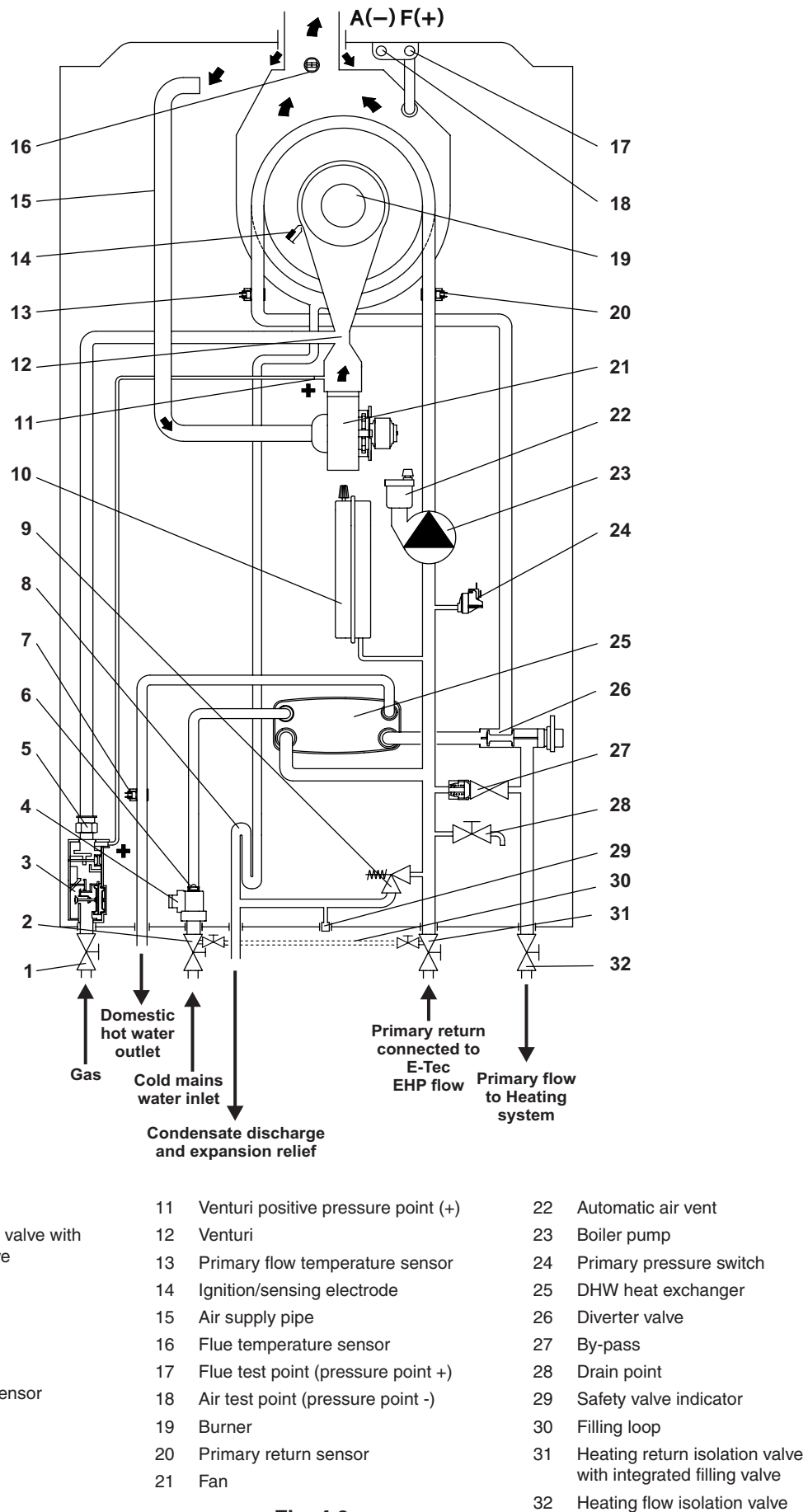
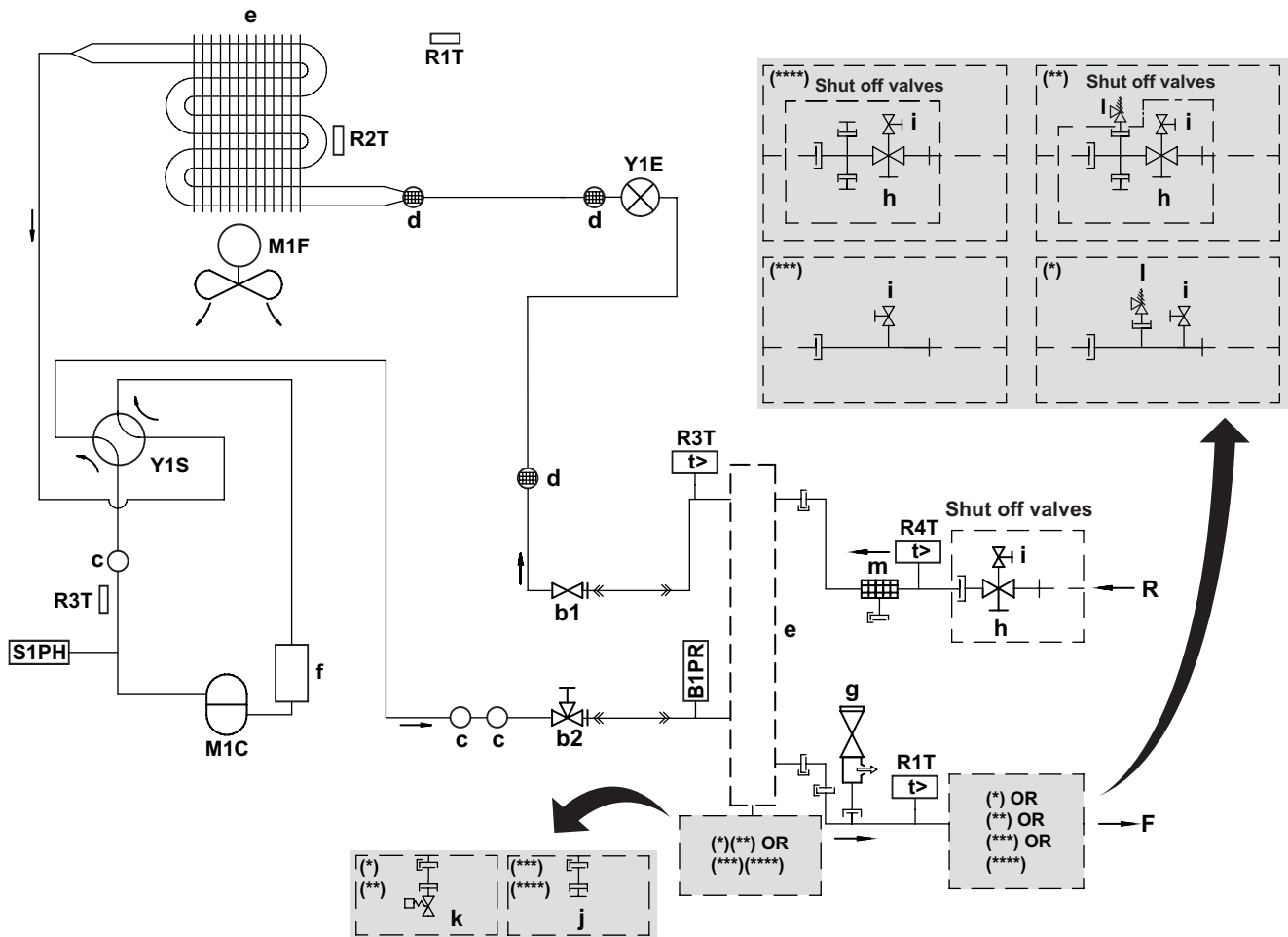


Fig. 4.9

4.9 HEAT PUMP SCHEMATIC

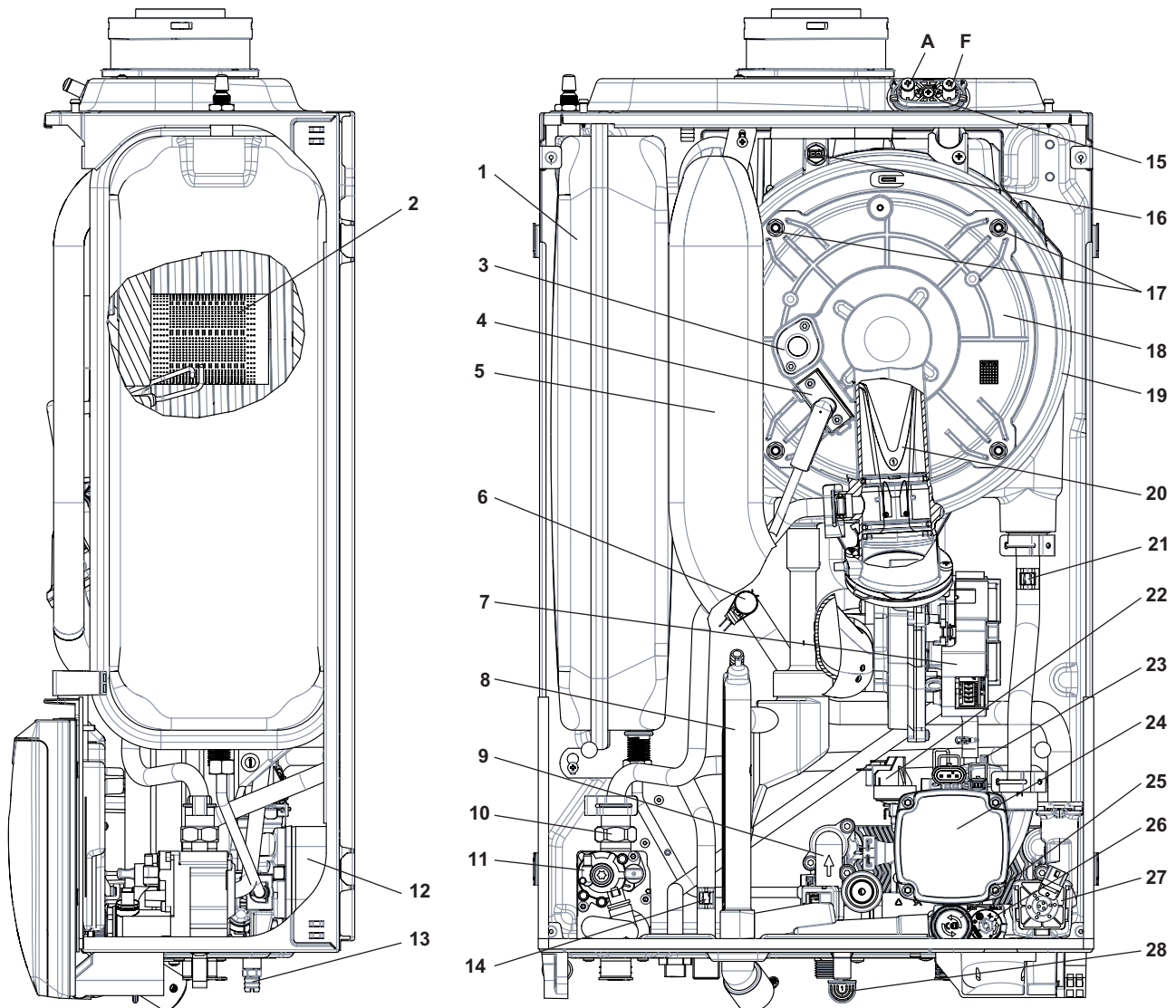


R.....Return to heat pump
F Flow from heat pump
b1.....Stop valve (cooling liquid)
b2.....Stop valve with service opening (coolant gas)
c.....Silencer
d.....Silencer with filter
e.....Heat exchanger
f.....Storage tank
g.....Safety valve
h.....Cut-off valve
i.....Air purge
j.....Cap
k.....Antifreeze protection valve
l.....Vacuum switch
m.....Filter
B1PR.....Coolant pressure sensor

Shut-off valve... Standard supplied shut-off valves
M1C.....Compressor motor
M1F.....Fan motor
R1T.....External probe
R1T (t>) ...Water outlet probe
R2T.....Evaporator probe
R3T.....Compressor outlet probe
R3T (t>) ...Liquid phase probe
R4T (t>) ...Water inlet probe
S1PH.....High pressure switch
Y1E.....Electronic expansion valve
Y1S.....Four way solenoid
—|—.....Screw connection
>>>.....Flared connection
—|—.....Quick release connector

Fig. 4.10

4.10 BOILER MAIN COMPONENTS



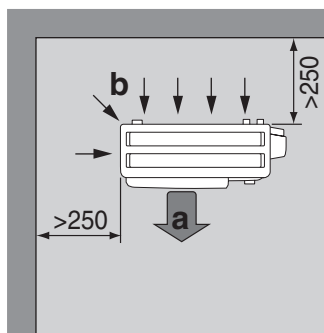
- | | | | |
|----|---------------------------------|----|-----------------------------------|
| 1 | Expansion vessel | 15 | Test points (air A, flue F) |
| 2 | Burner | 16 | Flue temperature sensor |
| 3 | Viewing window | 17 | Four fixing nuts for item 18 |
| 4 | Ignition/sensing electrodes | 18 | Combustion chamber front assembly |
| 5 | Air supply pipe | 19 | Primary heat exchanger |
| 6 | Primary flow temperature sensor | 20 | Venturi |
| 7 | Fan | 21 | Primary return temperature sensor |
| 8 | Condensate trap | 22 | Primary pressure switch |
| 9 | DHW flow switch | 23 | Automatic air vent |
| 10 | Gas injector | 24 | Boiler pump |
| 11 | Gas valve | 25 | 3 bar safety valve |
| 12 | DHW heat exchanger | 26 | By-pass |
| 13 | Boiler drain point | 27 | Diverter valve |
| 14 | DHW temperature sensor | 28 | Safety valve operation indicator |

Fig. 4.11

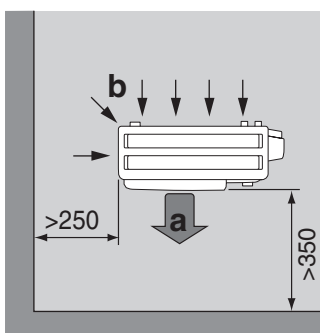
5 INSTALLATION OF HEAT PUMP

5.1 MINIMUM INSTALLTION CLEARANCES

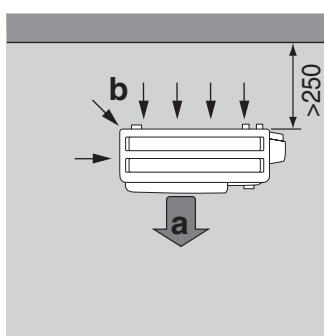
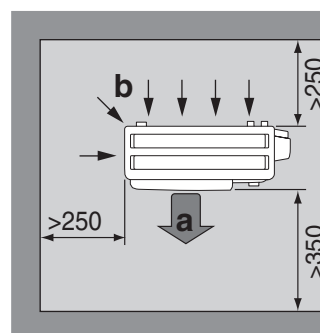
With two sides of the unit facing a side and rear wall



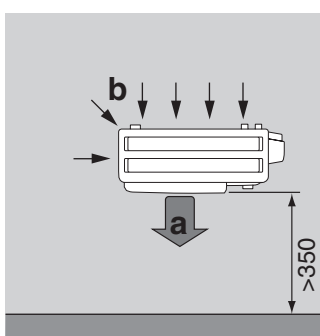
With two sides of the unit facing a side and front wall



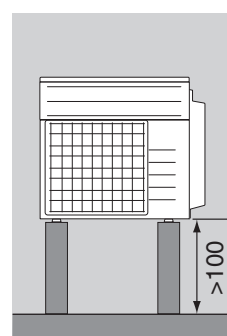
With three sides of the unit facing a wall



With the back side of the unit facing a wall



With the front side of the unit facing a wall



(mm)

a - Air outlet
b - Air inlet

Fig. 5.1

The place of installation of the heat pump is very important and must be established by the system designer or by a specifically qualified person, and must take into account the technical requirements, standards and regulations in force. The heat pump unit must only be installed outside the building. The boiler unit must only be installed inside the building.

It is recommended to avoid:

- Positioning near windows.
- Obstacles or barriers that cause recirculation of exhaust air.
- Places with aggressive atmospheres.
- Limited spaces or places where sound levels from the unit can be enhanced through reverberations or resonance.
- Positioning in corners where there is an accumulation of dust, leaves and anything else that can reduce the efficiency of the heat pump.
- Prevent exhaust air from the unit from coming into the rooms through doors or windows.

The heat pump must:

- Be placed on a level surface that is able to withstand its weight.
- Be placed on a slab that is hard enough and which does not transfer any vibrations to the underlying or adjacent rooms.
- In any case, provide a space of at least 100 mm under the unit (to avoid operating problems in the event of heavy snow). Where there is a risk of snow build up or leaves increase the clearance.
- Use the vibration-dampening supports supplied with the unit.
- The effects of the wind can be minimised by installing the unit with the intake side facing a wall.
- The unit must not be installed with the intake side against the prevailing wind.
- The effects of the wind can be further minimised by installed a deflector plate facing the unit air flow side (not supplied).
- Be at least 1m distance from any part of the outdoor unit and property boundary.



5.2 POSITIONING THE HEAT PUMP



NOTE: The clearances shown in Fig. 5.1 must be left free to allow air to circulate and to ensure accessibility for repairs or maintenance on every side of the heat pump. In fact, it must be possible to disassemble all the components under the utmost safety conditions (both for objects and for people).

If the heat pump is to be installed in regions subject to heavy snow:

It will be necessary to raise the unit by at least 100 mm above the maximum expected snowfall or, alternatively, use wall-support brackets, see Fig. 5.5 (optional) to protect the unit from direct snowfall and take care that the unit is NEVER buried under snow.

The unit must be installed in a position protected from snow falling from above.

If this is not possible, you must at least prevent the snow from clogging the air/coolant exchanger (even by constructing a small protective roof for the heat pump, if necessary. See Fig. 5.3).

If blowing lateral snowfalls are possible, make sure that the heat exchanger coil CANNOT be covered by snow.

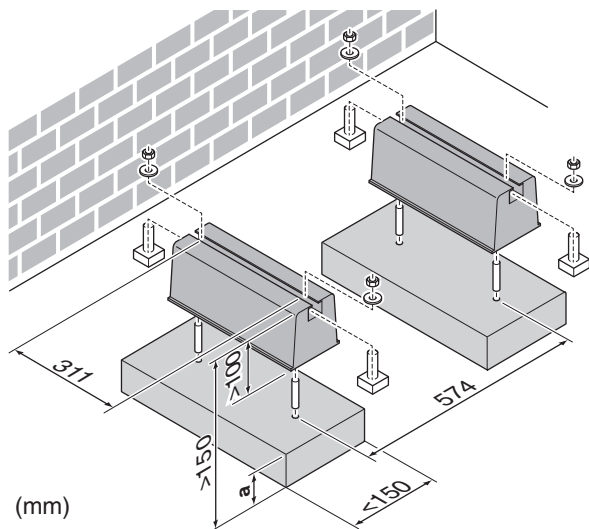
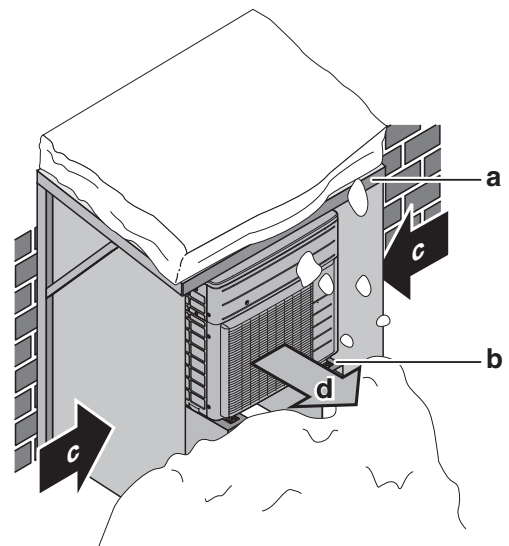


Fig. 5.2



- a - Snow cover or shelter
- b - Pedestal
- c - Prevailing wind direction
- d - Air outlet

Fig. 5.3

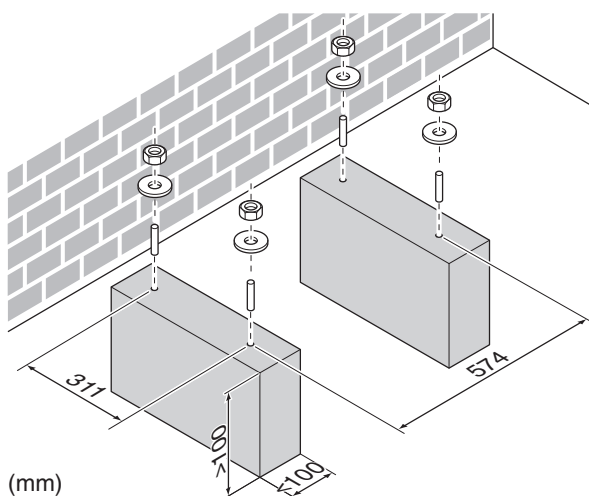
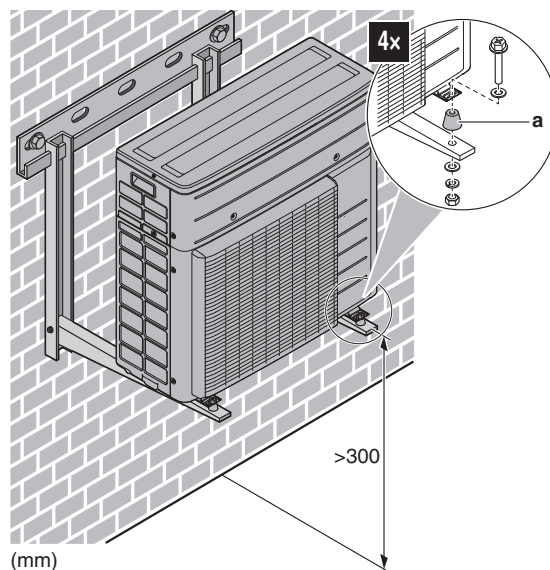


Fig. 5.4



- a - Anti-vibration rubber

Fig. 5.5

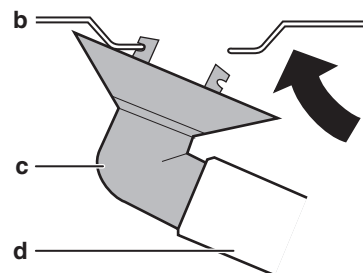
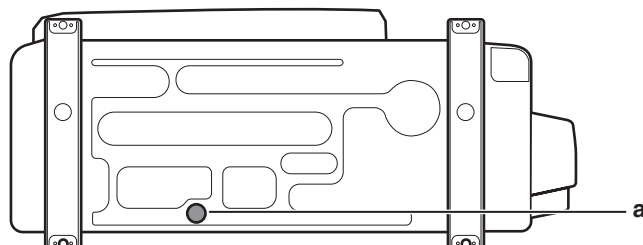
5.3 CONDENSATE DRAINAGE



If the condensate produced is drained through the drain pipe, connect the drain fitting (**c** in Fig. 5.6) supplied as standard to the drain pipe (**d** in Fig. 5.6) (not supplied) with an internal diameter of 16 mm.

If the installation is in a very cold area or where heavy snow is likely and there is the possibility that the condensate might freeze, an optional trace heating kit for the outdoor unit is available which gives anti-freeze protection on the outdoor unit up to -15 °C.

NOTE: If the condensate water produced by the unit is not properly drained, the performance of the entire system will suffer a negative impact and the system itself could be damaged.



- a - Drain hole
- b - Lower frame
- c - Drain fitting (supplied as standard)
- d - Flexible hose (not supplied)

Fig. 5.6

5.4 THERMOSTATIC ANTIFREEZE VALVE



The E-Tec Hybrid is equipped with a system that protects it against freezing thanks to the periodic start-up of the pump and, if necessary, activation of the boiler unit.

If the outdoor unit is installed in areas where the temperature might fall below 0°C, it is recommended to provide special antifreeze systems in order to guarantee the units integrity, especially the water-gas heat exchanger, when there is a power cut.

For example, insert an appropriate quality, non-hazardous antifreeze liquid into the heating system. In this case, the instructions of the manufacturer of this liquid must be followed scrupulously regarding the percentage necessary with respect to the minimum temperature at which the system must be kept.

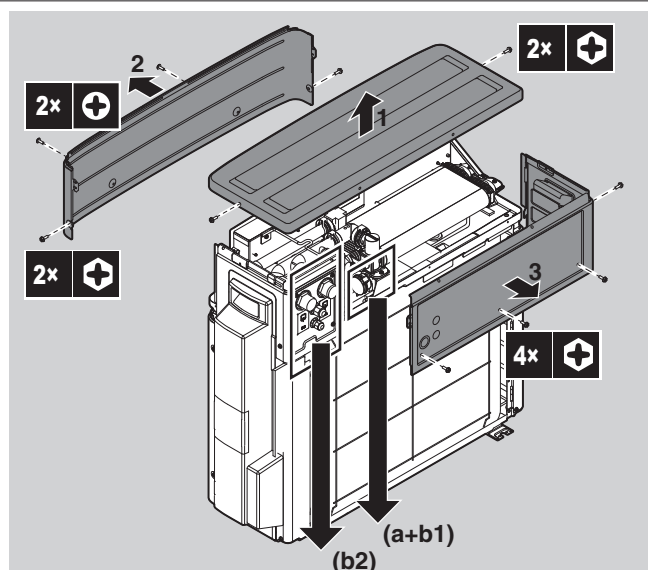
An aqueous solution must be made with potential pollution class of water 2 (EN 1717:2002).

NOTE: In cases where you do NOT wish to introduce antifreeze glycol into the system, the outdoor unit is equipped with a thermostatic antifreeze valve (supplied as standard, but to be installed as shown in Fig. 5.7), which intervenes when the water temperature detected inside the heat pump drops below 3 to 4°C, allowing the water inside the machine to be drained. The water drain is directed towards the condensate collection tank located in the lower part of the heat pump.

ATTENTION: Using the thermostatic antifreeze valve is an alternative to the solution of introducing antifreeze glycol into the circuit.

Refer to Fig. 5.7 and remove the covers to gain access to fit the freeze protection valve and vacuum breaker.

- 1 Remove the fixing screws and remove the top cover.
- 2 Remove the fixing screws and remove the front cover.
- 3 Remove the fixing screws and remove the rear cover.



- a - Connection piece for b1
- b1- Freeze protection valve (for water drainage)
- b2- Vacuum breaker

Fig. 5.7

1 Remove the clip.

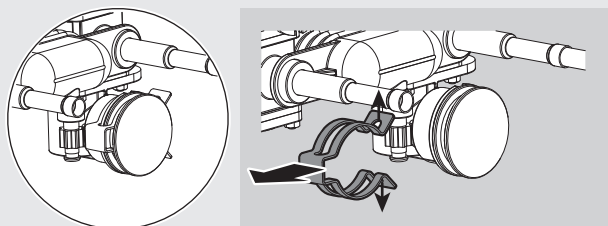


Fig. 5.8

2 Remove and discard the stop with sealing washer.

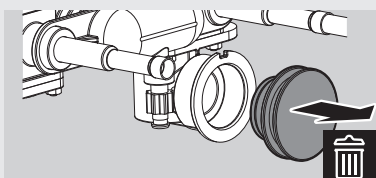


Fig. 5.9

3 Attach the freeze protection valve (b1) to the connection piece (a), using thread sealant.

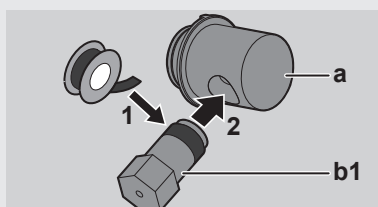


Fig. 5.10

4 Attach the connection piece to the heat pump unit.

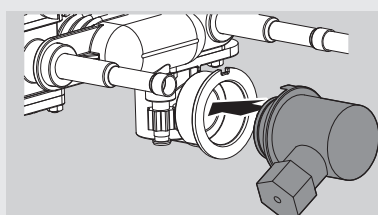


Fig. 5.11

5 Replace the clip.

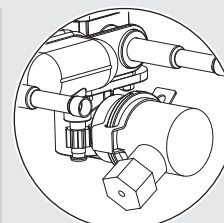
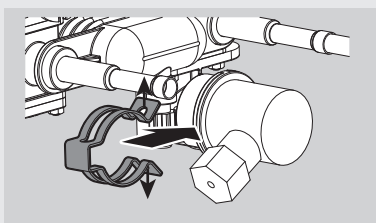


Fig. 5.12

6 Replace the rear, front and top covers.

NOTE: In addition to the thermostatic antifreeze valve, a vacuum breaker valve is also supplied, which must be installed on the heat pump delivery valve (flow from the heat pump, F in Fig. 5.2) by removing the cap present in the valve and replacing it with the vacuum breaker as shown in Fig. 5.13.

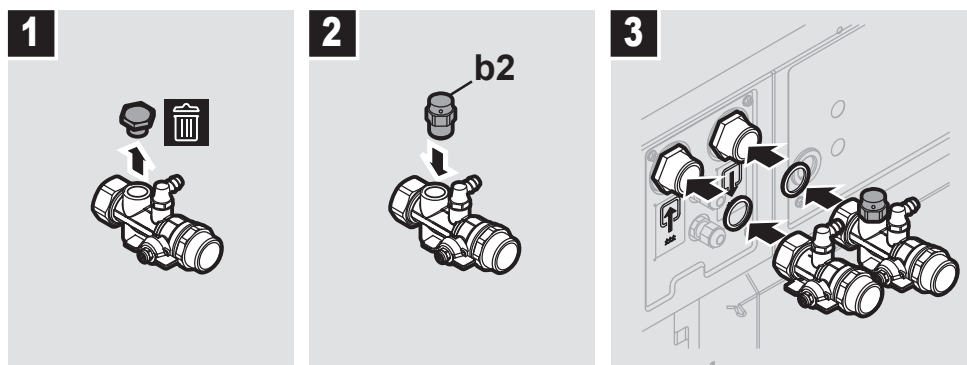


Fig. 5.13

5.5 CONNECT THE HEAT PUMP WIRING

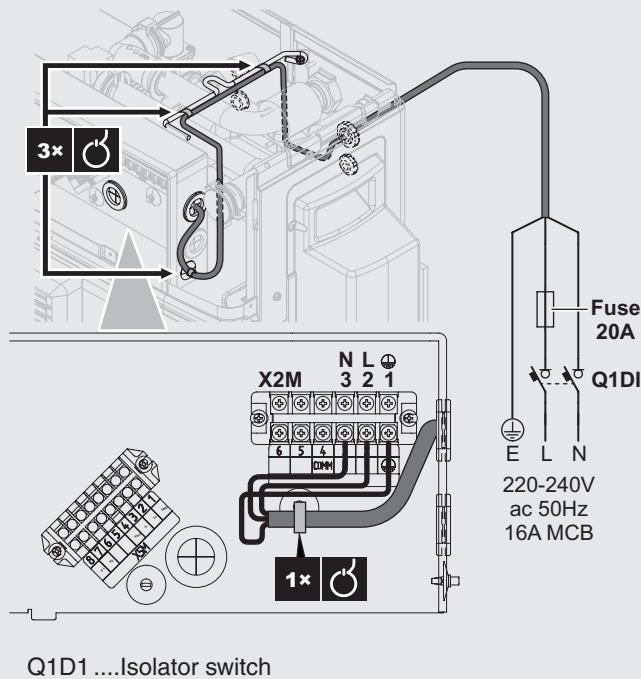


Fig. 5.14

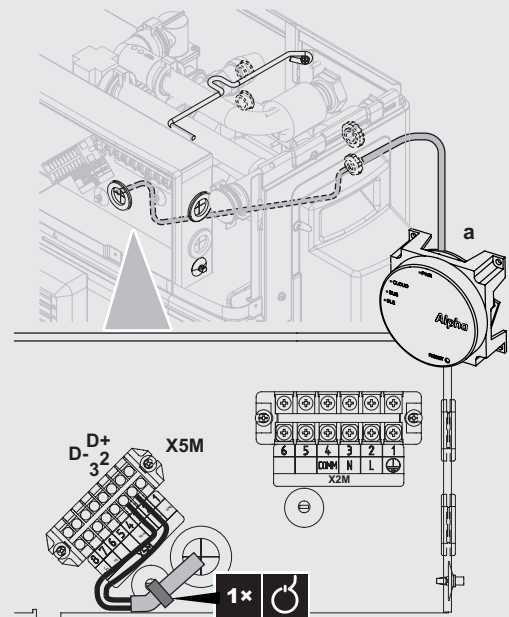


Fig. 5.15

Refer to Sections 4.1 and 4.7 for further wiring details.

1. Connect the power supply cable (shown in Fig. 5.14) to the heat pump terminal block X2M and secure in position with the 4 cable ties.
2. Connect the Smartech boiler receiver unit (a shown in Fig. 5.15) to the heat pump (terminal block X5M terminals 2 and 3) and secure in position with the cable tie.

The outdoor unit power cable (not standard supplied) must be suitable for outdoor installation and must have at least a flexible polychloroprene sheath (code IEC:60245 IEC 57 / CENELEC:H05RN-F). Indicatively, the appropriate cable section can be 2.5 x 4 mm², to be checked depending on the specific installation conditions.

Outdoor Unit	Nominal Values		Field of Tolerable Voltage		Maximum absorbed current (MAC) in normal operation	Supply fuse/MCB required (a) 100mA RCD	Power supply cable
	Hz	V	V	V	A	A	
E-Tec external heat pump	50	220-240	198	264	10.3	16	2.5 mm ² , 3 core

For the connection between outdoor and indoor units use H07RN-F or H05RN-F class cables to power the indoor unit.

Indoor gas boiler power supply			BUS Communication cable between outdoor unit and Control panel
Power supply	Max./Min.(V)	Connection cable	
Single phase, 220-240V, 50Hz	±10%	1.5 mm ² , 3 core	0.75 mm ² , 2 core

6 E-TEC HYBRID OPERATING PRINCIPALS

The E-Tech Hybrid control logic establishes various operating situations described below:

CENTRAL HEATING MODE

When operating in winter heating mode the operating logic between the boiler and heat pump can be selected between 2 options:

- With fixed external switching temperature ("MANUAL" mode).
- With variable external switching temperature according to the electricity and gas costs ("AUTO" mode).

OPERATION IN ROOM HEATING MODE (MANUAL MODE):

Following a request in the room heating phase, if an external switching temperature between boiler and "manual" heat pump is set in the Control panel menu, below this temperature (example +5 °C) only the boiler is activated, above this temperature the heat pump always starts and if the set delivery time is not reached in the waiting time (which can be set in the specific parameter menu), the boiler is also activated, in series and simultaneously.

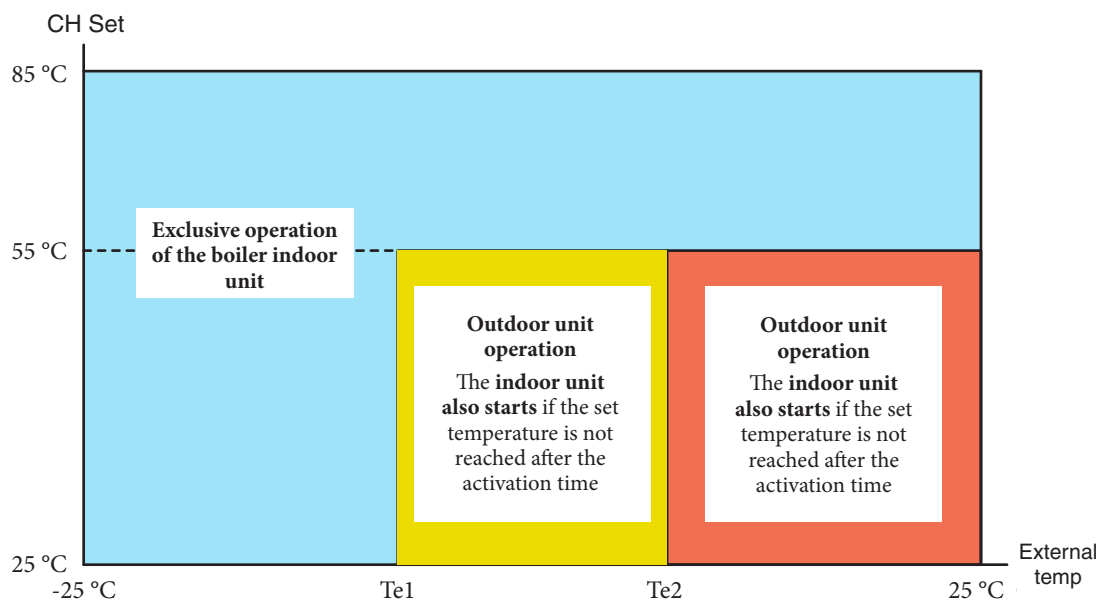
OPERATION IN ROOM HEATING MODE (AUTOMATIC MODE):

With automatic operation, the specific menu includes the costs of electricity and gas through which the electronics calculate a convenience COP; based on the detected external temperature and the calculated flow set, the boiler (COP lower than the convenience COP) or the heat pump (COP greater than or equal to the convenience COP) are activated.

Also in the latter case, if in the waiting time (which can be set in the specific parameter menu) you do not reach the set delivery set, the boiler is also activated, in series and at the same time.

Simultaneous operation significantly increases the number of hours in which the heat pump is active in the heating period: for most of the time the heating request is satisfied by the heat pump alone or by the hybrid operating mode.

NOTE: Depending on the outdoor temperature, for a flow temperature higher than 55 °C, the boiler is activated directly.



In "automatic" mode values Te1 and Te2 are determined by the system logic
(by setting the "manual" mode, the value "Te2" corresponds to the value of "Te1" + 5 °C)

Fig. 6.1

7 SMARTTECH CONTROL SYSTEM SETTINGS

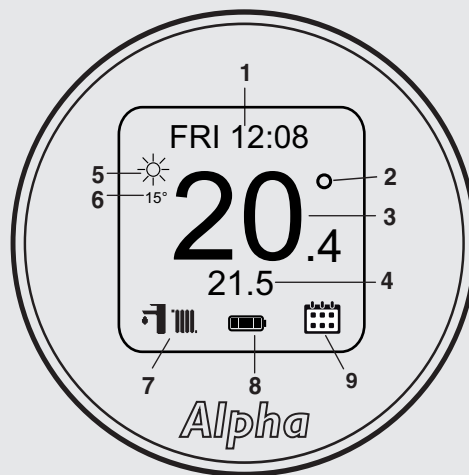


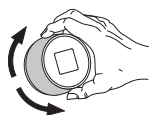
Fig. 7.1

The Alpha E-Tec Hybrid is supplied with the Smarttech WiFi control for full remote set-up and control of the Hybrid system. For the initial set-up and user control please refer to the documentation supplied with the Smarttech device. The advance settings in this document are for the commissioning engineer only and should not be altered once the system has been set up by the engineer.

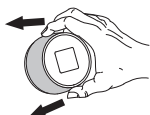
7.1 MAIN SCREEN

The external body of the thermostat is either a button or adjustment knob.

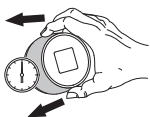
Navigation operations.



Rotate



Press



Press for three seconds



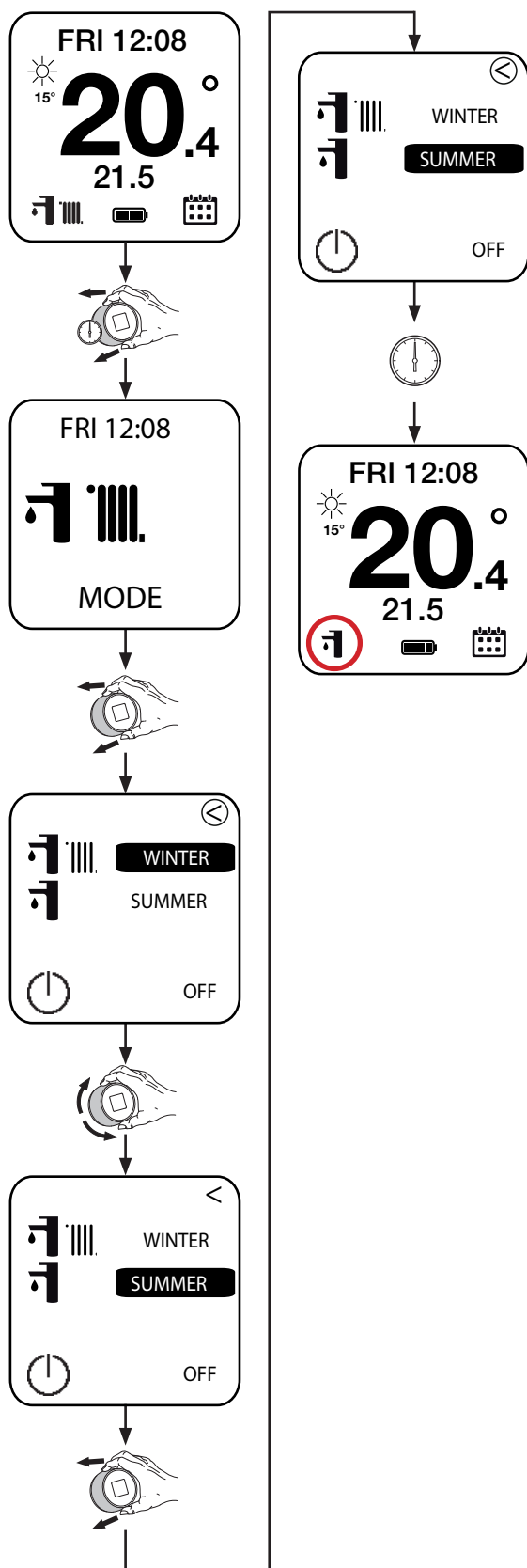
Wait five seconds

It is possible to set the temperature both locally (from the thermostat) and remotely from the App.

Item	Main screen display
1	Text message (for example: date, connection status, error)
2	○ Temperature degree symbol ||| Heating request ⚡ DHW request
3	Detected room temperature
4	Set room temperature
5	Weather (if connected to internet)
6	Outdoor temperature (if connected to internet)
7	⌚ STAND-BY operating mode ⚡ SUMMER operating mode ⚡||| WINTER operating mode
8	🔋 Battery level 100% 🔋 Battery level 75% 🔋 Battery level 50% 🔋 Battery level 25% 🔋 Battery flat
9	📅 Automatic mode with programming 📅 Temporary manual mode (until next time slot) - semi automatic 👉 Manual mode

7.2 OPERATING MODE

Mode: To define the operating mode of the boiler refer to the boiler instructions.

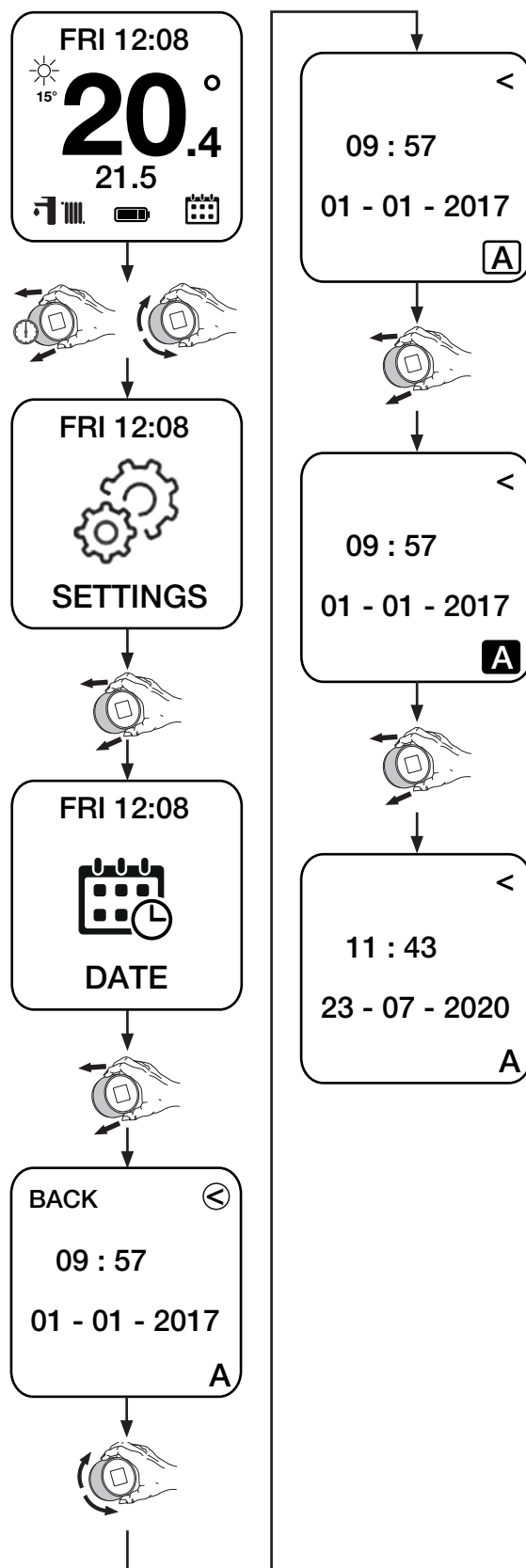


7.3 DATE AND TIME SETTING

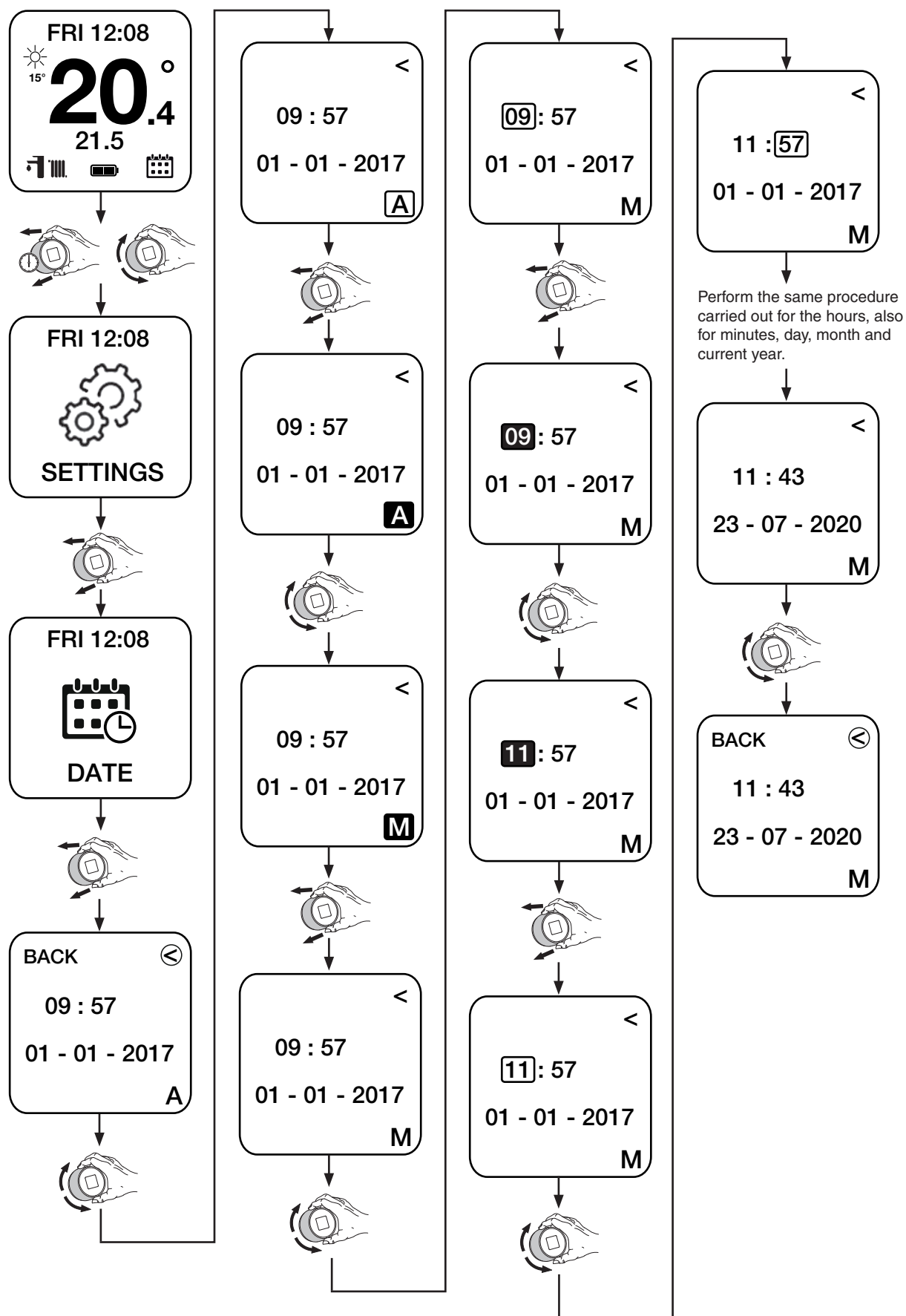
Date: You may set the date and time.

If A is displayed, the time and data are set automatically from Internet.

NOTE: Check that the date and time are entered correctly to guarantee proper operation of the calendars.

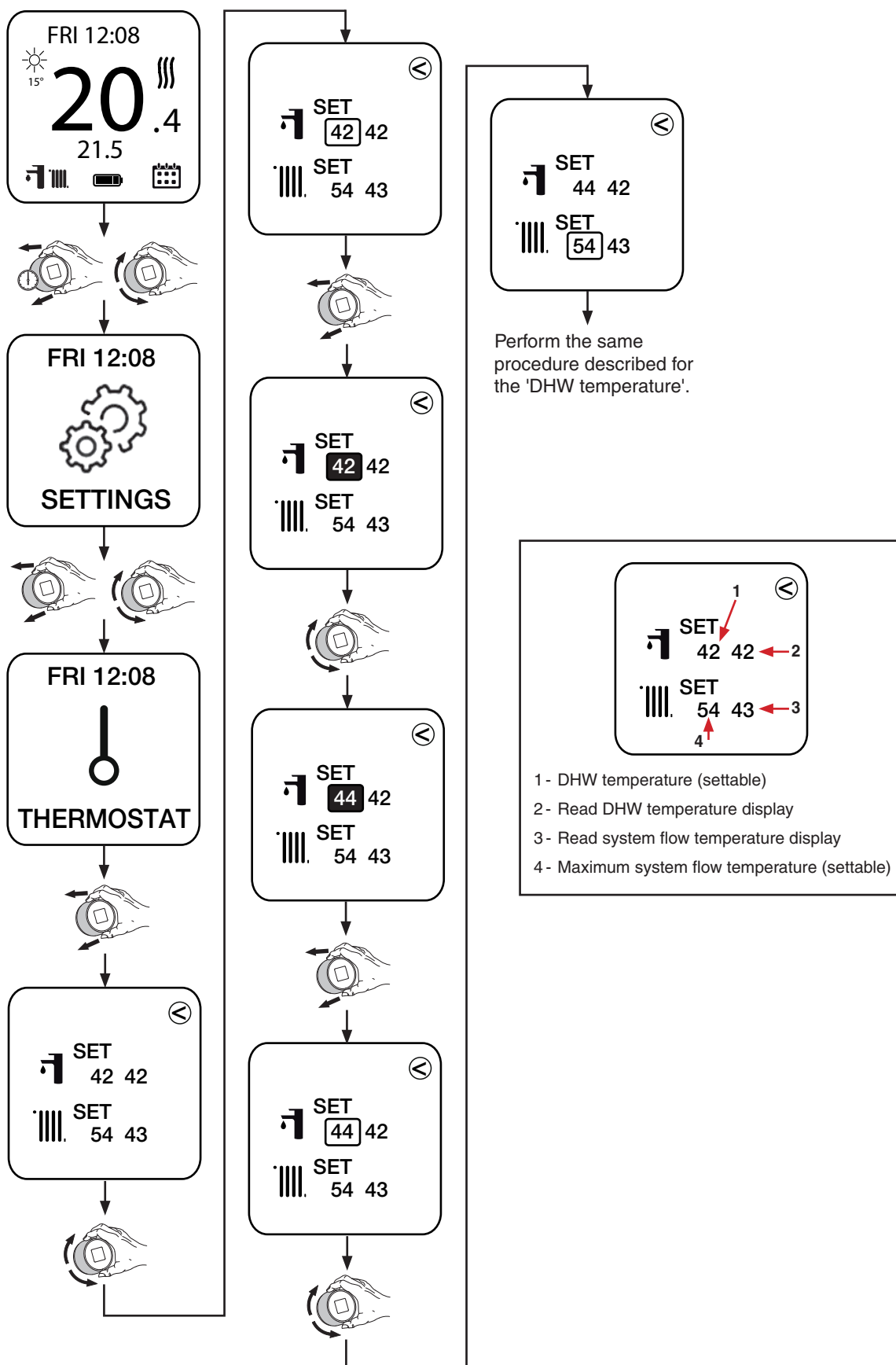


If the Smartech is not connected to the Internet, you must enter the M mode, to manually set the current time and date.

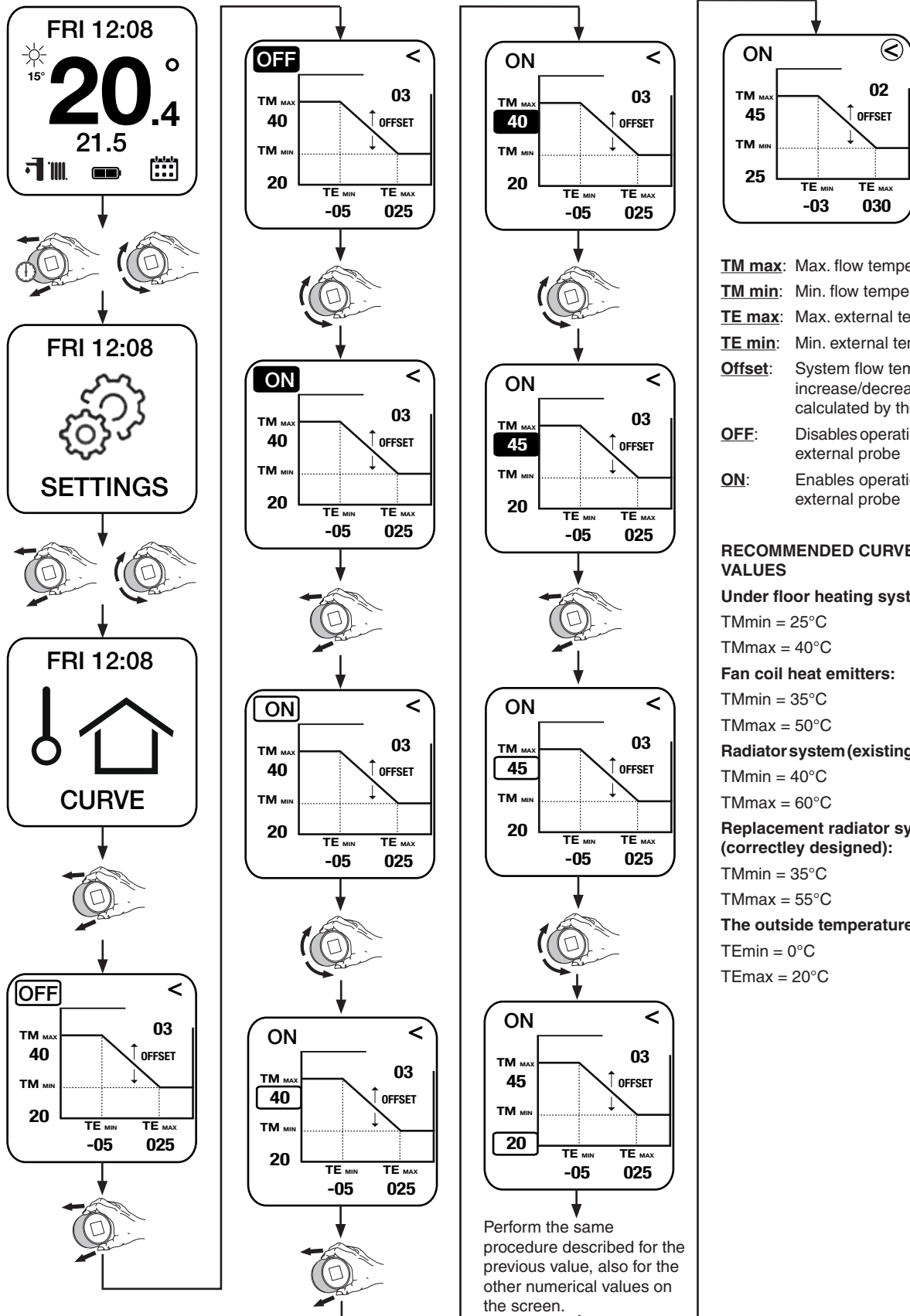


7.4 SETTING UP THE SYSTEM FLOW AND DHW TEMPERATURES

Select the 'THERMOSTAT' screen to set up 'Maximum system delivery temperature' and 'DHW temperature'.

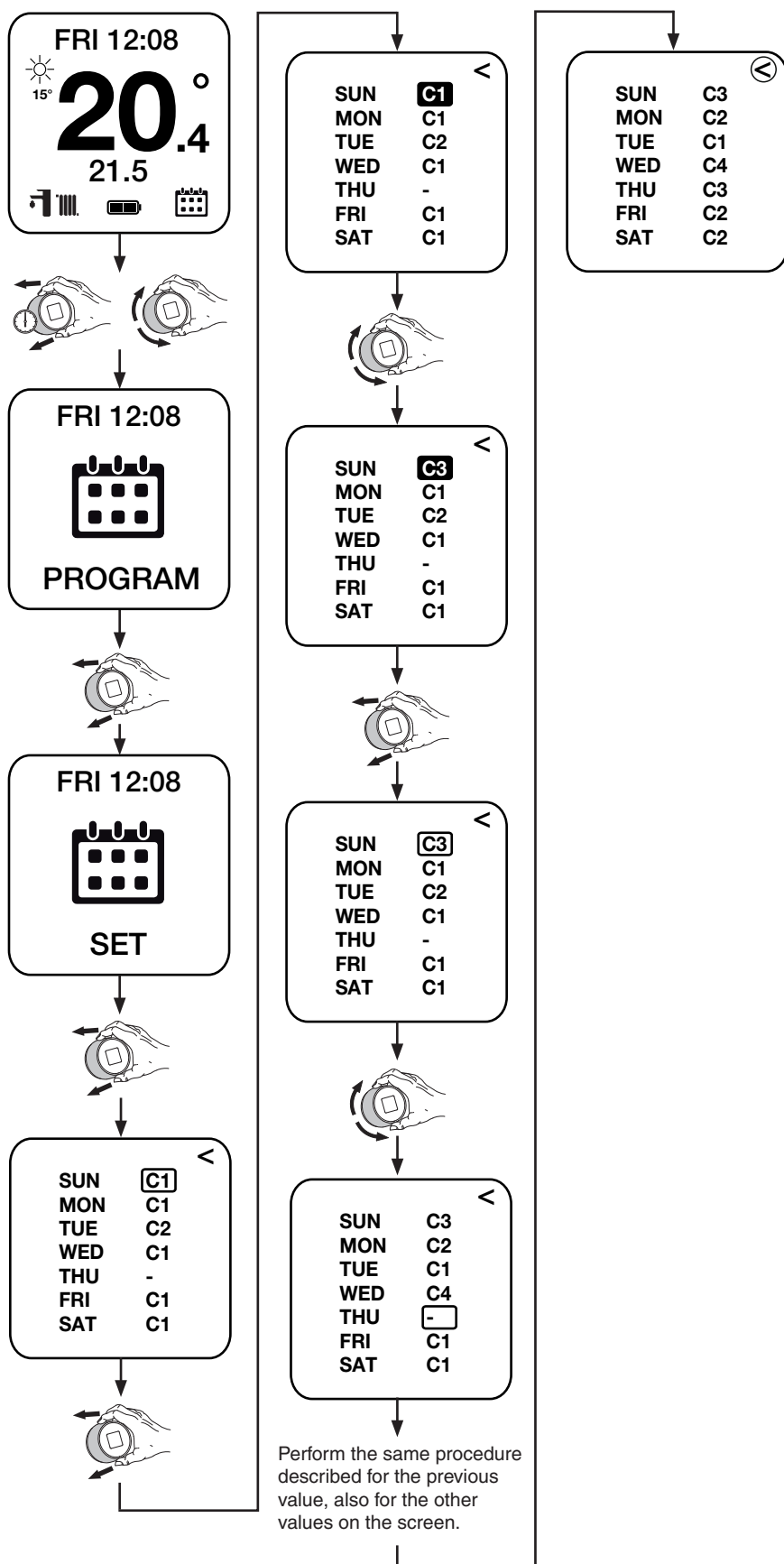


NOTE: The external temperature value TE is detected by the external units probe.



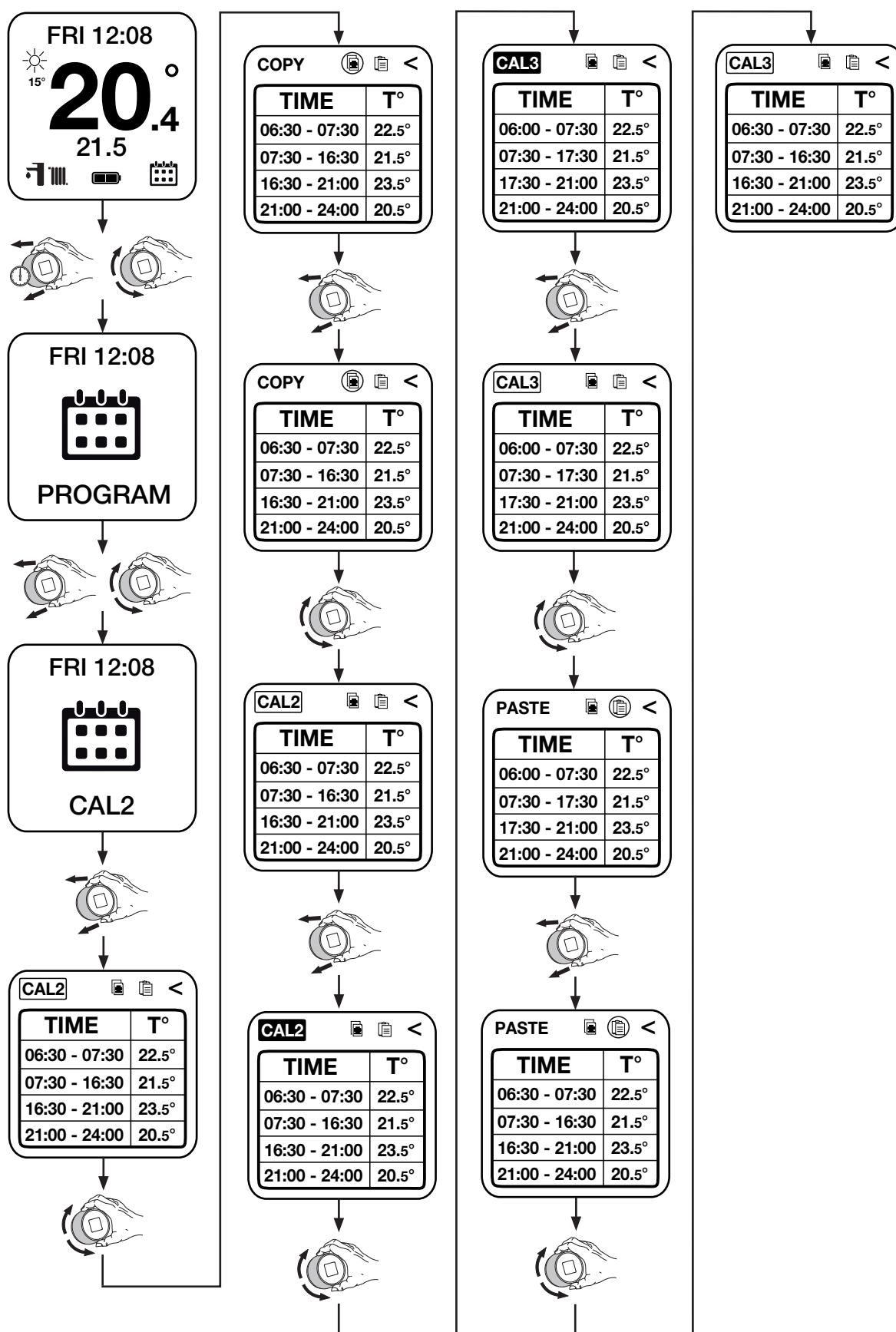
7.6 SET PROGRAM

Set: Allows you to program the various days of the week, associating them to one of the stored calendars.



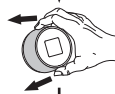
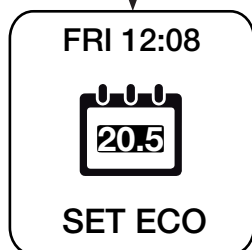
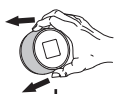
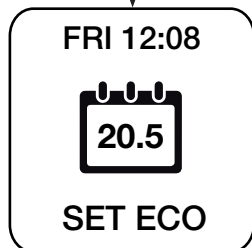
Calendar 'Copy' and 'Paste' function

It is also possible to manually change the data of the various calendars, to copy the calendar already set (for example: Cal2) and to paste it onto another calendar (for example: Cal3).



7.7 SET ECO PROGRAM

Set Eco: Allows you to set the room temperature outside of the programmed time slots of the calendar.

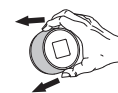
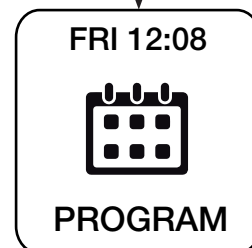


It is recommended to set the ECO temperature at 15°C to maintain efficiency.

Lower ECO settings will cause the Hybrid boiler to be less efficient working against the building thermal mass and building heat losses.

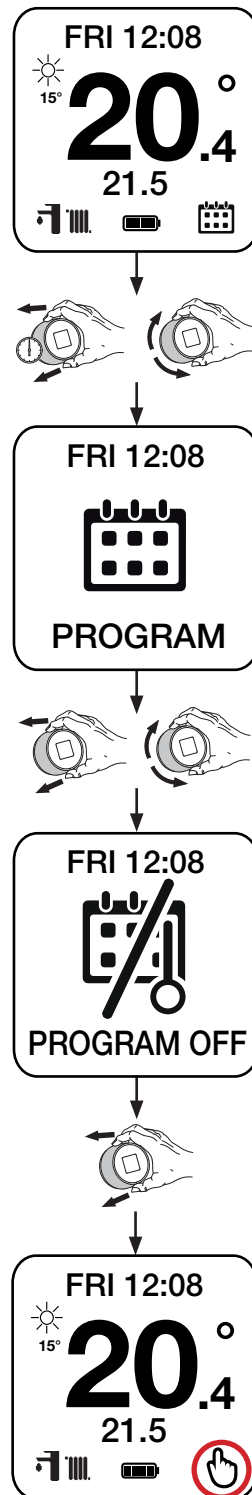
7.8 PROGRAM ON

Program On: Allows you to follow the hourly programming set by the user.



7.9 PROGRAM OFF

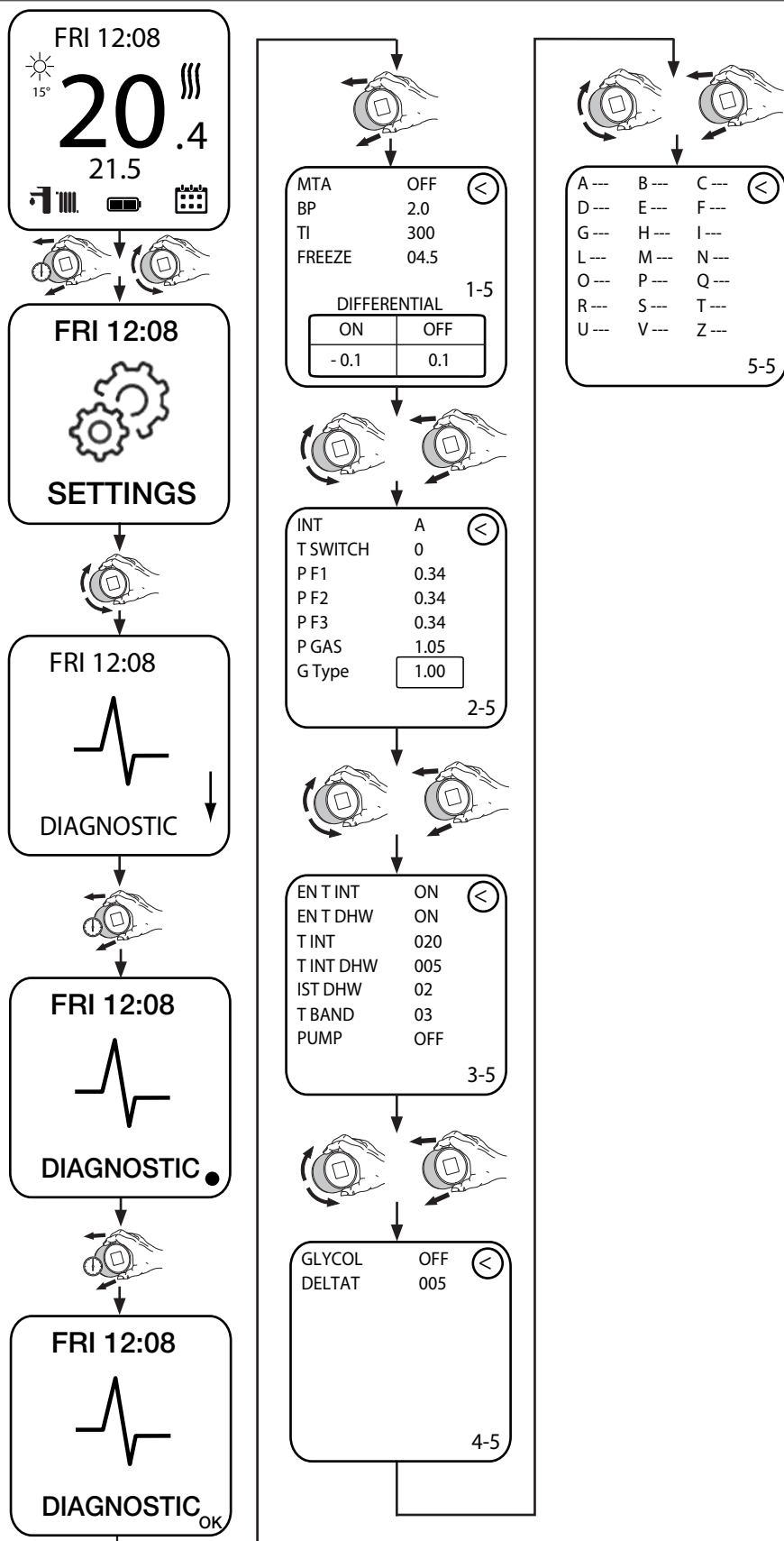
Program Off: Enables manual mode, keeping the room temperature set by the user.



7.10 ADVANCED SETTINGS MENU

Enter the hidden menu of the 'DIAGNOSTIC' screen to view and set up the systems advanced settings.

NOTE: To prevent malfunction due to any incorrect settings, access to this menu is solely restricted to an authorised Alpha technical support centre.



7.11 LIST OF ADVANCED SETTINGS

Advanced settings screen 1 - 5

Menu Parameter	Description	Range	Default
MTA	Room Probe Temperature Modulation If enabled (On): It allows the Smartech to modulate the system flow temperature according to the difference between the desired room temperature and the detected one If disabled (Off): The system flow temperature will be kept constant until the desired room temperature is reached Note: If the climatic offset function is enabled the maximum system flow temperature will be calculated based on the external ambient temperature according to the offset curve set. See Section 7.5	On/Off	On
BP	Proportional Band The temperature band for set point approach modulation	0 - 9.9°C	2.0°C
TI	Time Interval Check period for Proportional Band calculation to achieve set point	60 - 990 sec	300 sec
Freeze	Room Anti-freeze Function Allows to set the room temperature for activation of the anti-freeze function	0 - 10.0°C	4.5°C
Differential	Thermal Differential Value to be added to/subtracted from the room set point which determines the end/start of the heating request	-0.1 - 1.5°C	±0.1°C

Advanced settings screen 2 - 5

Menu Parameter	Description	Range	Default
INT	Integration Mode Establishes the integration mode of the heat pump with the boiler. It is possible to choose Automatic or Manual	Auto - Man	Auto
T SWITCH	T Switch (manual activation temperature) Establishes the outdoor temperature under which heating integration is enabled	-10 - 30°C	0
P F1	F1 Electricity Price Allows the peak price of electricity to be entered in £/kWh for time slot 1	0 - 2.50 £/kWh	0.34
P F2	F2 Electricity Price Allows the intermediate price of electricity to be entered in £/kWh for time slot 2	0 - 2.50 £/kWh	0.34
P F3	F3 Electricity Price Allows the off peak price of electricity to be entered in £/kWh for time slot 3	0 - 2.50 £/kWh	0.34
P GAS	Gas Price Allows the price gasd to be entered in £/m³ Note: £/m³ = £/kWh x K (K is different for each gas type) K = 9.588 (kWh/m³) G20 (m³) K = 25.48 (kWh/m³) Liquid gas (m³) K = 6.6 (kWh/L) liquid gas (L)	0 - 2.50 £/m³	1.05
G TYPE	This parameter must be set to 1	0.00 - 9.99	1

Advanced settings screen 3 - 5

Menu Parameter	Description	Range	Default
EN T INT	Enable Heating Integration Enables the operation of the boiler in heating	On/Off	On
EN T SANI	<i>not used</i>	-	-
T INT	Heating Integration Wait Time Heat pump running time before integration check	10 - 240 mins	20
T INT SANI	<i>not used</i>	-	-
IST SANI	<i>not used</i>	-	-
BAND	Integration Band Temperature band to determine if integration is required	0 - 15 °C	3
PUMP	Pump Down Function for gas removal on water/gas heat exchanger	On/Off	Off

Advanced settings screen 4 - 5

Menu Parameter	Description	Range	Default
GLYCOL	Indicate the presence of anti-freeze fluid in the system	Yes/No	No
DELTAT	Heat Pump Operating Delta T Temperature delta to be maintained with heat pump operation	5 - 10	5

Advanced settings screen 5 - 5

Menu Parameter	Description	Range
A Pump down	Function for gas removal on water/gas heat exchanger	0 = Off 1 = On
B T switch setting	Temperature switch value in manual mode	-10 - 30
C -	<i>not used</i>	-
D -	<i>not used</i>	-
E -	<i>not used</i>	-
F -	<i>not used</i>	-
G -	<i>not used</i>	-
H Heat pump set up	Heat pump flow set temperature	-
I Heat pump return temp	Heat pump return temperature	-
L Heat pump flow temp	Instant outlet temperature from heat pump	-
M Compressor outlet temp	Heat pump compressor temperature	-
N Cool temp on heat exchanger	Coolant temperature inside heat exchanger	-
O Evaporator temp	Evaporator temperature	-
P Compressor frequency	Current compressor frequency	0 - 110
Q Heat pump initialisation	Indicates that the initialisation phase of the boiler has ended	0 = Off 1 = On
R Heat pump operational	Indicates that the heat pump is available	0 = Off 1 = On
S -	<i>not used</i>	-
T Hot start	Indicates that the machine was hot started in DHW	0 = Off 1 = On
U Cold start	Indicates the machine was cold started	0 = Off 1 = On
V Heat pump heating request	Heating request towards heat pump	0 = Off 1 = On
Z Heat pump DHW request	DHW request to heat pump (only for system boiler models)	0 = Off 1 = On

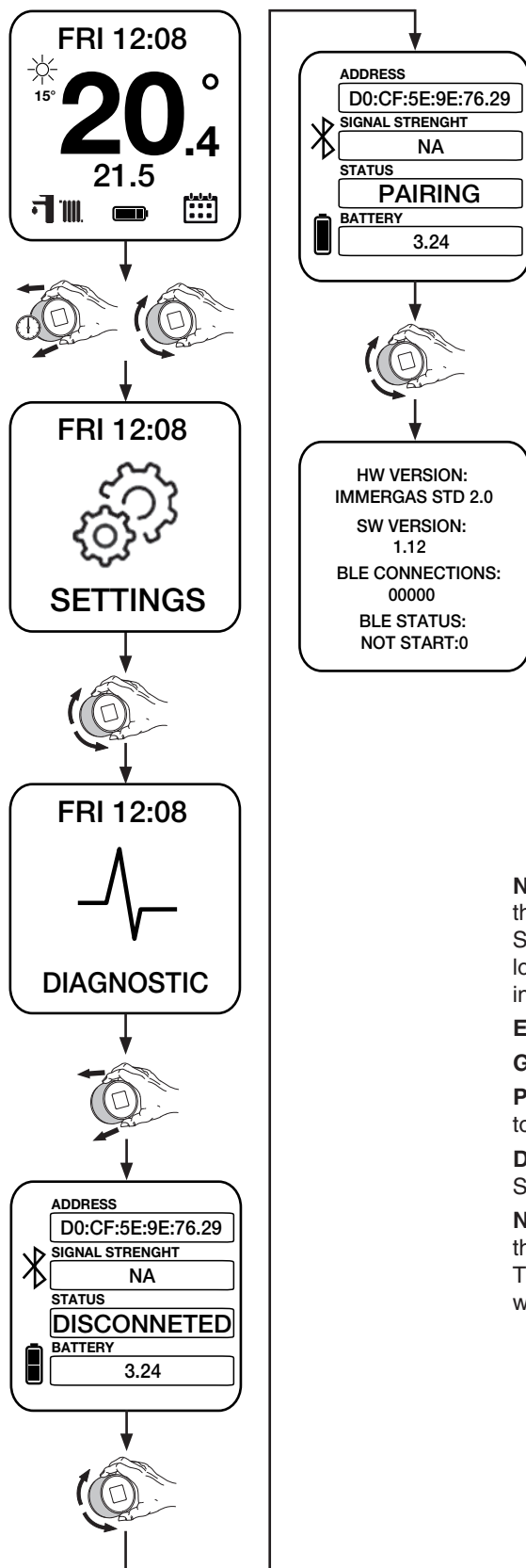
Note: The system has other settings that have been placed inside the boiler control panel, see Section 3.12 internal unit PCB programming of the E-Tec 33 Hybrid.

7.12 DIAGNOSTICS



Select the 'DIAGNOSTIC' screen to view some system information including MAC address of the radio module, quality of the Bluetooth signal, current status of the connection between the boiler unit and Smartech, battery level and HW and SW versions.

This screen is also used if you need to make a new pairing between the boiler and the Smartech.



Note: The 'Signal strength' field indicates the quality of the Bluetooth transmission between the boiler and the Smartech. It is recommended to use this indication when looking for the proper position of the Smartech. The indications provided are as follows:

Excellent: Stable and strong signal

Good: Stable signal

Poor: Weak signal, the Smartech should be moved closer to the boiler

Disconnected: Signal quality is insufficient, move the Smartech closer to the boiler.

Note: The maximum communication distance between the boiler and the Smartech is 10 metres in open field. The maximum actual distance might be shorter if there are walls, ceilings or obstacles between the two items.

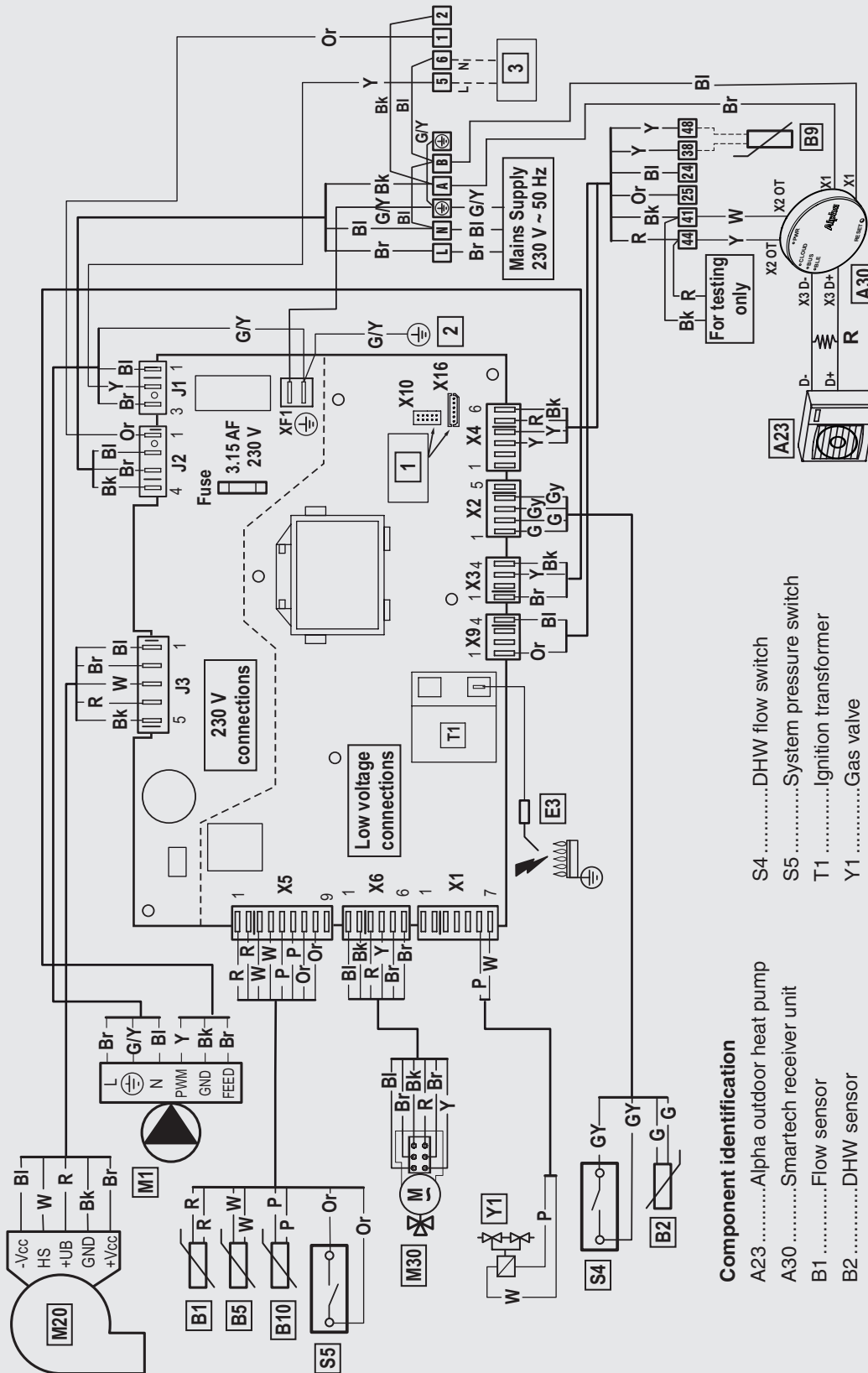
7.13 RESTORING DEFAULT SETTINGS

In the event of incorrect programming of the Smartech settings, default values can be reset as follows:

Enter the 'Diagnostic' menu (Section 7.10) and press 5 times until the word 'DEFAULT' appears in the 'SIGNAL STRENGTH' screen.

8 WIRING DIAGRAM

8.1 ILLUSTRATED WIRING DIAGRAM



Colour Code

Bk	.....	Black
Bl	.....	Blue
Br	.....	Brown
G	.....	Green
Gy	.....	Grey
G/Y	.....	Green/Yellow
Or	.....	Orange
P	.....	Purple
R	.....	Red
V	.....	Violet
W	.....	White
Y	.....	Yellow

Component identification

A23	.....	Alpha outdoor heat pump
A30	.....	Smarttech receiver unit
B1	.....	Flow sensor
B2	.....	DHW sensor
B5	.....	Return sensor
B9	.....	DHW inlet sensor (optional)
B10	.....	Flue sensor
E3	.....	Ignition and detection electrode
M1	.....	Boiler pump
M20	.....	Fan
M30	.....	3-way valve motor
R	.....	120 Ohm resistor

S4	.....	DHW flow switch
S5	.....	System pressure switch
T1	.....	Ignition transformer
Y1	.....	Gas valve
1	.....	Engineers palmtop connection
2	.....	Frame earth
3	.....	Output relay

ROOM THERMOSTAT CONTROL PANEL

The connection of the Smarttech receiver unit (A30) is required for the Alpha heat pump to operate.

9 ERROR CODES AND FAULT FINDING

9.1 CARRY OUT INITIAL FAULT FINDING CHECKS



In the event of a suspected functional fault with the boiler, carry out initial fault finding checks to establish the cause.

1. Check the correct gas, electrical and water supplies are available at the boiler.
2. Check the boiler system pressure is in the green area when cold.
3. Check that any boiler controls fitted are working and in an 'ON' position.
4. Carry out electrical supply and connection checks and check all fuses.

Where an error code is displayed use the following tables to identify the fault and possible causes.

10.2 BOILER ERROR CODES AND FAULT FINDING

If any fault or anomaly persists, contact Alpha Heating Innovation Technical Helpline.

The history of errors can be viewed in the 'INFO' menu - d9

Error code	Fault	Fault description	Possible causes
01	Ignition failure	Flame not detected during ignition sequence	Gas supply Check ignition/sensing electrode Ignition generator or lead Gas valve operation Check PCB and wire connections Flue restriction or blockage
02	Overheat boiler lock out	Overheat sensor has activated	Pump or restricted flow problem Blocked heat exchanger Air in heat exchanger Check external valves/circuit *
03	High flue temperature	Flue sensor intervention (flue temperature too high)	Blocked or restricted primary flow Heat exchanger air flow blocked Flue restriction Flue sensor fault Air in primary heat exchanger
04	Gas valve electrical connection fault	Gas valve wiring circuit fault detected	Gas valve lead connection fault Faulty gas valve Faulty PCB
05	CH flow sensor fault	Incorrect flow sensor resistance value	Flow sensor wire connections or sensor faulty
06	DHW sensor fault	DHW sensor resistance value is incorrect	DHW sensor wiring connection or sensor faulty
08	Max. number of resets	Maximum number of resets reached (5)	Refer to fault history codes (INFO menu d9), to reset by turning the boiler off and on. If it will not clear replace PCB
10	Primary system pressure low	Primary pressure switch has operated	Check expansion vessel pressure (1 bar) Leak in system Expansion relief valve operated Primary pressure switch
12	DHW inlet sensor fault	Optional DHW inlet sensor resistance out of range	Check sensor wiring and connections Check sensor resistance
15	Incorrect configuration	Incorrect hydraulic configuration There is an inconsistency between the settings and signals received from the PCB	Check the settings of the 'A' family parameters
16	Fan fault	Fan wiring fault or fan faulty	Check fan wiring connections Fan fault PCB fault
20	Flame sensing fault	False flame detection Flame detected but gas valve is not open	Check flame sensing electrode and lead Electrical short circuit on sensing wires PCB fault
22	PCB fault	PCB software error	Replace PCB
23	Return sensor fault	Return sensor resistance out of range	Check sensor wiring and connections Check sensor resistance
24	Control panel button fault	Control panel button stuck in the on position	Check for jammed control panel buttons Check for jammed PCB buttons

* When external zone valves are fitted an external by-pass must also be installed.

Error code	Fault	Fault description	Possible causes
25	PCB fault	PCB fault - software error	Replace PCB
27	Primary circuit overheat	Insufficient circulation in primary circuit causing overheating	Air in heat exchanger Isolation/system valves closed Check wiring/power to pump Pump seized/blocked Pump failed
29	Flue sensor fault	Flue sensor resistance out of range	Check sensor wiring and connections Check sensor resistance
31	Loss of communication with external control (Alpha Climatic)	Loss of connection between the boiler and Alpha Climatic control unit	Remote control or receiver connection wiring Distance or interference of RF signal Remote control or receiver fault (Check batteries if using RF controller)
37	Low supply voltage	Insufficient supply voltage to operate boiler	Check mains power supply Check for bad cable connections etc
38	Loss of flame rectification	Flame detected but signal lost. Ignition retries after fan purge	Check flame sensing electrode and lead Check for flue gas recirculation Check the gas valve Check flue system and termination Check gas supply/working pressure Check/adjust combustion settings Check burner earth connection
43	Loss of flame rectification	Repeated loss of flame signal during operation This fault can occur if the flue is exposed to high wind conditions (shown as E38 in the fault code history in the INFO menu)	Check as above for error code 38
45	High ΔT	The boiler detects a sudden, unexpected increase in ΔT between the flow sensor and the system return sensor	Burner input is limited for boiler protection, and once the right ΔT is restored, the boiler resumes regular operation. Make sure there is water circulating in the boiler, that the pump is configured according to the system requirements and that the return sensor is correct.
47	Reduced burner output	Flue thermostat has sensed high flue gas temperature (110°C) and reduced the burner output to prevent damage. If the temperature continues to rise the boiler will lock out and E03 will be displayed	Air in heat exchanger Restricted primary flow Heat exchanger air flow blocked Flue restriction Flue sensor fault Pump fault
51	Climatic RF communication fault	Error between communication of the Climatic transmitter and boiler receiver	Batteries require replacing
60	Pump fault	The pump is stuck or there is an electrical pump fault	Check the pump operation, it may be necessary to free the pump shaft Check the pump wiring Replace the pump
61	Air in the pump	Restricted CH flow due to air or a circuit restriction	Check Flow and Return valves are open Check for correct system pressure Check the system is purged properly
70	Return/flow sensor error (return reading higher than flow)	Possible wiring fault, sensors incorrectly fitted, system blocked	Check sensor wiring and connections Check sensor resistance Check circulation
75	Return/flow sensor fault	Possible failure of one or both sensors	Check sensor wiring and connections Check sensor resistance
76	Return/flow sensor fault	Possible failure of one or both sensors	Check sensor wiring and connections Check sensor resistance

Error code	Fault	Fault description	Possible causes
Sr	Service reminder	Service reminder count down (0 - 36 months) has reached zero See Section 6.13, parameter P6 Note: E97 is also shown on Climatic controller, if used	Note: The 'Sr' code will not stop the boiler functioning Note: Pressing the RESET button will clear the 'Sr' code for 24 hrs to allow the display to be read To permanently reset the error 'Sr' / E97 1. Enter the parameter menu using the password 69. See Section 6.13 2. Parameter P6 will show 0 3. Set P6 to any value above zero, save by pressing the mode button () and wait for '88' to be displayed as confirmation 4. Then set P6 to 0, save by pressing the mode button () and wait for '88' to be displayed as confirmation 5. Now set the parameter P6 at the number of months to the next service reminder (i.e. 12 for one year). Save by pressing the mode button () and wait for '88' to be displayed as confirmation
■	Boiler completely turned off	Screen only shows a single dot to indicate boiler is completely off	Press mode button () for 2 seconds then release. Boiler display will return and you can select an operating mode
'Blank screen'	Boiler fused blown	Fuse on main PCB blown	Incorrect power supply Seized or sticking pump - Check pump for free rotation Boiler component drawing excessive current. Check individual components in turn
	Pump with UPM3 W3 electronics ONLY Red pump LED	Pump fault	There can be three possible causes for this anomaly: 1. Low power supply voltage. When the minimum voltage is reached after about two seconds, the LED turns from red to green to red and the pump stops. Wait for the power supply voltage to rise. When the pump restarts the LED will turn green again with a delay of about one second Note: The flow rate decreases as the supply voltage decreases 2. Seized rotor. After about four seconds of the seized pump trying to start the LED turns from green to red. Carefully rotate the screw in the middle of the pump head to manually release the rotor. Circulation starts up immediately the rotor is freed and after about ten seconds the LED turns from red to green 3. Electrical fault. Pump, wiring or PCB fault. Check the indicated components
	Pump with UPM4 electronics ONLY Symbol  with steady red light	Pump fault	Possible causes for this anomaly: 1. Low power supply voltage 2. Seized rotor 3. Electrical fault

10.3 BOILER ERROR CODES AND FAULT FINDING

List of Outdoor Unit Error codes – Shown on the Smartech Control and the user App.

Error code	Fault	Fault description	Possible causes
1006	Return sensor fault	Incorrect reading from heat pump return sensor (water inlet)	Check sensor fitting Check sensor connections Check sensor for damage or incorrect readings
1008	Flow sensor fault	Incorrect reading from heat pump flow sensor (water outlet)	Check sensor fitting Check sensor connections Check sensor for damage or incorrect readings
1015	Flow temperature increase (during DHW)	Abnormal flow temperature increase in the outdoor unit during DHW mode	Check pipework is connected correctly Check flow sensor Check gas boiler diverter valve
1016	Flow temperature increase	Abnormal flow temperature increase in the outdoor unit	Check pipe connections Check all valves are open Check for blockages or flow restrictions
1019	System water high temperature	System water circuit overheating	Check pipe connections Check all valves are open Check for blockages or flow restrictions
1020	Power supply voltage anomaly	The supply voltage to the outdoor unit is out of the normal range	Check cable condition and connections Check for water ingress or short circuit connections Check main power supply, consumer and breaker for faults
1021	High pressure error	Outdoor unit evaporator/condenser fault (evaporator temperature below 0°C or condenser temperature $\geq 59.5^{\circ}\text{C}$)	Check the evaporator fins are clean and clear Check the condensation drainage is clear Check for freezing faults or ice build up Check compressor pipes for signs of leaks
1022	Overheat	Outdoor unit sensors overheat anomaly	Check all heat pump sensors
1024	DHW cylinder overheat	DHW cylinder high temperature reading	Check cylinder for potential overheating Check back up heater functions Check DHW cylinder sensor
1026	DHW cylinder heating	DHW heating time greater than 6 hours	Check for correct diverter valve directions Check for excessive hot water demand or draw off Check DHW cylinder coil transfer too slow or scale build up
1032	Liquid probe error	Compressor liquid phase temperature sensor fault	Check for correct compressor function
1036	PCB fault detected	EEPROM control board error	Check wiring to PCB and connections Check for water ingress on electrics
1039	High pressure switch fault	High pressure switch intervention	Check pressure switch function and connections High pressure in compressor circuit
1040	High pressure switch fault	The pressure sensor has activated repeatedly (16 times in 300 minutes)	Check the pressure switch and connections Check for compressor function issues
1043	Compressor overload	Compressor inverter overheat detected	Faulty compressor in heat pump
1044	Compressor start anomaly	Compressor motor rotation anomaly	Compressor start capacitor faulty Faulty compressor in heat pump
1045	Fan anomaly	Fan stopped on start up	Fan faulty or jammed
1046	Fan anomaly	Fan rotation anomaly	Fan blocked Fan blades excessively dirty Fan blades or housing damaged
1050	Compressor high current anomaly	Compressor power supply voltage too high	Faulty compressor in heat pump
1054	DHW temperature fault	Abnormal DHW temperature increase	Check sensor position and connections Check back up immersion operation Check for additional heat sources (Solar/PV etc.)
1057	Power supply voltage to compressor	Compressor power supply voltage out of range before start up	Check cable condition and connections Check for water ingress or short circuit connections
1060	High pressure switch error	High pressure switch fault	Check high pressure switch function and connections
1064	Compressor start anomaly	The compressor does not start up properly	Check compressor electrical connections Heat pump compressor fault

Error code	Fault	Fault description	Possible causes
1065	Compressor anomaly	Compressor power supply BUS not coherent	Check compressor electrical connections Check heat pump PCB connections Check for water ingress on PCB electronics
1066	External temperature sensor error	Outdoor air temperature sensor anomaly	Check connections and position of outside sensor Check sensor is not influenced by surrounding heat sources
1072	High discharge temperature	Compressor discharge temperature too high	Compressor fault Compressor overheating Excessive heat pump operating time
1077	High external coil temperature	High temperature on external coil	Blocked/damaged evaporator fins Restricted air flow across evaporator Check clearances and obstructions around heat pump Check and clean evaporator fins High ambient temperature operation
1078	High pressure on external coil	Pressure too high on external coil	Blocked/damaged evaporator fins Restricted air flow across evaporator Check clearances and obstructions around heat pump Check and clean evaporator fins
1079	Pressure sensor anomaly	Detected cooling gas pressure out of range	Expansion valve fault
1080	Coolant pressure probe anomaly	Coolant pressure probe anomaly	Check sensor location or damage Check sensor connections
1081	Discharge probe anomaly	Compressor temperature sensor anomaly	Check sensor location or damage Check sensor connections
1083	Evaporator probe anomaly	Outdoor coil temperature anomaly	Blocked/damaged evaporator fins Restricted air flow across evaporator Check clearances and obstructions around heat pump Check and clean evaporator fins
1103	High inverter temperature	Inverter board temperature too high	Check inverter board connections Check for dust or dirt on board
1104	Inverter temperature increased abnormally	Temperature on cooling fins too high	Check for dust or dirt on board
1105	Inverter high current	High current detected on inverter	Check inverter board connections Check for dust or dirt on board
1118	Inverter temperature sensor fault	Inverter temperature sensor anomaly	Check inverter sensor and connections
1119	Coolant loss	Lack of coolant in outdoor unit	Check for compressor circuit leaks
1123	Power supply voltage anomaly	Power supply voltage out of range	Check cable condition and connections Check for water ingress or short circuit connections
1128	Communication error with outdoor unit boards	Inverter communication error - hydronic board	Check cable condition and connections

If the error or anomaly persists, contact an approved company (e.g. HVAC engineer or manufacturer).



Instructions on how to correctly dispose of the product.

At the end of its life, this appliance must not be disposed of as mixed municipal waste. It is mandatory to separate this type of waste so that the materials making up the appliance can be recycled and reused. Contact authorised operators for disposal of this type of appliance. Incorrect management of waste and its disposal has potential negative effects on the environment and on human health. The symbol on the appliance represents the prohibition of disposing of the product as mixed municipal waste.