

Installation and Servicing Instructions

E-Tec EHP

External Heat Pump

For Technical help or for Service call ...
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Alpha
HEATING INNOVATION

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Leave these instructions with the User

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1 INTRODUCTION

The Alpha E-Tec 33 EHB 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 PCB 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 .
- Sced 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 with bus connection via a cable between the outdoor and indoor units. Using the separate Smartech 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



SAFETY FOOTWEAR

3 GENERAL INFORMATION

3.1 DIMENSIONS

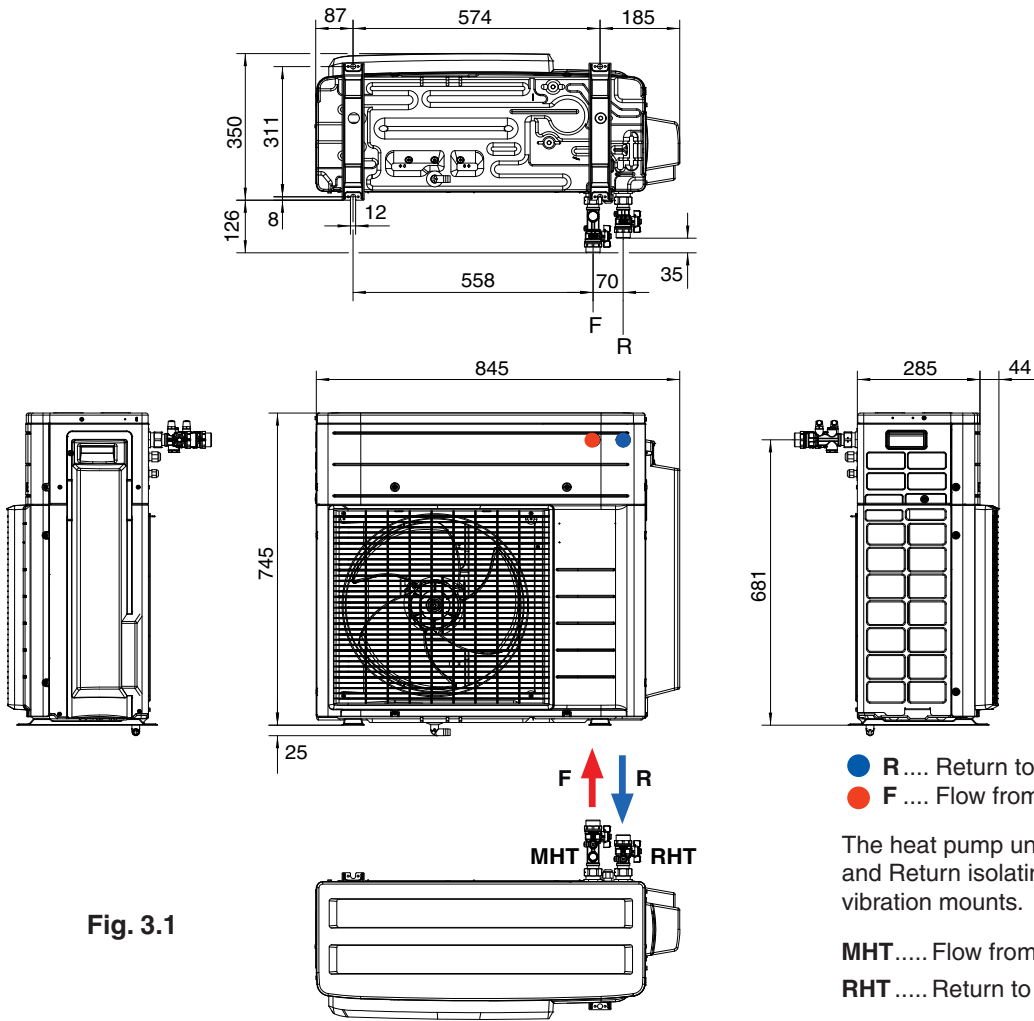


Fig. 3.1

3.2 PERMITTED PIPE LENGTH AND HEIGHT DIFFERENCE

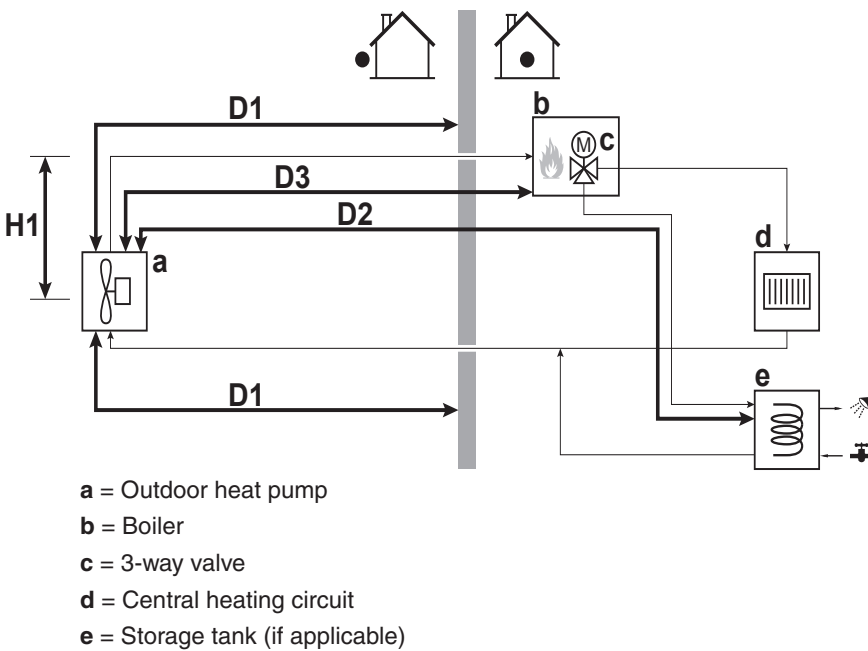


Fig. 3.2

	Item	Distance
H1	Maximum height difference between heat pump and boiler	Maximum 4 m
—	Maximum total length of the water pipe (internal section + external section)	To be calculated according to the head available to the system (refer to Alpha instruction manual)
D1	Maximum length of the external section of the water pipe (to prevent freezing the water pipe)	10 m (but limited to D2 when a storage tank is installed)
D2	Maximum distances between the heat pump and a storage tank (if applicable)	10 m
D3	Maximum distance between heat pump and boiler	10 m (but limited to D2 when a storage tank is installed)

3.3 WATER VOLUME AND FLOW RATE - MINIMUM CONTENTS

Minimum water volume

Check that the total water volume in the system, EXCLUDING the water volume inside the heat pump, is at least 20 litres.

Minimum flow rate

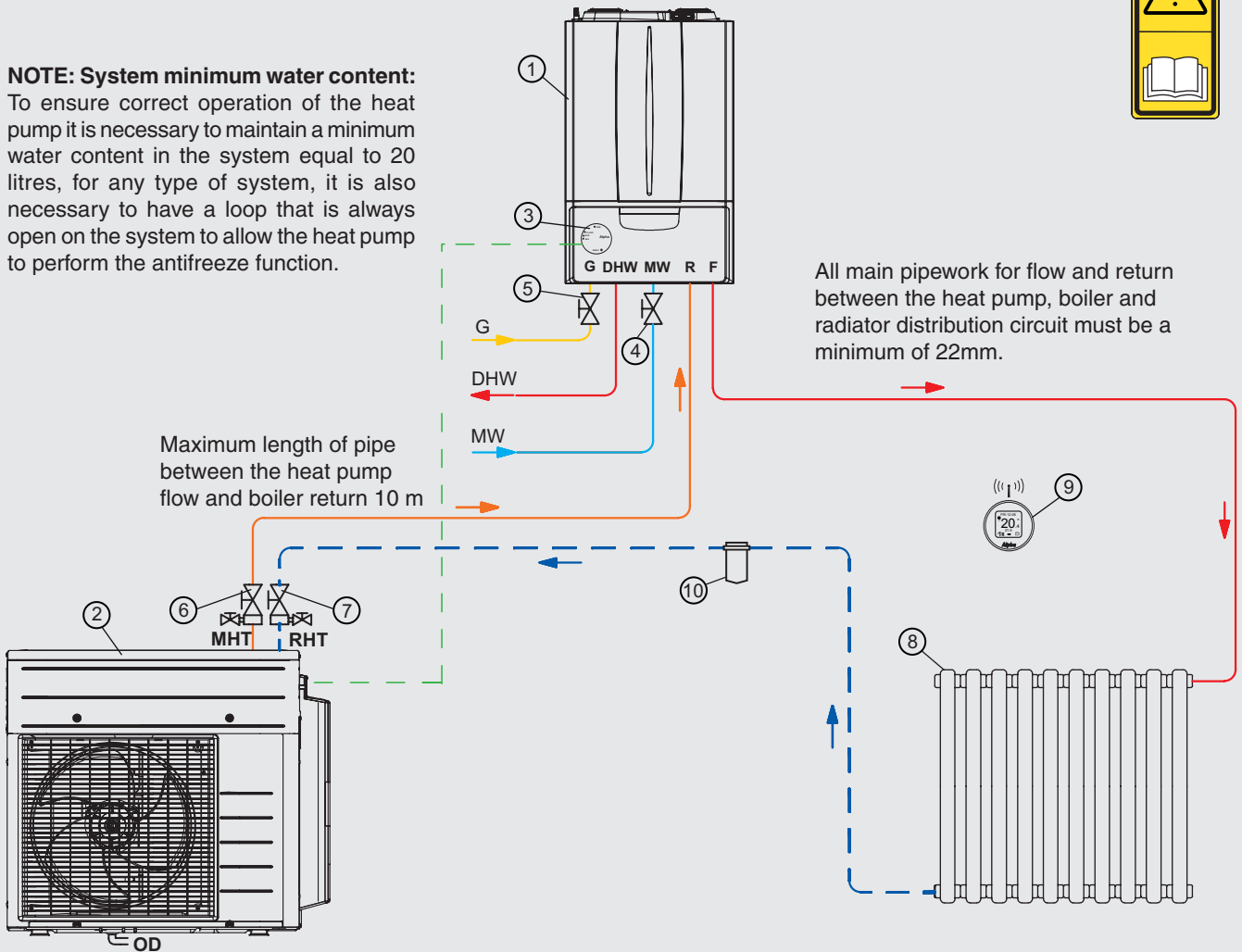
Ensure minimum flow rate, so that the heat pump does not go into high pressure error (1021). For the flow rate guidelines, see the table in Section 3.2 - Permitted pipe length and height difference.

The minimum permitted flow rate is 500 l/h.

3.4 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.



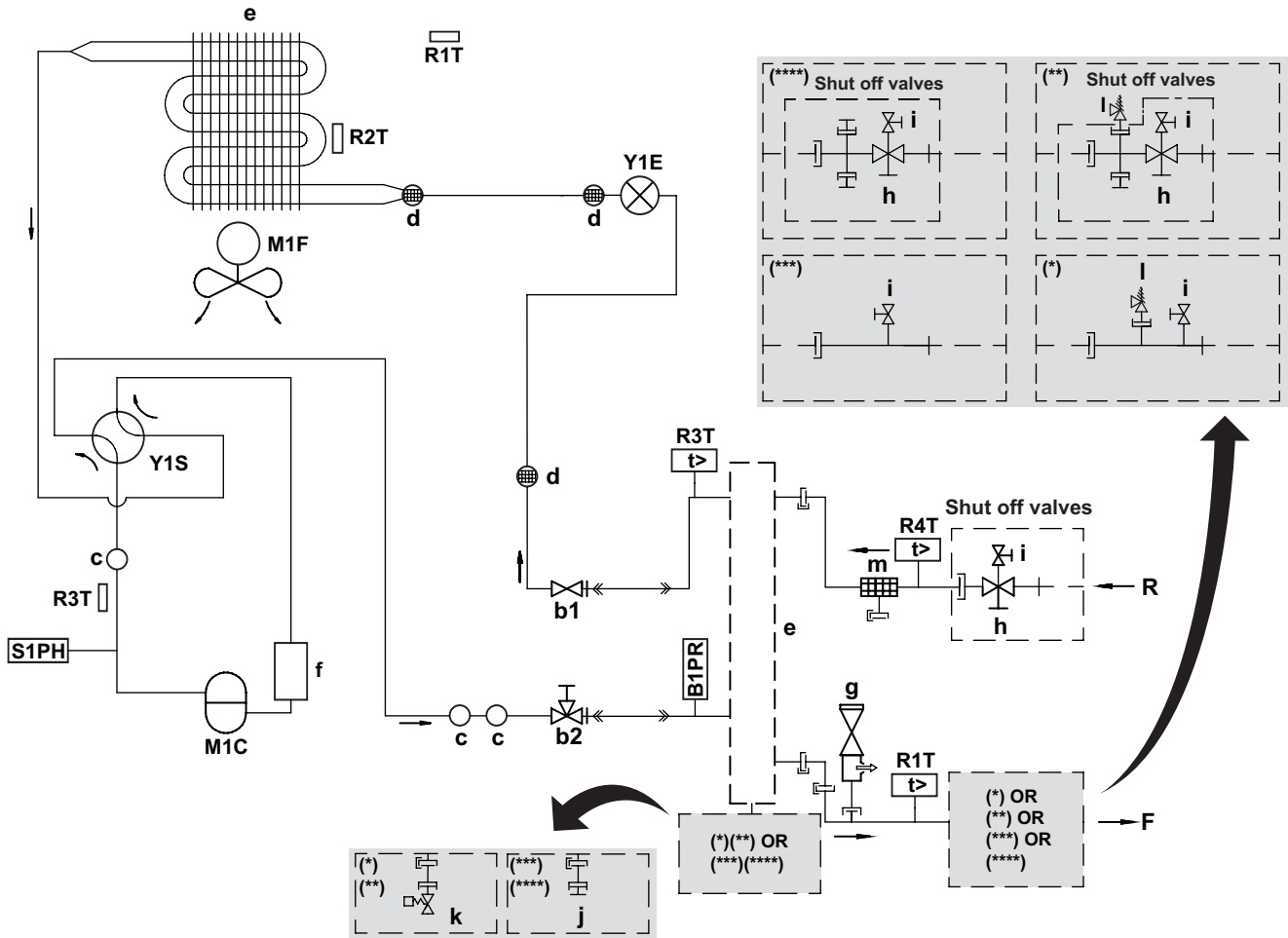
- 1 Alpha hybrid boiler (indoor unit)
- 2 Alpha heat pump (outdoor unit)
- 3 Smarttech boiler mounted receiver
- 4 Domestic hot water inlet isolating valve
- 5 Gas isolating valve
- 6 Heat pump flow isolating valve with vent
- 7 Heat pump return isolating valve with vent
- 8 Heating system
- 9 Smarttech 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. 3.3

3.5 HEAT PUMP SCHEMATIC



- RReturn to heat pump
- FFlow from heat pump
- b1Stop valve (cooling liquid)
- b2Stop valve with service opening (coolant gas)
- cSilencer
- dSilencer with filter
- eHeat exchanger
- fStorage tank
- gSafety valve
- hCut-off valve
- iAir purge
- jCap
- kAntifreeze protection valve
- lVacuum switch
- mFilter
- B1PRCoolant pressure sensor

- Shut-off valve... Standard supplied shut-off valves
- M1CCompressor motor
- M1FFan motor
- R1TExternal probe
- R1T (t>) ...Water outlet probe
- R2TEvaporator probe
- R3TCompressor outlet probe
- R3T (t>) ...Liquid phase probe
- R4T (t>) ...Water inlet probe
- S1PHHigh pressure switch
- Y1EElectronic expansion valve
- Y1SFour way solenoid
- |—Screw connection
- >>Flared connection
- |—Quick release connector

Fig. 3.4

4 CASE RELATED INFORMATION

4.1 OUTDOOR UNIT UNPACKING

ATTENTION:

To prevent damage or injuries, avoid touching the air inlet aluminium fins of the unit.

NOTE:

To prevent damaging the mount feet, NEVER tilt the unit sideways in any way.

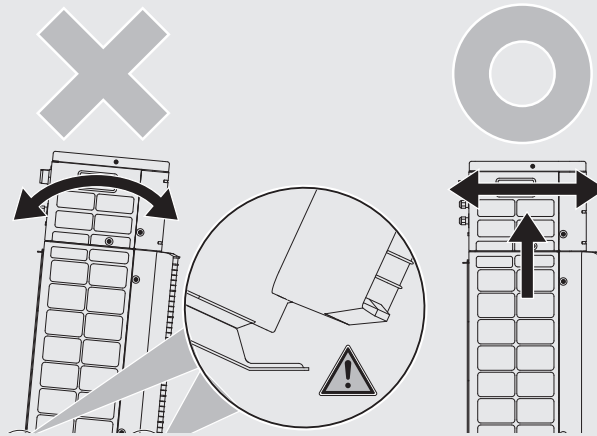


Fig. 4.1

Slowly transport the unit as shown in Fig. 4.2.

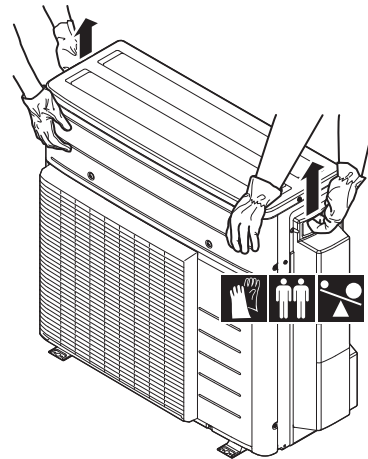


Fig. 4.2

4.2 REMOVE ACCESSORIES FROM THE PACK

- 1) Lift the outdoor unit. See Section 4.1.
- 2) Remove the accessories at the bottom of the unit.

Component:

- a = Antifreeze valve adaptor with 'O' ring (see Section 5.4)
- b = Antifreeze valve (see Section 5.4)
- c = Vacuum valve (see Section 5.4)
- d = Installation manual of the outdoor unit
- e = Cable clamp
- f = Drain fitting

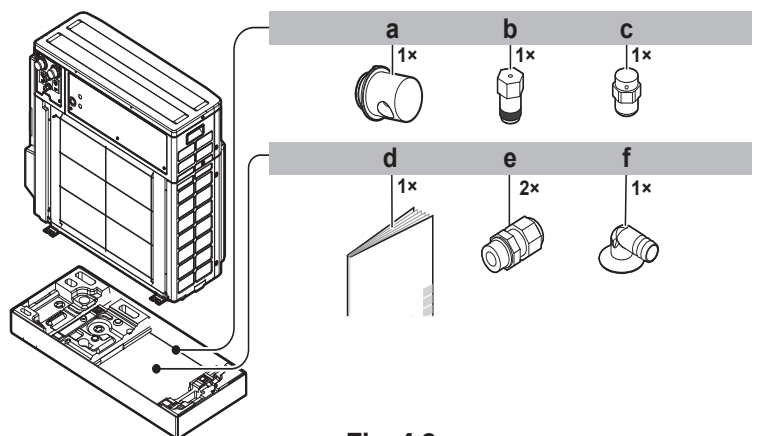


Fig. 4.3

NOTE:

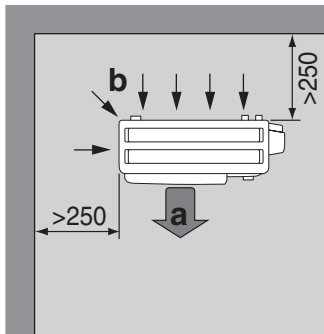
The isolation valves, the controller and the vibration dampening mounts are located inside the accessory pack, inside the boiler packaging.



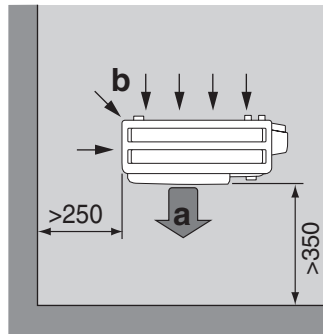
5 INSTALLATION OF HEAT PUMP

5.1 MINIMUM INSTALLTION CLEARANCES

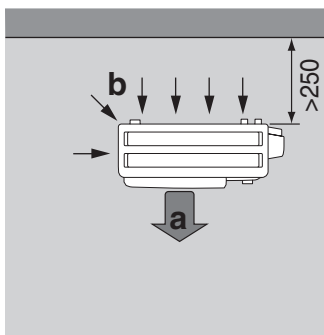
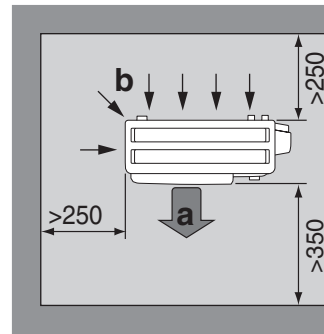
With two sides of the unit facing a side and rear wall



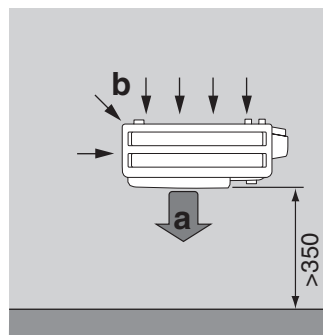
With two sides of the unit facing a side and front wall



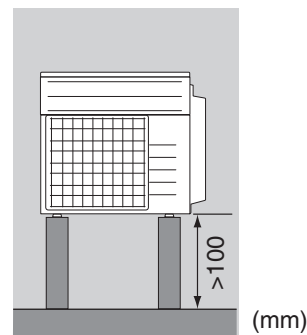
With three sides of the unit facing a wall



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

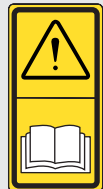
The place of installation of the heat pump is very important and must be established by the system designer or by a specifically qualified person, and must take into account the technical requirements, standards and regulations in force. The heat pump unit must only be installed outside the building. 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.
- Must have all external pipework and valves insulated with a suitable UV resistant lagging.



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.

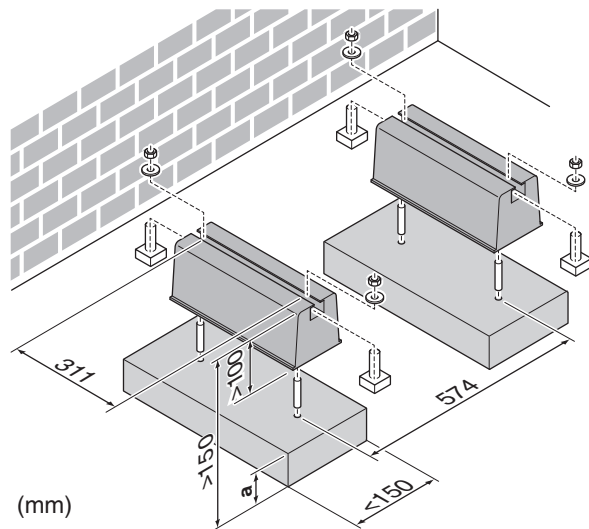
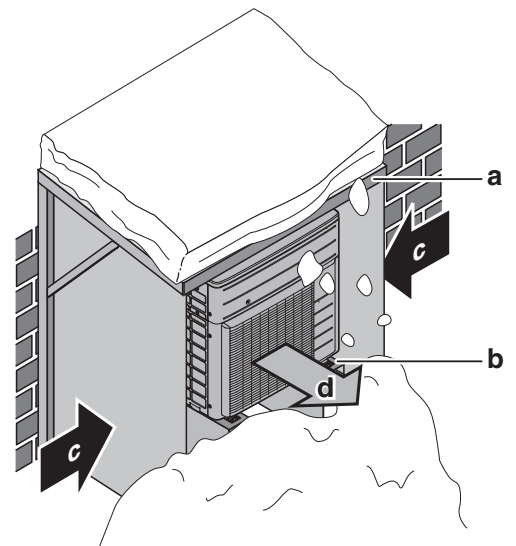


Fig. 5.2



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

Fig. 5.3

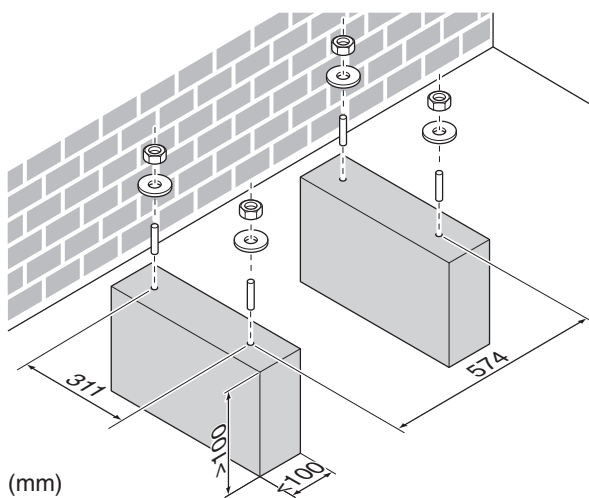


Fig. 5.4

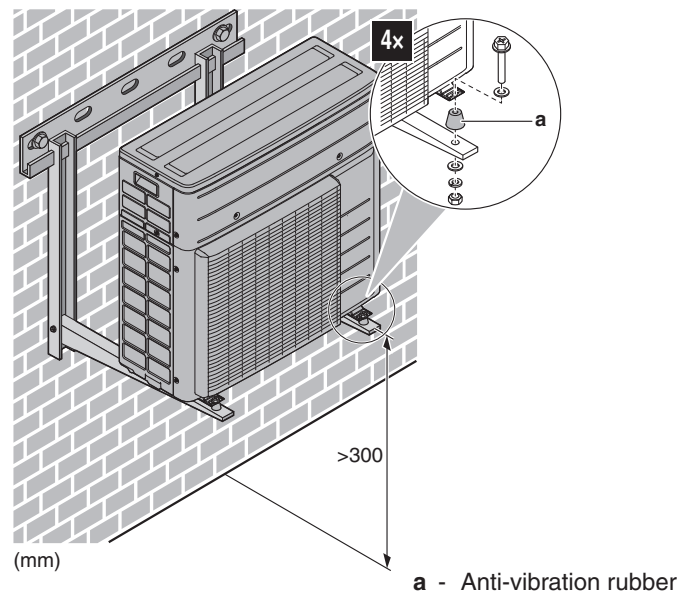


Fig. 5.5

- a - Anti-vibration rubber

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.

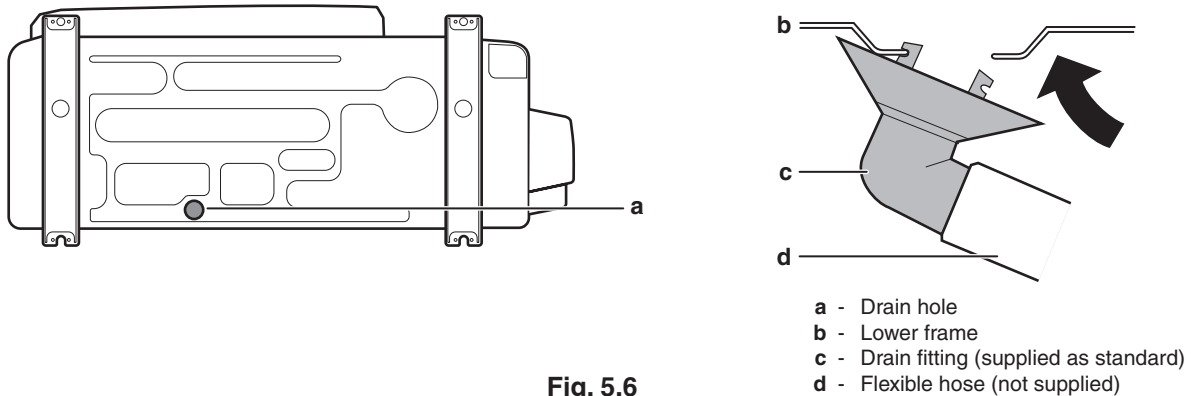


Fig. 5.6

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.

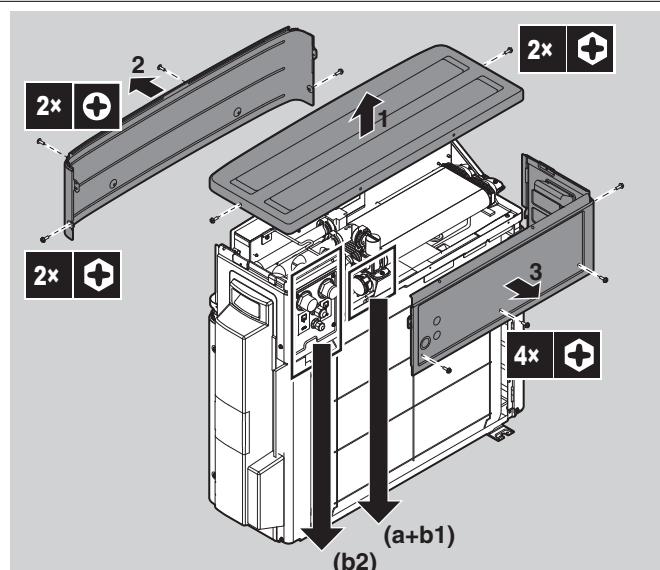
An aqueous solution must be made with potential pollution class of water 2 (EN 1717:2002).

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.

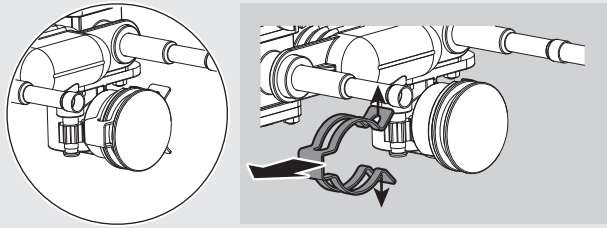


Fig. 5.8

2 Remove and discard the stop with sealing washer.

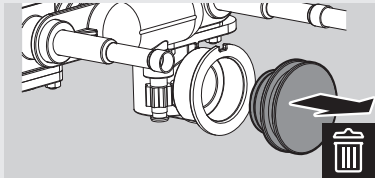


Fig. 5.9

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

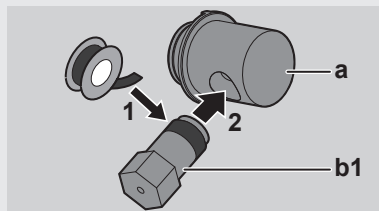


Fig. 5.10

4 Attach the connection piece to the heat pump unit.

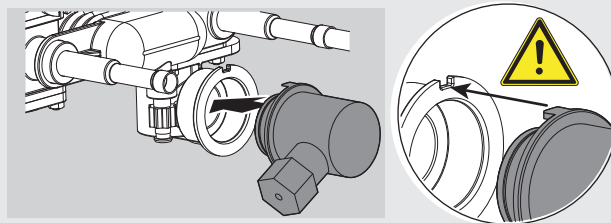


Fig. 5.11

5 Replace the clip.

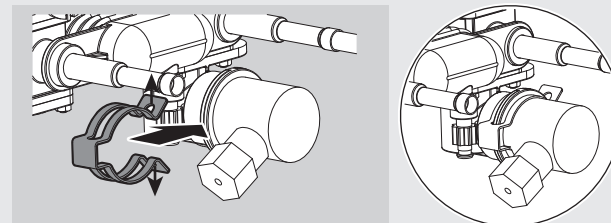


Fig. 5.12

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.

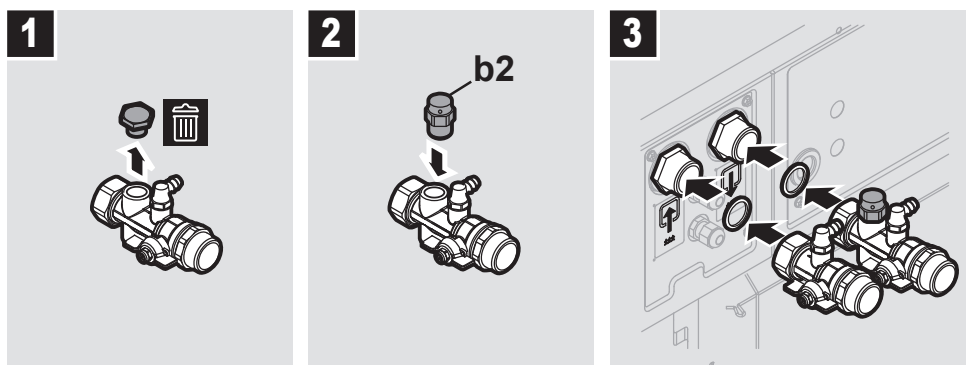
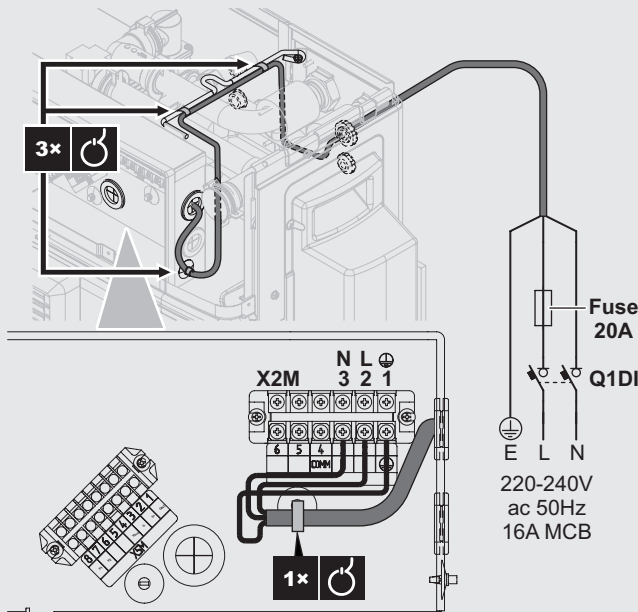


Fig. 5.13

5.5 CONNECT THE HEAT PUMP WIRING



Q1D1Isolator switch

Fig. 5.14

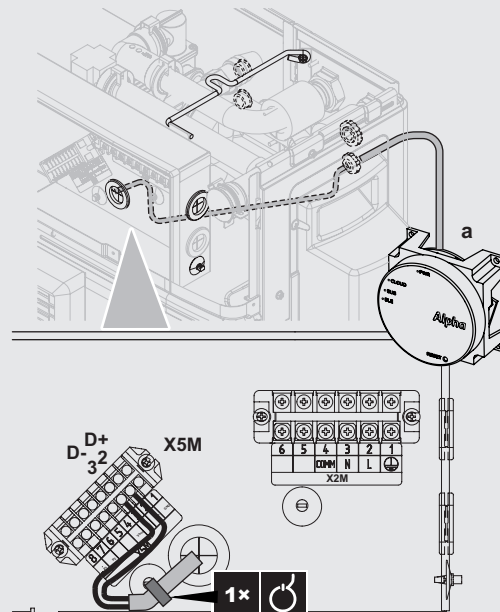


Fig. 5.15

Refer to the boiler instructions 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 Smarttech 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.

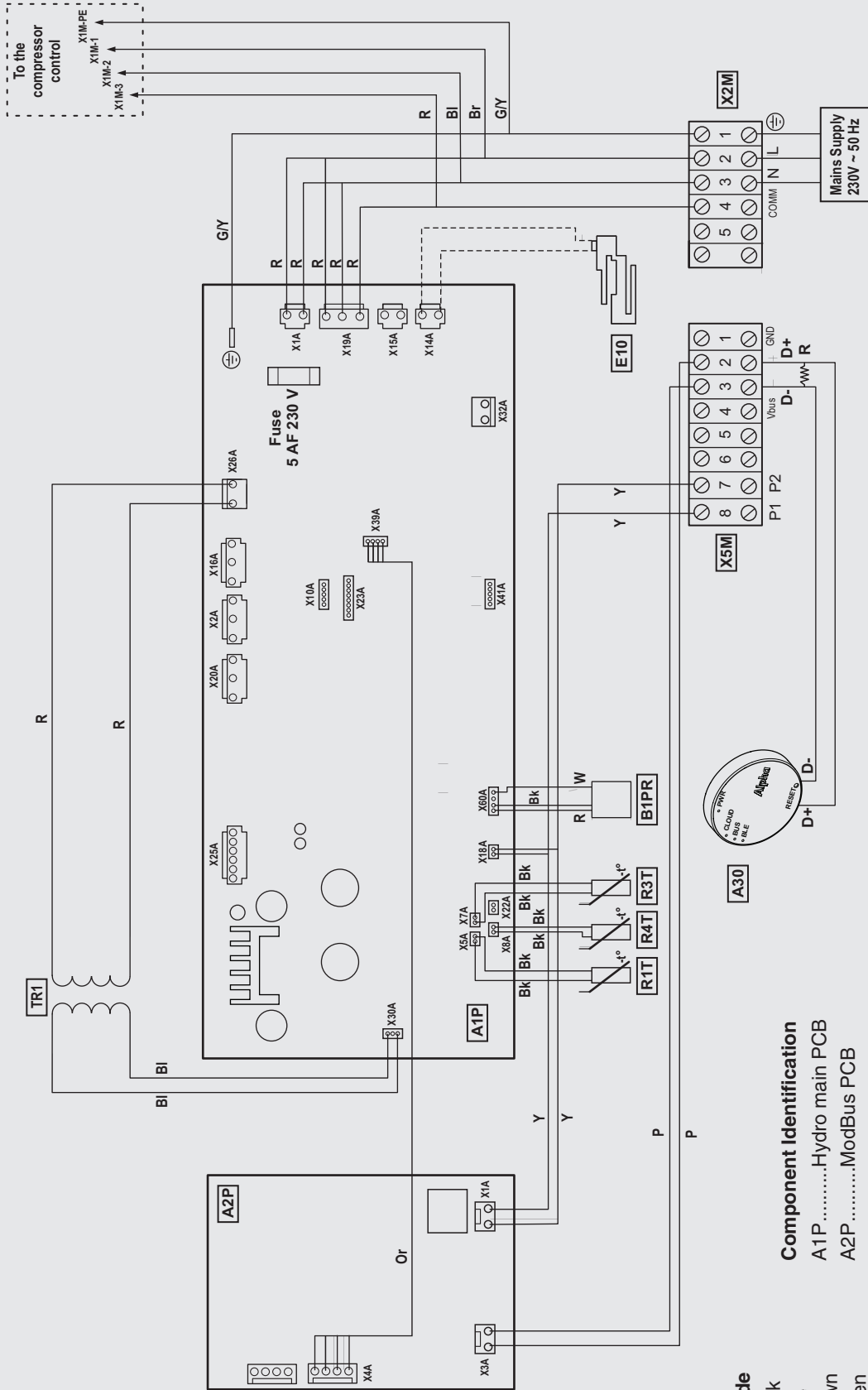
Outdoor Unit	Nominal Values		Field of Tolerable Voltage		Maximum absorbed current (MAC) in normal operation	Supply fuse/MCB required (a) 100mA RCD	Power supply cable
	Hz	V	V	V	A	A	
E-Tec external heat pump	50	220-240	198	264	10.3	16	2.5 mm ² , 3 core

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 WIRING DIAGRAMS

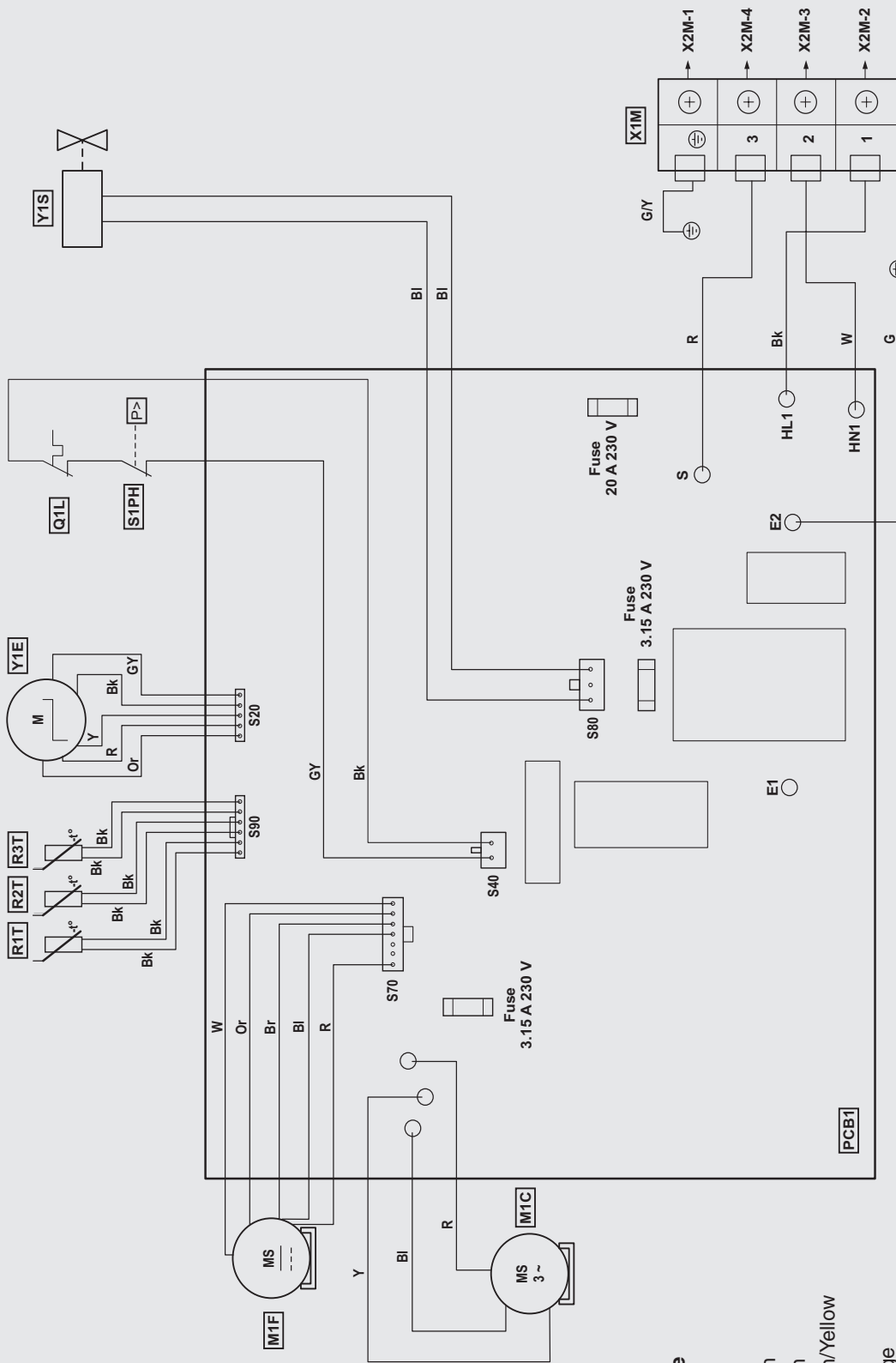
6.1 HEAT PUMP WIRING DIAGRAM



- Colour Code**
- Bk Black
 - Bl Blue
 - Br Brown
 - G Green
 - G/Y Green/Yellow
 - Or Orange
 - P Purple
 - R Red
 - W White
 - Y Yellow

- Component Identification**
- A1PHydro main PCB
 - A2PModBus PCB
 - A30Smartech boiler receiver
 - B1PRCoolant pressure sensor
 - E10Adhesive heating resistance (antifreeze)
 - R1TWater outlet probe
 - R3TLiquid phase probe
 - R4TWater inlet probe
 - TR1Transformer

6.2 Inverter Wiring Diagram



Colour Code

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

Component Identification

M1C Compressor motor
 M1F Fan motor
 Q1L Heating thermostat
 R1T External probe
 R2T Evaporator probe
 R3T Compressor outlet probe
 R4T Water inlet probe
 S1PH High pressure switch
 Y1E Electronic expansion valve
 Y1S Four way reversal

7 SERVICING and MAINTENANCE

The heat pump should be checked and serviced annually to maintain efficiency and ensure correct operation. Before the winter it is recommended to have the unit serviced by a qualified heating or HVAC engineer.

Isolate the electrical supply to make safe while servicing the external heat pump unit.

Check all electrical contacts and cables and ensure they are protected from the elements and supported correctly.

Check for correct unit clearances and that there are no obstructions around the unit.

Clean and check the condition of the heat pump external casing using a brush and cloth and water without detergents added.

Carefully clean the main air heat exchanger fins with compressed air and a soft brush making sure the fins are not blocked or damaged.

Check for excessive dirt collected on the fan blades and clean with a cloth or brush if required.

Check the condensation drain in the bottom tray is clear to enable free drainage of any condensation.

Check for any signs of system water leaks on all pipe work between the heat pump and internal heating system connections.

Check all external pipes are fully insulated and the lagging is not deteriorated or damaged.

Isolate the heat pump and remove the system water strainer to remove any collected system debris and replace the strainer.

A magnetic system filter should also be fitted inside the property to maintain the heating system water. This should be isolated and cleaned according to the filter manufacturers recommendations.

Where Glycol is used in the system water the glycol concentration should be checked with a refractometer and glycol added if necessary.

Once the above checks have been carried out and the heating system is filled to the correct pressure, turn the power on and check for normal operation.

Test thermostat/controller and settings under normal operating conditions to check the system is working correctly.

Check the parameter settings are correct and energy tariff values where applicable.



8 WARRANTY and SERVICE RECORD

It is a requirement of the warranty that the heat pump is installed and commissioned to the manufacturers instructions and the data in the commissioning checklist completed in full.

To instigate the warranty the heat pump needs to be registered with the manufacturer within one month of the installation.

The service details should be recorded in the service record below and left with the householder. Failure to comply with the manufacturers servicing instructions and requirements will invalidate the warranty.

Service Record	Date:	Service Record	Date:
Engineers name:		Engineers name:	
Company name:		Company name:	
Telephone No:		Telephone No:	
All checks have been carried out according to the servicing requirements.		All checks have been carried out according to the servicing requirements.	
Comments/ Observations:		Comments/ Observations:	
Signature:		Signature:	

Service Record	Date:	Service Record	Date:
Engineers name:		Engineers name:	
Company name:		Company name:	
Telephone No:		Telephone No:	
All checks have been carried out according to the servicing requirements.		All checks have been carried out according to the servicing requirements.	
Comments/ Observations:		Comments/ Observations:	
Signature:		Signature:	

Service Record	Date:	Service Record	Date:
Engineers name:		Engineers name:	
Company name:		Company name:	
Telephone No:		Telephone No:	
All checks have been carried out according to the servicing requirements.		All checks have been carried out according to the servicing requirements.	
Comments/ Observations:		Comments/ Observations:	
Signature:		Signature:	



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.