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ait
HEAT PUMPS



Operating Manual

Wall-mounted controller WR 2.1-16kW

Accessory for heat pumps

UK

www.aitgroup.com

83058900dUK



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1 About this operating manual

This operating manual is part of the unit.

- ▶ Before working on or with the unit, read the operating manual carefully and follow it for all activities at all times, especially the warnings and safety instructions.
- ▶ Keep the operating manual to hand at the unit and pass on to the new owner if the unit changes hands.
- ▶ If you have any questions or anything is unclear, ask the manufacturer's local partner or the factory's customer service.
- ▶ Note and follow all other reference documents.

1.1 Validity

This operating manual refers solely to the unit identified by the nameplate.

1.2 Reference documents

The following documents contain additional information to this operating manual:

- Planning & design manual, hydraulic integration
- Operating manual of the heat pump
- Operating manual of the heating and heat pump controller
- Brief description of the heat pump controller
- Operating manual of the expansion board (accessory)

1.3 Symbols and markings

Identification of warnings

Symbol	Meaning
	Safety-relevant information. Warning of physical injuries.
	Safety-relevant information. Warning of physical injuries. Flammable materials / flammable (primary) refrigerant
	Safety-relevant information. Warning of physical injuries. Flammable materials / flammable (primary) refrigerant

Symbol	Meaning
	Safety-relevant information. Warning of physical injuries. Danger of fatal injury due to electric current.
DANGER	Indicates imminent danger resulting in severe injuries or death.
WARNING	Indicates a potentially dangerous situation, which can result in severe injuries or death.
CAUTION	Indicates a potentially dangerous situation, which can result in moderate or minor injuries.
IMPORTANT	Indicates a potentially dangerous situation, which can result in property damage.

Symbols in the document

Symbol	Meaning
	Information for qualified personnel
	Information for the owner/operator
✓	Requirement for action
▶	Procedural instructions: Single step action prompt
1., 2., 3., ...	Procedural instructions: Numbered step within a multi-step action prompt. Keep to the given order.
	Additional information, e.g. a tip on making work easier, information on standards
→	Reference to further information elsewhere in the operating manual or in another document
•	Listing
	Secure connections against twisting



1.4 Contact

Addresses for purchasing accessories, for service cases or for answers to questions about the unit and this operating manual can be found on the internet and are kept up-to-date:

- www.aitgroup.com

2 Safety

Only use the unit when it is in flawless technical condition and only use it as intended, safely and aware of the hazards, and follow this operating manual.

2.1 Intended use

The unit is designed for household use and, combined with a compatible air/water heat pump, is solely intended for the following purposes

- Heating
- Domestic hot water preparation
- Cooling (flow temperature of down to 7°C)
- ▶ Intended use includes complying with the operating conditions and the operating manual and observing and following the reference documents.
- ▶ When using the local regulations note: laws, standards, guidelines, directives.

All other uses of the unit are not as intended.

2.2 Personnel qualifications

The operating manuals supplied with the product are intended for all users of the product.

The operation of the product via the heating and heat pump control and work on the product which is intended for end customers / operators is suitable for all age groups of persons who are able to understand the activities and the resulting consequences and can carry out the necessary activities.

Children and adults who are not experienced in handling the product and do not understand the necessary activities and the resulting consequences must be instructed and, if necessary, supervised by persons experienced in handling the product and who are responsible for safety.

Children must not play with the product.

The product may only be opened by qualified personnel.

All procedural instructions in this operating manual is solely directed at qualified, skilled personnel.

Only qualified, skilled personnel are able to carry out the work on the unit safely and correctly. Interference by unqualified personnel can cause life-threatening injuries and damage to property.

- ▶ Ensure that the personnel is familiar with the local regulations, especially those on safe and hazard-aware working.
- ▶ Ensure that the personnel are qualified to handle flammable (primary) refrigerant.
- Work on the refrigerating circuit may only be carried out by qualified personnel with appropriate qualifications for refrigeration system installation.
- Work on the electrics and electronics may only be carried out by electrical technicians.
- Any other work on the system may only be carried out by qualified personnel (heating installer, plumbing installer).

During the warranty and guarantee period, service work and repairs may only be carried out by personnel authorised by the manufacturer.

2.3 Personal protective equipment

During transport and work on the unit, there is a risk of cuts due to the sharp edges of the unit.

- ▶ Wear cut-resistant protective gloves.

During transport and work on the unit, there is a risk of foot injuries.

- ▶ Wear safety shoes.

When working on liquid-conveying lines, there is a risk of injury to the eyes due to leakage of liquids.

- ▶ Wear safety goggles.



2.4 Residual risks

Injuries caused by electric shock

Components in the unit are energised with life-threatening voltage. Before working on the unit:

- ▶ Disconnect unit from power supply.
- ▶ Secure unit against being switched back on again.

Existing earthing connections within housings or on mounting plates must not be altered. If this should nevertheless be necessary in the course of repair or assembly work:

- ▶ Restore earthing connections to their original condition after completion of the work.

Safety instructions and warning symbols

- ▶ Observe the safety instructions and warning symbols on the packaging and on and in the unit.

3 Operation and maintenance



NOTE

The unit is operated via the control panel of the heating and heat pump controller (→ operating manual of the heating and heat pump controller).

3.1 Energy and environmentally-conscious operation

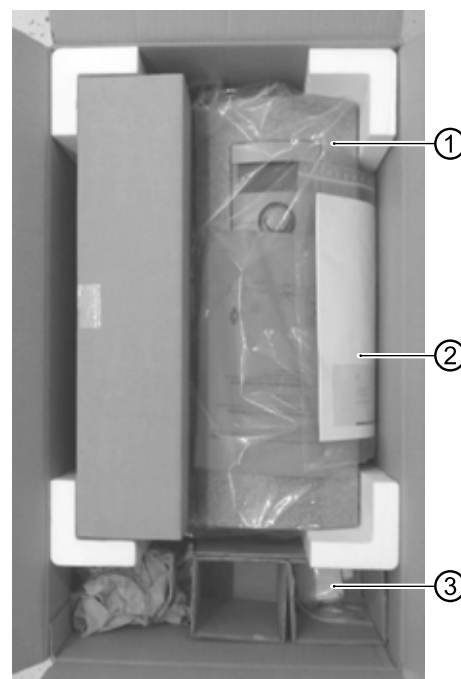
The generally accepted requirements for an energy-conscious and environmentally-conscious operation of a heating system also apply to use of a heat pump. The most important measures include:

- No unnecessarily high flow temperature
- No unnecessarily high domestic hot water temperature
- Do not open windows with just a gap or tilt open (continuous ventilation); instead, open wide for a short time (shock ventilation).
- Always ensure that the controller settings are correct

3.2 Maintenance

Wipe down the outside of the unit only using a damp cloth or cloth with mild cleaning agent (washing-up liquid, neutral cleaning agent). Do not use any harsh, abrasive, acid or chlorine-based cleaning products.

4 Scope of supply



- 1 Wall-mounted controller with control panel
- 2 Operating manual, installation materials
- 3 Outdoor sensor

1. Check the delivery for outwardly visible signs of damage.
2. Check the scope of supply for completeness. Any defects or incorrect deliveries must be reported immediately.
 - Outdoor sensor
 - Drill template
 - Operation manual
 - Installation accessories (drills, dowels)

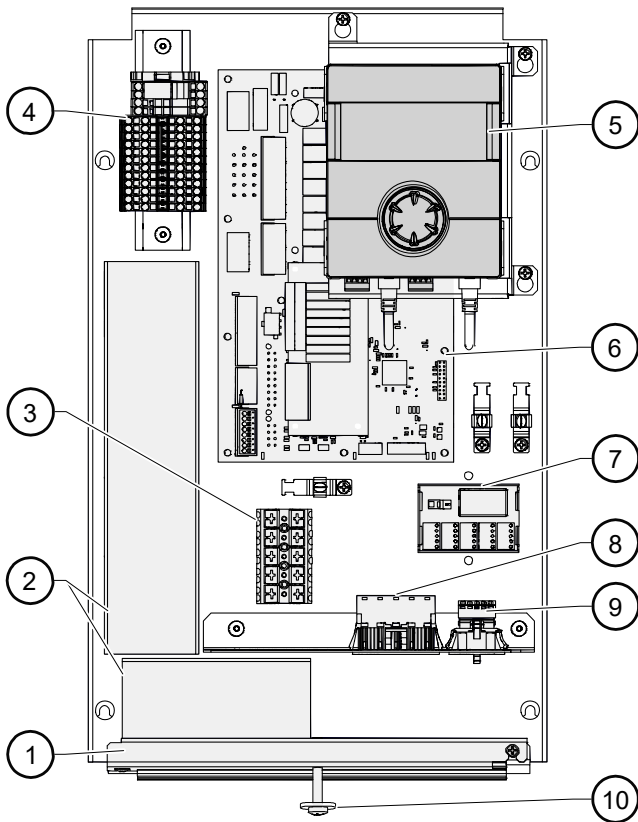
4.1 Accessories

The following accessories are available for the unit through the manufacturer's local partner:

- Expansion board with various additional functions
- Room control unit for controlling the main functions from the living room
- Domestic hot water tank
- Buffer tank
- Immersion heaters



4.2 Components of the unit



- 1 Cable entry with clamp
- 2 Cable glands
- 3 Device connection terminals
- 4 Connection terminals load cable / control voltage
- 5 Control panel
- 6 Circuit board of heating and heat pump control
- 7 Modbus hub distributor
- 8 Load cable connection socket^{*)}
- 9 Bus cable connection socket^{*)}
- 10 Closure of the unit front hood

^{*)} The plugs are supplied with the heat pump and must be installed on site on the cables to be laid by the customer

Nameplate

A nameplate is attached to the outside of the unit at the factory.

The nameplate contains the following information at the very top:

- Model, item number
- Serial number

The nameplate also contains an overview of the most important technical data.

5 Storage, transport, installation

5.1 Storage

- ▶ Store unit protected against:
 - Moisture/damp
 - Frost
 - Dust and dirt

5.2 Transport and unpacking

Notes on safe transport

There is a risk of injuries or damage to property if the unit falls or overturns.



NOTE

To prevent damage during transport, always transport the unit to final installation location in its original packaging.

Carrying the unit

- ▶ Transport the wall-mounted controller to the installation location.

Unpacking

1. Remove plastic films and cardboard. Ensure that you do not damage the unit.
2. Dispose of the transport and packaging material in an environmentally friendly way and in accordance with local regulations.

5.3 Installation

Installation location

IMPORTANT

Install the unit inside buildings only.

The installation area must be frost-free and dry. It must fulfil the relevant local regulations.

Observe safety and service clearances.

→ "Dimensioned drawings", page 10, and "Dimensioned drawings", page 10

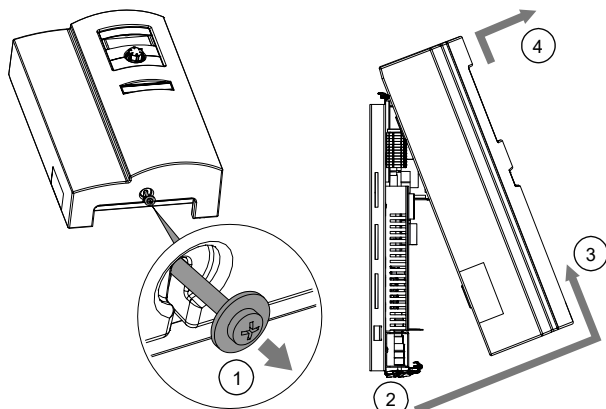


Assembly

IMPORTANT

The load-bearing capacity of the wall must be guaranteed.

1. Align drill pattern, mark drill holes and drill.
→ "Drill pattern", page 10
2. Take off the front hood.



3. Set aside the front hood so that it is protected from damage.
4. Use the plugs and screws supplied to fix the wall-mounted controller onto the wall:

The plugs supplied are only suitable for use with the following types of walls:

- Concrete
- Solid lightweight concrete blocks
- Cavity block made of lightweight concrete
- Cellular concrete
- Prestressed concrete - hollow ceiling/floor slabs
- Natural stone with dense, close-grained microstructure
- Solid calcium silicate blocks
- Perforated calcium silicate blocks
- Solid bricks
- Vertically perforated (honeycomb) bricks
- Hollow floors/ceilings made of clay bricks, concrete or similar
- Solid gypsum boards
- Gypsum boards and gypsum fibre boards
- Particle boards

The board material must be dimensioned with sufficient thickness to ensure secure fixing. Appropriate fixing material must be provided on site for other types of wall constructions.

IMPORTANT

The gap between the unit and the wall helps back ventilation. It may not be sealed or closed off.

5. Lay cable glands at a distance of at least 2 cm from the wall-mounted controller.

6 Install the hydraulic connections

IMPORTANT

Avoid open heating systems and / or heating systems that are not oxygen diffusion-tight.

If this is not possible, a system separation must be installed.

Depending on the dimensioning of the heat exchanger and the additionally required circulation pump, the system separation worsens the energy efficiency of the system.

IMPORTANT

Dirt and deposits in the (existing) hydraulic system can cause damage to the heat pump.

- ▶ Ensure that an air / magnetic sludge separator is installed in the hydraulic system.
- ▶ Rinse the hydraulic system thoroughly prior to establishing the hydraulic connection of the heat pump.
- ✓ Cross-sections and lengths of the pipes for the heating circuit are adequately dimensioned.

6.1 Outdoor sensor

- Operating manual of the heating and heat pump controller, part 2



7 Electrical installation

7.1 Connect the electrical cables

IMPORTANT

Irreparable damage to the compressor due to wrong rotating field!

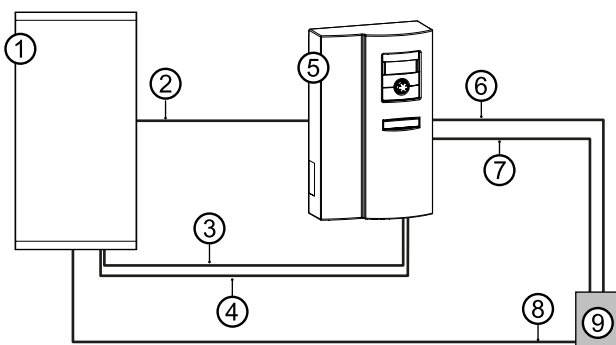
- ▶ Ensure that there is a clockwise rotating field for the compressor load infeed.

Basic information on the electrical connection

- The specifications of the local energy supply company may apply to electrical connections
 - Fit the power supply for the heat pump with an all-pole circuit breaker with at least 3 mm contact spacing (per IEC 60947-2)
 - Note the level of the tripping current
 - Comply with the electromagnetic compatibility regulations (EMC regulations)
 - Lay unshielded power supply cables and shielded cables (bus cable) sufficiently far apart (> 100 mm)
 - Maximum line length: 30m
- Cable extension details see heat pump manual

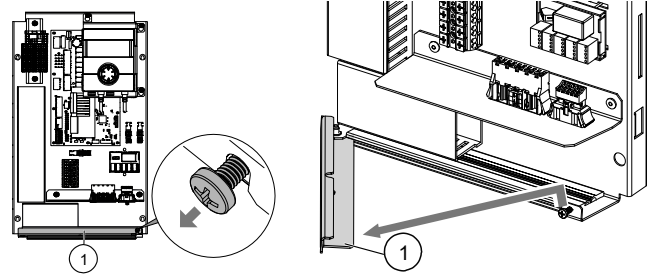
7.2 Electrical connection

The wall-mounted controller is connected electrically on site according to the following scheme:

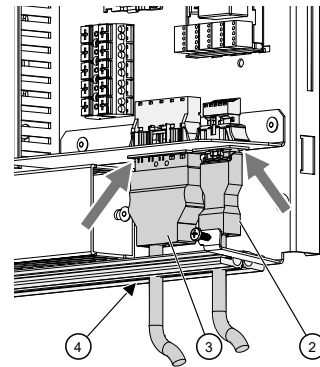


- 1 Heat pump
- 2 Control voltage
- 3 Bus cable (shielded)
- 4 Load cable compressor
- 5 Wall-mounted controller
- 6 Control voltage
- 7 Load cable compressor
- 8 Load cable electric heating element
- 9 Sub-distribution

1. Fit the connectors to the bus cable and power cable of the heat pump.
→ Operating manual of the heat pump
2. Open the clamp (①) of the cable entry.



3. Route the wired plugs of the heat pump bus cable (②) and power cable (③) between the two rubber seals (④) and plug them into the corresponding socket in the wall-mounted controller.



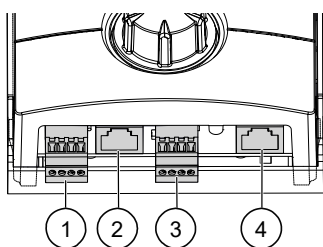
4. Strip the control and sensor cable, of the cable for the EVU blocking time as well as the cables of external loads before feeding them into the wall-mounted controller (stripping length of each of the individual wires: 6 mm).
5. Route cables and wires between the two rubber seals (④), route them through the cable ducts in the wall-mounted controller and make the electrical connections in accordance with the terminal diagram.
→ „Terminal diagrams“, from page 12



NOTE

The control panel of the heating and heat pump controller can be connected to a computer or network using a suitable network cable, enabling the heating and heat pump controller to be controlled remotely from there.

If such a connection is desired, route a shielded network cable (category 6, with RJ45 connector) into the wall-mounted controller and plug it to the corresponding socket (②) of the control panel.



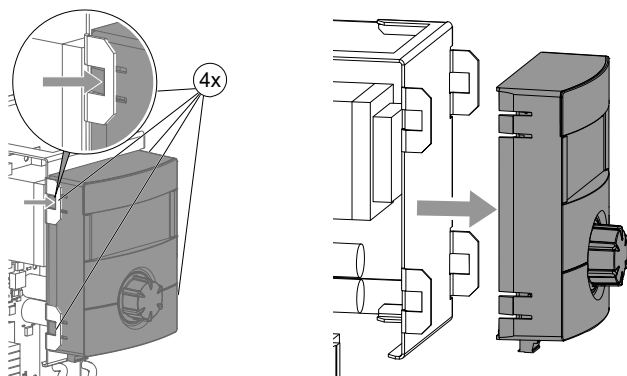
- 1 RS485 for connecting the room control unit RBE (accessory)
- 2 RJ45 for network cable connection
- 3 RS485 LIN bus cable connection to the control board
- 4 RJ45 connection Modbus cable to Modbus distributor.

6. Close the clamp and screw it tightly in place.
7. Put on the front hood of the unit and screw it tightly in place.

8 Control panel

The control panel is pre-assembled at the factory. If the control panel needs to be removed for any reason:

1. Disconnect or unplug all connections at the bottom.
2. Lift off the control panel.



- ▶ To reattach the control panel, proceed in reverse order.

9 Commissioning

- Operating manual of the heating and heat pump controller
- Operating manual of the heat pump

10 Faults

- ▶ Read out the cause of the fault via the diagnostics program of the heating and heat pump controller.
- ▶ Contact the local partner of the manufacturer or the factory's customer service. Have the fault message and unit number (→ Nameplate) to hand.

11 Dismantling and disposal

11.1 Dismantling

- ▶ Separate components by their materials.

11.2 Disposal and recycling

- ▶ Recycle or ensure proper disposal of unit components and packaging materials in accordance with local regulations.

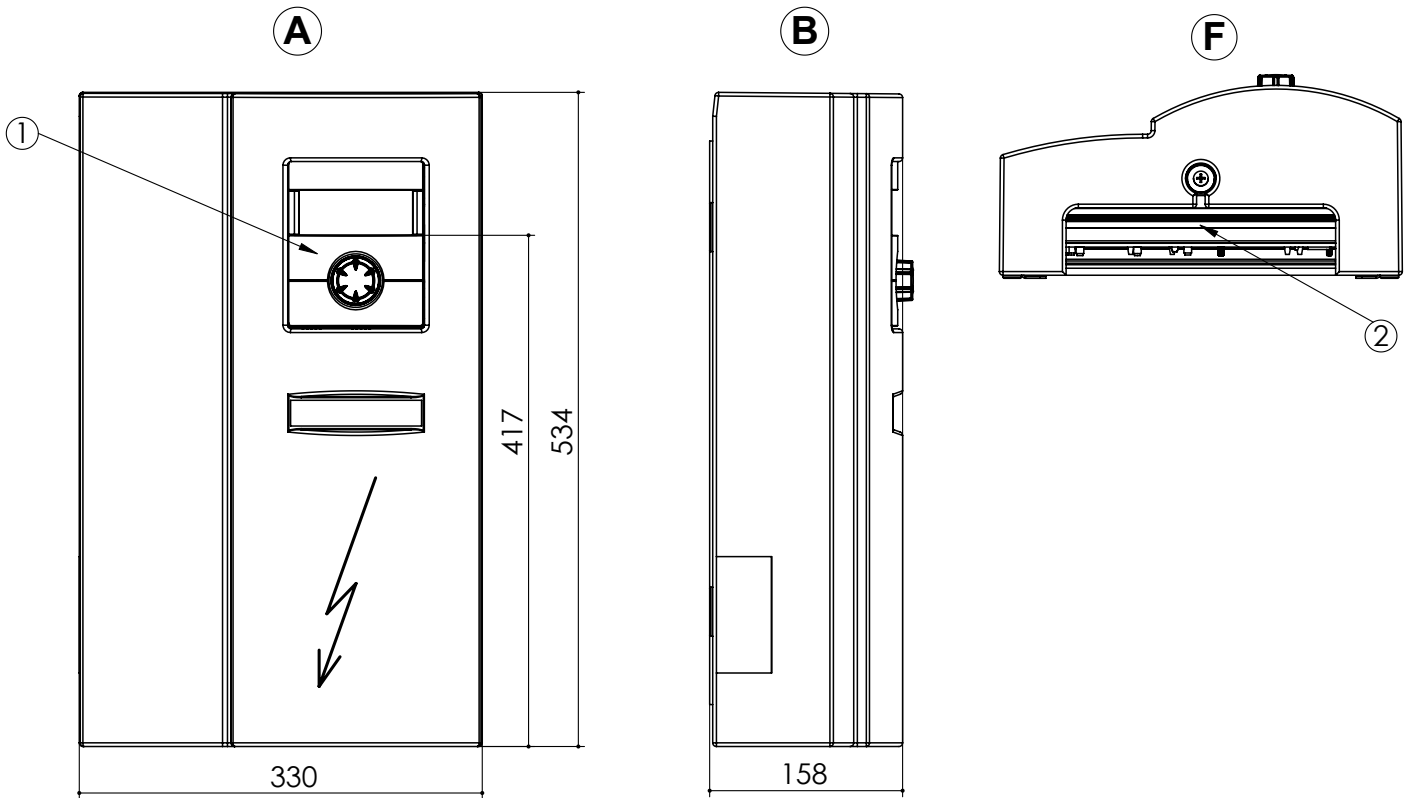
11.2.1 Removal of the buffer battery

1. Use a screwdriver to push out the buffer battery on the processor board of the control panel.
2. Dispose of the buffer battery (type: CR2032, lithium) in accordance with local regulations.



Dimensioned drawings

WR 2.1-16kW



Key: UK819482-
All dimensions in mm.

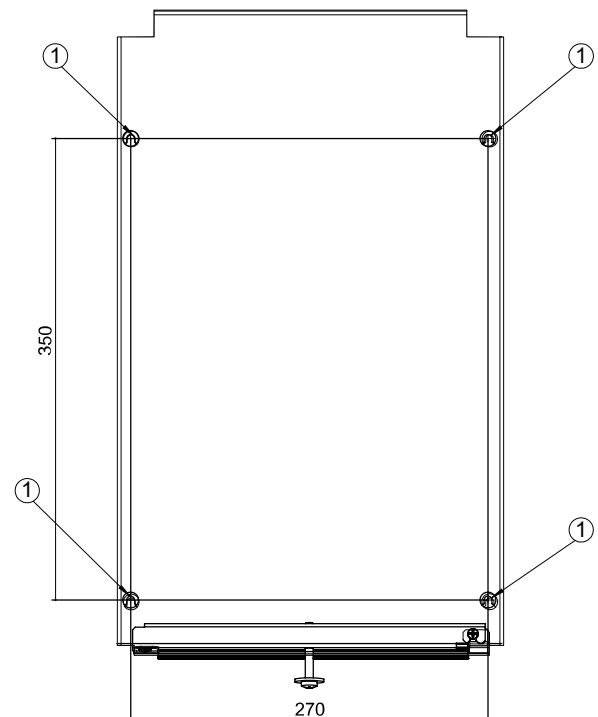
Pos.	Name
A	Front view
B	Side view from left
F	View from below

Pos.	Name
1	Control panel
2	Feed-through for electric/sensor cables

Drill pattern

Key: UK819494
All dimensions in mm. Spacing for drill pattern.

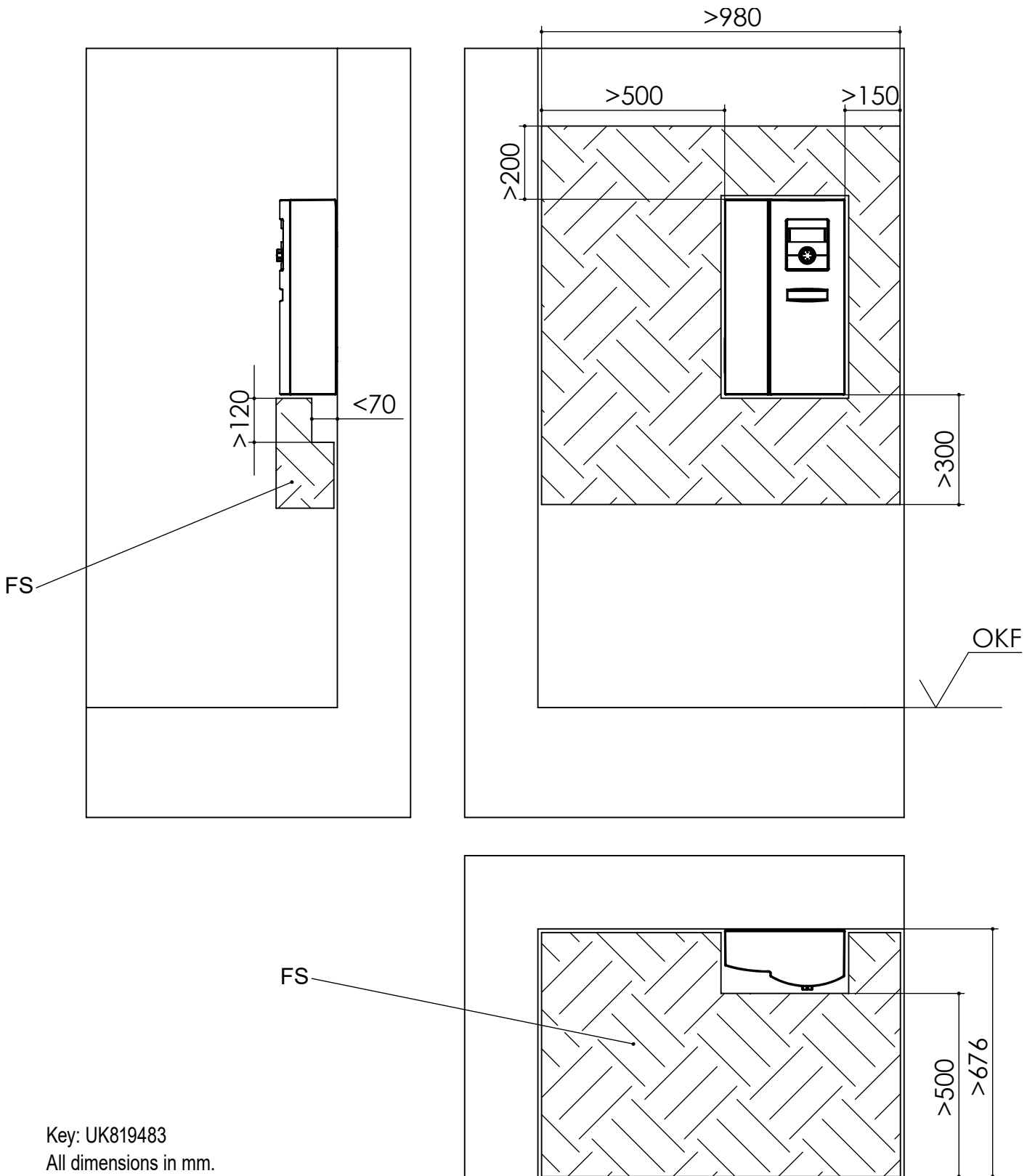
Pos.	Name
1	Hole Ø6, for wall/floor plugs (accompanying package)





WR 2.1-16kW

Installation plan

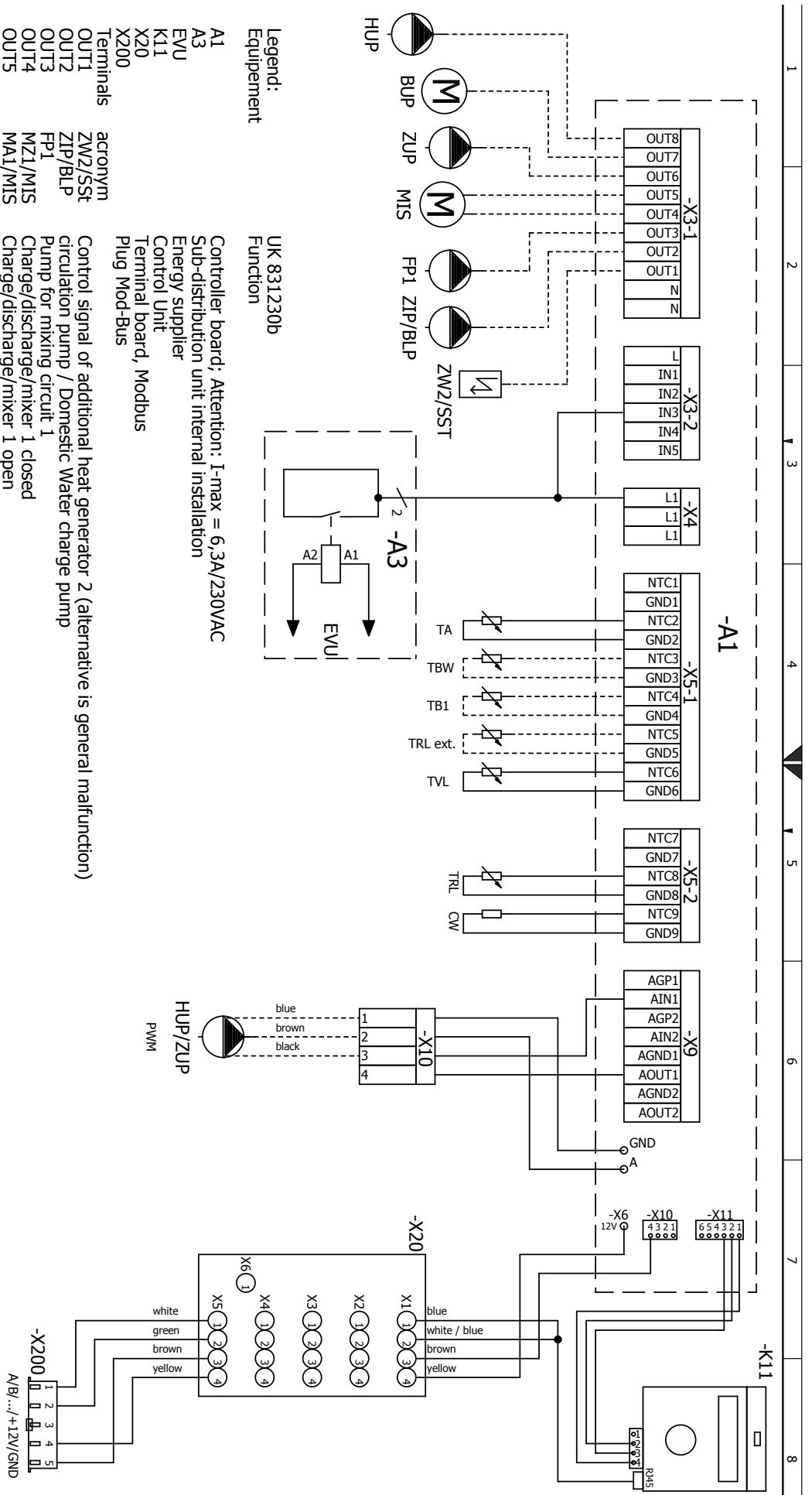


Key: UK819483
 All dimensions in mm.

Pos.	Name
FS	Free space for service purposes
OKF	Top edge of the finished floor



Terminal diagram



Legend:
Equipment

- A1
- A3
- EVU
- K11
- X20
- X200
- Terminals
- OUT1
- OUT2
- OUT3
- OUT4
- OUT5
- OUT6
- OUT7
- OUT8
- IN3
- IN4
- NTC2
- NTC3
- NTC4
- NTC5
- NTC6
- NTC8
- NTC9

UK 831230b
Function

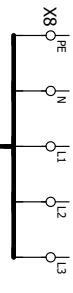
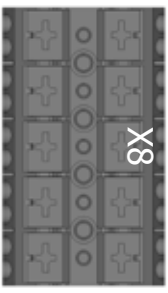
- acronym
 - ZW2/SSf
 - ZIP/BLP
 - FPI
 - MZ1/MIS
 - MA1/MIS
 - ZUP
 - BUP
 - HUP
 - EVU1
 - EVU2
 - TA
 - TBW
 - TB1
 - TRL ext.
 - TVL
 - TRL
 - CW
- Control signal of additional heat generator 2 (alternative is general malfunction)
 circulation pump / Domestic Water charge pump
 Pump for mixing circuit 1
 Charge/discharge/mixer 1 closed
 Charge/discharge/mixer 1 open
 Auxiliary circulation pump
 Diverting valve for domestic hot water
 Heating circuit circulating pump
 Energy supplier contact; closed on release; bridge if no blocking interval
 Energy supplier contact; closed on release; bridge if no blocking interval
 External sensor
 Accessories: Process water sensor/thermostat
 Sensor mixing circuit 1
 External return sensor
 Flow sensor
 Return sensor
 Encoding resistor



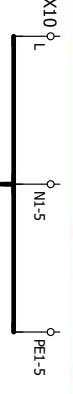
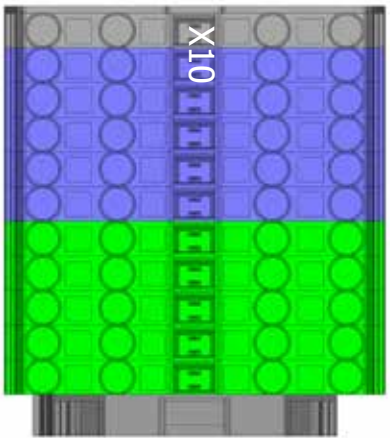
WR 2.1-16kW Terminal diagram mains connection heat pump 3~400V

0 1 2 3 4 5 6 7 8 9

1x400V 50Hz / N / PE
Power supply compressor



1x230V 50Hz / N / PE
Power supply control



Sub-distribution unit internal installation
Please refer to the technical data for fuse protection!
UK
831226

Equipment	Description
FKU1	Circuit breaker compressor
FKU2	Circuit breaker control
X8	Terminal for compressor
X10	Terminal for control

Refer to protection notice ISO 16016.





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The logo for ait Heat Pumps is located in the top right corner. It features the lowercase letters 'ait' in a white, sans-serif font on a dark blue square background. A small blue square is positioned above the 'i'. Below the 'ait' text, the words 'HEAT PUMPS' are written in a smaller, white, uppercase, sans-serif font.

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