QUANTUM TRAINING

Renewable Demonstration Unit

Air Source Heat Pump

Operation & Maintenance Manual

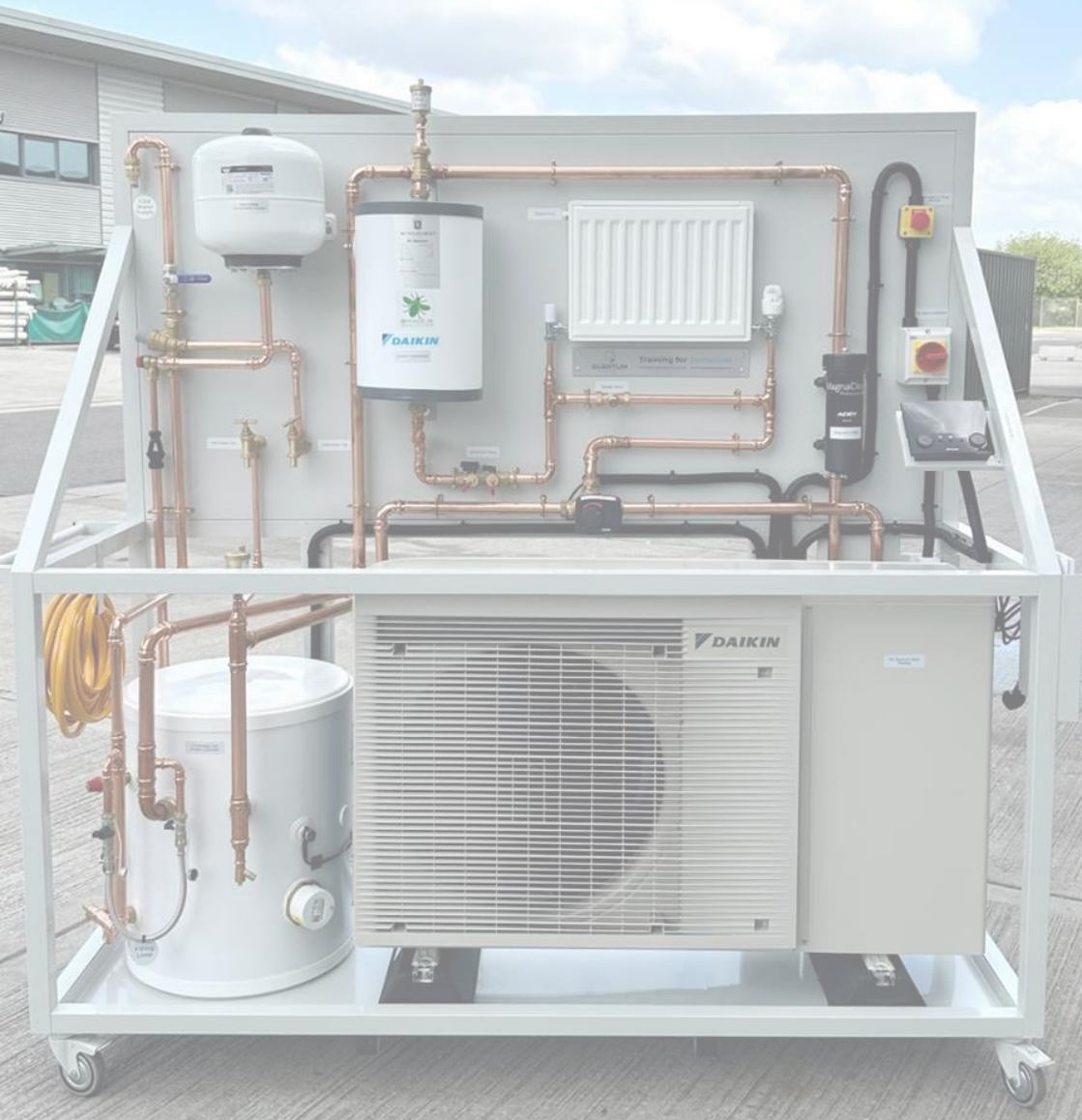

Table of Contents

To be used only by a competent person.

Please note there are two options to fill the system:

1. Using the filling loop
2. Using the external heat pump unit

You will find instructions for both depending upon teaching both options.

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General Health & Safety Advice

Please carry out the following to ensure safe methods of work during the use of this demonstration unit.

1. Ensure that the demonstration unit is connected by a competent person to ensure electrical safety.

2. Inform your electrical tester about this rig, so that it can be included in the portable appliance testing as appropriate.

3. Inform your manual handling advisor, so that any persons handling the rig can be trained and a risk assessment can be carried out.

4. Inform your legionnaires disease risk assessor about this portable demonstration unit, so that it can be included in the risk assessment.

5. Clear up immediately, any spillages of water to reduce the risk of slipping.

Initial Filling & Preparation

Part 1: Electrical Connection

1. Carry out a visual inspection of the electrical installation.

2. Connect the unit to a suitable electrical supply. This unit has been adjusted to operate on a standard ring main circuit and is protected by a 13-amp fuse.

3. Reset emergency stop button by turning in the direction of the arrows, clockwise so that the red button protrudes.

4. Select the on position on the AC rotary isolator.

Part 2: Filling Hot Water System Pipework

1. Ensure that all the taps and drain valves are closed.

2. Attach the flexible hose from the water fill point to a clean water source.

3. Open lever valve and allow pressure to stabilize.

4. Open hot and cold taps and allow water to flow until air is removed from the system.

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Part 3: Filling Central Heating Using Filling Loop

1. Ensure that all the drain valves are closed.

2. Attach the linking hose between the filling loop valves.

3. Open the two lever valves on the filling loop which will allow the water into the system.

4. Pull the control knob on the motorised diverter valve towards you to the '*out position*'. The motorised diverter valve will now be in the manual operating mode when the red underside is exposed. As system filling is carried out, alternate the orientation of the control knob to ensure air is expelled from the entire system.

Valve Out

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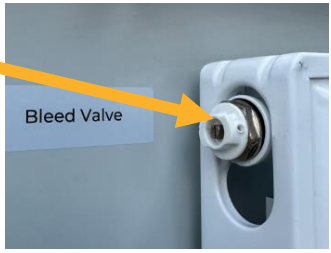
5 Slowly fill the system until it says '1 bar' on the system controller home screen.

(This demo unit has MMI – follow MMI Instructions to monitor pressure readings)

6 Manually open the bleed valve on the radiator (using radiator bleed key) until water appears, then close it.

NB: You can use a cloth/towel to capture any water.



7 Manually open the bleed valve on the magnetic filter until water appears (using radiator bleed key) - you may also hear a hissing noise, then close it.

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8 Ensure that the auto air vent is open, and air is expelled as the system fills. You will hear a hissing noise. When this noise ceases, the system is filled.

9 Push the control knob back in on the motorized diverter valve so red is no longer exposed. This returns the valve to its automatic function.

10 To use the MMI Interface please see the relevant instructions on page 11.

Part 4: Filling Central Heating System Pipework using External Pump Unit

1. Ensure that all drain valves are closed.

2. Pull the control knob on the motorised diverter valve towards you to the *'out position'*. The motorised diverter valve will now be in the manual operating mode when the red underside is exposed.

Valve Out

3. Fill the Rothenberger Pump Unit in accordance with manufacturer's instructions.

4. Attach pump unit hoses to fill & flush valve as shown. Ensure the lever valves on the fill & flush are in the correct orientation for the bypass function.

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5 Operate the Pump Unit in accordance with manufacturer's instructions.

6 Manually open the bleed valve on the radiator (using radiator bleed key) until water appears, then close it.

NB: You can use a cloth/towel to capture any water.

7 Manually open the bleed valve on the magnetic filter until water appears (using radiator bleed key) - you may also hear a hissing noise; then manually close it back in place

8 Ensure that the automatic air vent (AAV) on the volumizer is open and air is expelled as the system fills.

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9 As the system fills, alternate the orientation of the motorised diverter valve to ensure that water enters both the hot water and heating circuit.

10 Reposition the lever handles on the Fill & Flush Valve to isolate hoses. Open bypass lever as shown and disconnect pump unit hoses.

11 Push the control knob back in on the motorized diverter valve so red is no longer exposed. This returns the valve to its automatic function.

12 To use the MMI Interface please see the relevant instructions on page 11.

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Relevant Daikin MMI Instructions

Figure 1: Daikin Man-Machine Interface (MMI). Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

Key	Function	Description
1	Left Dial	Turn it to navigate through the menu structure and press to confirm your choice
2	Back	Press to go 1 step back
3	Home	Press to go back to the home screen
4	Help	Press to show additional information related to the current page. Enables Bread Crumb
5	Right Dial	Turn it to change a value or setting and press to confirm your choice

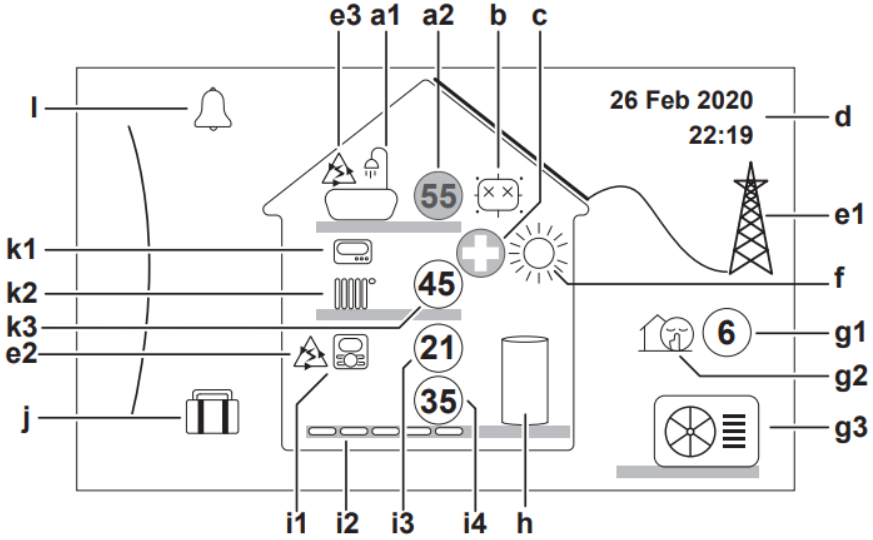

Figure 2 2: Daikin MMI Interface Possible Screens Key. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

a1	Domestic Hot Water
a2	Measured tank Temperature
b	Disinfection Modes (should be disabled)
c	Emergency
d	Current date & time
e1	Smart energy available via solar panels or smart grid)
e2	Smart energy being used for space heating
e3	Smart energy is being used for domestic hot water
f	Space operation mode
g1	Outdoor/ quiet mode: Measured outdoor temperature
g2	Quiet mode active
g3	Outdoor unit
h	Domestic hot water tank: Standalone tank installed
i1	Installed room Thermostat type
i2	Installed heat emitter type
i3	Measured room temperature
i4	Leaving water temperature setpoint
j	Holiday mode active

1 All of the unit's internal sensors will run when the unit is turned on.

Power should not be turned off as it will also be communicating with the outdoor unit during this time.

Figure 3: Daikin MMI Interface Synchronisation Screen. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

2 On the air purge section, you will see 2 modes for purging.

[Please note that before starting the air purge, we need to ensure that all AAV's are open plus any on the Back Up Heater if applicable.]

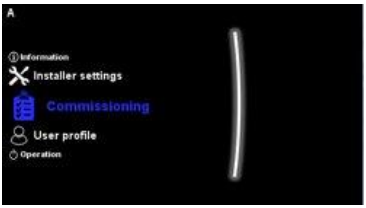

Figure 4: Daikin MMI Interface Air Purge Instructions. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide (1)

1) Manual option:
You can set the pump speed to low or high & set the circuit (the position of the motorized diverter valve) to Space or Tank. You must perform air purge for both space heating & tank (domestic hot water) circuits.

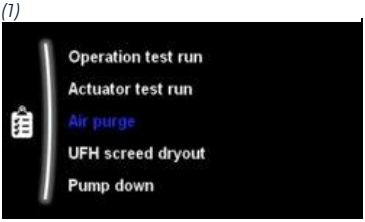

Figure 5: Daikin MMI Interface Air Purge Instructions. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide (2)

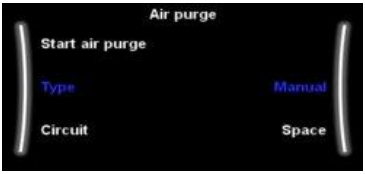

Figure 6: Daikin MMI Interface Air Purge Instructions. Image taken from

Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide (3)

2) Automatic option:

The unit automatically changes the pump speed & switches the position of the motorized diverter valve between the space heating & the domestic hot water circuit.

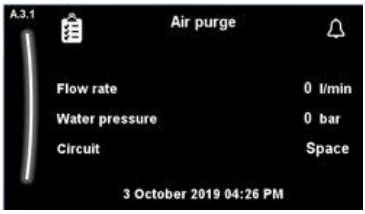

Figure 7: Daikin MMI Interface Air Purge Instructions. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide (4)

3

To set the valve:

1) Fully open the bypass valve.
2) To run the pump at 100%, activate the Air Purge mode in high speed via the controller.
3) Turn off any emitter or zone that can turn off **automatically**.

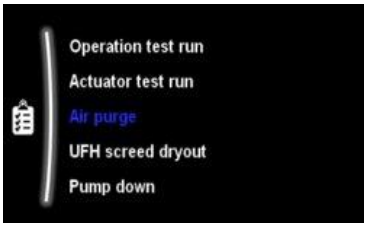

Figure 8: Daikin MMI Interface Air Purge Flow Rate Check Instructions. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

4) Turn down the bypass valve slowly until it is set just above your minimum flow rate (approx. 1-2ltrs/min above to allow for debris etc that may collect in the strainers, so this

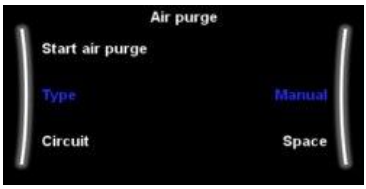

Figure 9: Daikin MMI Interface Air Purge Flow Rate Check Instructions. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

does not create flow errors).

4 Operating modes:

Once you have entered all the settings you can set the unit to work.

In this section you can active/deactivate different operation modes that the unit is set up to complete.

Press the left dial & scroll to the “Operation” option and press the left dial again to enter the menu.

Use the Left dial to highlight the mode of operation you wish to activate and use the right dial to change the status from “off” to “on”.

Figure 10: Daikin MMI Interface Operation Modes. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

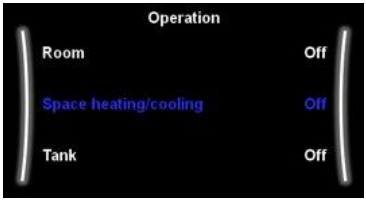

Figure 11: Daikin MMI Interface Operation Modes. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

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For information, you can also access other options by entering the main menu (press the left dial). Depending on user profile, you can access options like:

- Room
- Main Zone
- Additional Zone
- Space Heating/Cooling
- Tank
- Instant Hot Water
- User Settings
- Information
- Installer Settings
- Commissioning
- User profile
- Operation
- Wireless Gateway
- Malfunctioning

Figure 12: Daikin MMI Interface Main Menu Structure. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

6

For this Demonstration Unit, the Main “Room” operates on a Leaving Water temperature of 45 Degrees Celsius. As an option, the space heating temperature could be controlled by

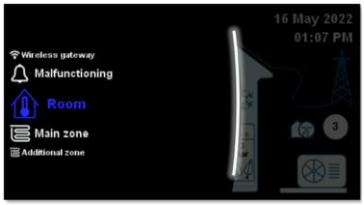


Figure 13: Daikin MMI Interface Room Settings. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

Madoka or an RT External Thermostat in a residential installation.

Figure 14: Daikin MMI Interface Room Settings. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

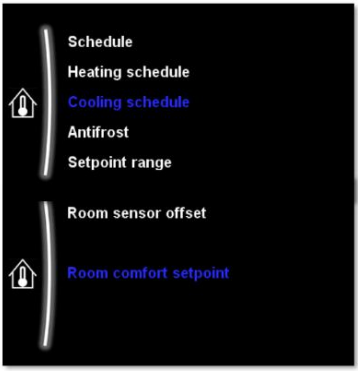


Figure 15: Daikin MMI Interface Room Settings. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

7

When you go to 'Tank' in the MMI settings, the tank menu contains all the settings you need to configure your DHW set up.

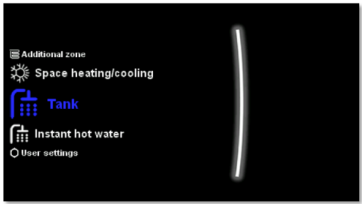


Figure 16: Daikin MMI Interface Tank Settings. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

Please note that this menu will be unavailable to the installer/end user

if the MMI has not been configured to include a DHW cylinder.

Figure 17: Daikin MMI Interface Tank Settings. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

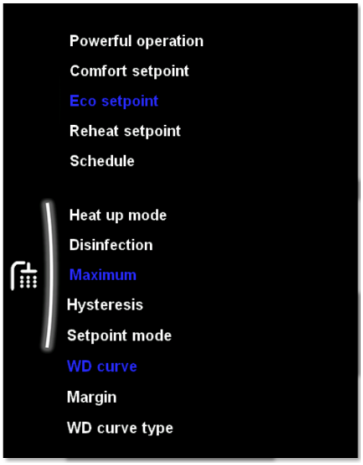


Figure 18: Daikin MMI Interface Tank Settings. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

8 Following the configuration wizard the unit will synchronise to upload the setting input.

Figure 19: Daikin MMI Interface Synchronisation Screen. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide

9 For different user profiles, you can change the access profile for the unit by entering the appropriate access code in the User Profile page.

Use the left-hand dial to enter into the page and then use the right-hand dial to alter the highlighter number and confirm selection.

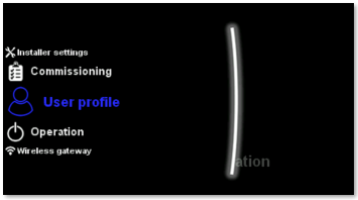


Figure 20: Daikin MMI Interface User Profiles. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide (1)

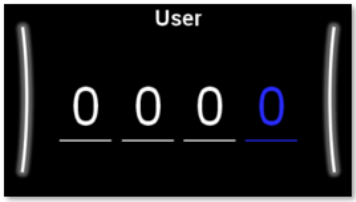


Figure 21: Daikin MMI Interface User Profiles. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide (2)

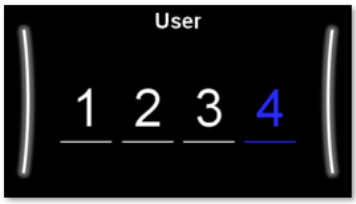


Figure 22: Daikin MMI Interface User Profiles. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide (3)

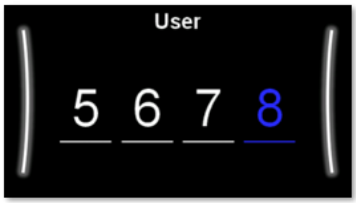


Figure 23: Daikin MMI Interface User Profiles. Image taken from Daikin Altherma 3 Monobloc User Interface Basics and Start-Up Guide (4)

The images and instruction information that are included above have been retrieved from Daikin Altherma 3 Monobloc User Interface Basics and Start – Up Guide.

The disinfection setting has been disabled as there is no heating element in the immersion heater. Please ensure that this is not enabled otherwise a disinfection fault error will occur.

Operations / Demonstration

The system is now ready for operation. This is achieved by activating the MMI Controller.

The MMI Controller is ready for operation; once you are in the main menu structure, use the left-hand dial to highlight the desired mode and press the button to select operation. Now refer to the separate MMI operation instructions, to set operational parameters and activate individual components.

The MMI will provide information data on temperature and operational status.

The ASHP will now initiate, and the fan will operate.

You will be able to observe the operation of the diverter valve and circulation of the water by the temperature rise in the pipework, radiator and cylinder.

Shut Down & Decommission

The system shut down is the reverse of the system start up.

1. Cancel the call for heat on the MMI controller (referring to MMI Instructions).
2. Allow ASHP to shut down and system to come to rest.
3. Disconnect Water Supply.
4. Disconnect Electricity supply.
5. Stow hoses and cables on hooks.
6. If unit is not to be used for an extended period (30 days or more) drain down using the drain points provided.

Routine Maintenance

This Demonstration unit will require very little routine maintenance.

We recommend three key activities:

1. The magnetic filter should be cleaned annually.

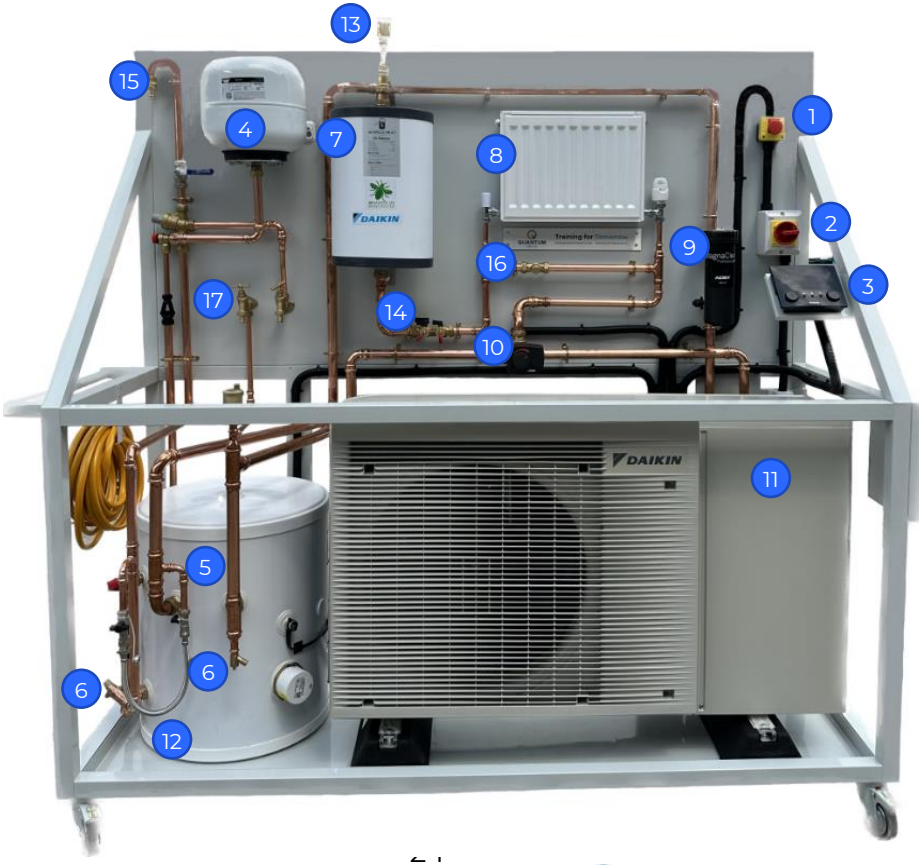
2. Although not recommended, if the system is left filled with water, then corrosion inhibitor should be added.

3. The filter in the ASHP should be cleaned in line with the manufacturer's instructions.

   These activities should only be carried out by competent engineers.

Equipment Key

1. Emergency Stop Button
2. AC Rotary Isolator
3. MMI System Controller
4. Hot Water Expansion Vessel
5. Unvented Hot Water Cylinder
6. Drain Valve
7. System Volumizer
8. Radiator
9. Magnetic Filter
10. Motorised Diverter Valve
11. Air Source Heat Pump
12. Filling Loop
13. Auto Air vent
14. Fill & Flush Valve
15. Cold Water Supply
16. Bypass Valve
17. Taps



QUANTUM TRAINING

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