
DAIKIN

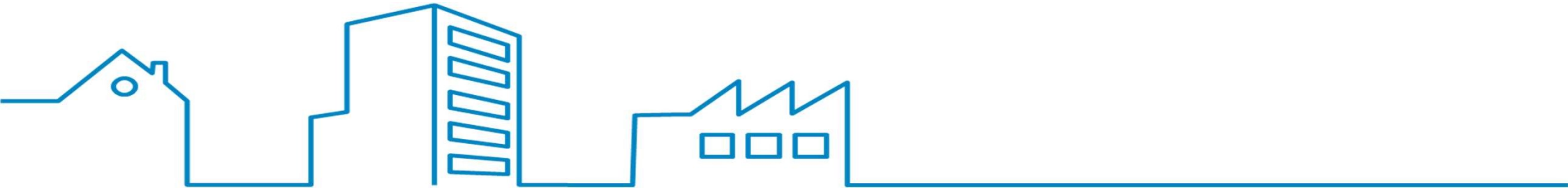
Session 2 Questions

1. Where does the Daikin controller connect to and on what terminals?
2. Where do the interconnecting cables from the OU connect to on the boiler unit?
3. What connection does the boiler module connect to on the boiler PCB?
4. Where do 3rd party thermostats connect to and what should they be?
5. What type of sensor is used for DHW and why should it not be cut, shortened or extended?
6. What size cable is recommended for the Daikin controller
7. Where does a secondary circulation pump connect to and on what terminals?
8. If a cylinder is fitted, what 2 safety devices should be installed to the system?
9. What voltage will be supplied to the black wire on the ESBE diverter valve when in CH mode?
10. Where does a bottom plate heater connect to and what terminal?

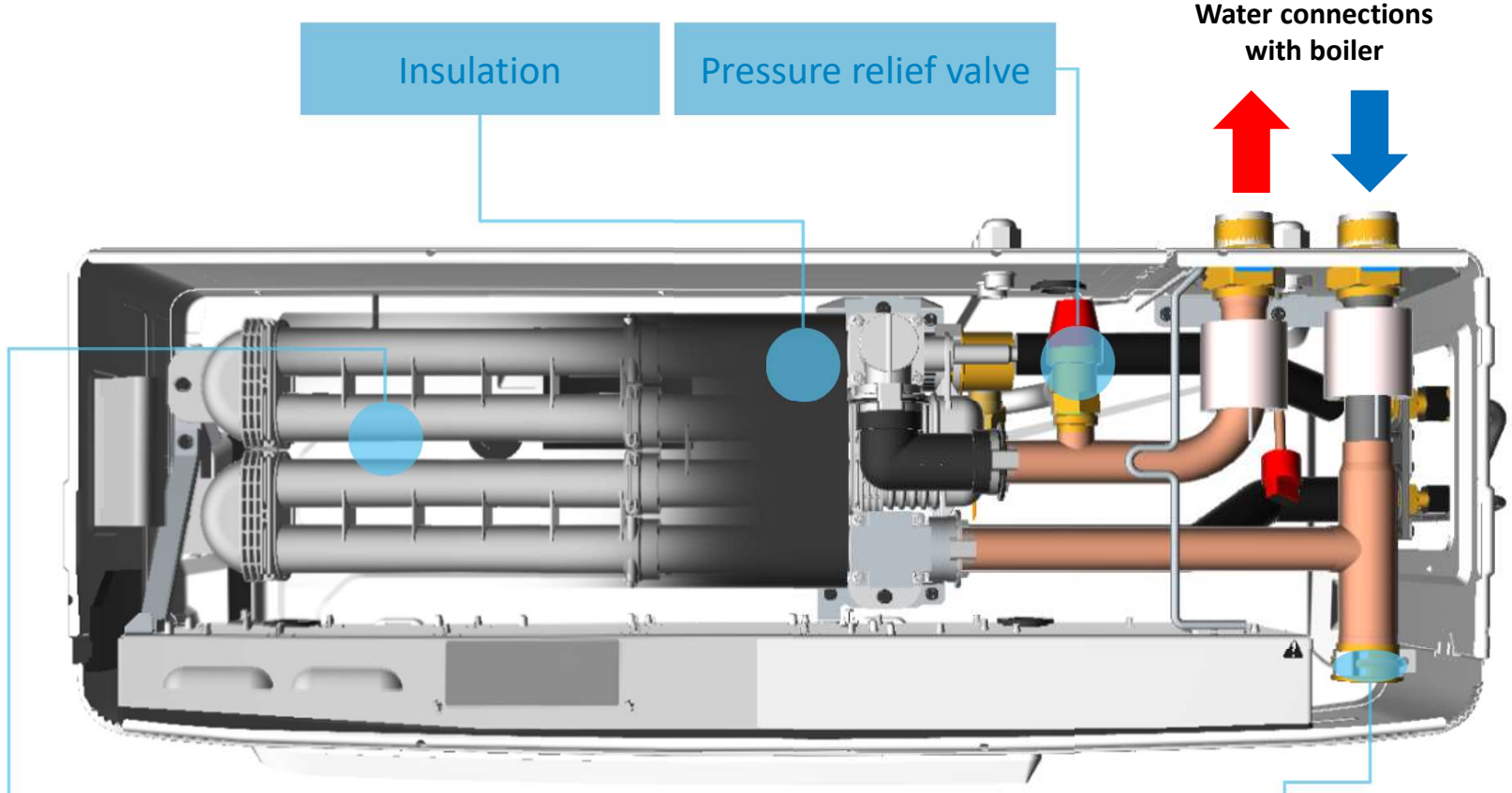
Section 3.1

Hydraulic Connections - OU

Daikin Altherma Hybrid Monobloc



1. Outdoor Unit



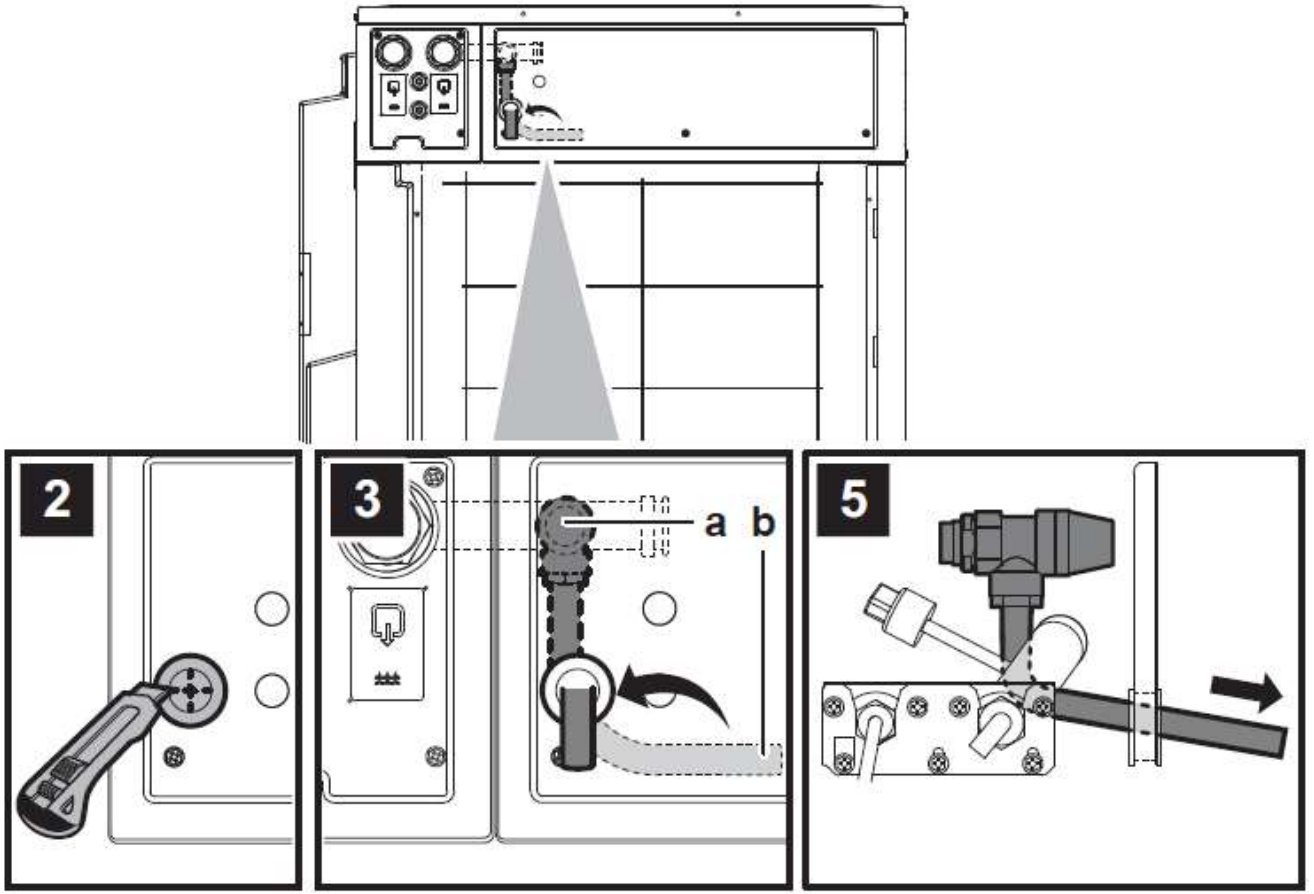
- **Placed on top** of the outdoor unit
- **Reduced dimensions** and **light** compared to normal plate heat exchanger

1. Outdoor Unit

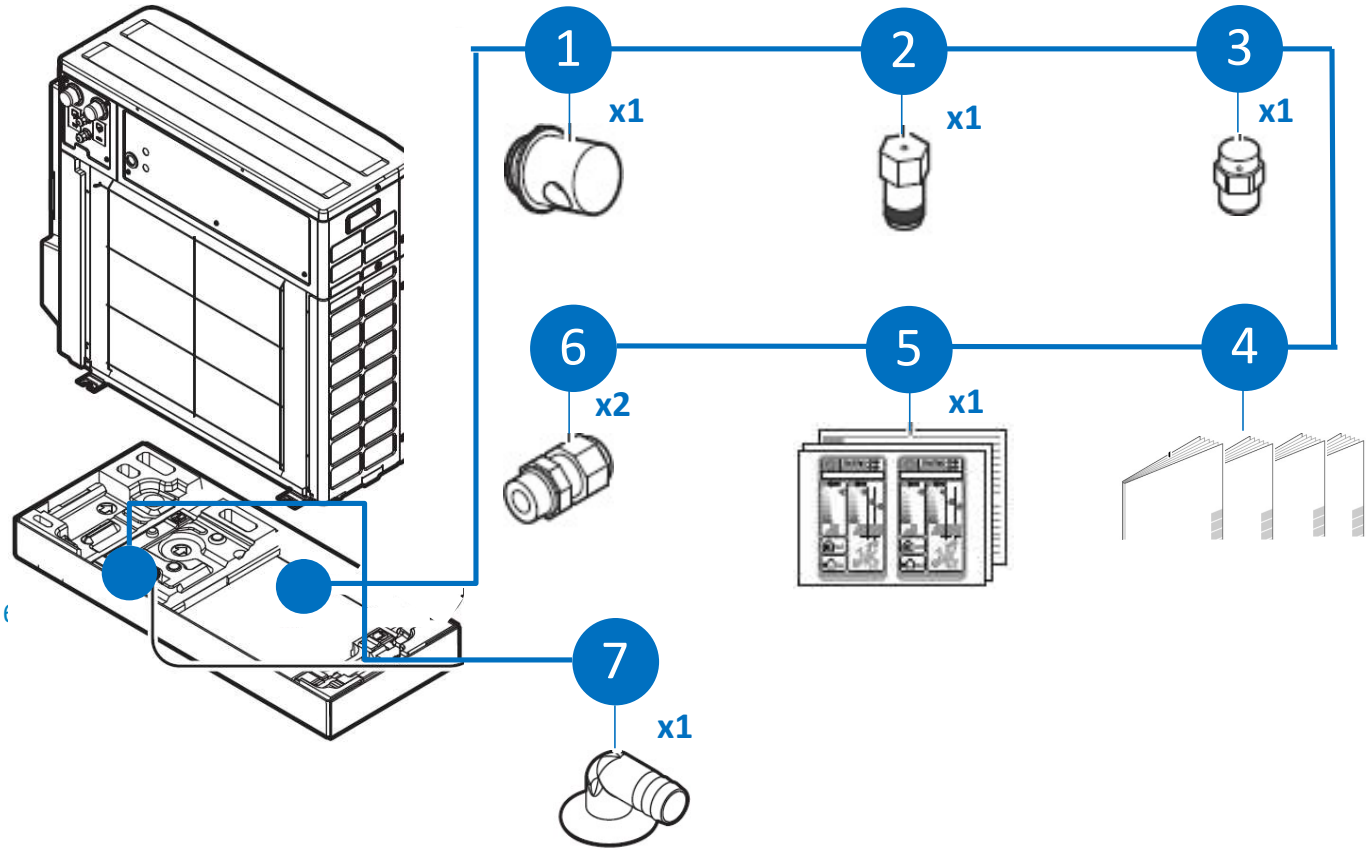
Provide drainage for the **pressure relief valve:**

If overpressure occurs, the system will release some of the liquid through the pressure relief valve (3 bar). In any case, make sure that **a flexible hose is connected to the pressure relief valve** and is ALWAYS free to release pressure.

Cut the rubber grommit on the rear of the unit and thread the PRV within the unit hose through the grommit so it terminates externally

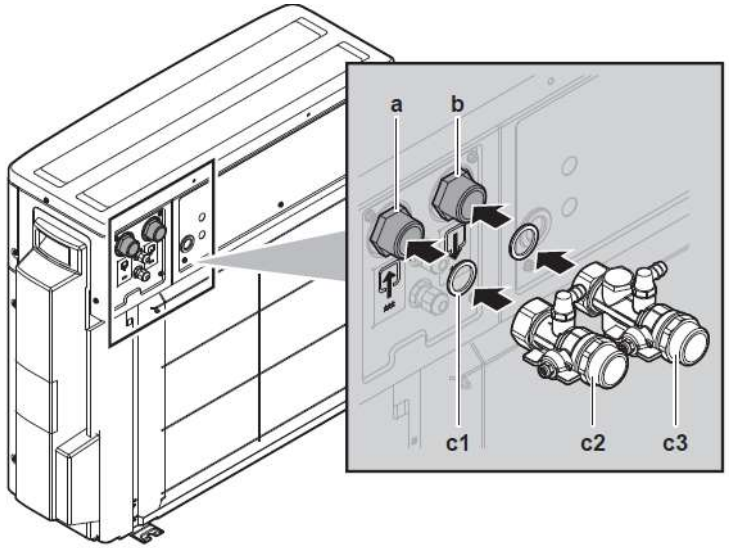


1. Outdoor Unit



1. Connection piece (with O-ring) for freeze protection valve inside the outdoor unit
2. Freeze protection valve (for inside the outdoor unit)
3. Vacuum breaker
4. General safety precautions, Addendum book for optional equipment, Outdoor unit installation manual, Operation manual
5. Energy label
6. Cable gland
7. Drain plug

4. Freeze protection: b3 + b4 shut-off valves [EKBALLV1]



a: Water inlet (G1") (coming from the heat emitters)
b: Water outlet (G1") (going to the gas boiler)
c1: O-rings
c2: Shut-off valve
c3: Shut-off valve with integrated connection for the vacuum breaker (if applicable)

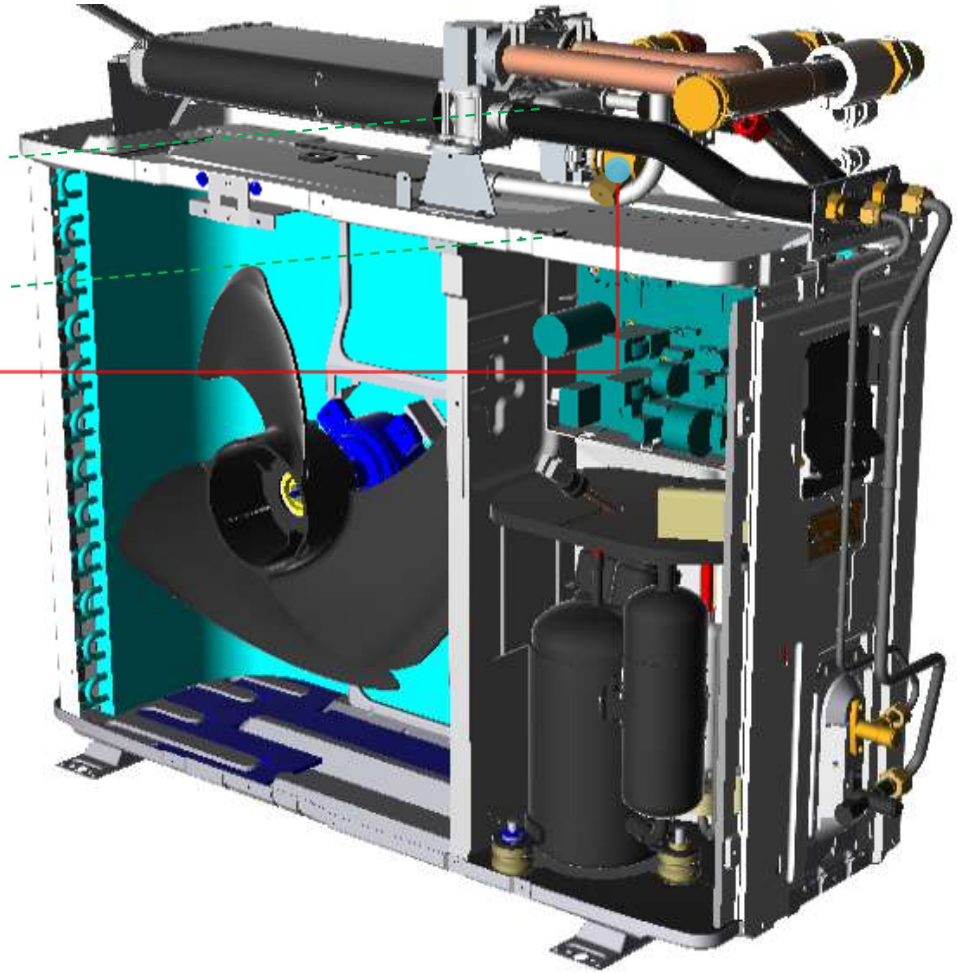
If using Glycol, the optional isolation valves can be fitted to the back of the unit.

If using the exogel valve instead of glycol, the vacuum break must be installed

1. Outdoor Unit

Exogel valve

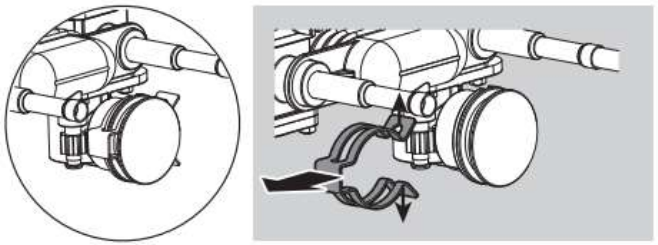
- The Exogel (Freeze protection) valve to drain the water from the outdoor unit before it can freeze can be fitted if you prefer not to use glycol within the system.
- The rear pane of the unit must be removed to fit the valve.
- The connection is sited to the rear of the unit at the bottom.



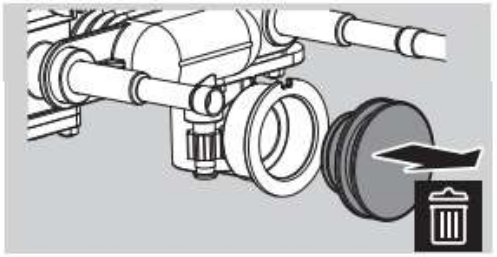
Water piping connections

Freeze protection: b1: Freeze protection valve (for water drainage)

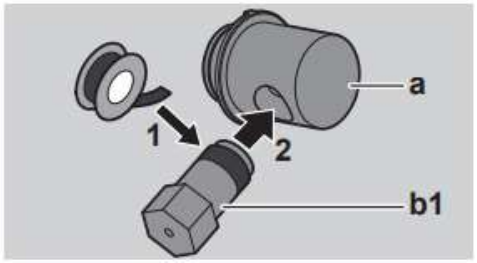
1. Remove the clip.



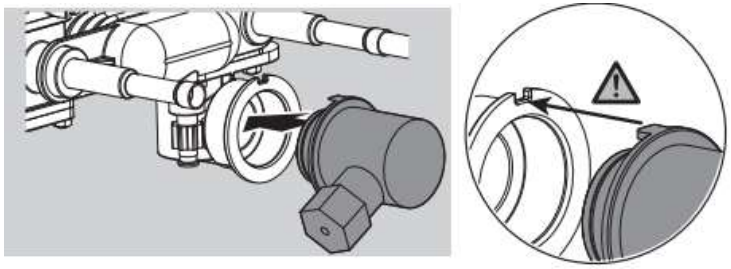
2. Remove and discard the stop with the o-ring seal.



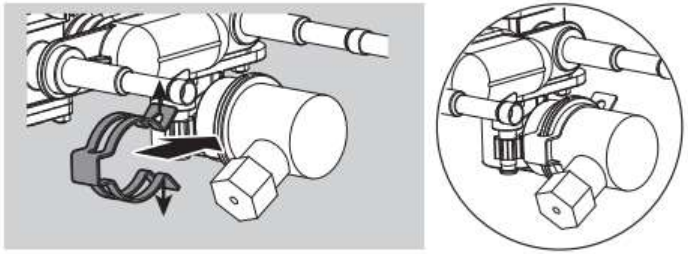
3. Attach the freeze protection valve (b1) to the connection piece (a), using thread sealant.



4. Attach the connection piece to the outdoor unit. ensuring the exogel valve outlet is pointing downwards



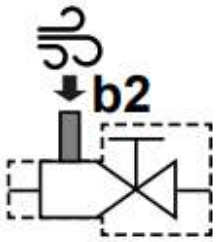
5. Attach the clip



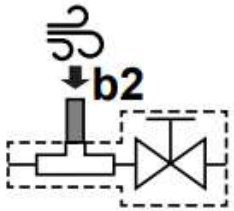
4. Freeze protection: b2: Vacuum breaker (head-up for air supply)

To make proper drainage through the freeze protection valve inside the outdoor unit possible, the vacuuum breaker must be installed correctly:

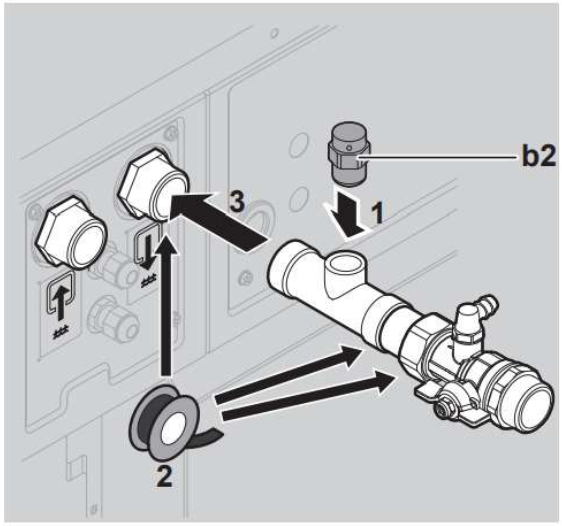
- Directly at the water outlet of the unit, without any field piping or valve in between.
- Head-up for air supply.



Possibility 1: With option EKBALLV1 (shut-off valves with integrated connection for the vacuum breaker).

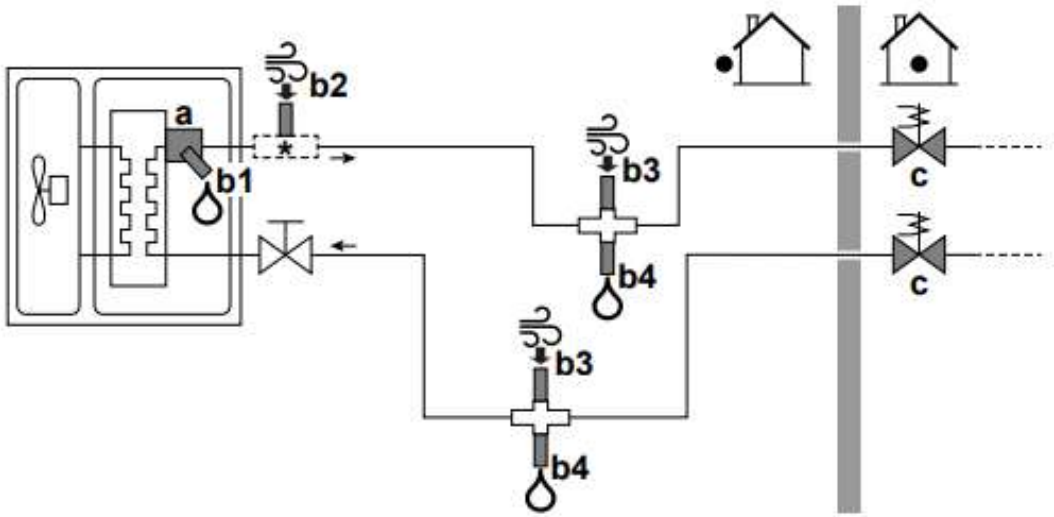


Possibility 2: With T-joint (field supply) + shut-off valve (field supply).



4. Freeze protection

When no glycol is added to the water, you can use freeze protection valves to drain the water from the system before it can freeze. To do so, install the following parts:



a+b1+b2: Protection for the outdoor unit; Mandatory – Delivered as accessory.

- **a:** Connection piece for b1
- **b1:** Freeze protection valve (for water drainage)
- **b2:** Vacuum breaker (head-up for air supply)

These parts are necessary to protect the piping inside the outdoor unit against freezing.

Note: These parts do NOT protect the field piping against freezing.

b3+b4: Protection for the field piping (Optional – Field supply).

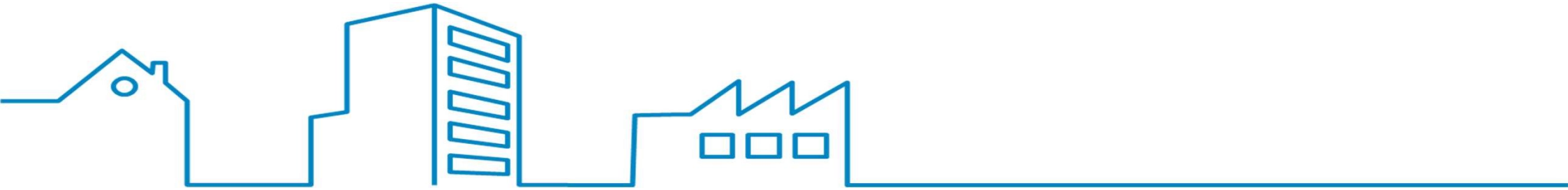
- **b3:** freeze protection valve (head-up for air supply)
- **b4:** Freeze protection valve (head-down for water drainage)

c: Isolation of water inside the house when there is a power interruption.

Section 3.1

External Pipe runs and Insulation

Daikin Altherma Hybrid Monobloc



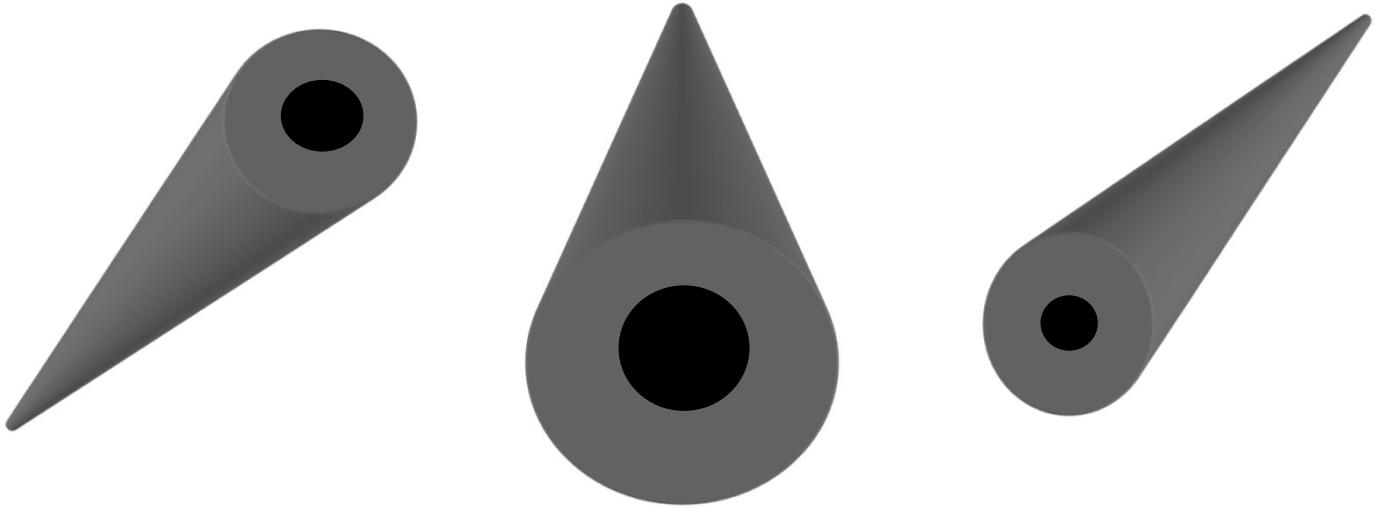
Water Pipework Insulation

Both the flow and return pipework must be insulated externally along their full length using minimum 13mm wall Insulation, recommended 20mm. Take extra care lagging the flare nuts on the fan coils using the kits provided or condensation will occur causing water leaks.

Recommended that all **hot** and **cold** water pipes to be insulated throughout installation, please comply to building regulations

Please note, Class O insulation is not UV stable and should be covered to stop degredation.

If pipes are run underground, the pipework must be fully insulated and in a protective sleeve. The sleeve must be sealed to stop water ingress as this will reduce efficiency



Pipework Insulation

Outdoor water piping insulation

NOTICE

Outside piping. Make sure the outside piping is insulated as instructed to protect against hazards.

For piping in free air, it is recommended to use the insulation thickness as shown in below table as a minimum (with λ=0.039 W/mK).

Piping length (m)	Minimum insulation thickness (mm)
<20	19
20~30	32
30~40	40
40~50	50

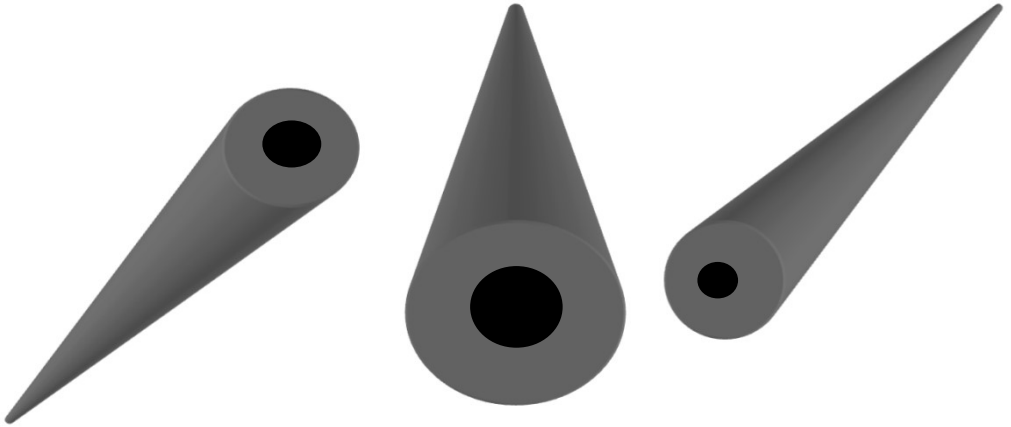
For other cases the minimum insulation thickness can be determined using the Hydronic Piping Calculation tool.

The Hydronic Piping Calculation tool also calculates the maximum hydronic piping length from the indoor unit to the outdoor unit based on the emitter pressure drop or the other way around.

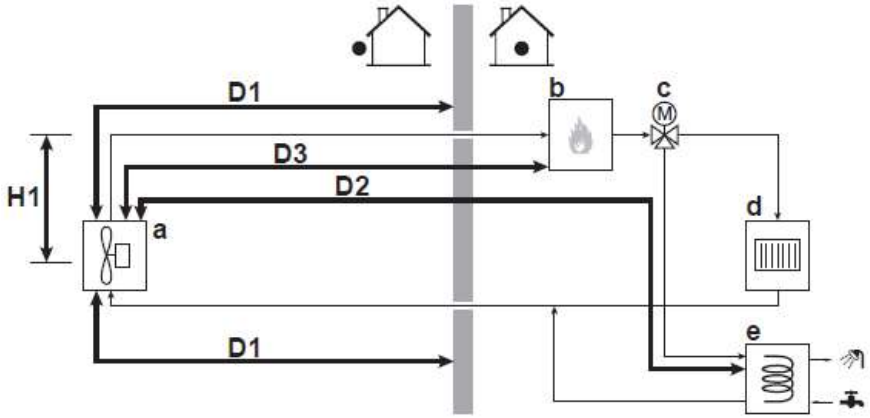
The Hydronic Piping Calculation tool is part of the Heating Solutions Navigator which can be reached via https://professional.standbyme.daikin.eu.

Please contact your dealer if you have no access to Heating Solutions Navigator.

This recommendation ensures good operation of the unit, however, local regulations may differ and shall be followed.



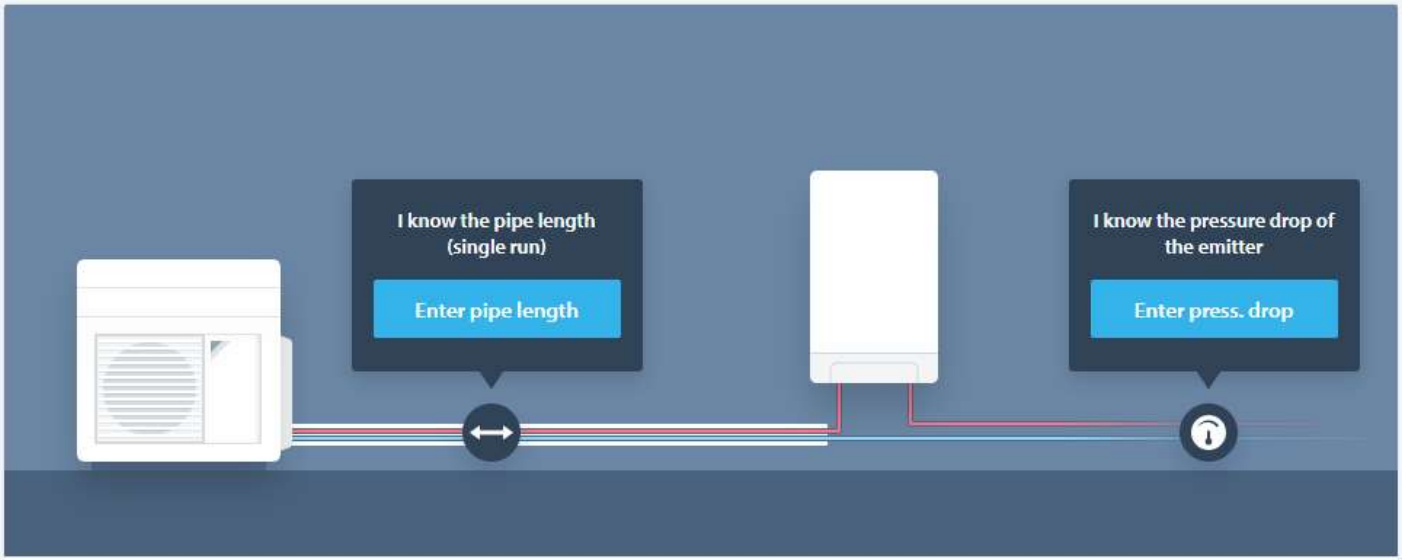
In case of EHY2KOMB28+32AA gas boiler



a. Outdoor unit
b. EHY2KOMB28+32AA gas boiler
c. 3-way valve
d. Space heating circuit
e. DHW tank (if applicable)

What		Distance
H1	Maximum height difference between outdoor unit and EHY2KOMB28+32AA gas boiler	Depends on the expansion vessel (option on EHY2KOMB28+32AA gas boiler)
-	Maximum total length of the water piping (indoor part + outdoor part)	Depends on the external static pressure (ESP) of the system
D1	Maximum length of the outdoor part of the water piping (to prevent freeze-up of the water piping)	30 m (but restricted by **D2** when a DHW tank is installed)
D2	Maximum distance between outdoor unit and DHW tank (if applicable)	10 m
D3	Maximum distance between outdoor unit and EHY2KOMB28+32AA gas boiler	See next slide

Pipe sizing calculation tool



I know the pipe length

When the pipe length from the indoor unit to the outdoor unit is known, you can calculate the available emitter pressure drop.

I know the pressure drop of the emitter

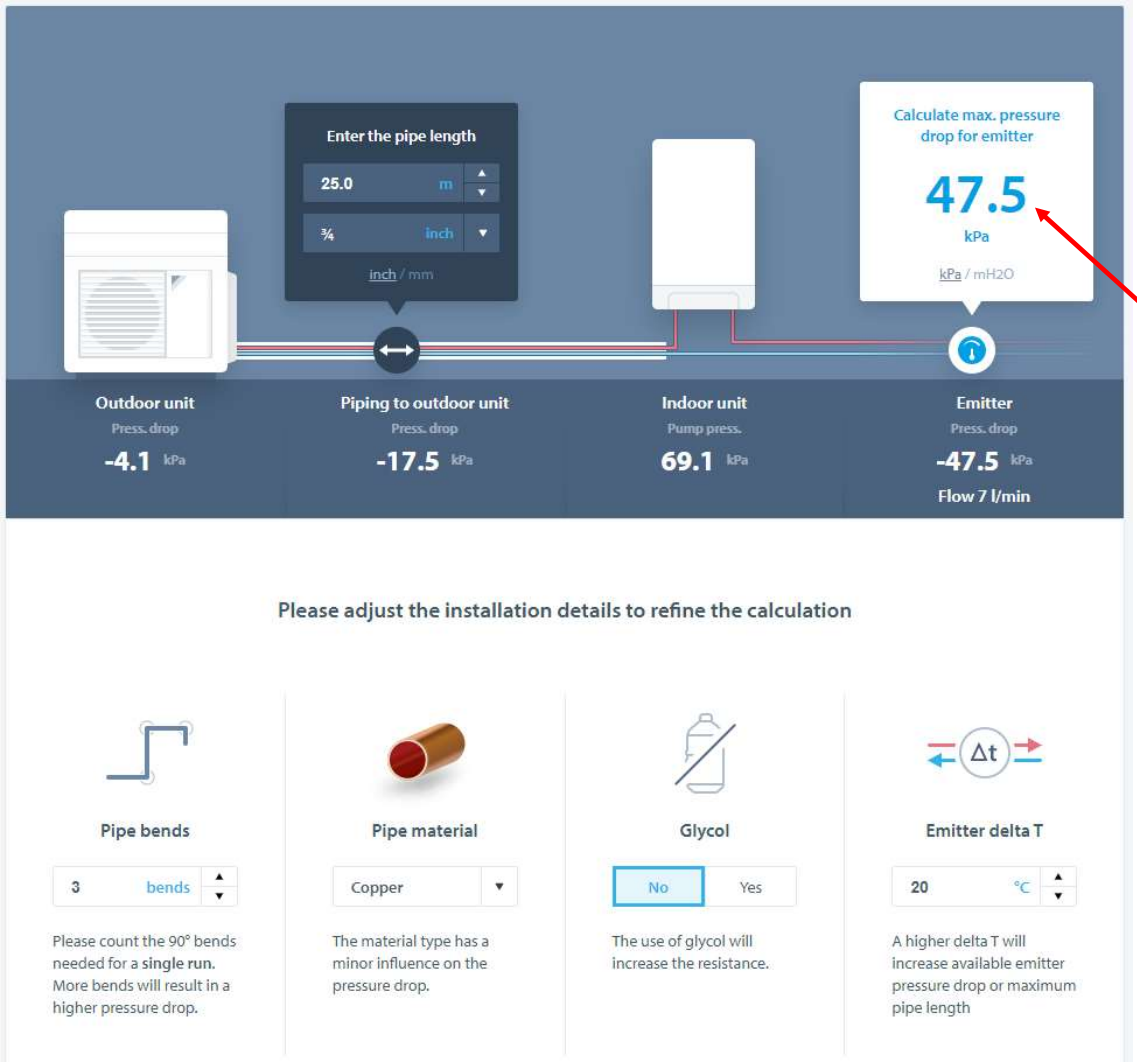
When the required pressure for the emitter is known, you can calculate the maximum pipe length from the indoor unit to the outdoor unit.

Once a unit has been chose on HSN you should use the pipe sizing tool to determine the distance from the OU to the boiler unit.

You can choose the distance from the OU to the boiler and the tool will work out the allowable pressure drop on the system

Alternatively if you know the pressure drop on the system, it will tell you the maximum distances for the OU to the hydrobox

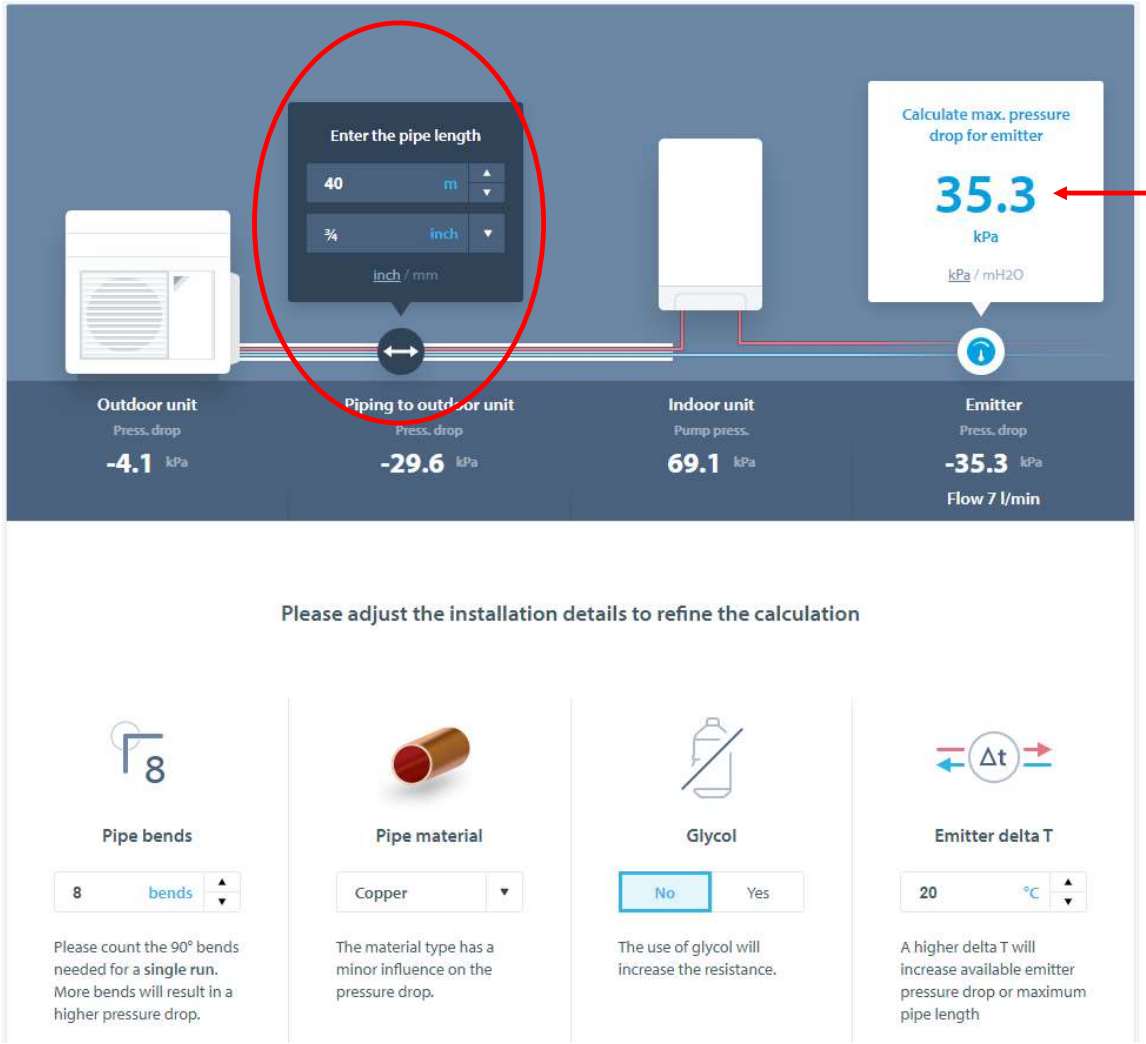
Pipe sizing calculation tool



You can choose the length of run from the OU and the pipe sizing, no. of bends, pipe material, whether the system contains glycol and the delta t of the emmiters.

This will all have an effect on the maximum pipe runs as shown by the allowable system kPa

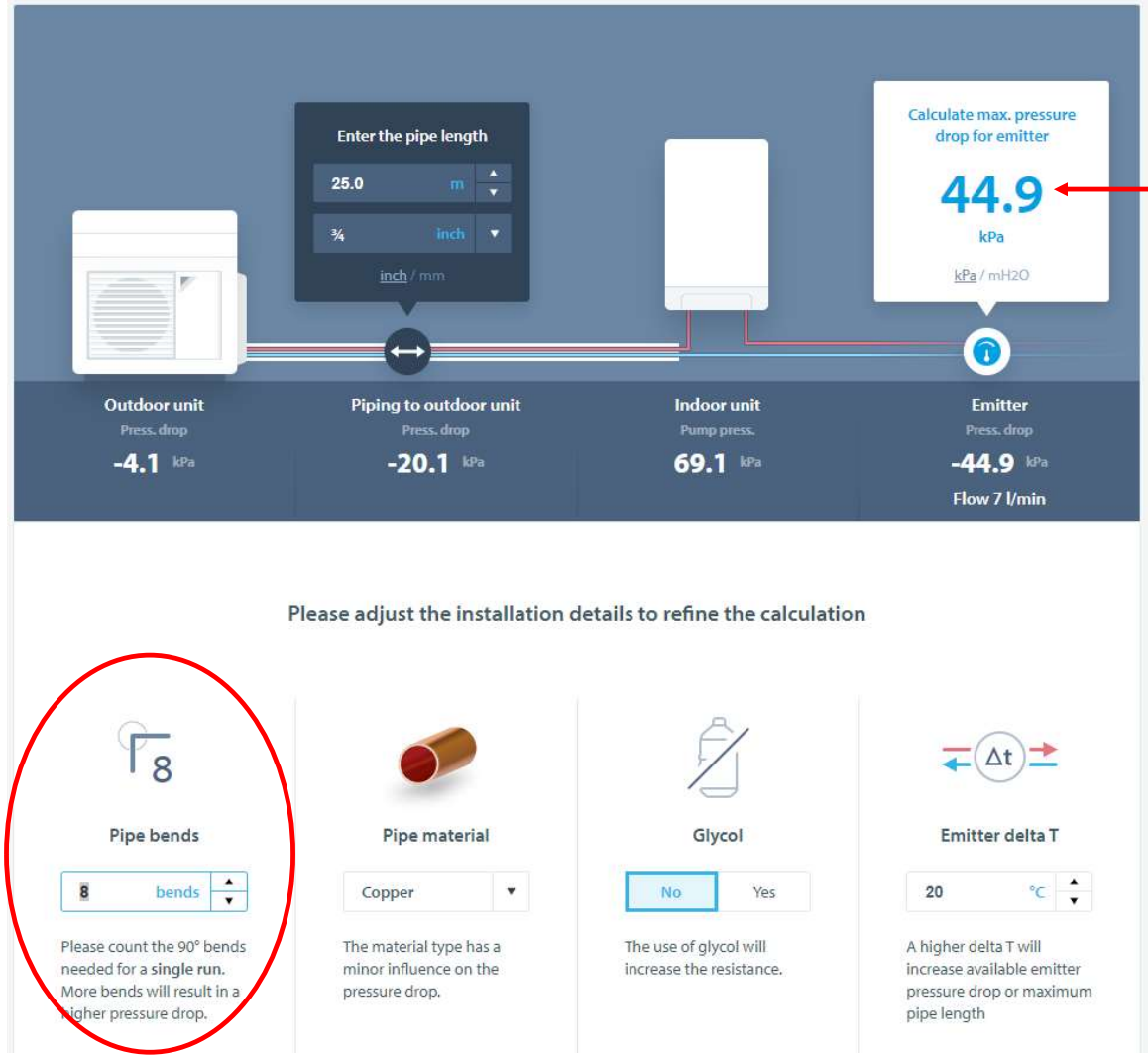
Pipe sizing calculation tool



Increasing the Length from the OU will reduce the allowable system pressure drop

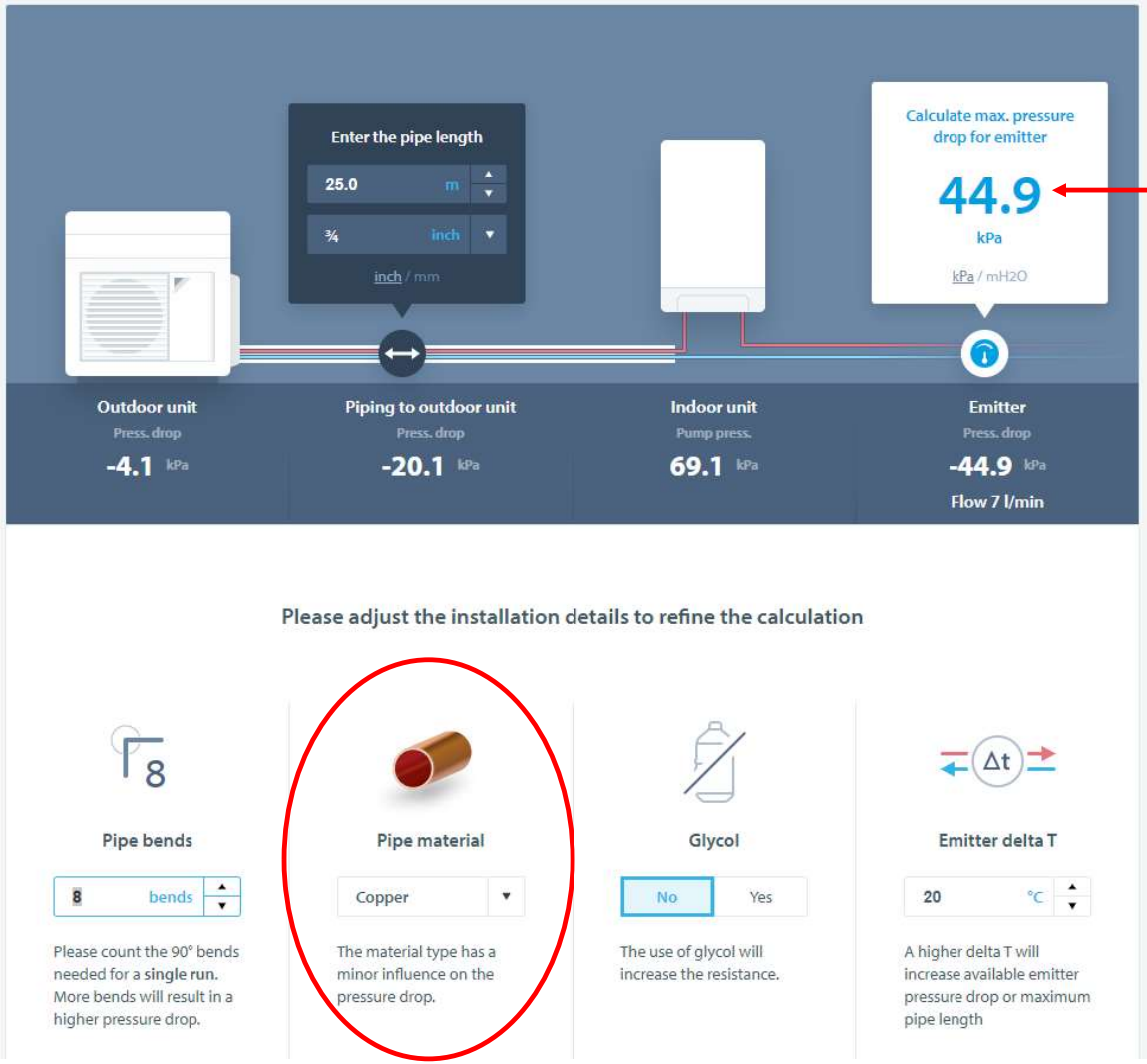
The maximum distance from the OU to the boiler is 30m

Pipe sizing calculation tool



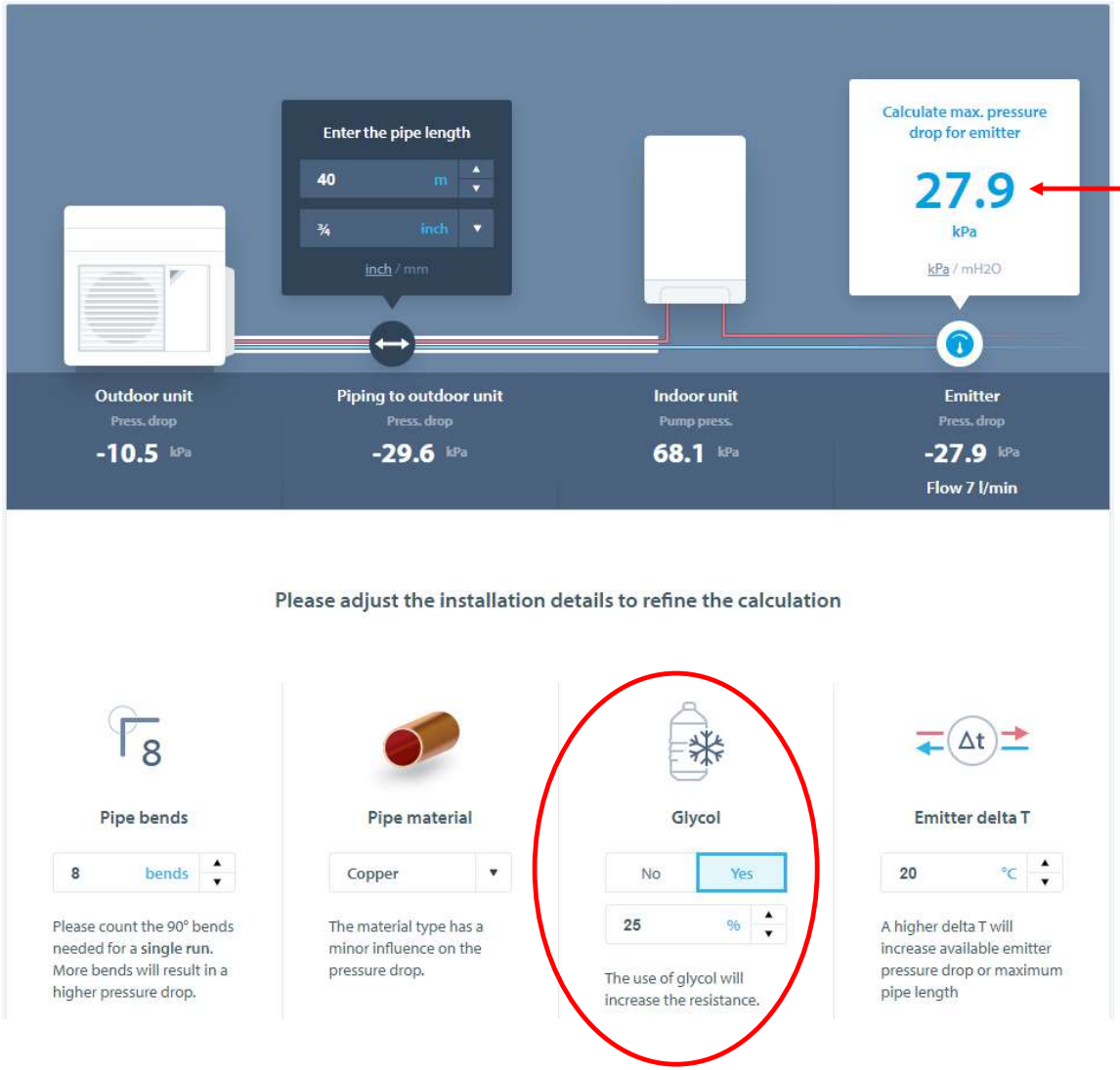
Increasing the amount of bends from the OU to the boiler will reduce the allowable system pressure drop (kPa)

Pipe sizing calculation tool



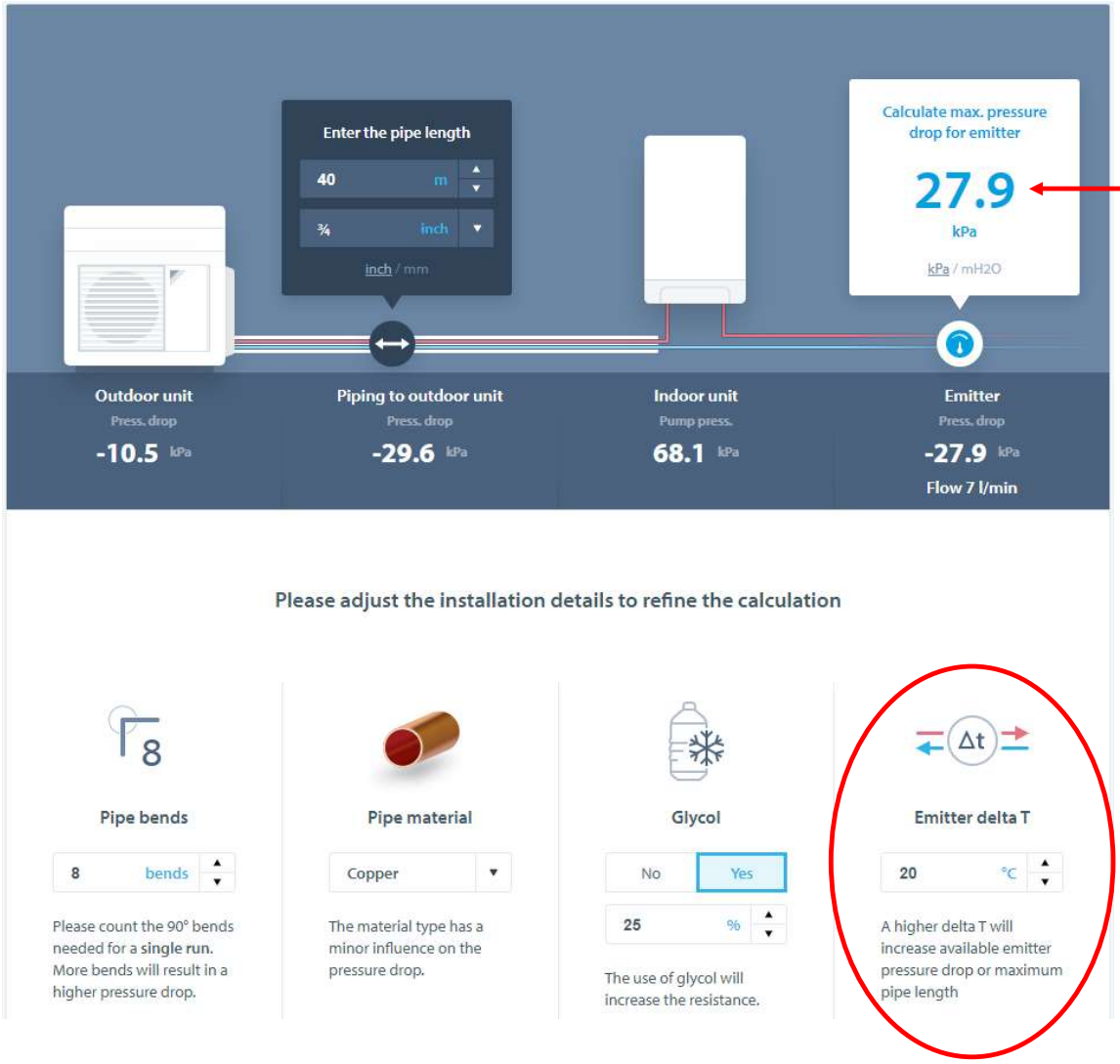
Changing the material can have a large effect on the kPa as the internal diameter of plastic pipework is considerably smaller than copper.

Pipe sizing calculation tool



Adding glycol thickens the water and will reduce the allowable system pressure drop

Pipe sizing calculation tool



The Delta T across the emitters should be left at the heat pump delta t not the boiler delta t to ensure the higher flow rates can be achieved

This should be taken into consideration during the design of the radiator system.

A higher delta T is used when in boiler mode to ensure the boiler runs efficiently and will condense where possible.

Attention points for the Water Circuit

Installation of shut-off valves at the inlet and outlet of the Daikin Altherma are required for safe isolation and maintenance (only return valve supplied)

Installation of drain points at all system low points will enable adequate drainage if required

Air vents should be installed at all system high points to ensure an air free circuit

All field piping must be able to withstand the water pressure

For health and safety reasons be careful when adding additives i.e. Fernox / Sentinel.

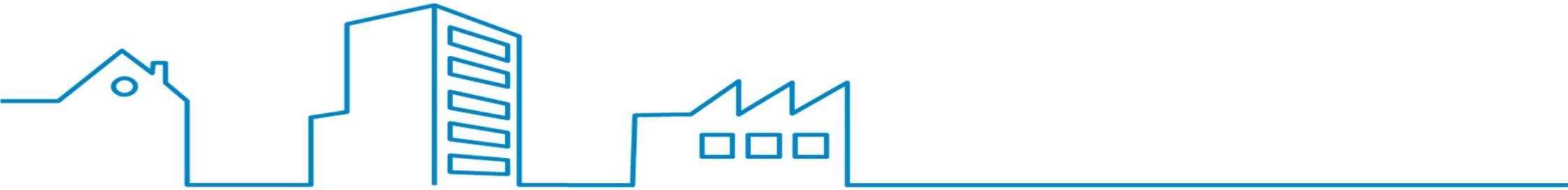
The addition of additives may lead to contamination of the domestic hot water if a leakage should occur within the cylinder coil.

Always consult the manufacturer of the additive to make sure it complies to water category regulations

Section 3.3

Hydraulic connections to the boiler unit

Daikin Altherma Hybrid Monobloc

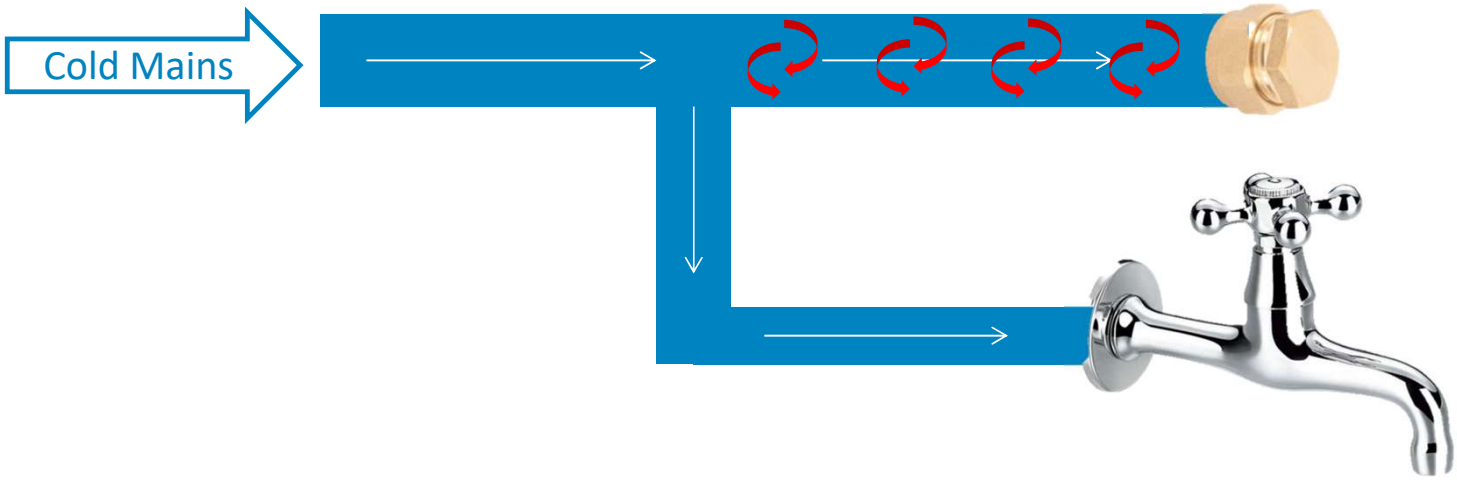


Water Pipe Connections

When connecting the pipework to the hydrobox please note the following:

- Do not connect to the unit with soldered/braised or non removable fittings
- Full bore isolation valves to be fitted at the space heating flow and return connections (compression type supplied).
- No plastic pipework within 1 metre of the unit.
- Installation of a 3rd party filling loop within the space heating pipework required (This must comply to current water regulations).
- Water pressure gauge can be fitted, however the boiler display will show the water pressure when power applied and the boiler is switched off.
- A suitable bypass must be installed within the space heating circuit to maintain the required flow rate. Please note that the minimum water volume within the space heating circuit must also be maintained (20 litres at all times).
- It is recommended to fit a water arrestor on the cold water inlet side of the domestic hot water.

Pipework Dead Legs



If the cold mains or DHW pipework contains dead legs, when a cold mains tap is run the turbulence is created and flows up the dead leg. Upon turning off the tap, the sudden change in direction and velocity creates pressure (known as Hydraulic Shock). This increased pressure can flow back and forth through the water pipework until this energy is dispersed. This pressure could travel through the boiler unit causing a momentary demand for DHW where the boiler will try to fire.

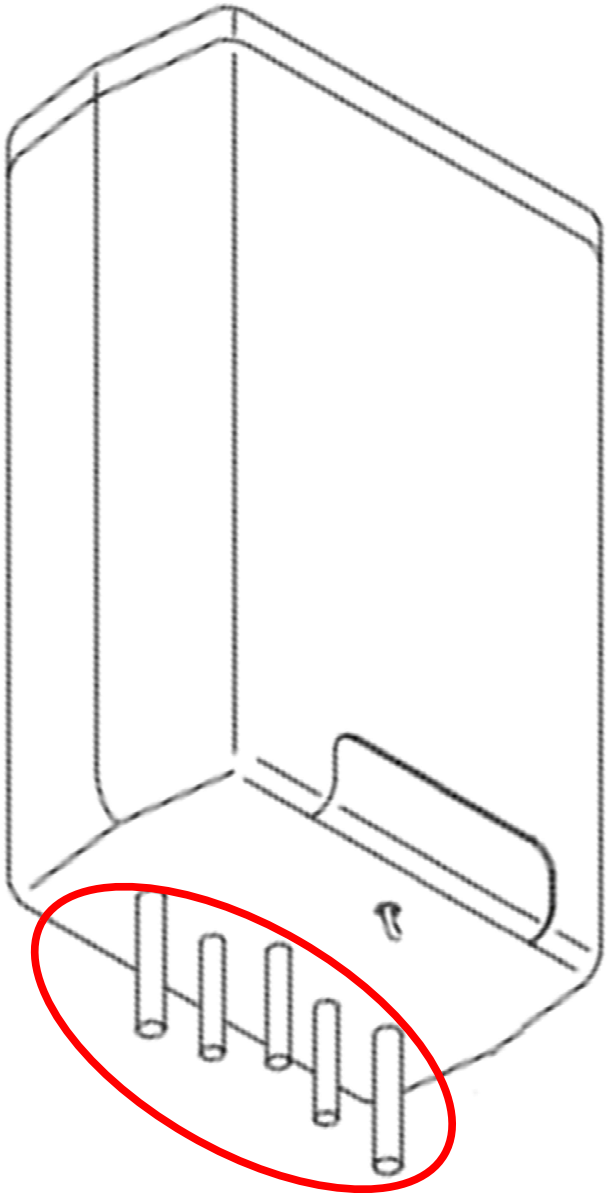
Water Arrester

Where back-flow prevention devices, including water meters, are fitted the expansion of hot water into the cold water main can be prevented. This can result in a pressure build-up that may cause damage to household devices such as showers, washing machines etc. In these cases we recommend that a mini-expansion vessel be fitted adjacent to the boiler in the cold water mains.

Hydraulic connections to the boiler

When making the bottom connections to the boiler, please ensure when tightening that it does not disturb or undo the pipework on the boiler.

If the boiler pipework is turned whilst tightening fittings it can cause internal leaks within the boiler where the connections to the heat exchanger are made



Condensate Internal Connection:

In order to minimize the risk of freezing during cold spells, the following methods of installing condensate drainage pipe adopted in order of priority.

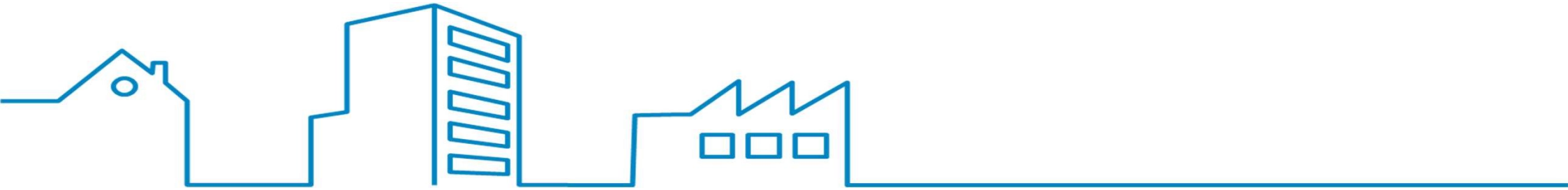
If possible the condensate drain pipe should be routed and terminated so that the condensate drains away from the boiler under gravity to a suitable internal foul water discharge point such as an internal soil and vent stack. A suitable permanent connection to the foul waste pipe should be used.

A condensate trap of 75mm is already delivered with the gas boiler.

Section 3.4

Flow Rates and Water Volumes

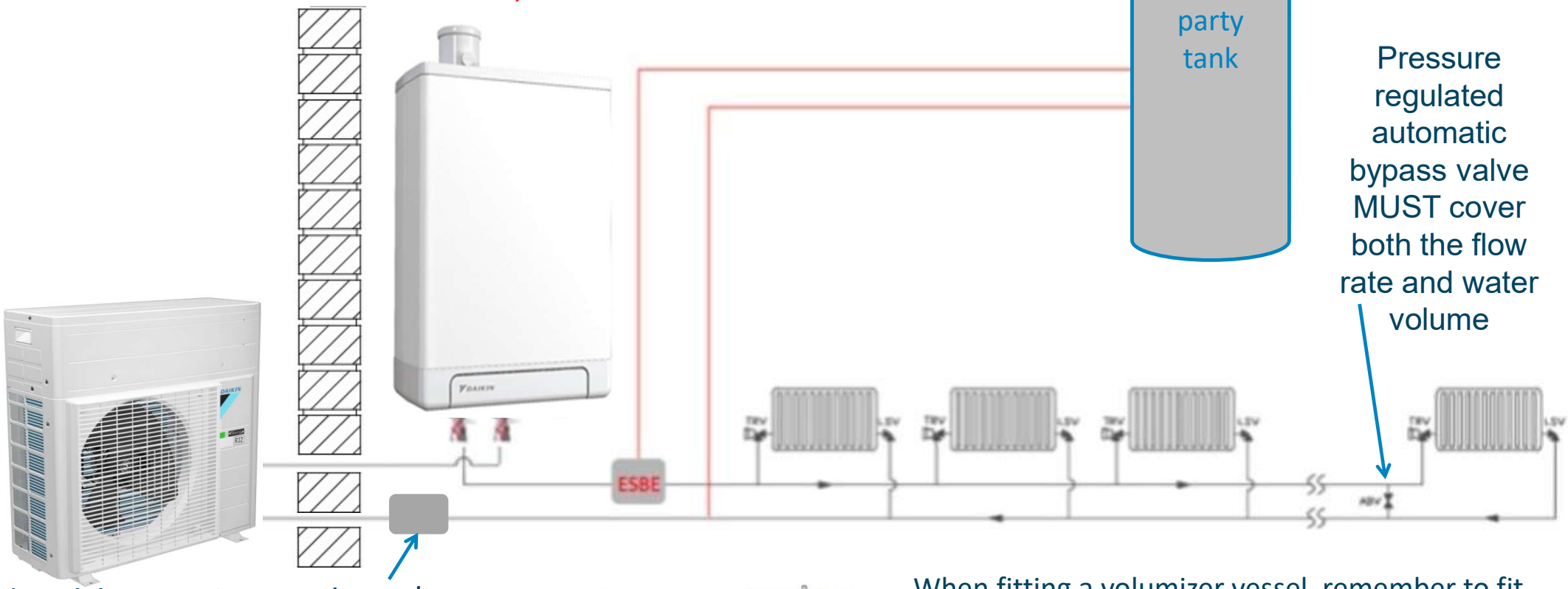
Daikin Altherma Hybrid Monobloc



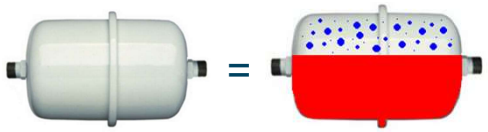
- Minimum Flow Rate – 11.5l/m (No glycol & 5 deg c DT).
- Minimum Flow Rate – 12.8l/m (Using glycol & 5 deg c DT).

20 litres volume required for defrost.

The automatic bypass must be fitted to ensure ***BOTH*** minimum flow rates and volumes are met when all radiators within the system are closed



If the minimum water quantity can't be met then an inline buffer will be required to amend the water quantity to the minimum required.



When fitting a volumizer vessel, remember to fit vertically not horizontally to ensure air is not trapped which reduces water volume

Automatic Bypass Valve Cont'd

To ensure that we keep the system operating correctly, it is mandatory that a bypass valve is fitted as far away from the Boiler as possible on the space heating circuit.

This is to relieve the pressure within the primary water circuit when multiple zones have modulated (closed) and pressure has built up to ensure that we have minimum water quantities flowing through the unit and the unit does not go to a E5 flow error as the system shuts down.

The ABV must ensure that the necessary water volume can be covered in the pipework when radiators are closed

This is to ensure the system has enough energy within the water circuit to complete a full defrost cycle

How important is flow rate?

Q = M x Cp x Delta t

(Output in kW = Flow Rate (l/s) x Specific Heat Capacity x Delta t)

how much energy can be absorbed kJ/kg

temperature difference across flow &return

Q = 46/60 x 4.186 x 5 Output = 16.04kW

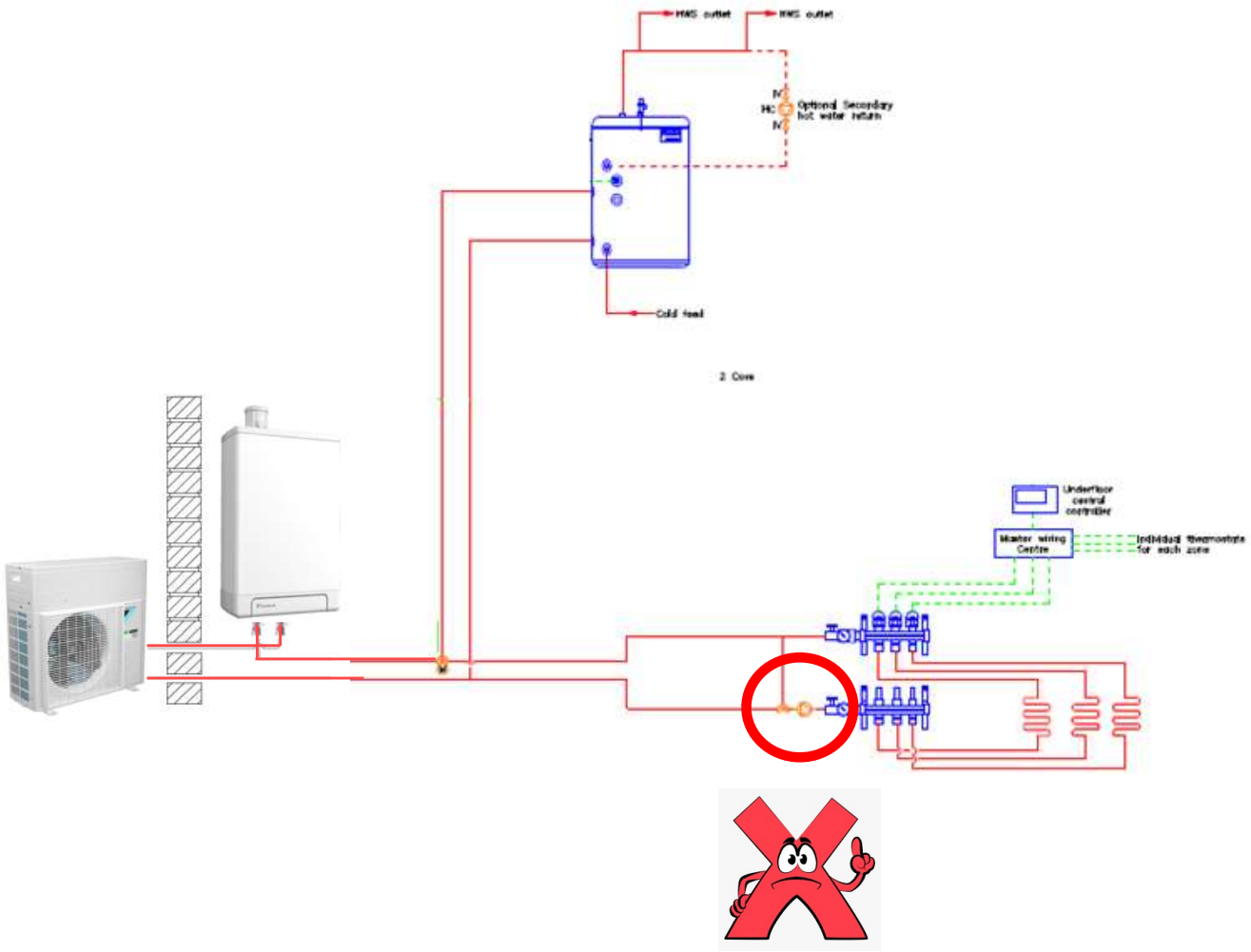
Q = 43/60 x 4.186 x 5 Output = 14.99kW

What about Glycol?

Q = 46/60 x 3.96 x 5 Output = 15.18kW

Q = 43/60 x 3.96 x 5 Output = 14.19kW

Hydraulic Separation



When using a second pump on a system ie. On an underfloor heating manifold it can cause issues with the heat pump.

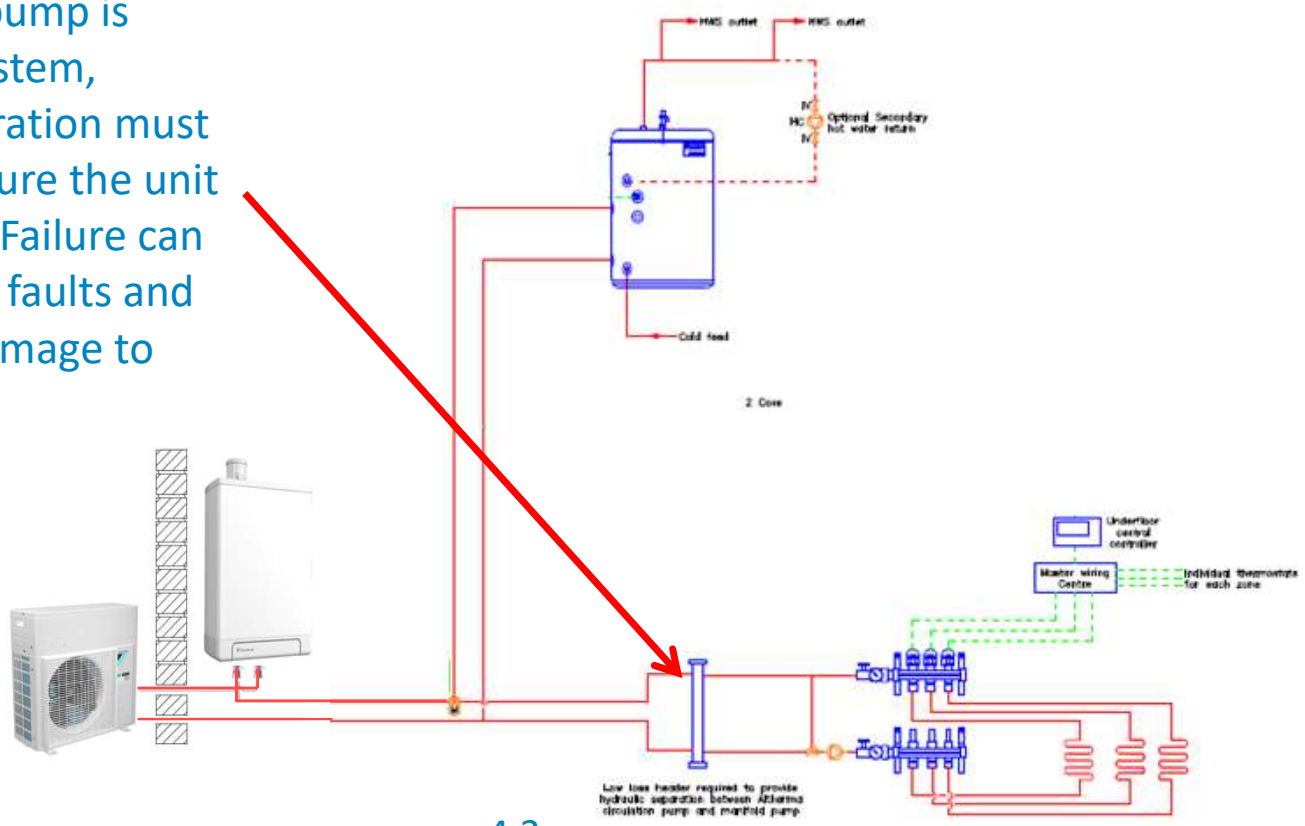
If the external pump continues to run after the heating demand has finished, the unit sees the flow and sees an error in the system.

Hydraulic separation must be used to stop this issue.

There is no external pump interlink within the Daikin unit due to the delta T logic of the internal pump.

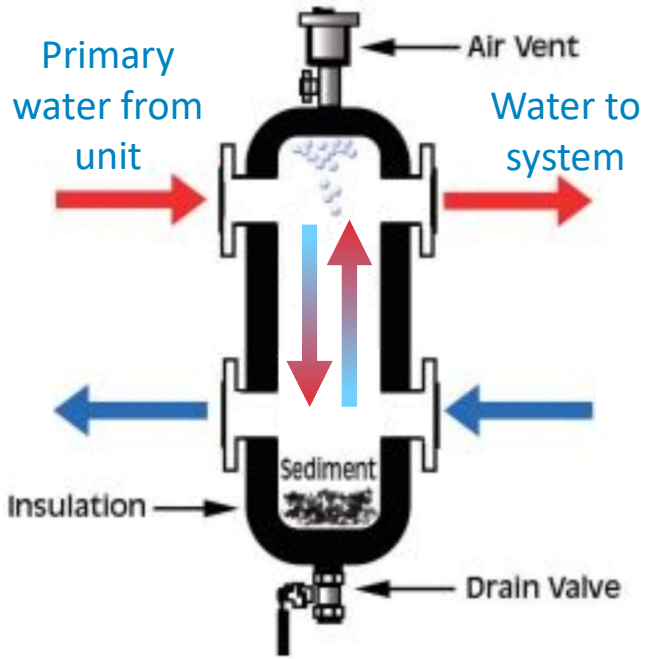
Hydraulic Separation – Example Drawing only

If an external pump is used on the system, hydraulic separation must be used to ensure the unit runs correctly. Failure can cause CO flow faults and could cause damage to the unit



4.3

Low Loss Header Explained



Although a low loss header does not fully separate the heat pump water from the system water, it provides a direct separation between the two systems making it more efficient than a plate heat exchanger.

The heat from the primary source is passed to the system water however the two do not pass directly from one side to the other ensuring the unit does not show a C0 fault.

Hydraulic separation

Hydraulic separation can be created with the use of several items.

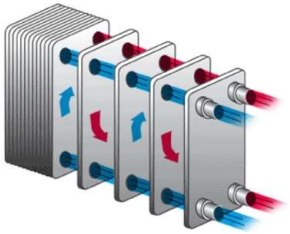
1. Low loss header

2. Inline separation (buffer)

3. Plate heat exchanger

Each has advantages/disadvantages and should be chosen dependant on system constraints.

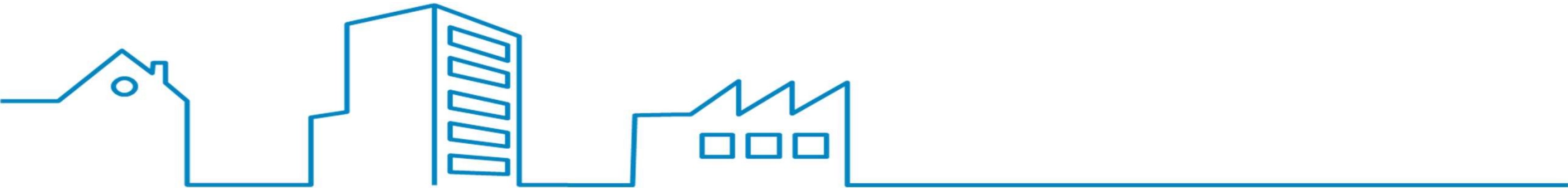
As well as providing hydraulic separation, these devices can assist with the required system volumes required for defrost purposes/



Section 3.5

3rd Party Boiler Connections

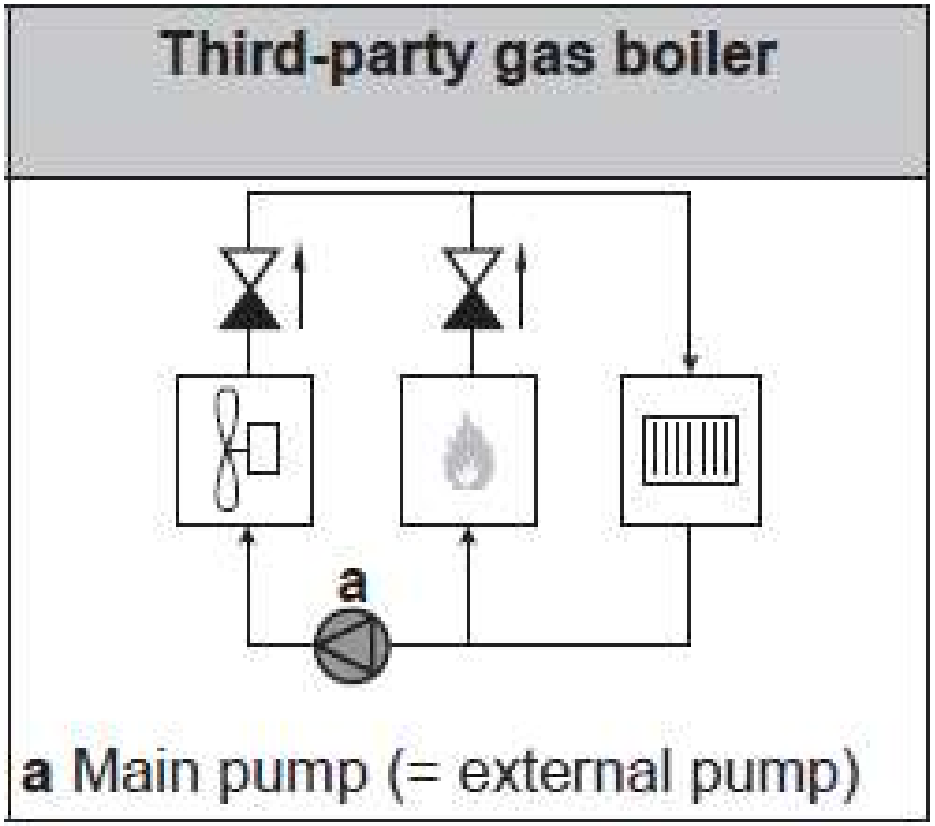
Daikin Altherma Hybrid Monobloc



The third party boiler must be connected in parallel. During HP operation, the unit will use the external EKADDONNJH pump kit which should be placed as close to the boiler circuit as possible bot no further than 10m from the OU

You will also require the EKADDONNJH2 for the pump wiring and non return valves. All pump wiring connects back to the OU.

During boiler operation, the HP will turn off and send a run signal to the boiler which will use its own internal circulating pump for the CH demand.

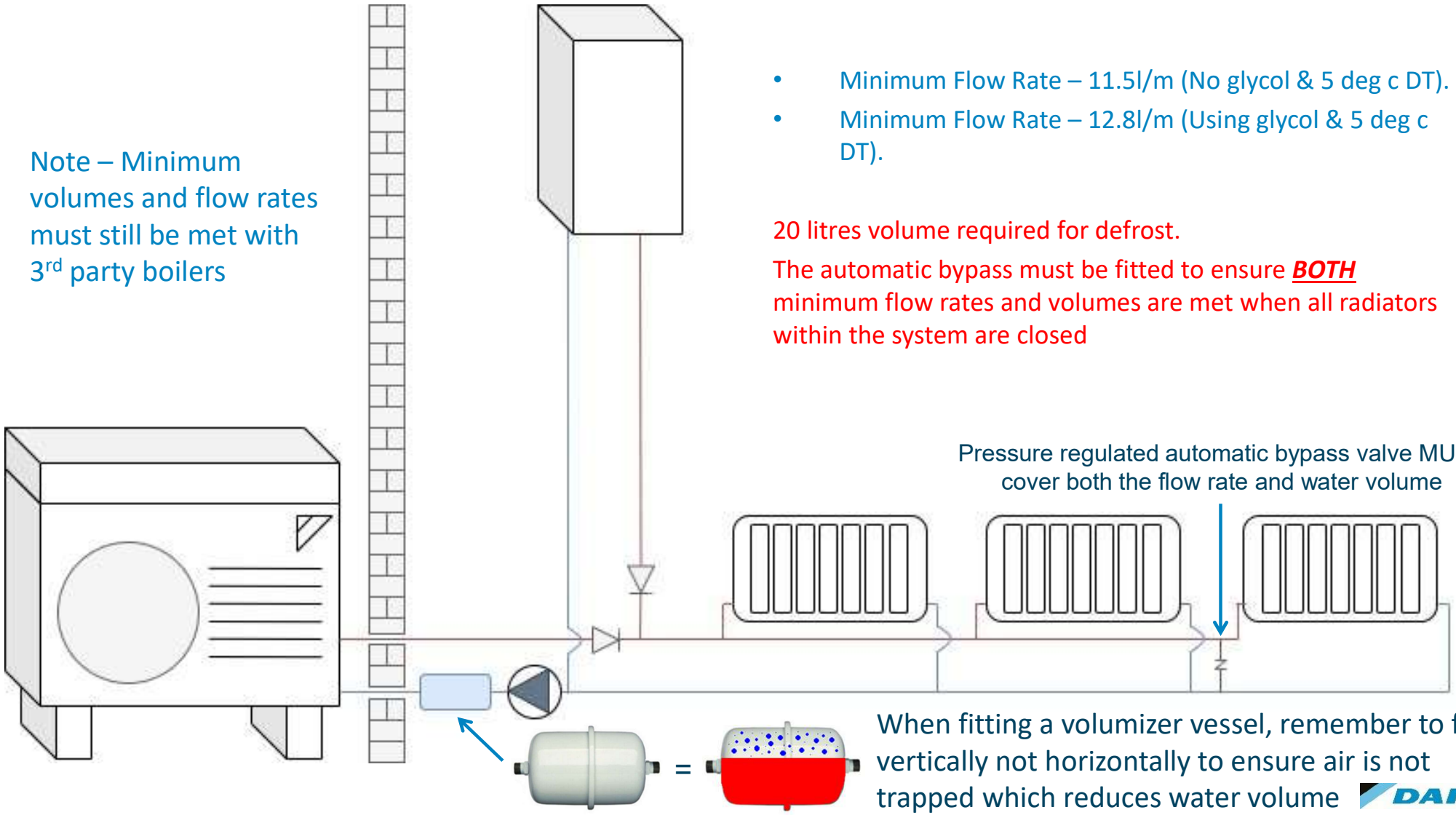


Note – Minimum volumes and flow rates must still be met with 3rd party boilers

- Minimum Flow Rate – 11.5l/m (No glycol & 5 deg c DT).
- Minimum Flow Rate – 12.8l/m (Using glycol & 5 deg c DT).

20 litres volume required for defrost.

The automatic bypass must be fitted to ensure ***BOTH*** minimum flow rates and volumes are met when all radiators within the system are closed

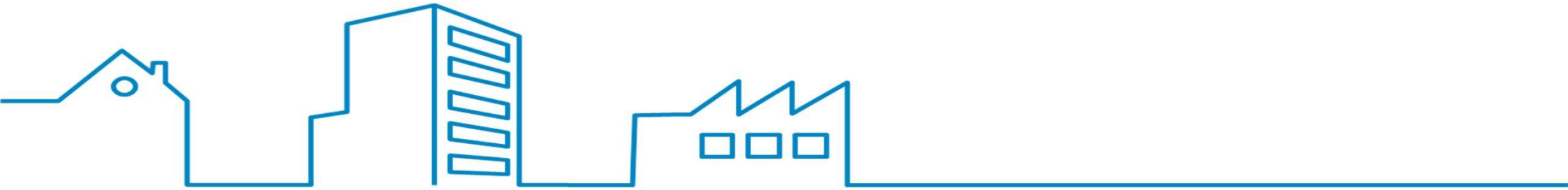


When fitting a volumizer vessel, remember to fit vertically not horizontally to ensure air is not trapped which reduces water volume

Section 3.6

ESBE 3.W.V. Installation

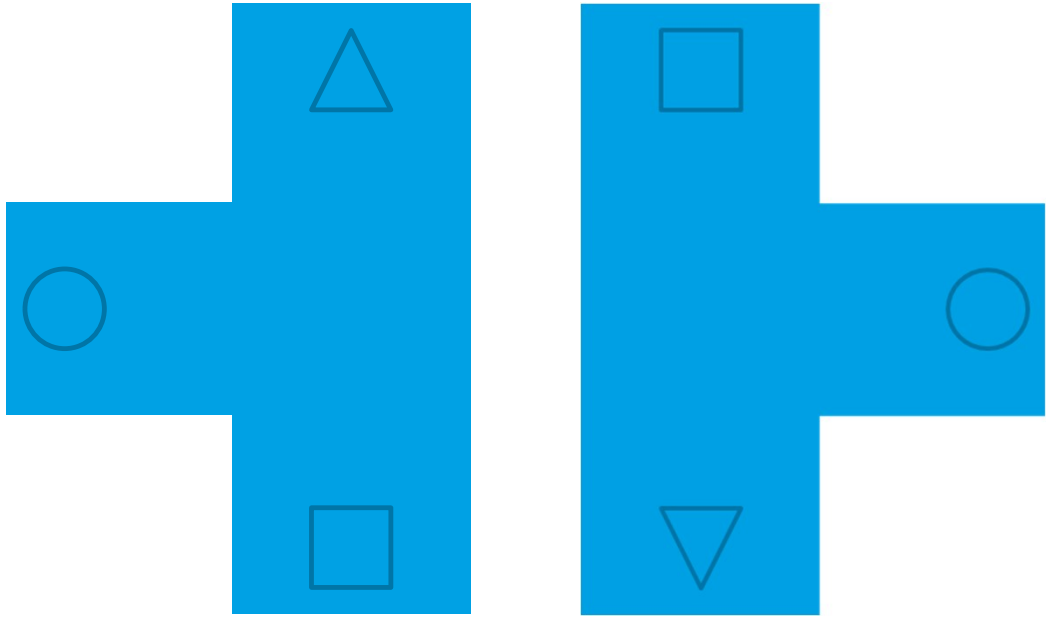
Daikin Altherma Hybrid Monobloc



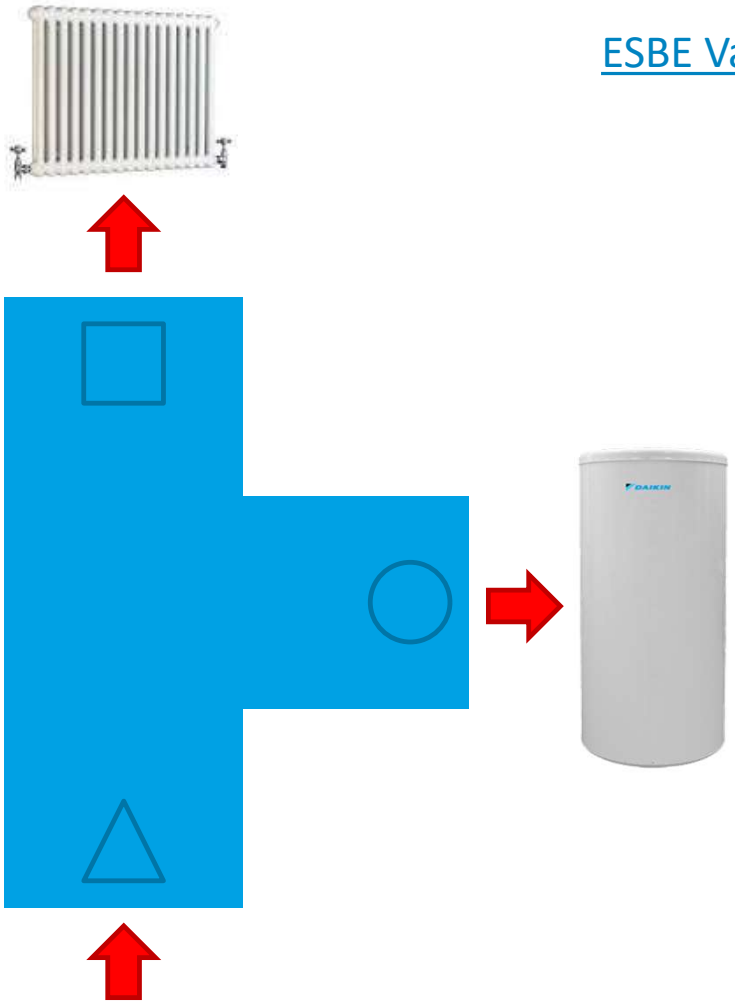
ESBE Valve Markings and positioning

The ESBE valve can be set up in 4 ways however, the flow from the Daikin Altherma unit cannot enter the branch (circle) as on most other valves.

Symbols are imprinted onto the brass body of the valve as shown and you can follow the simple setup method from the next slides



ESBE Valve Markings and positioning



The triangle is the Daikin symbol and the flow into the valve from the OU.

The circle represents the cylinder and is therefore the flow to DHW.

The square represents a radiator and is therefore flow to the CH zones.

Using this valve positioning ensures a uniformed fitting throughout different sites and ensures no adjustment to the valves electrical jumpers is necessary.

Three Way Valve – Simple Installation Method

BEFORE ELECTRICIAN POWERS UP

There are three shapes embossed into the brass body of the valve Triangle represents Daikin flow in

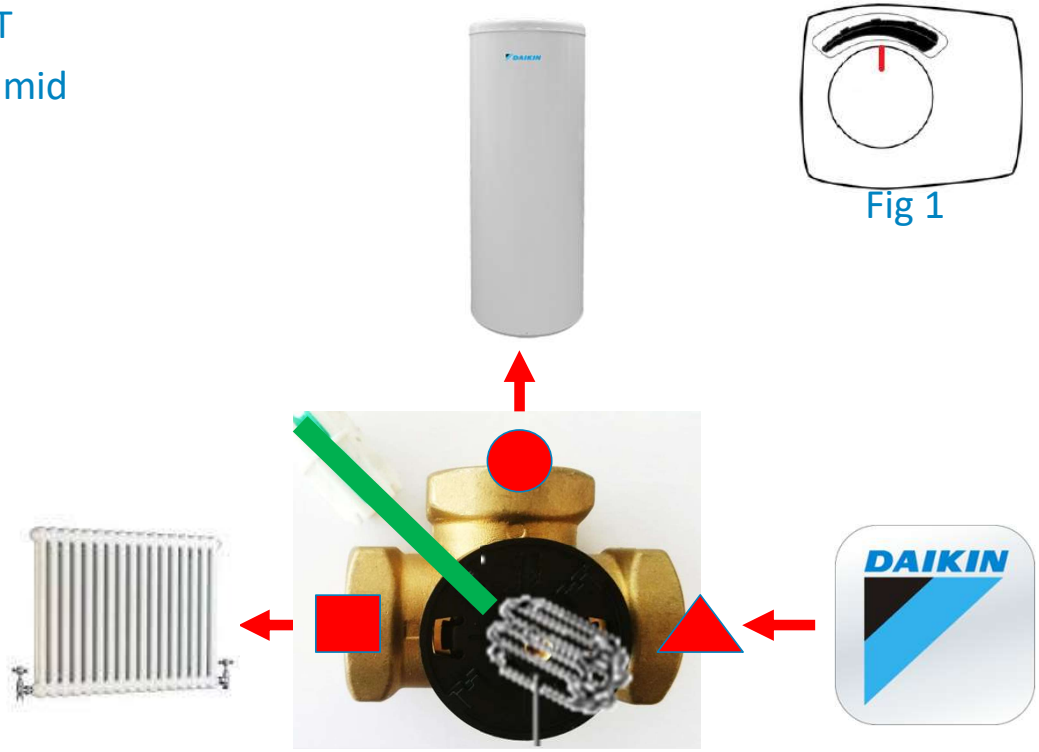
Circle represents DHW out to the cylinder

Square represents CH out

This is fitted to figure ‘C’ so the jumpers do NOT need to be changed. The head should be set in mid Position as standard (see fig 1)

Fig 1

Point the line on the spindle to mid position inbetween circle and square as shown and fit the head to the body of the valve



Three Way Valve – Simple Installation Method

IF THE ELECTRICIAN HAS POWERED UP THE UNIT

Providing the valve has been fitted in the same manner and If the electrician has powered up the unit you will find that the dial on the head has moved clockwise (see fig 2)

Point the line on the spindle to the Circle

as shown and fit the head to the body of the valve

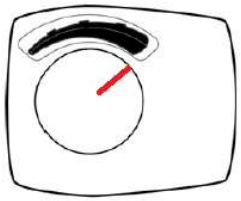
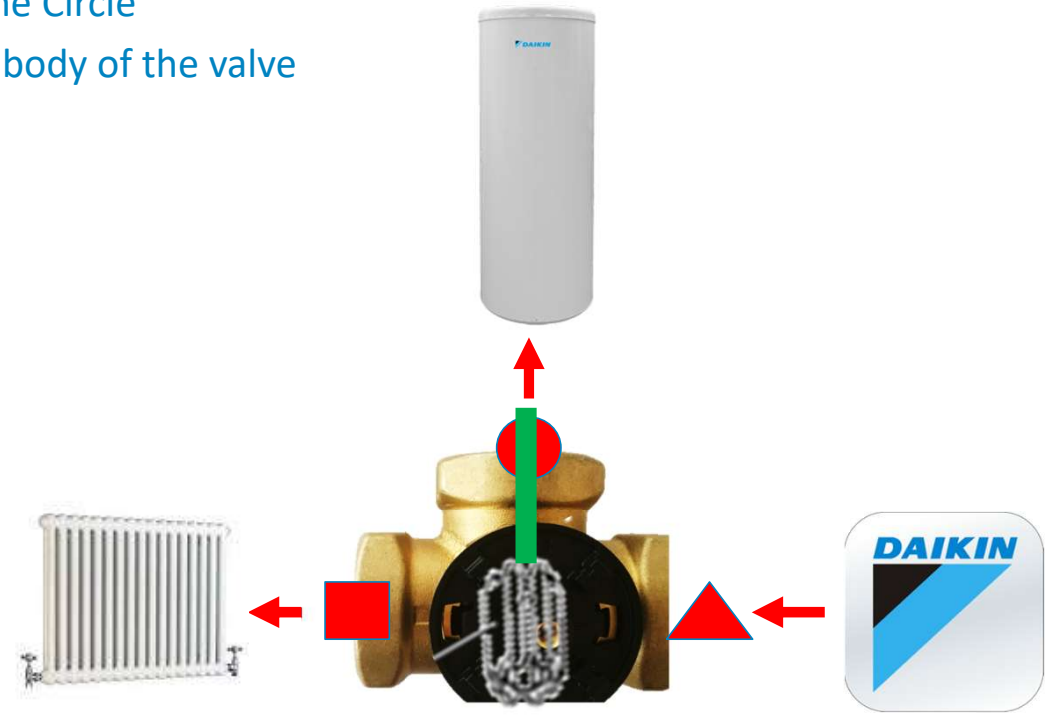


Fig 2

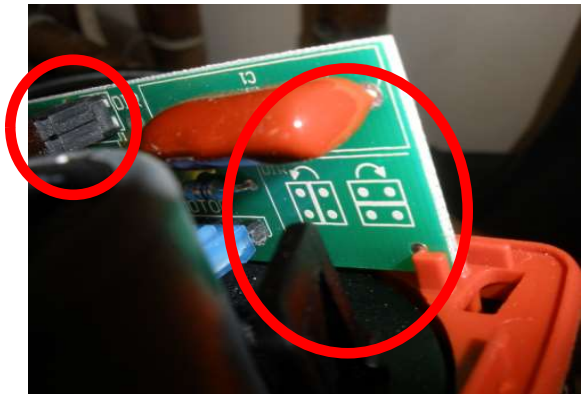


Working/repairing the valve

If the valve has been installed incorrectly or there is a fault, it is important to know several things…

1. The unit as standard defaults to CH not DHW
2. CH operation provides 0v to the black wire on the divertor valve and 230v for DHW operation
3. The line from the top to bottom of the castle always points to the CLOSED port in the valve
4. The jumpers inside the head decide which way the valve will spin

FROM *CH* TO *DHW*



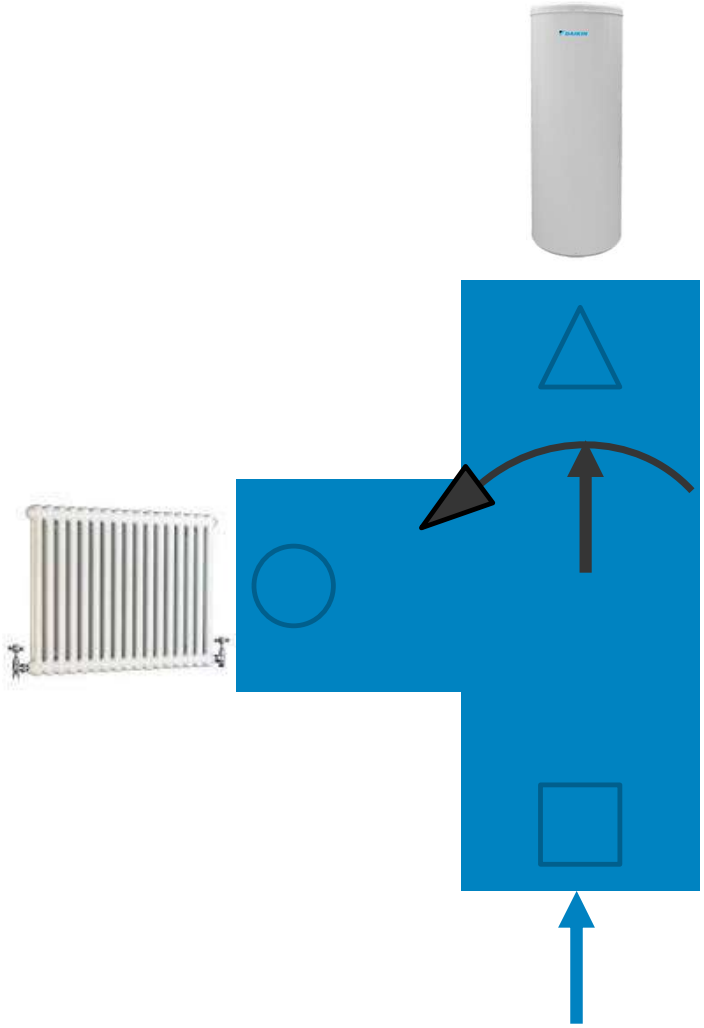
The motor jumpers

As the valve can be fitted in 4 ways it spins through 90 degrees NOT 180. The only installation that is NOT permitted is with the flow from the unit into the branch of the valve!

With this information any problem can be solved

If the valve has been fitted in a different format

Scenario 1



You find the valve has been fitted in this format.

Is this OK?

YES… only fitting the flow in the branch is not OK

Step 1. Force the unit into CH mode. How can you check it is in CH mode

0v on the black wire from the diverter valve head

Power down and remove black wire if necessary

Step 2. remove the head and point the line on the castle to the correct place… where should it be?

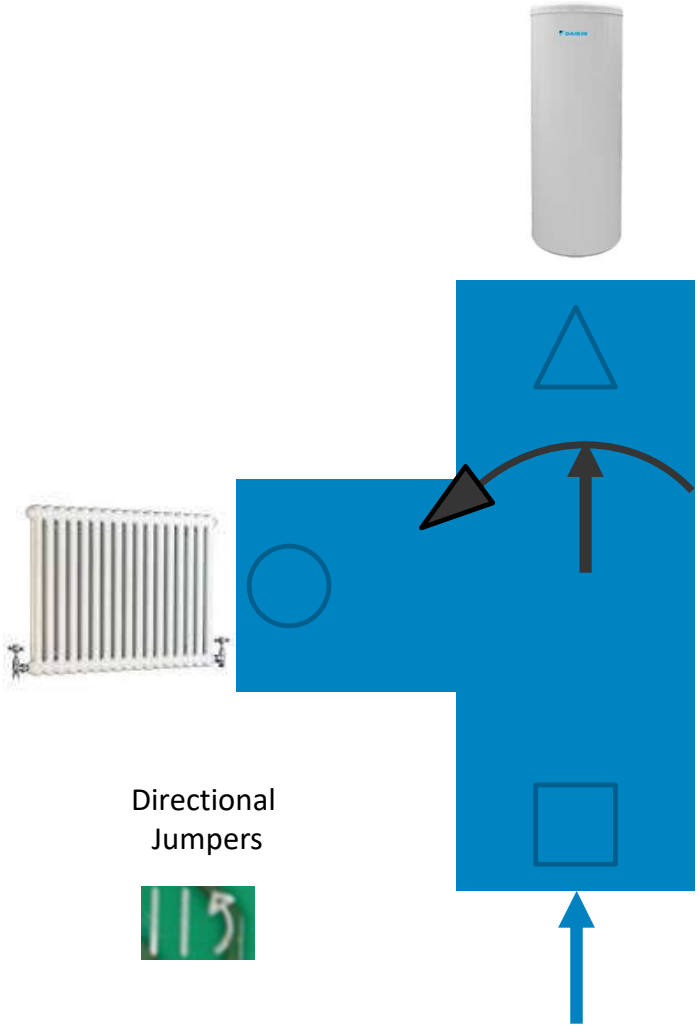
Pointing to the triangle as you want to block DHW If you are in CH mode

Step 3. which way does the valve need to spin **FROM *CH* TO *DHW***

Anticlockwise as the water flows to the cylinder and the CH is now blocked

If the valve has been fitted in a different format

Scenario 1



You find the valve has been fitted in this format.

Is this OK?

YES

Step 1. Force the unit into CH mode How can you check it is in CH mode

0v on the black wire from the diverter valve head

Power down and remove black wire if necessary

Step 2. remove the head and point the line on the castle to the correct place… where should it be?

Pointing to the triangle as you want to block DHW If you are in CH mode

Step 3. which way does the valve need to spin **FROM *CH* TO *DHW***

Anticlockwise as the water flows to the cylinder and the CH is now blocked

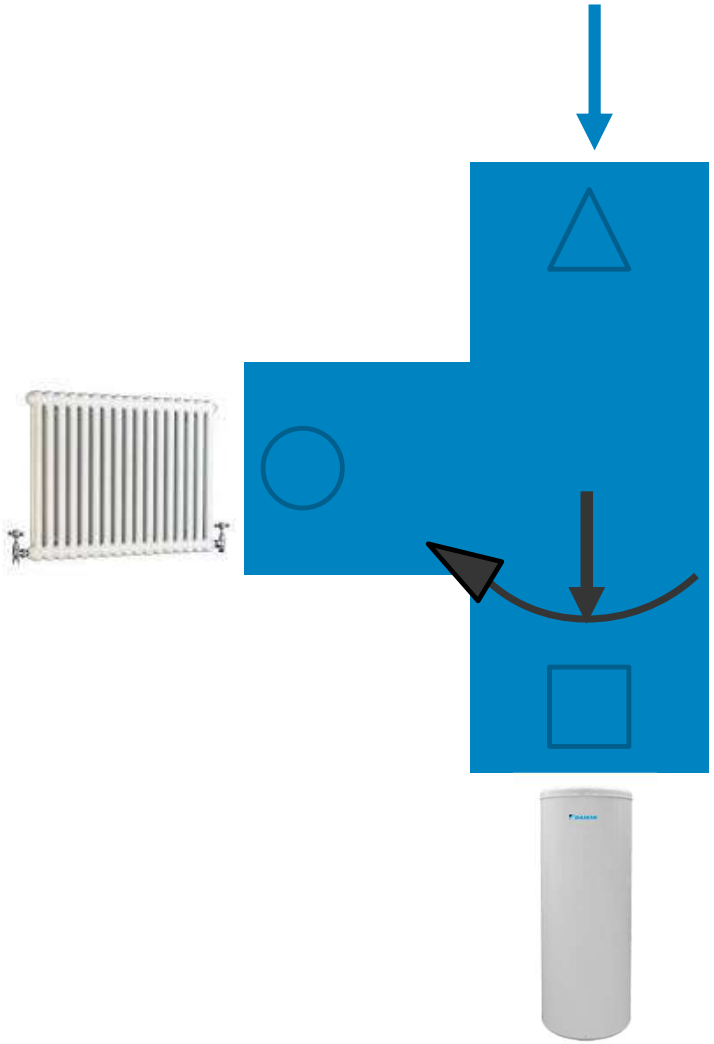
Step 4. leave the castle pointing towards the triangle, power down if necessary and change the jumpers in the valve head, to the vertical position. With the cap fully inserted onto the head (no red showing) power on the unit.

Step 5. Checking it is still in CH mode

wait for the valve to move. Remove the cap and reinstall the head

If the valve has been fitted in a different format

Scenario 2



You find the valve has been fitted in this format.

Is this OK?

YES… only fitting the flow in the branch is not OK

Step 1. Force the unit into CH mode. How can you check it is in CH mode

0v on the black wire from the diverter valve head

Power down and remove black wire if necessary

Step 2. remove the head and point the line on the castle to the correct place… where should it be?

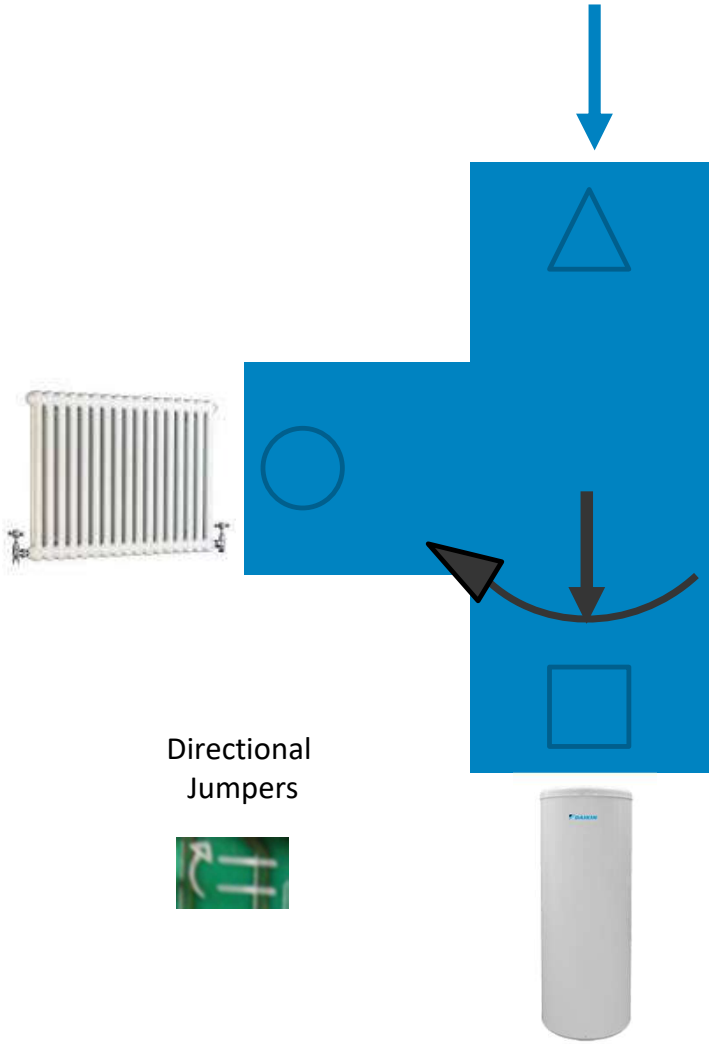
Pointing to the square as you want to block DHW If you are in CH mode

Step 3. which way does the valve need to spin **FROM *CH* TO *DHW***

Clockwise as the water flows to the cylinder and the CH is now blocked

If the valve has been fitted in a different format

Scenario 2



Directional Jumpers

You find the valve has been fitted in this format.

Is this OK?

YES

Step 1. Force the unit into CH mode How can you check it is in CH mode

0v on the black wire from the diverter valve head

Power down and remove black wire if necessary

Step 2. remove the head and point the line on the castle to the correct place… where should it be?

Pointing to the triangle as you want to block DHW If you are in CH mode

Step 3. which way does the valve need to spin **FROM *CH* TO *DHW***

Clockwise as the water flows to the cylinder and the CH is now blocked

Step 4. leave the castle pointing towards the triangle, power down if necessary and change the jumpers in the valve head, to the horizontall position. With the cap fully inserted onto the head (no red showing) power on the unit.

Step 5. Checking it is still in CH mode

wait for the valve to move. Remove the cap and reinstall the head

Three Way Valve Installation

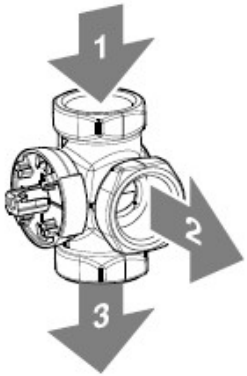


figure A

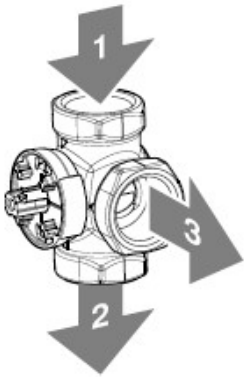


figure B

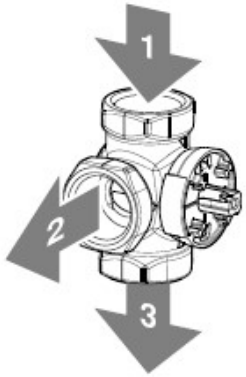


figure C

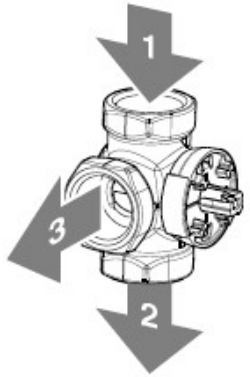
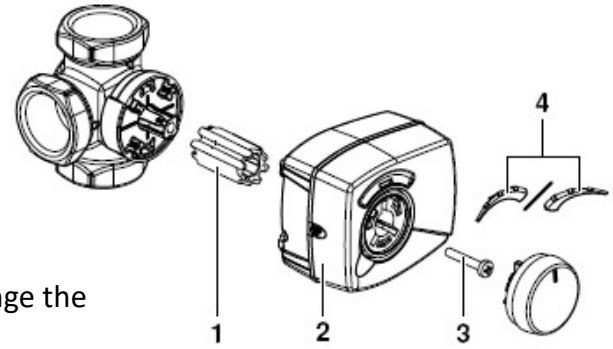


figure D

1	From altherma by DAIKIN indoor unit
2	To domestic hot water tank
3	To room heating



If you install the motor to figure B or C you do NOT have to change the jumpers.
NOTE: If you set the jumpers to clockwise the motor will turn anti clockwise.

Any Questions

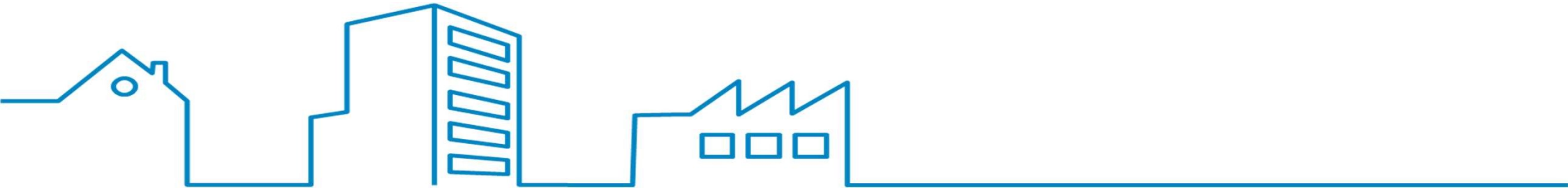
Session 3 Questions

1. Can the Exogel or antifreeze valves be used in conjunction with Glycol?
2. If using the exogel valve, what supplied part should be fitted externally on the unit?
3. What must be completed on the PRV pipework on the OU?
4. What insulation should be used on external pipework and what precautions should be considered?
5. What will happen if a dead leg is left on the cold mains/DHW pipework.
6. If fitting the unit as a combination boiler, what should be fitted on the cold mains supply into the boiler?
7. What is the minimum water volume required in the system and why is it necessary?
8. When is hydraulic separation required and which fault code could indicated that it is required?
9. In the simple installation method for an Esbe valve which pipes connect to the following marked ports:
    1. Square symbol
    2. Circle symbol
    3. Triangle symbol
10. On the Esbe valve what does the black wire control?

Section 4.1

Water Quality

Daikin Altherma Hybrid Monobloc



What is BS 7593:2019?

It's the British Standard code of practice for the preparation, commissioning and maintenance of domestic central heating and cooling water systems.

It applies to individual domestic premises when commissioning a system for the first time on a new build, or re-commissioning following the installation of a new boiler, or any other major remedial work. It's not just about boilers. The guidance includes individual heating circuits within blocks of flats, heat interface units (HIU) and wet cooling systems too.

When does it come into force?

This Code of Practice came into effect on 31 May 2019, replacing the version published in 2006. BS 7593 is a regulatory requirement within Building Regulations, Part L.

Why are the regulations changing?

The British Standards Institute has been listening to evidence from the industry to ensure its guidance is fit for purpose.

More is now understood about effective water treatment for today's appliances and the steps that can be taken to minimise the negative impacts of corrosion. The changes acknowledge that chemical water treatment isn't a fit and forget solution, and magnetic filters shouldn't just be considered a nice to have.

A high proportion of boilers that fail in the first year do so because of poor water quality. By introducing regular testing and re-dosing, proper system cleaning and the mandatory installation of an in-line filter to the industry's code of practice, we can significantly improve the efficiency and life expectancy of every household system.

DAIKIN

BS 7593:2019 - A summary

The revised standard now includes the following key changes for those specifying, installing and maintaining domestic heating and cooling systems.

- For the first time, the fitting of a permanent in-line filter is required in addition to a chemical clean and fresh water flush before inhibitor is added
- An in-line filter should be fitted to ALL systems
- All recommended cleaning methodologies can be improved with external magnetite capture equipment and mechanical vibration of radiators
- An on-site water test is required to test the level of inhibitor and cleanliness of the system every year
- Inhibitor should be re-dosed every five-years or a full system water test undertaken
- BS 7593:2019 is now applicable to both closed loop heating and cooling circuits
- Biocide is required in cooling and low temperature heating systems, and should be considered for higher temperature systems for added protection during downtime

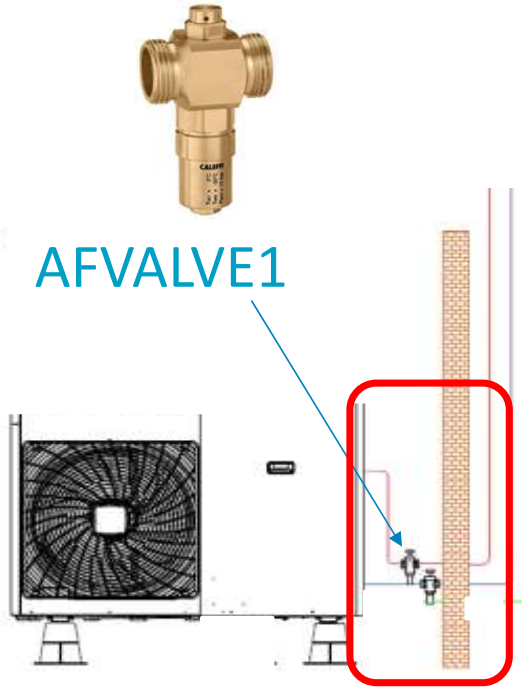
Attention Points For The Water Circuit

- An internal Gauze filter is supplied however external filters should be used (BS7593) providing they do not reduce flow rates, especially when full

Please note – an Exogel antifreeze valve is supplied with the OU.

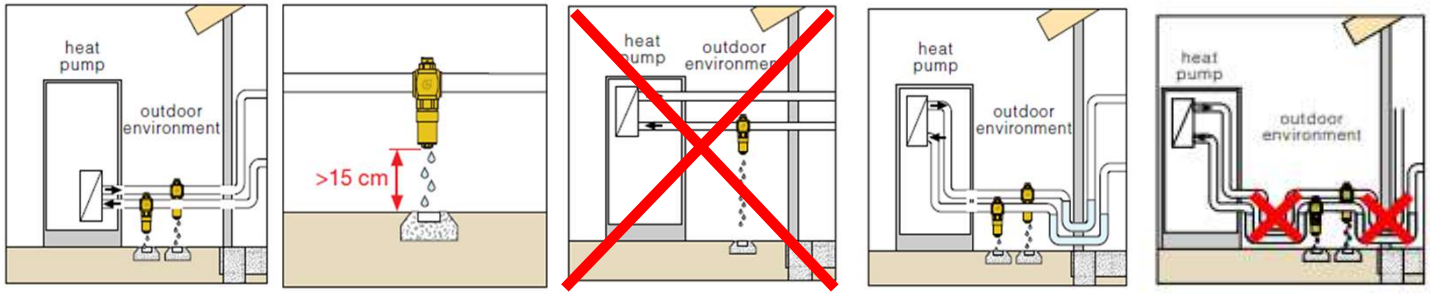
The AFVALVE1 can be used in place of or as an extra precaution to the Exogel valve.

The Exogel or antifreeze valves must NOT be used in conjunction with Glycol



Freeze protection : what are the options?

- Use glycol➔ impact on performance +/- 3% loss and on the heatpump 2% more PI and up to 6 % on indoor emitters.
- Install heat tape with thermostatic control
- Install Caleffi AFVALVE1



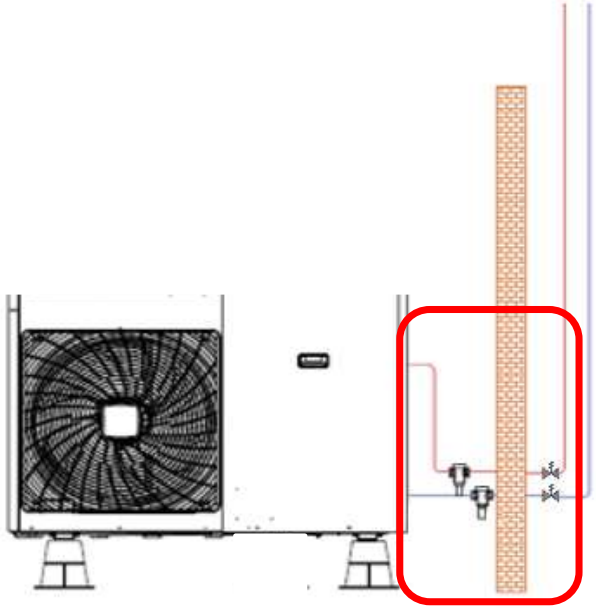
Both pipes are at the bottom | Minimum 15 cm of clearance from the ground is needed | One pipe is at the bottom | HEX is on the top & both pipes are the bottom

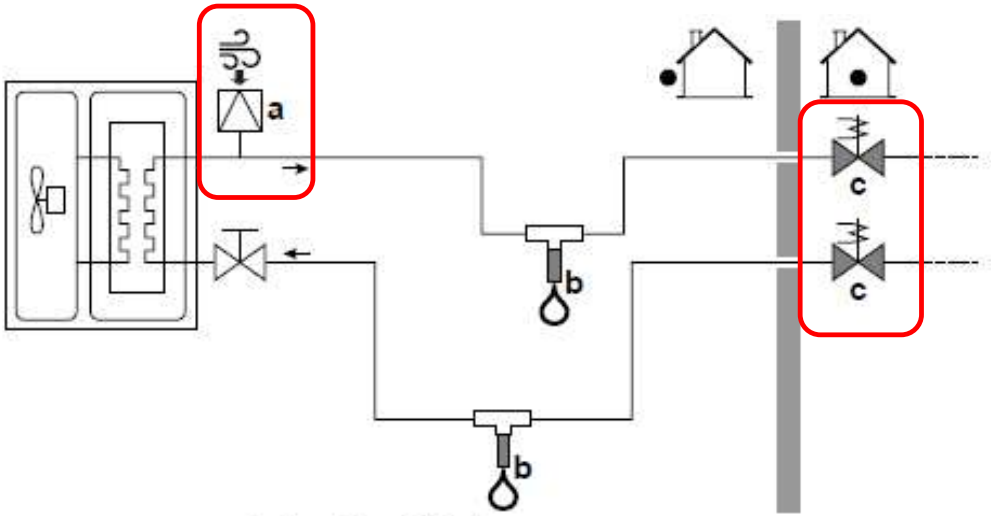
AFVALVE1

If Antifreeze valves are fitted to a cooling unit the cooling setpoint must not be set lower than 8°c.

If 3rd party antifreeze valves (b) are installed, a vacuum break or air admittance valve (a) must be fitted.

To prevent full system drain down, 2 x N.C. 2 port valves (c) can be fitted inside the property.





a Automatic air intake
b Protection for the field piping
c Isolation of water inside the house when there is a power interruption

Attention Points For The Water Circuit – Glycol Requirements

The software contains special functions using pump and back up heater to protect the complete system against freezing.

This function will only be active when the unit is powered on however, in case of power failure, above mentioned features can not protect the unit from freezing.

If power failure can occur at times the unit is unattended and the anti-freeze valves are not fitted Daikin recommends adding glycol to the water system.

Attention Points For The Water Circuit – Glycol Requirements

If water freezes inside the unit, it will expand and cause major damage

The Hybrid Monobloc has internal freeze-up protection software

However incase of prolonged power failure, the equipment will not be protected

If there is a risk of power failure, it is strongly recommended that glycol is used with the necessary additives to prevent freezing of the water and corrosion of the system.

Additives in the water system which is also used in an indirect DHW cylinder, must not exceed a water Category 3 (Water Regulations)

Minimum outdoor temperature	Glycol
–5°C	10%
–10°C	15%
–15°C	20%
–20°C	25%
–25°C	30%

These values will not protect against water freezing but protects against the expansion of freezing water thus protecting the equipment

Please note: Ethylene Glycol Is Poisonous

- For Installations with a domestic hot water tank, propylene glycol must be used

Water Pressures

Check the CH water pressures on the internal manometer are between 1 and 1.5bar when the system is cold and the PRV is not leaking or blocked.

If system pressure is low this will need to be re-pressurised either through the filling loop (no glycol) or pumping station if glycol is used. Glycol levels will then need to be checked with your refractometer.

Run the CH system and ensure the pressure does not rise above 3bar.

If pressures rise above 3bar, check expansion vessel pressures are correct (with system empty).

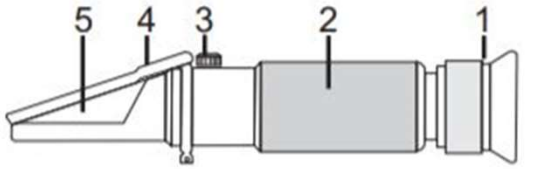
Combined filling loop and pressure gauge

Glycol Pump station

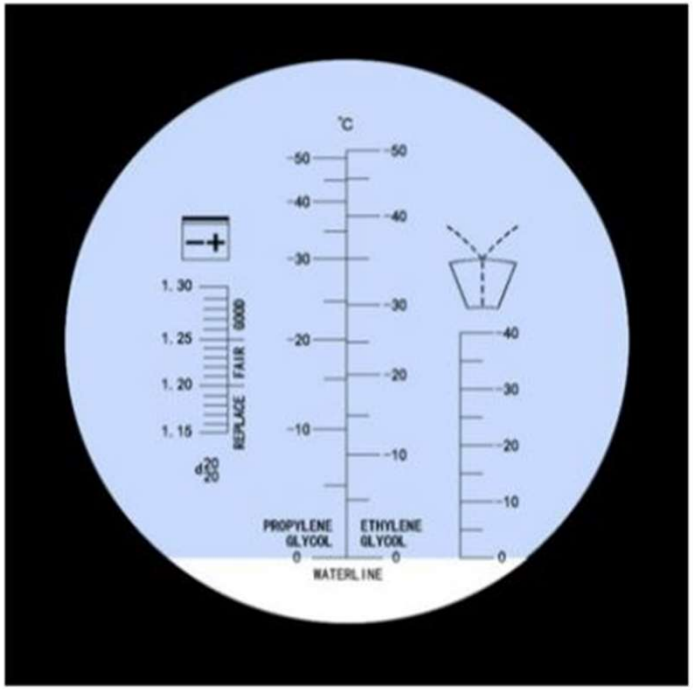
Filling the system

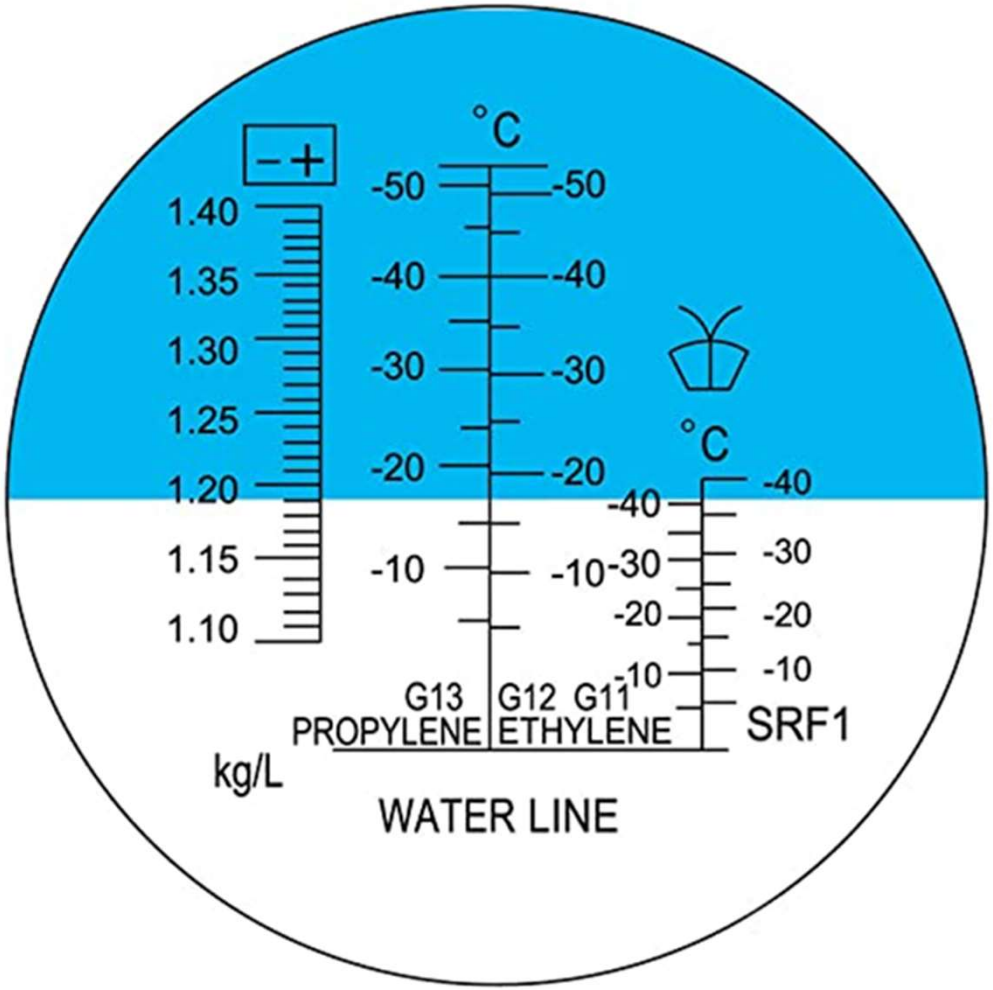
Refractometer calibration

1. Eyepiece
2. Mirror Tube
3. Adjustment screw
4. Cover Plate
5. Prism



Scale





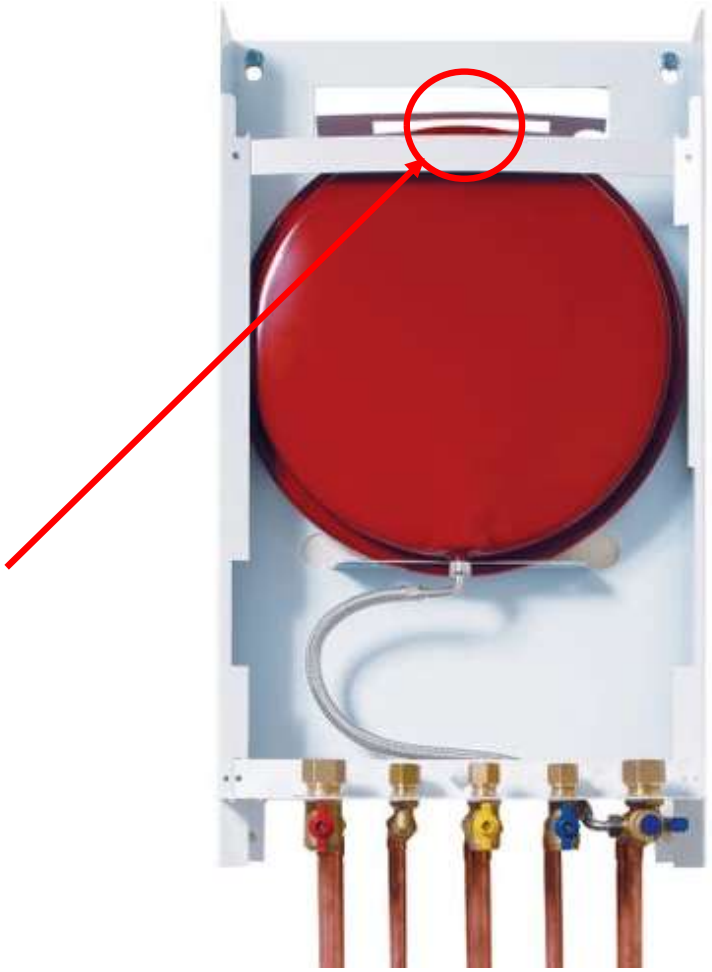
Expansion Vessel

There is a charging point to adjust the pressure inside the expansion vessel

Pre-pressure of the expansion vessel: 1 bar

Any alteration to the pre-pressure should be performed by use of oxygen free nitrogen before the system is filled.

Expansion vessel is situated to the rear of the B-Pack kit with the schrader valve on the top



Calculating The Expansion Vessel Pre-Pressure Setting

Most expansion vessels are pre-charged to 1 bar pressure which can be adjusted to the individual system requirements

The pre-pressure (Pg) to be set depends on the maximum installation height difference (H) and is calculated as below:
Pg=(H/10+0.3) bar

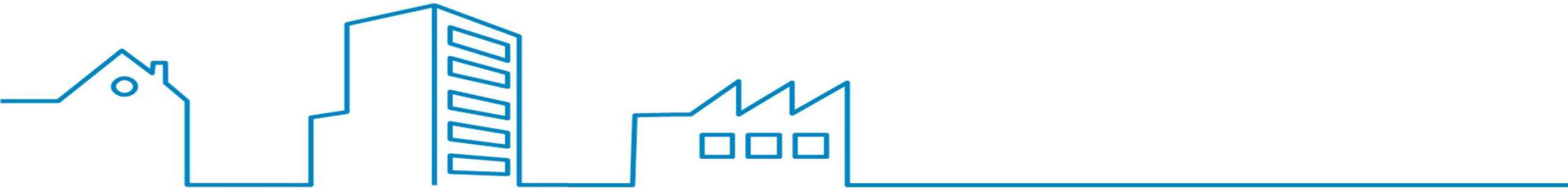
Considerations should be made to the effects of glycol.

If using 3rd party expansion vessels, please check the instructions

Section 4.2

Pre Start-up Checks

Daikin Altherma Hybrid Monobloc



Hybrid Monobloc pre-start up checks
System Flow rate calculations
Pump curves and ESP’s
Expansion vessel
Cleaning of the internal water filter

In menu 6.1 several settings can be checked to ensure the unit is running correctly.

Tank temperature
Outdoor ambient
Flow water after heat exchanger
Flow water temperature after backup heater
Return water temperature
Liquid refrigerant temperature

Pre-Start Up Checks

Ensure power has been supplied to the unit for at least 6 hours prior to running the compressor

Check the unit for damage

Check all equipment has been correctly sited and securely mounted

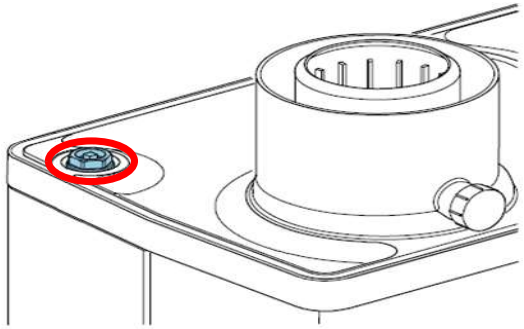
Check all electrical connections are correct and secure

Check any additional thermostat / external valves interlock terminations

Check that the correct power supplies available for the OU, BSH and BUH via a local isolator

Ensure that the water circuit has been correctly installed, insulated, pressure tested, filled and vented of all air

Ensure that both water isolation valves are fully open



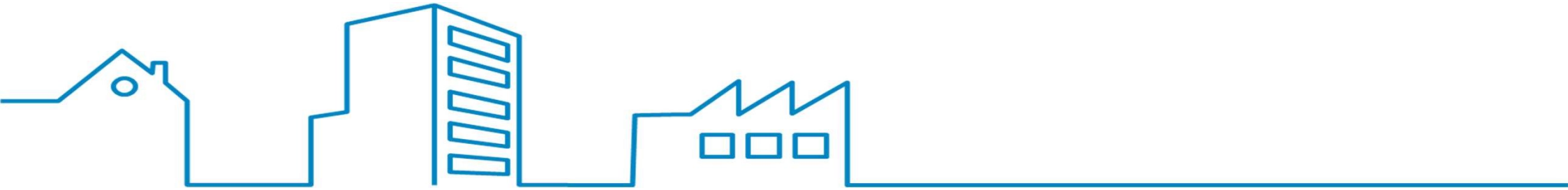
DHW Tank – Pre-Start Up Checks

- Check the unit for damage
- Check that the DHW tank has been correctly sited
- Check the DHW tank to hydrobox electrical connections
- Check that the correct power supply is available for the booster heater, via a local isolator
- Check the safety device settings
- Check the factory fitted pressure/temperature relief valve has been discharged to a suitable location, complying with G3 regulations
- Check for correct water supply, flow, return, hot water & drainage connections
- Check that the DHW tank sensor has been installed correctly
- Check that the G3 Label has been filled in on the DHW tank

Section 4.3

Controller Basics

Daikin Altherma Hybrid Monobloc



EKRUMHL Remote Controller

Malfunction Information
If this symbol is displayed on the screen this button can be pushed to show a more detailed explanation of the fault

On/Off
This will turn on or off the space heating (room temperature, leaving water temperature) & DHW (domestic hot water temperature) control

Navigation or changing settings
These buttons will move the cursor on the screen.
Navigate in the menu structure.
Change settings.
Selects a mode.

Menu Structure or Back
From the home page this will open the menu structure.
Within the menu structure this button will go up a level.
In programing this button is also your back button

Home Pages
This will allow you to toggle between 4 home pages

- Room temperature
- LWT main
- LWT Additional
- DHW tank temperature

OK
This button will take you to the next setting / schedule whilst programing the controller, it will also confirm the setting change.
Switches the display from actual and desired (offset if selected) values from the main screen.
Activate or deactivate the child lock by pushing and holding for more than 5 seconds

Daikin Altherma hybrid Remote Controller – Symbols

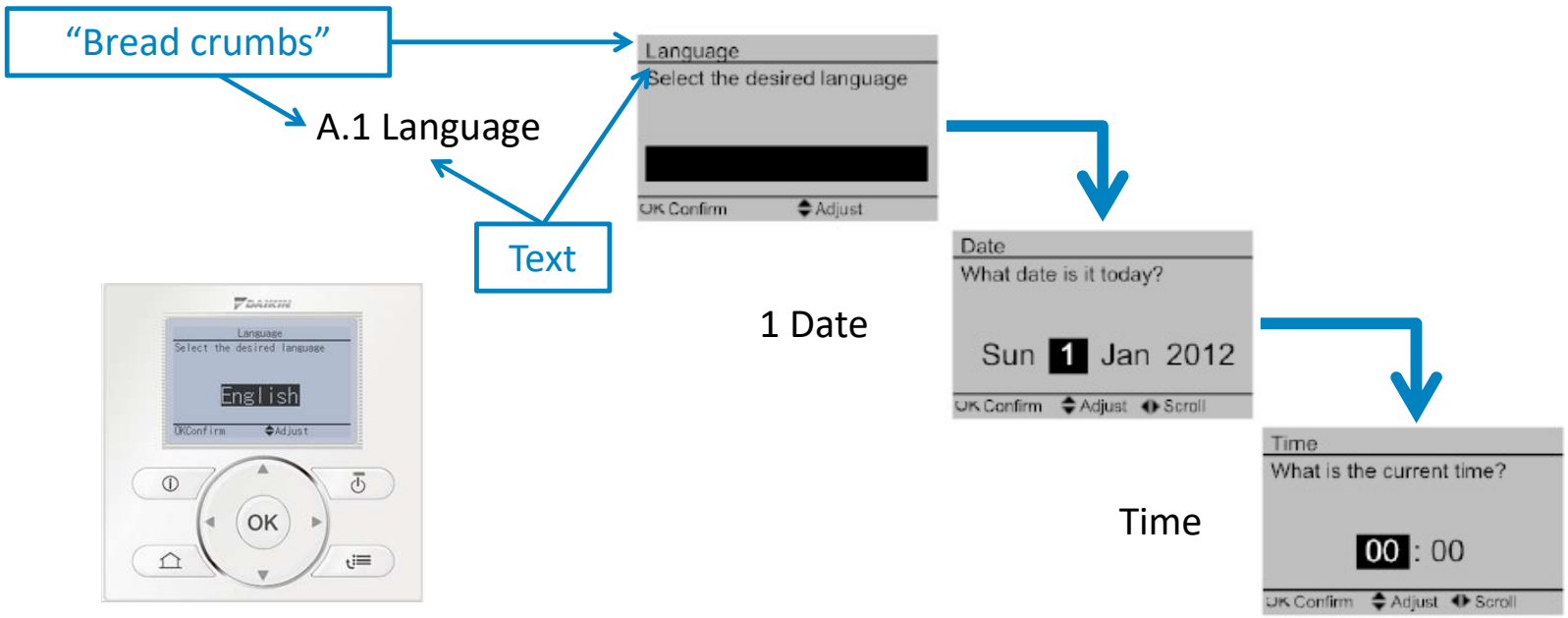
Icon	Description
	Space operation mode = Heating.
	Space operation mode = Cooling.
	Unit is operating.
	Desired room temperature = preset value (Comfort; daytime).
	Desired room temperature = preset value (Eco; nighttime).
	• On the room temperature home page: Desired room temperature = according to the selected schedule. • On the DHW tank temperature home page: DHW tank mode = Scheduled mode.
	DHW tank mode = Reheat mode.
	DHW tank mode = Scheduled + reheat mode.
	At the next scheduled action, the desired temperature will increase.
	At the next scheduled action, the desired temperature will NOT change.
	At the next scheduled action, the desired temperature will decrease.
	The preset value (Comfort or Eco) or scheduled value is temporarily overruled.
	The system will produce domestic hot water for the indicated number of persons.
	The DHW tank booster mode is active or ready to be activated.
	Quiet mode is active.
	Holiday mode is active or ready to be activated.
	Child lock mode and/or function lock mode is active.
	Boiler operation.

Icon	Description
	Heat pump operation.
	Boiler and heat pump operation.
	The disinfection mode is active.
	A malfunction occured. Press to display more information about the malfunction.
	Weather-dependent mode is active.
	User permission level = Installer.
	Defrost/oil return mode is active.
	Hot start mode is active.
	Emergency operation is active.

Bread crumbs Explanation

After the power is applied to the indoor unit for the first time you will be guided through the following set up.

There are “breadcrumbs” and text to easily locate where you are within the menus.



Do not confirm the layout until the settings have been changed as this will skip the Quick wizard

5.02

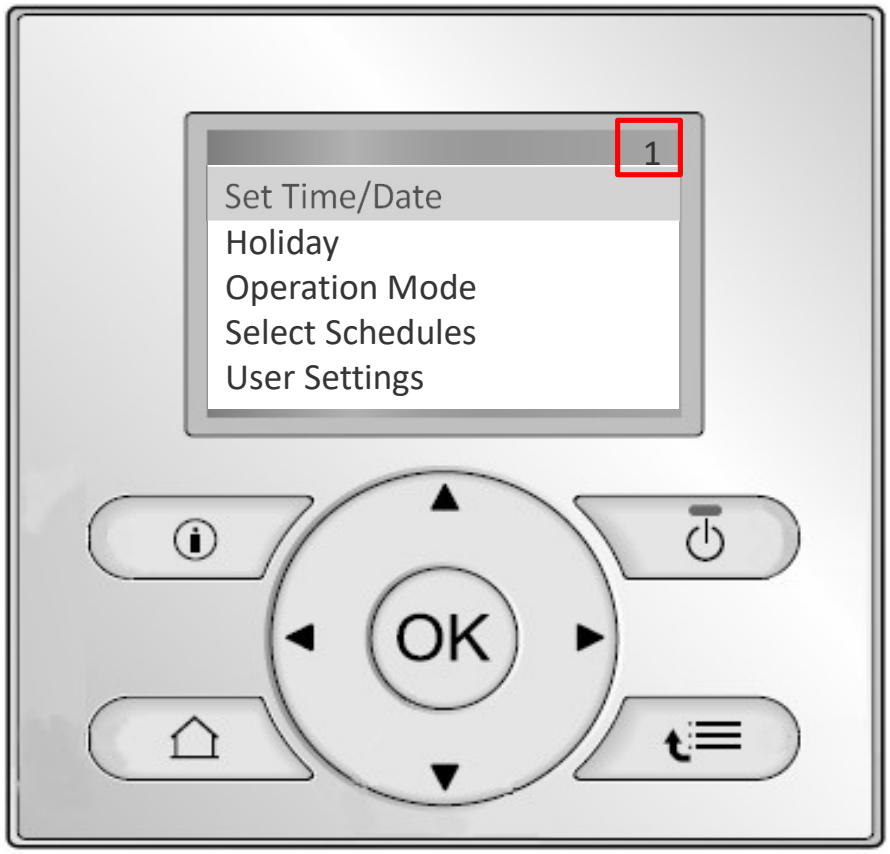
Breadcrumb Structure

Example:

When entering the menu structure (press the bottom right button) you will notice “1” in the top right side of the display and “Set Time/Date” will be highlighted.

Each menu has its own number, this is the “breadcrumb structure” and is used throughout the training and installation manuals

Not all menus will be available depending on what mode you are in.



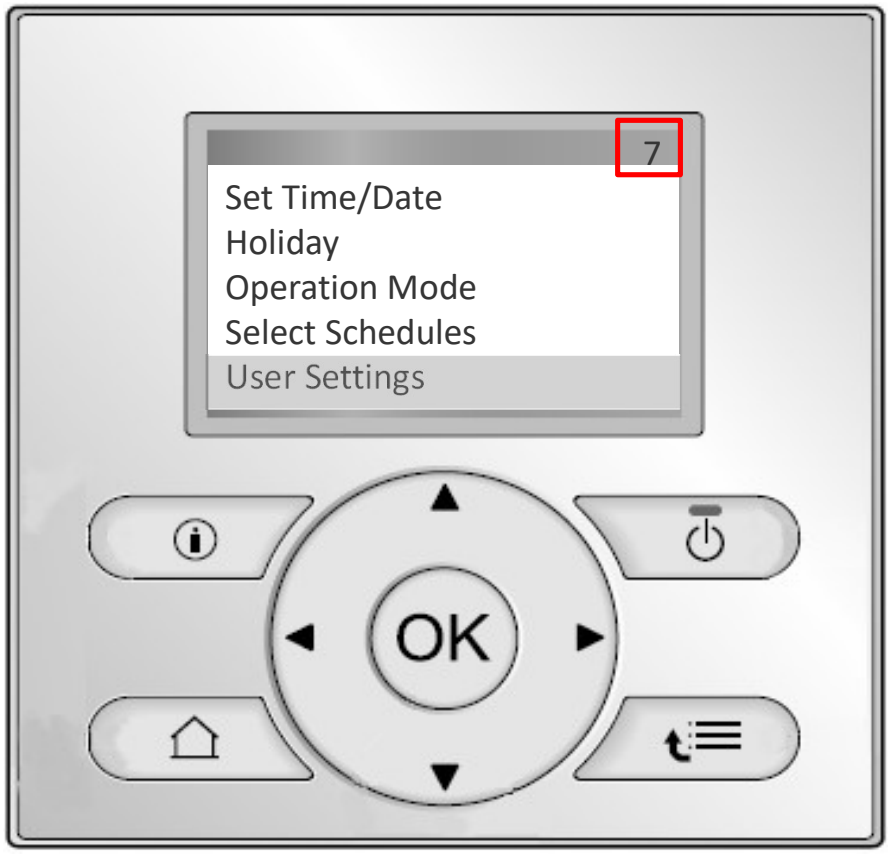
Breadcrumb Structure

Example:

You move through the menus using ▲ + ▼

Once at the desired menu press OK to enter it.

Menu 7 is “User Settings”.



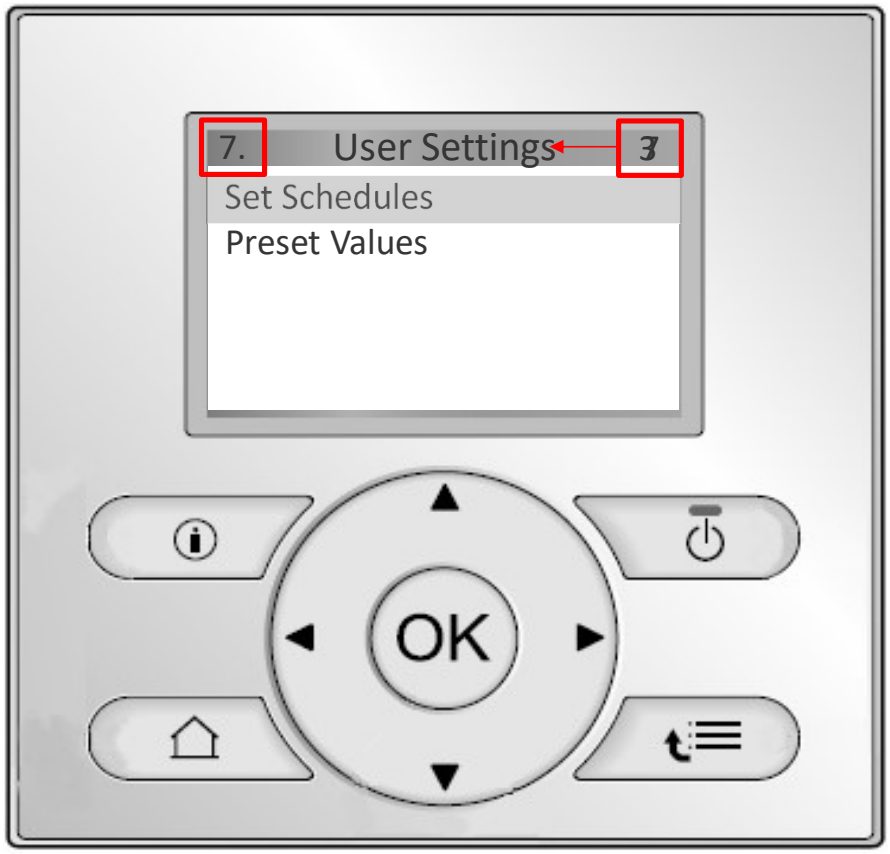
Breadcrumb Structure

Example:

Once you enter the menu, the 1st breadcrumb will move to the left side with the name of the menu you entered at the top

The sub-menus will appear and the breadcrumb for them will be show on the right side.

Not all sub-menus will be available depending on what mode you are in.



Breadcrumb Structure

Example:

On entering the chosen sub-menu, the breadcrumb will again move to the left side

Furher sub-menus may appear and the breadcrumb for them will be show on the right side

Setting a schedule for heating is setting 7.3.1

HOW TO ENTER ADV END USER MODE

From End User mode on any home screen Press the button.

Press and hold the button, until you see + before breadcrumb.

This is now in ***Adv End User*** mode

The menu structure will expand. More menus and sub-menus will be available. You will now find menu 6

Menu 6.1 is where you will find “Sensor Information” which is used during commissioning

Entering Higher Levels & Menus

To enter Installer mode and access installer menus

Go to menu 6 “Information” and press OK

Go to menu 6.4 “User permission level” and press OK

Press and hold the button until it says “Installer Mode”

Press 2 times to go back to the 1st level of the breadcrumb structure

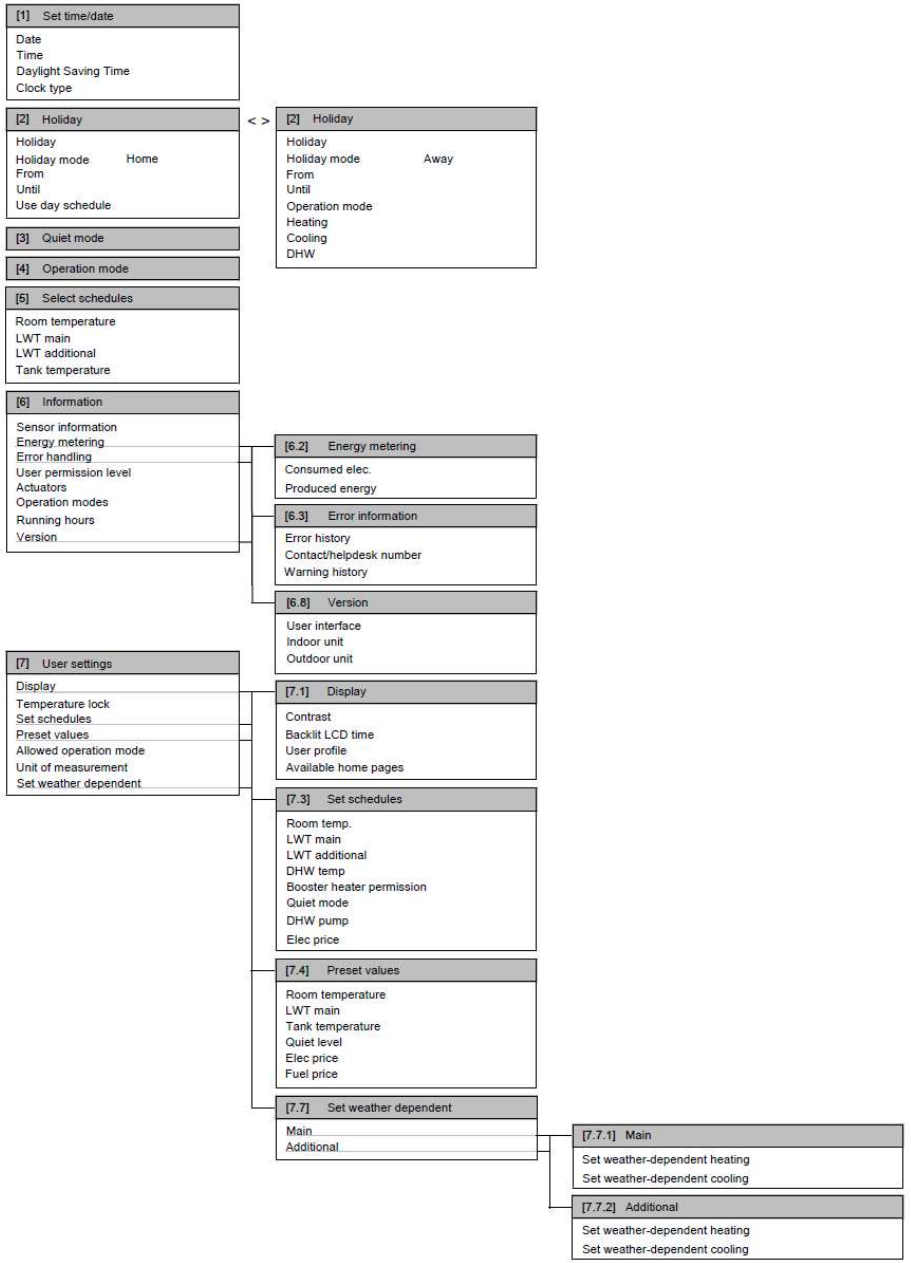
Scroll down to menu A “Installer Settings”
Press OK to enter.

On the home screen a symbol denotes Installer mode Is active. This can be deactivated by pressing for 5 seconds on any home screen

Available End User / Adv End User Menus

Within the installer reference guides you will find these tables showing the full menu and sub-menu structure

The main (1st) menu is highlighted in grey and the sub-menus are shown underneath



Breadcrumb Structure

When entering Installer Mode “A. Installer Settings” will be shown in the main menu. All installer breadcrumbs will start with “A”

Menu A.7 is for Commissioning

Please Note – Installer menus are completely different from end user menus

Example

7.3.1 Was an end user menu for setting a heating schedule

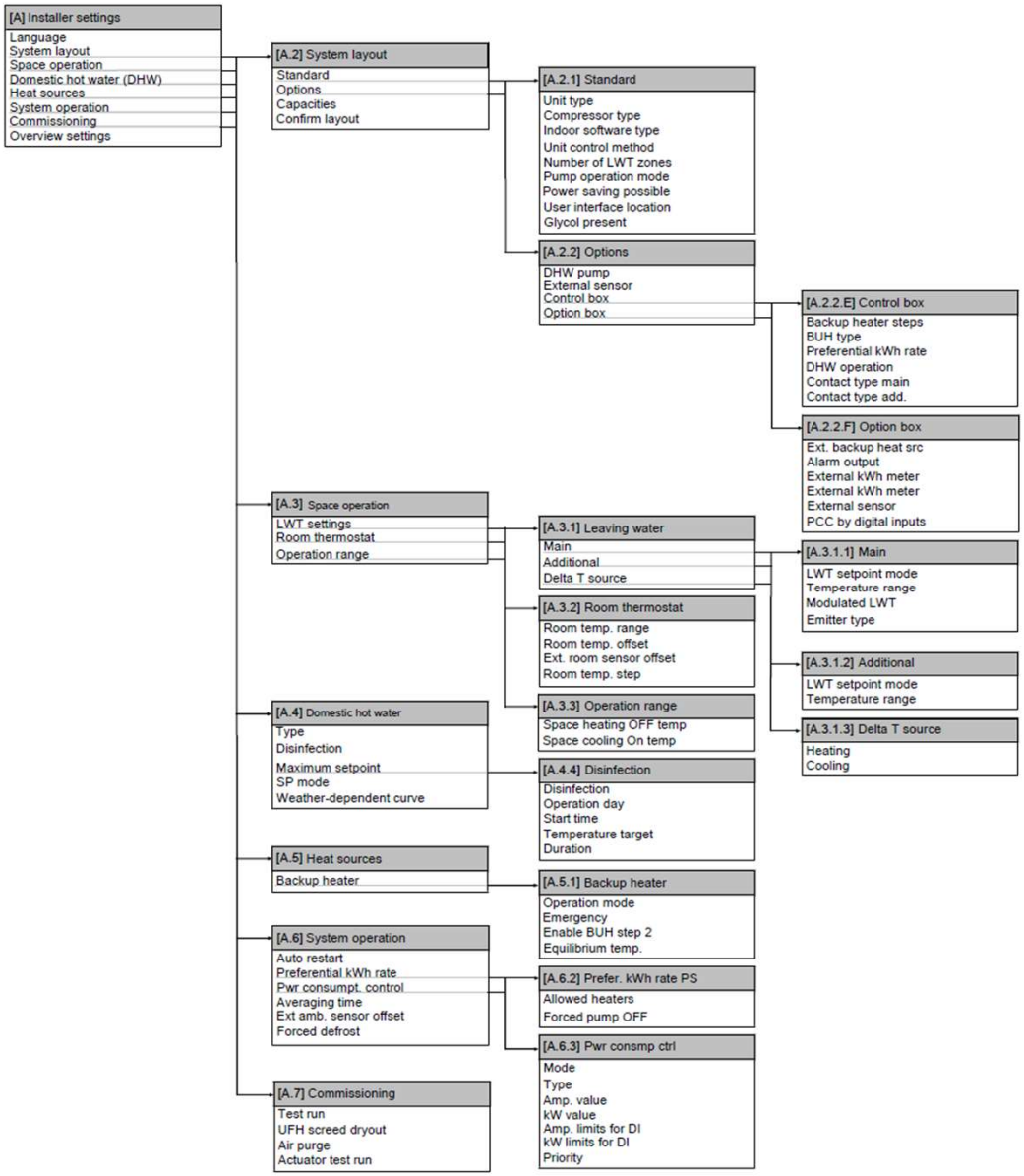
A.7.3.1 is an installer setting for use during commissioning

Installer Menu Structure

All installer menus will also be found in the installer reference guides in the same format as previously shown.

All menus are explained fully throughout the mauals using the breadcrumb structure as shown below.

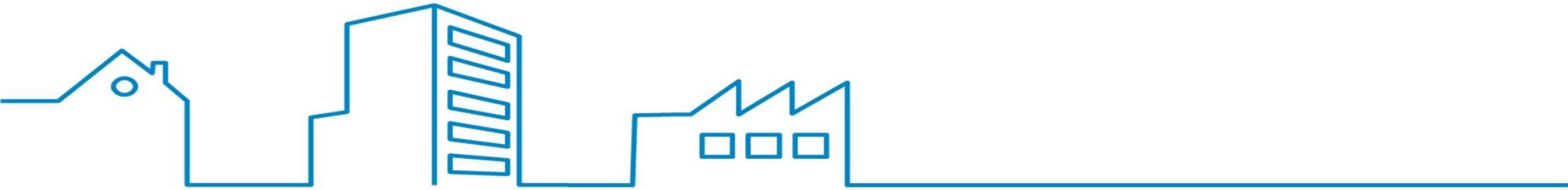
#	Description
[A.2.1.7]	Unit control method: • 0 (LWT control): Unit operation is decided based on the leaving water temperature regardless the actual room temperature and/or heating or cooling demand of the room. • 1 (Ext RT control): Unit operation is decided by the external thermostat or equivalent (e.g. heat pump convector). • 2 (RT control)(default): Unit operation is decided based on the ambient temperature of the user interface.



Section 4.4

A.7 – Commissioning

Daikin Altherma Monobloc CA



Breadcrumb Settings : Commissioning

A.7.3 – Manual Air Purge

This function will allow for a manual air purge of the heating system, this is **essential** for correct operation.

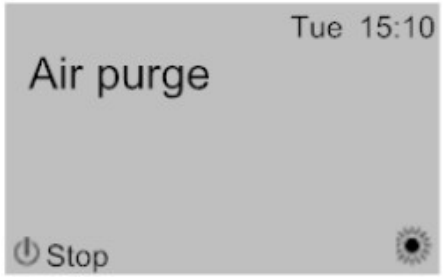
A.7.3.1 set to Manual and press OK

A.7.3.2 set to either Low or High pump speed and press OK

A.7.3.3 set to either SHC (space heating/cooling) or Tank (DHW operation) and press OK

A.7.3.4 set to Start and press OK to start the air purge function

Air purge will now start and the following screen will be shown



To Interrupt the air purge function press and then press OK

Bread Crumb	Overview
A.7.3	N/A

Breadcrumb Settings : Commissioning

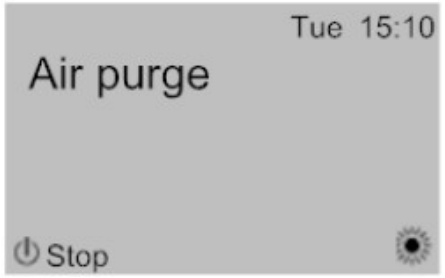
A.7.3 – Manual Air Purge

This function will allow for an automatic air purge of the heating system, this is essential for correct operation

A.7.3.1 set to Automatic and press OK

A.7.3.4 set to Start and press OK to start the air purge function

Air purge will now start and the following screen will be shown



To Interrupt the air purge function press ⏻ and then press OK

Bread Crumb	Overview
A.7.3	N/A

Commissioning

At the end of the commissioning process the Daikin controller will default ALL home screens to off and they must be turned back on.

Remember, even if the boiler is set up as a combi, The DHW screen on the Daikin controller must be turned ON or DHW will not operate when there is a demand.

Any Questions

Thank you